1 Useless

Van Looy et al. (2009) on Flow and over Dunes (2002) Aalto (2002) Abbe and Montgomery (2003) El Kadi Abderrezzak et al. (2014) El Kadi Abderrezzak et al. (2016) Abgrall and Karni (2009) Achoui (2020) Ackers and Charlton (1970) Ackers and White (1973) Adami (2016) Afentoulis et al. (2022) Agtersloot et al. (2019) Agtersloot and Sieben (2020) Ahmed and Sanchez (2011) Ahnert (1987) Ahnert (1994) Akimoto and Yamamoto (2017) Akkerman et al. (2006) Alexander et al. (2012) Alexy (2008) Alexy (2018) Allen (2008) Allen (1965) Allen (1968a) Allen (1968b) Allen (1969) Allen (1970a) Allen (1970b) Allen (1978) Allen (1985) Allgower and Georg (1990) Alvarado Ortega (2013) Alvarez et al. (2017) Ambagts et al. (2017) Ambagts (2019) Ambati (2008) An et al. (2017a) An et al. (2017b) An et al. (2018) An et al. (2019) An et al. (2021) Ancey et al. (2002) Ancey et al. (2006) Ancey et al. (2008) Ancey (2010) Ancey and Heyman (2014) Ancey et al. (2015) Ancey (2020a) Ancey (2020b) Ancey and Pascal (2020) Anderson (1986) Anderson and Meerschaert (1998) Andrews (1980) Andrews (1983) Andrews and Erman (1986) d'Angremond and van Roode (2004) Arailopoulos (2014) Arcadis (2011) Arcadis15 (2015) Ardron (1980) Arkesteijn et al. (2017) Arkesteijn et al. (2019) Arkesteijn et al. (2021) Arkesteijn Armanini et al. (2015) Armanini (2017) Armanini and Di Silvio (1988) Armanini and Di Silvio (1989) Armanini (1995) Armi (1986) Arnaud et al. (2015) Arnaud et al. (2017) Arnott and Hand (1989) Ashida and Michiue (1971) Ashida and Michiue (1972) Ashida and Michiue (1973) Ashida et al. (1990) Ashmore et al. (2018) Ashmore et al. (1992) Asselman et al. (2018) Asselman and de Grave (2021) Atwater (1987) Audusse, Emmanuel et al. (2015) Axler (2015) Azhar (2018) Baar et al. (2018) Baar et al. (2019) Baatjes (2002) Babovic and Minns (2022) Bacchi et al. (2014) Backert et al. (2010) Bagnold (1941) Bagnold (1973) Ballio et al. (2018) Ballio et al. (2019) Balmforth and Mandre (2004) Balmforth and Vakil (2012) Banks et al. (1992) Baptist (2005) Bardají et al. (1990) Bardoel (2010) Barker et al. (2015) Barker and Gray (2017) Barker et al. (2017a) Barker et al. (2017b) Barneveld (2018) Barneveld et al. (2021) H. et al. (2022) Barneveld (2023) Barneveld (1988) Barry et al. (2004) Barry et al. (2007) Barton et al. (2022) Bassi et al. (2022) Bastiaansen et al. (2018) Batalla (2003) Batchelor (1970) Bates et al. (2005) Bates et al. (2010) Bathurst (1985) Battjes and Labeur (2014) Battjes and Labeur (2017) Baumanis and Kim (2016) Baur and Jagers (2002) Baydoun. (2018) Bechteler (2003) Becker (2015) Becker (2017a) Becker (2017b) Becker (2017c) Becker (2021) Becker et al. (2022) Beckers et al. (2020) Beeler et al. (1972) Begin et al. (1981) Begin (1988) Begnudelli et al. (2010) Belanger (1828) Bell and Sutherland (1983) Bell et al. (1986) Belleudy et al. (2010) Benjamin and Feir (1967) Bennett and Nordin (1977) Benson and Thomas (1966) Berends (2014) Berends et al. (2020) Berends et al. (2021) Berends et al. (2022) Berezowsky and Jiménez (1994) Ber (1925) Berkhof et al. (2018) Berkhout (2003) Bernard and Schneider (1992) Bernard (1993) Bernardara et al. (2008) Bernhardt et al. (2009) Bertagni and Camporeale (2018) Bertagni (2019) Berthon et al. (2015) Bertin et al. (2009) Bertin et al. (2014) Bertin et al. (2015) Bertoldi and Tubino (2005) Bertoldi et al. (2005) Bertoldi and Tubino (2007) Bertoldi et al. (2009) Bertoldi et al. (2014) Best (2005) Best (2019) Bettess and Frangipane (2003) Bettess and White (1983) Bialik et al. (2015) Biedenharn et al. (2008) Bijkerk et al. (2014) Bijkerk et al. (2016) Bijlsma et al. Binnenvaartkrant (2021) Biondini and Trogdon (2017) Bird (2008) Birkhoff (1954) Bispen et al. (2014) F.R.S. (2001) E. Bladé (2014) Blanckaert and Graf (2001) Blanckaert and de Vriend (2003) Blanckaert and De Vriend (2004) Blanckaert and Graf (2004) Blanckaert (2009) Blanckaert (2010) Blanckaert et al. (2013) Blench (1966) Blevins (1982) Blöschl et al. (2019) Blokland (1985) Blom (2000) Blom et al. (2003) Blom and Parker (2004) Blom and Kleinhans (2006) Blom et al. (2006) Blom (2008) Blom et al. (2008) Blom and Chavarrías (2014) Blom et al. (2015a) Blom et al. (2015b) Blom et al. (2016a) Blom (2016) Blom et al. (2016b) Blom et al. (2017a) Blom et al. (2017b) Blom et al. (2017c) Blom et al. (2017d) Blom and Kleinhans (1999) Blondeaux et al. (2018) Blondeaux and Seminara (1985) Blott and Pye (2001) Blum and Törnqvist (2000) Boersema (2020) Boesch et al. (1994) Bohorquez and Ancey (2015) Bohorquez and Ancey (2016) Bolla Pittaluga et al. (2003) Bolla Pittaluga et al. (2014) Bolla Pittaluga et al. (2015a) Bolla Pittaluga et al. (2015b) Bolwidt et al. (2017) Bom (2017) Bomers et al. (2019) Bonasoundas (1973) Bonilla-Porras et al. (2021) Booij (2003a) Booij (2003b) Booij and Pennekamp (1983) Booij and Pennekamp (1984) Booß-Bavnbek and Høyrup (2003) Borah et al. (1982a) Borah et al. (1982b) Borah (1988) Borges (1964) Borges (1977) Borsboom (2011-06-20) Borsboom (2015) Borsboom (2017) Borsboom (2019a) Borsboom (2019b) Borsboom (2020) Borsboom (2021) Borsboom (1997) Borsboom (1997) Borsbooma et al. Borsboom Bosch (2014) Bouchaud and Georges (1990) Bouchut et al. (2022) Bouratsis et al. (2013) Boussinesq (1901) Boussinesq (1903) Box (1976) Boyer et al. (2005) Braat et al. (2017) Braat et al. (2019) Bradley et al. (2010) Bradley and Tucker (2012) Bradley (2017) Bradshaw (1987) Brakenhoff et al. (2020) Bravard et al. (1999) Bravo-Espinosa et al. (2003) Bray (1975) Breda et al. (2007) Breda et al. (2009) Bregman (2018) Bressan (2011) Bresse (1860) Breusers (1966) Breusers and Schukking (1971) Breusers and Schukking (1976) Breusers et al. (1977) Bridge and Jarvis (1976) Bridge and Dominic (1984) Bridge and Bennett (1992) Bridge (1992) Bridge (1993) Brock (1967) Brock (1969) Broomans (2003) Brown and Lawler (2003) Brown et al. (2018) Brownlie (1983) De Bruijn (1911) Brundrett and Baines (1964) Brunner (2016) Buffington (2012) Buffington and Montgomery (1997) Buffington and Montgomery (1999) Bui and Bui (2020) Buijse et al. (2019a) Buijse et al. (2019b) Bulle (1926) Burge (2006) Burkhalter and Koschmieder (1974) Busnelli et al. (2001) Busse (1978) Butcher (1996) Butcher and Wanner (1996) Consorcio Estudio Canal de Barranquilla (2020) CIRIA et al. (2007) Collaboration (2012) CSO (2013) Cai et al. (2021) Call et al. (2017) Callander (1969) Camenen et al. (2017) Camporeale et al. (2007) Canestrelli et al. (2009) Canestrelli et al. (2010) Canestrelli et al. (2012) Canestrelli et al. (2016) Cao and Carling (2002a) Cao and Carling (2002b) Cao et al. (2002) Cao and Carling (2003) Cao et al. (2004) Cao et al. (2011) Cao et al. (2016) Miralles (2017) Caponi and Siviglia (2018) Carling et al. (2000a) Carling et al. (2000b) Carling et al. (2005) Carling (1988) Carling (1999) Carniello et al. (2012) Carraro et al. (2018a) Carraro et al. (2018b) Carson (1951) Caruso et al. (2016) Carver and Hinds (1978) Castro et al. (2001) Castro et al. (2009) Castro-Bolinaga et al. (2016) Díaz et al. (2008) Díaz et al. (2009) Castro Díaz et al. (2011) Casulli and Zanolli (2002) Casulli (2014) Caviedes-Voullime et al. (2012) Caviedes (1984) Cayocca (2001) Cerna and Harvey (2000) Chalons and Del Grosso Chan (1984) Chang et al. (2017) Chapra and Canale (2010) Charru et al. (2004) Charru and Hinch (2006) Charru (2006) Chatanantavet and Parker (2009) Chatanantavet et al. (2010) Chaudhry (2008) Chaudhry (2010) Chavarrías et al. (2013a) Chavarrías et al. (2013b) Chavarrías et al. (2014a) Chavarrías et al. (2014b) Chavarrías et al. (2014c) Chavarrías et al. (2015a) Chavarrías et al. (2015b) Chavarrías and Ottevanger (2016) Chavarrías et al. (2016) Chavarrías and W (2017) Chavarrías et al. (2017) Chavarrías et al. (2018a) Chavarrías et al. (2018b) Chavarrías et al. (2018c) Chavarrías et al. (2018d) Chavarrías et al. (2018e) Chavarrías and Blom (2019) Chavarrías et al. (2019a) Chavarrías et al. (2019b) Chavarrías et al. (2019) Chavarrías (2019a) Chavarrías and Ottevanger (2019) van der Kaaij and Chavarrias (2019) Chavarrías et al. (2019c) Chavarrías et al. (2019d) Chavarrías (2019b) Chavarrias et al. (2020) Chavarrías et al. (2020a) Chavarrías et al. (2020b) Chavarrías (2020) Chavarrías and Ottevanger (2020) Chavarrias (2020) Chavarrias et al. Chavarrías et al. (2021a) Chavarrías et al. (2021b) Chavarrias and Ottevanger (2021) Chavarrias (2021a) Chavarrias (2021b) Chavarrías et al. (2021c) Chavarrías et al. (2021c) Chavarrias (2021c) Chavarrías et al. (2022) Chavarrías et al. (2022) Chavarrias (2022a) Chavarrias (2022b) Chavarrias (2022c) Chavarrias and Ottevanger (2022) Chavarrias Chavarrias et al. (2022) Chavarrías et al. Chavaz and Gygax (1964) Chbab (1996) Chen and Peng (2006) Chen et al. (2007) Chen (2015) Chen et al. (2017) Chen and Jirka (1995) Chen and Jirka (1997) Cheng and da Silva (2019) Cheng and Chang (1992) Cheviron and Moussa (2016) Chien and Wan (1999) Chiew (1992) Chiew and Parker (1994) Chin et al. (1994) Toe (2018) Chivers and Sleightholme (2012) Cho (2012) Choi and Merkle (1991) Choi and Merkle (1993) Chorin (1967) Chorin (1968) Chorley and Kennedy (1971) Chow (1959) Chrzanowski et al. (2019) Chrzanowski and Buijse (2019) Chu et al. (1991) Church and Ham (2004) Church (2006) Church (2013) Church and Ferguson (2015) Church (2015) Church and Haschenburger (2017) Church and Rood (1983) Church and McLean (1992) Cihan and Hafizoğullari (2021) Clare et al. (2022) Clark (2002) Coates and Vitek (1980) Colebrook (1939) Colella (1988) Colina Alonso et al. (2020) Colina Alonso et al. (2022) Collas et al. (2020) Colombini (2004) Colombini and Stocchino (2005) Colombini and Stocchino (2008) Colombini and Stocchino (2011) Colombini and Stocchino (2012) Colombini (2014) Colombini and Carbonari (2017) Colombini (2022) Colombini et al. (1987) Colombini and Tubino (1991) Colombini (1993) Colombini and Parker (1995) COMBY (2015) Copeland et al. (2005) Copernicus (1543) Cordier et al. (2011) Cordier et al. (2019) Corenblit et al. (2015) Cormagdalena et al. (2012) Corner et al. (1990) Correia et al. (1992) Cosner (1991) Cotino Cotino Cotteleer et al. (2019) Cotteleer and Van der Mark (2019) Courant et al. (1928) Courant and Hilbert (1989) Cox et al. (2021) Crank and Nicolson (1947) Crickmore and Lean (1962a) Crickmore and Lean (1962b) Crosato and Mosselman (2009) Crosato (2013) Crosato and Mosselman (2020) Crosato (1990) Cross and Hohenberg (1993) Crowe et al. (2009) Cui et al. (2003a) Cui et al. (2003b) Cui and Parker (2005) Cui et al. (2006a) Cui et al. (2006b) Cui (2007) Cui and Parker (1998) Culling (1960) Cunge and Hager (2015) Cunge and Perdreau (1973) Curtis et al. (2010) Czapiga et al. (2021) Matt Czapiga and Viparelli (2021) Czapiga et al. (2022) Dabrio et al. (1991) Dade et al. (2011) Dade and Friend (1998) Dafermos (2010) Dafermos (2016) Dalton and Szabo (1977) Damsma and Van Koningsveld (2016) Darby et al. (2002) Dargahi (1990) Darmofal and Schmid (1996) Davidson (2004) Day (1980) De Goede (2020) De Heer and Mosselman (2004) Deakin and Kildea (1999) Decyk and Gardner (2007) Decyk and Gardner (2008) Decyk and Gardner Defina (2003) Deigaard and Fredsøe (1978) Deigaard (1980) Deigaard (1982) Van der Deijl (2021a) Van der Deijl (2022) Van der Deijl (2021b) Delaunay (1934) Delis et al. Dellacherie (2010) Deltares (2015) Deltares (2020a) Deltares (2022a) Denaro (2023) DÃ©pret et al. (2017) Devaney (1989) Devauchelle et al. (2010) Dewals et al. (2015) Dey (2014) Dey (1999) Dhamotharan et al. (1980) Dhont and Ancey (2018) Di Silvio and Nones (2014) Di Silvio and Peviani (1989) Di Silvio (1992a) Di Silvio (1992b) Di Silvio and Marion (1997) Die Moran et al. (2013) Dierx (2018) Dietrich et al. (1979) Dietrich and Smith (1983) Dietrich and Smith (1983) Dietrich and Smith (1984) Dietrich et al. (2017) Dingle et al. (2017) Dinh et al. (2003) Disco and Van den Ende (2003) Disco and Toussaint (2014) Doelman (1991) Doets (2015) Dogan et al. (2009) Donchyts et al. (2013) Donchyts et al. (2014) Dong et al. (2016) Doornekamp (2019a) Downs and Gregory (2004) Doyle et al. (2007) Doyle and Shields (2008) Drake et al. (1988) Drazin and Reid (1982) Dressler (1949) Drew et al. (1979) Drew and Passman (1999) Du et al. (2012) Duan et al. (2001) Duan (2004) Duan and Julien (2005) Duan and Julien (2010) Duan (1998) Duizendstra (2001) Duizendstra and M.Laguzzi (1996) Duizendstra and Flokstra (1998) Duizendstra (1999) Dulal et al. (2010) Dumbser and Toro (2011) Dumbser and Casulli (2013) Dunbar et al. (2023) Dunne and Jerolmack (2018) Duró (2020) Duró et al. (2020) Duró et al. (2018) Dutta et al. (2017) Dutta and Garcia (2018) Džubáková et al. (2015) ENW (2021) Eça et al. (2016) Eckhaus (1965) Eckhaus and Iooss (1989) Eckhaus (1992) Eckhaus and Kuske (1997) Eden and Tunstall (2006) Edler (2020) Edmonds and Slingerland (2008) Edmonds et al. (2011) eekhout and Hoitink (2014) Eelkema (2021) Egashira and Ashida (1992) Egiazaroff (1965) Egiazaroff (1967a) Egiazaroff (1967b) Einfeldt Einstein (1905) Einstein (1936) Einstein et al. (1940) Einstein (1942) Einstein (1950) Einstein and Chien (1953) Einstein and Chien (1955) Einstein and Li (1958) Einstein and Shen (1964) Einstein (1971) Eke et al. (2014a) Eke et al. (2014b) Elder (1959) Eleftherakis et al. (2010) Eleftherakis (2013) Elling (2009) Elshobaki et al. (2018a) Elshobaki et al. (2018b) Emmanouil (2017) Emmett and Wolman (2001) Engelund and Hansen (1967) Engelund (1970) Engelund and Skovgaard (1973) Engelund (1974) Engelund (1975) Engelund et al. (1982) Englert and Brout (1964) Enrile et al. (2020) Erdogan and Chatwin (1967) Fernández-Nieto et al. Escarameia and May (1995) Esfahanian et al. (2013) Eslami et al. (2021) Eustice (1910) Eustice (1911) Ewe and Lauschke (2012) Exner (1920) Exner (1925) Ezz et al. (2012) Faddeev and Faddeeva (1963) Fairbanks (1989) Falcon (1984) Falconer (1980) Fan et al. (2016) Fan et al. (2017) Fargue (1894) Fasolato et al. (2009) Fasolato et al. (2011) Fathel et al. (2015) Fedele and Paola (2007) Federici and Paola (2003) Federici and

Seminara (2003) Feng and Merkle (1990) Fenton (2010) Fenton (2015) Fenton and Abbott (1977) Ferguson et al. (2002) Ferguson (2003) Ferguson and Church (2004) Ferguson (2007) Ferguson and Church (2009) Ferguson et al. (2011) Ferguson et al. (2015) Ferguson and Ashworth (1991) Ferguson et al. (1996) Ferguson et al. (1998) Fernandez and Guerra-Merchan (1996) Luque (1974) Fernandez-Luque and Van Beek (1976) Fernández Nieto (2003) Ferrer-Boix et al. (2013a) Ferrer-Boix et al. (2013b) Ferrer-Boix and Hassan (2014) Ferrer-Boix et al. (2014) Ferrer-Boix et al. (2015) Ferrer-Boix and Hassan (2015) Ferrer-Boix et al. (2016) Finnie et al. (1999) Fioole et al. (2002) Fioole (2005) Fischer (1967) Fischer (1969) Fischer (1973) Fleischmann et al. (2016) Flierman and Van der Sleen (2021) Flokstra (1977) Flo (1985) Flores et al. (2021) Forstner and Salomons (2010) Forterre and Pouliquen (2003) Intel Fortunato and Oliveira (2007) Foufoula-Georgiou and Stark (2010) Foufoula-Georgiou and Passalacqua (2013) Fowler (1997) Fraccarollo and Toro (1995) Francalanci and Solari (2007) Francalanci and Solari (2008) Francalanci et al. (2009) Fredsøe (1978) Fredsoe (1982) Friedkin (1945) Friedman (1963) Fri (2019) Friedrichs and Wright (2004) Frings (2007) Frings (2008) Frings and Kleinhans (2008) Frings et al. (2009) Frings (2011) Frings et al. (2011a) Frings et al. (2011b) Frings et al. (2012) Frings et al. (2014a) Frings et al. (2014b) Frings et al. (2015) Frings and Brinke (2017) Frings et al. (2019) Frings (2022) Fujisaki et al. (2023) Furbish et al. (2012a) Furbish et al. (2012b) Furbish et al. (2012c) Furbish and Schmeeckle (2013) Furbish et al. (2016) Furbish et al. (2017) Acoustics (2007) Delft (1989) Gabriel et al. (2009) Gabriel et al. (2011) Gad (2008) Galappatti and Vreugdenhil (1985) Galay (1983) Galloway (1975) Galloway (1989) Galvin (1965) Ganti et al. (2010) Ganti et al. (2013) Gao et al. (2016) García-García et al. (2006) Garcia and Parker (1991) García-Navarro et al. (2008) Gardiner (1988) Gardner (1994) Garegnani et al. (2011) Garegnani et al. (2013) Garg et al. (2005) Garres-Díaz et al. (2022) Gasparini et al. (2004) Gasparini et al. (2007) Gastel and Day (2016) Gaster (1962) Gavrilakis (1992) Rijkswaterstaat (2021) Gessler (1965) Gessner and Jones (1965) Gessner (1973) Ghamry and Steffler (2002a) Ghamry and Steffler (2002b) Gibbs et al. (1971) Gibbs (1898) Gibbs (1899) Gibling and Davies (2012) Gibson (1934) Gijón Mancheño et al. (2021) Gilbert (1914) Gilbert (1877) Gilbert (1885) Gilbert (1890) Gill (1968) Gill (1971) Giri and Shimizu (2006) Giri et al. (2008) Giri et al. (2021) Giri et al. (2021) Goddard (2003) Godfrey et al. (1993) Godin (2022-05-01) Godunov (1959) Godunov (1999) en Jan Van Kester (2013) Gölz (2002) Gölz (1990) Gölz (1994) Gomez et al. (2001) Gomez et al. (2007) Gomez et al. (1989) Gomez (1991) Gómez-Bueno et al. (2023) Gonzalez and Taha (2022) Goodwin (2004) Gottlieb et al. (2011) Govedarska et al. (2017) Grabowski and Berger (1976) Graf and Qu (2004) Grams and Wilcock (2007) Grant and Madsen (1982) Grass (1970) Gray and Koekelaar (2010) Gray and Ancey (2011) Greco et al. (2008) Greco et al. (2012) Gregory (2006) Gresho and Lee (1981) Grijsen and Vreugdenhil (1976) Grill et al. (2019) Groenewege (2022) Gruijters et al. (2001) Guala et al. (2014) Guerin et al. (2016) Guerit et al. (2014) Guerrero and Lamberti (2011) Guerrero et al. (2013a) Guerrero et al. (2013b) Guerrero and Lamberti (2013) Guerrero et al. (2015) Guglielmini (1697) Gundlach and Martin-Garcia (2005) Guo et al. (2014) Guo (2015) Guo et al. (2015a) Guo et al. (2015b) Guo et al. (2016) Gupta (2022) Guralnik et al. (1964) Gurnell (2014) Gutierrez et al. (2013) Gutknecht Guy et al. (1966) USACE (2021a) USACE (2021b) HEC-RAS Arneson et al. (2012) HRW (1990) Haberman (2004) Habersack (2001) Hack (1957) Hackney et al. (2017) Hackney et al. (2020) Hadamard (1923) Hager (2003) Hager and Liiv (2008) Hajek and Edmonds (2014) Hall (2004) Hall (2006) Hall (1954) Ham (2005) Ham and Church (2012) Hamamori (1962) Hamming (1962) Hanson (2017) Haque and Mahmood (1983) Harada et al. (2015) Harari (2016) Hardy et al. (2011) Hariharan (2019) Harlow and Amsden (1975) Harms (2021) Harten et al. (1983) Harten (1983) Harten (1984) Haschenburger and Wilcock (2003) Haschenburger (2011) Haschenburger (2013) Haschenburger (2017) Hasegawa (1977) Hasegawa (1981) Hasegawa (1983) Hasegawa (1989) Hass (2000) Hassan et al. (2013) Hassan et al. (1991) Hassan and Church (1994) Hassan et al. (1999) Havinga (2020) Havinga (2009) Havlin and Ben-Avraham (1987) Hazewinkel (2004) Heays et al. (2010) Heays et al. (2014a) Heays et al. (2014b) Heller (2011) Von Helmholtz (1868) Hendriks (2012) Herrero and Berni (2016) Hewitt and Hewitt (1979) Hey and Thorne (1975) Hey (1987) Hey (1996) Heyman et al. (2014) Heyman et al. (2016) Hicks et al. (2021) Higgs (1964) Hill et al. (2010) Hill et al. (2017) Hillebrand and Frings (2017) Himat (1977) Hirano (1971) Hirano (1972) Hodge et al. (2011) Hoeksema (2006b) Hoeksema (2006a) Hoey (1992) Hoey and Ferguson (1994) Hoffmans and Verheij (2021) Hoffmans and Verheij (1997) Hoitink et al. (2017) Holden (1987) Holdermans (2017) Holley (1971) Hollingshead (1968) Holly and Rahuel (1990) Holmes (2007) Holmes (2013) Holthuijsen (2007) Honsell (1885) Horritt and Bates (2002) Hosseini-Sadabadi et al. (2019) Hou and Floch (1994) Houssais and Lajeunesse (2012) Houssais et al. (2015) Hovda (2017) Howard (1965) Howard (1980) Howard (1982) Howard and Knutson (1984) Howard (1987) Elman (1999) Howe (1940) Hsieh and Yang (2003) Hsieh and Yang (2005) Hu and Guo (2011) Hu et al. (2014) Hu and Hui (1996a) Hu and Hui (1996b) Huang et al. (2002) Huang et al. (2018) Hubbell and Sayre (1964) Hubbell and Sayre (1965) Hubbell et al. (1985) Hudson (2001) Hudson and Sweby (2003) Hudson and Sweby (2005) Huismans et al. (2018) Hume (1748) Humphries et al. (2012) Hunter (1985) Huppes (2021) Huthoff et al. (2011) Huthoff et al. (2014) IDEAM (2018) I en W (2018) Ichim and Rădoane (1990) Ikeda et al. (1981) Ikeda (1984) Ikeda and Nishimura (1985) Ikeda and Nishimura (1986) Ikeda and Iseya (1986) Ikeda and Iseya (1988) Ikeda and Izumi (1991) Indah-Everts and Hermans (2021) Infrasite.nl (2007) Irving Irving Isaacson et al. (1954) Isaacson and Temple (1992) Iseya and Ikeda (1987) Israt (2021) Itoh et al. (2017) Itoh et al. (2018) Ivrii and Petkov (1974) Iwagaki (1956) Iwantoro et al. (2021) Iwasaki et al. (2017) Izbash and Khaldre (1970) Jaballah et al. (2015) Jaeggi (1984) Jafarinik et al. Jafarinik and Viparelli (2020) Jagers (2003) Jagers Jain and Kennedy (1974) Jain (1990) Jain (1992) James et al. (2000) Jammers (2017) Jang and Shimizu (2005a) Jang and Shimizu (2005b) Jang and Shimizu (2007) Jansen et al. (1979) Janson (2022) Javernick et al. (2016) Javernick et al. (2018) Jeffreys (1925) Jefimenko (1996) Jerolmack and Mohrig (2005) Jerolmack and Brzinski (2010) Jervey (1988) Jia and Wang (1999) Jiang and Shu (1996) Jiménez (2018) Jin and Steffler (1993) Johannesson and Parker (1989) Johansson (1976) John (1955) John (1960) Johnson et al. (2014) Johnson (1942) Johnson (1992) Jonoski (2022) Jop et al. (2005) Jop et al. (2006) Joseph and Saut (1990) Juez et al. (2014) Juez et al. (2016) Juez et al. (2018) Julien et al. (2002) Julien (1995) Kabanikhin (2008) Kabiri-Samani and Javaheri (2012) Kakinuma and Shimizu (2014) Kalinske (1947) Kalkwijk and De Vriend (1980) Kalkwijk and Booij (1986) Kamphuis (1974) Kantoush and Sumi (2010) Kantz and Schreiber (2003) Kapoor and Narayanan (2022) Karim et al. (1983) Karim and Holly (1986) Karim (1999) Karmineke (2004) Kassem and Chaudhry (2002) Kasvi et al. (2015) Kater (2014) Katz et al. (2002) Kaye and Barghoorn (1964) Keizer (2016) Kellermann (2011) Kelvin (1871) Kemp (2022) Kennedy (1963) Kerssens (1978) Kesseli (1941) Ketcheson and de Luna (2021) Kim et al. (2009) Kimiaghalam et al. (2015) King (1918) King (1933) Kinneging et al. (2012) Kitanidis and Kennedy (1984) Klaassen and Struiksma (1981) Klaassen et al. (1986) Klaassen (1987) Kla Klaassen (1990a) Klaassen (1990b) Klaassen (1991) Kleinhans et al. (2002) Kleinhans and van Rijn (2002) Kleinhans (2004) Kleinhans (2005) Kleinhans et al. (2005) Kleinhans et al. (2007) Kleinhans et al. (2008) Kleinhans et al. (2010) Kleinhans et al. (2009) Kleinhans et al. (2013) Kleinhans et al. (2014) Kleinhans et al. (2015) Kleinhans et al. (2017) Giuliani et al. (1994) Klonsky and Vogel (2011) Klösch et al. (2022) Knaapen and Hulscher (2003) Knight et al. (2007) Knighton (1999) Knowles and Sternberg (1975) Knowles and Sternberg (1976) Koch and Flokstra (1980) Koch and Flokstra (1981) Kodama (1994a) Kodama (1994b) Koedijk (2020) Kok et al. (2017) Kolmogorov (1941) Komar (1987a) Komar (1987b) Komarova and Newell (2000) Komarova and Newell (1995) Kondolf and Minear (2004) Kondolf et al. (2014) Kondolf and Matthews (1991) Kondolf (1997) Koren (1993) Koren (1993) Korteweg and de Vries (1895) Kostaschuk et al. (2009) Kosters et al. (2022) Kostic and Parker (2003a) Kostic and Parker (2003b) Kothe (2003) Koyré (1952) Kragten (2018) Kramer and Stelling (2008) Kranenburg (a) Kranenburg (a) Kranenburg (b) Kranenburg (b) Kranenburg (c) Kranenburg (c) Kranenburg (1992) Kremer et al. (2010) Kroon et al. (2015) Kubatko and Westerink (2007) Kuhnle et al. (2014) Kuhnle and Southard (1988) Kuhnle and Willis (1992) Kuhnle (1992) Kuhnle (1993) Kuijper (2015) Kuijper (2016) Kumbaro and Ndjinga (2011) Kummu et al. (2011) Kuroki and Kishi (1984) Kurstjens (2019) Kutta (1901) Kyong and Il (2016) Kyong (2018) Laan et al. Labbe et al. (2011) Lacey (1930) Lai et al. (2017) Lajeunesse et al. (2010) Lajeunesse et al. (2013) Lajeunesse et al. (2017) Lajeunesse et al. (2018) Lamb et al. (2008) Lamb et al. (2012) Lamb and Venditti (2016) Lamb (1945) Landau (1944) Lane (1954) Lane (1955) Lane (1957) Lange and Newell (1974) Langendoen et al. (2016) Langham et al. (2021) Lanzoni (2000a) Lanzoni (2000b) Lanzoni et al. (2006) Lanzoni and Seminara (2006) Lanzoni et al. (2017a) Lanzoni et al. (2018) Lanzoni and Tubino (1999) Lanzoni et al. (2017b) Laplace (1814) Latteux (1995) Lauer et al. (2008) Lauer and Parker (2008) Lauer et al. (2014) Lauer et al. (2016) Launder and Spalding (1974) Laurens (2020) Laursen and Toch (1956) Lawrence (1990) Lax (1957) Lax (1958) Lax (1980) Le et al. (2018a) Le et al. (2018b) LeVeque (2004) Frigo et al. (2019) Lebedev (1991) Leclair and Bridge (2001) Lee (2006) Lee and Ahn (2023) Lee and Odgaard (1986) Hong-Yuan and In-Song (1994) Lee and Yamamoto (1994) Leeder et al. (1998) Legleiter and Kyriakidis (2006) Leijnse (2018) Leijnse et al. (2021) Lely (1926) Lenau and A. T. Hjelmfelt (1992) H.J.R. Lenders and Leuven (2015) Lensky et al. (2005) Lenzi et al. (2006) Leopold and Maddock (1953) Leopold and Wolman (1957) Leopold et al. (1966) Leopold (1992) Lesser et al. (2004) Lesser (2009) Li (2010) Li et al. (2013) Li et al. (2014b) Li et al. (2014a) Li et al. (2014c) Li et al. (2016a) Li et al. (2016b) Li and Zheng (2016a) Li et al. (2017b) Li et al. (2017a) Li et al. (2018) Li and Zheng (2016b) Li (1994) Liang et al. (2016) Lien et al. (1999) Lin and Gray (1971) Lin (1974) Pin-nam Lin (1984) Karl-Erich Lindenschmidt Lindenschmidt (2017) Lindhart et al. (2015) Lindhart (2015) Liska et al. (1995) Liska and Wendroff (1997) Lisle et al. (2001) Lisle et al. (1991) Lisle et al. (1998) Little (1972) Litty and Schlunegger (2017) Litwin Miller et al. (2014) Liu et al. (2022) Liu (1987) Liu et al. (1994) Liu et al. (1995) Logan (2015) Lokin (2020) Lokin et al. (2022) Long et al. (2008) Long (1956) Longhitano (2008) Lonnquest et al. (2014) Van Looy and Coeck (2005) Lopez Dubon and Lanzoni (2019) Lorentz (1926) Lorenz (1963) Lorenzo-Trueba et al. (2009) Lorenzo-Trueba and Voller (2010) Lorenzo-Trueba et al. (2013) Love and Rider (2013) Lowe (1976) Luchi et al. (2010) LUCHINI and CHARRU (2010) Luchini and Charru (2019) A.P. Luijendijk et al. (2009) Luijendijk et al. (2019) Luijendijk et al. (2019) Luu et al. (2004) Luu et al. (2006) Lyczkowski et al. (1975) Lyczkowski et al. (1978) Lyn and Altinakar (2002) Lyn (1987) Lyn and Goodwin (1987) Lyn (1993) Ma et al. (2017) MacArthur et al. (1990) Mackin (1948) MacQueen et al. (1967) Madsen et al. (1988) Maerker (2013) Mahadevan et al. (1996) Mahiques (2019) Maljaars (2013) Malmon et al. (2002) Malmon et al. (2003) Malone and Parr (2008) Manning (1891) Marchesin (2018) Marion and Fraccarollo (1997) Markus Marr et al. (2000) Marra et al. (2014) Martin et al. (2012) Martin et al. (2014) Martín-Vide et al. (2010) Martín-Vide et al. (2019) Martín-Vide et al. (2022) Martinez-Ortiz et al. (2022) Martínez-Aranda et al. (2021) Martini et al. (2017) Massera (2020) Mathijssen et al. (2022) Carlin (2021) Mays (2010a) Mays (2010b) Mazure (1963) Mazzotti et al. (2009) McKie et al. (2021) McLean et al. (2016) McLean et al. (1999) McNamara and Borden (2004) Meijer (2020a) Meijer (2020b) Menéndez et al. (2021) Mens et al. (2018) Merkin and Needham (1986) Merkle and Athavale (1987) Merrill (1995) Métivier et al. (2017) Metzler and Klafter (2000) Metzler and Klafter (2004) Meyer-Peter and Müller (1948) DHI (2017) MIKOS et al. (1999) Miller et al. (2014) Miller and Ritter (1996) Milliman and Syvitski (1992) Miłosz (1988) Minns et al. (2020) Minns et al. (2022) Miori et al. (2006) Misri et al. (1984) Miwa and Parker (2012) Miyagawa et al. (2017) Mizohata (1961) Mogé et al. Mokrzycka (2013) Molnar (2004) Moncada et al. (2009) Monge (1850) Montijn (2021) Mooiman (2017) MORGAN et al. (2000) Morgan et al. (2020) Morris and Williams (1996) Morris and Williams (1997) Morris and Williams (1999a) Morris and Williams (1999b) Morton and Mayers (2005) Mosquera-Machado and Ahmad (2007) Mosquera-Machado and Ahmad (2007) Mosselman et al. (2000) Mosselman et al. (2001) Mosselman (2001) Mosselman and Sloff (2002) Mosselman et al. (2003) Mosselman et al. (2004) Mosselman (2005) Mosselman (2005) Mosselman (2006) Mosselman et al. (2006) Mosselman and Sloff (2007) Mosselman et al. (2007) Mosselman et al. (2008) Mosselman and Sloff (2008) Mosselman (2009) erik mosselman (2009) Mosselman (2010a) Mosselman (2010b) Mosselman (2013a) Mosselman (2012) Mosselman (2013b) Mosselman and Le (2015) Mosselman (2018a) Mosselman (2018b) Mosselman (2019a) Mosselman (2019b) Mosselman (2020) Mosselman et al. (2021a) Mosselman et al. (2021b) Mosselman (2022) Mosselman (1995) Mosselman (1998) Mosselman et al. (1999)

Mulder-Noordermeer (2008) Muñoz et al. (2021) Muñoz-Ruiz and Parés (2008) Murillo Muñoz and Klaasen (2006) Murillo et al. (2007) Murillo and García-Navarro (2021) Murillo Muñoz and Eduado (1998) Murray (2007) Murray (1965a) Murray (1965b) Murray and Paola (1994) Murray and Paola (1996) Murray and Paola (1997) Muthukumar (2014) Muto and Swenson (2005) Muto et al. (2007) Muto and Steel (1992) Muto and Steel (1997) Na Ranong et al. (2010) Nabi et al. (2012) Nabi et al. (2013a) Nabi et al. (2013b) Nabi et al. (2013c) Nabi et al. (2015) Nabi et al. (2017) Naito et al. (2019) Nakagawa and Tsujimoto (1979) Nakagawa and Tsujimoto (1980a) Nakagawa and Tsujimoto (1980b) Nakagawa et al. (1982) Nakagawa and Tsujimoto (1983) Nakagawa and Tsujimoto (1984) Nakagawa (1988) Naqshband et al. (2014) Naqshband et al. (2016) Nash (1994) NEDECO (1959) NEDECO (1973) Needham and Merkin (1984) Needham (1990) Nelson et al. (1995) Nemec (1990a) Nemec (1990b) Von Neumann and Richtmyer (1950) Nezu and Nakagawa (1984) Nezu et al. (1985) Niesten et al. (2017) Niesten et al. (2019) Niesten et al. (2020) Niesten et al. (2020) Nieuwstadt et al. (2016) Nikora et al. (2002) Nikuradse (1930) Nikuradse (1933) Niño et al. (1994) Niño and García (1994) Niño and García (1998) Nittrouer et al. (2011) Nittrouer et al. (2012) Nittrouer and Viparelli (2014) Oberbeck (1879) Ockelford (1981) Ockelford et al. (2019) Odgaard (1984) Ogink and Stolker (2004) Ogink (2009) Olesen (1981) Olesen (1982) Olesen (1983) Olesen (1985) Olesen (1987) Oliger and Sundström (1978) Olver and Shakiban (2018) Omer (2019) Omer and Yossef (2020) Oreskes et al. (1994) Orrú et al. (2014a) Orrú et al. (2014b) Orrú et al. (2015) Orrú et al. (2016a) Orrú et al. (2016b) Ortega y Gasset (1937) Orton (1988) Orton and Reading (1993) Ottevanger (2005) Ottevanger and Yossef (2006) Ottevanger et al. (2012) Ottevanger (2013a) Ottevanger et al. (2013) Ottevanger (2013b) Ottevanger et al. (2015) Ottevanger (2015) Ottevanger et al. (2016) Ottevanger (2017a) Ottevanger (2017b) Ottevanger and Spruyt (2018) Ottevanger et al. (2020) Ottevanger and Martinez Barbosa (2020) Ottevanger et al. (2021) Ottevanger (2021a) Ottevanger (2021b) Ottevanger and Chavarrias (2022a) Ottevanger (2022a) Ottevanger and Chavarrias (2022b) Ottevanger (2022b) Ouwehand (1958) Overmars (2020) Owens et al. (2004) Owens (2005) MarCom Working Group 180 (2015) Paarlberg et al. (2009) Paarlberg (2009) Paarlberg et al. (2020) Paarlberg et al. (2021) Paine (1776) Paintal (1971) Palmsten et al. (2015) Paola (2000) Paola (2001) Paola et al. (2001) Paola and Voller (2005) Paola et al. (2009) Paola et al. (2011) Paola and Leeder (2011) Paola and Martin (2012) Paola (1988) Paola et al. (1992a) Paola et al. (1992b) Paola and Seal (1995) Paola and Mohrig (1996) Paola (1996) Papanicolaou et al. (2004) Parés (2006) Park et al. (2023) Park and Jain (1987) Parker et al. (2000) Parker and Toro-Escobar (2002) Parker et al. (2003) Parker (2004a) Parker (2004b) Parker and Perg (2005) Parker et al. (2007) Parker et al. (2008a) Parker et al. (2008b) Parker et al. (2008c) Parker (2008) Parker et al. (2008d) Parker et al. (2011) Parker Parker (1976) Parker (1978a) Parker (1978b) Parker and Klingeman (1982) Parker et al. (1982a) Parker et al. (1982b) Parker et al. (1982c) Parker and Andrews (1985) Parker and Sutherland (1990) Parker (1990a) Parker (1990b) Parker (1991a) Parker (1991b) Parker (1992) Parker and Wilcock (1993) Parker and Cui (1998) Parrot (2015) Parsons et al. (2005) Partheniades (1965) Payne and Sather (1967) Péchon et al. (1997) PEERY and IMLAY (1988) Pelanti et al. (2008) Pelosi et al. (2014) Pelosi and Parker (2014) Pelosi et al. (2016) Pennekamp and Booij (1983) Pennekamp and Booij (1984) Perko (1993) Peters et al. (2001) Peters (2022) Petts et al. (1989) Pfeiffer et al. (2017) Phillips et al. (2013) Phillips and Jerolmack (2016) Phillips et al. (2016) Phillips (1957) Phillips and Sutherland (1989) Phillips and Sutherland (1990) Phillips (1992) Piccolroaz et al. (2018) Pickup and Warner (1976) Pickup and Rieger (1979) Pierce (2021) Pilarczyk (1995) Pinos and Timbe (2019) Plato Platzek (2017) Plows (1968) Ponce (1991) Ponce (1991) Poole (2016) PORNPROMMIN et al. (2002) PORNPROMMIN et al. (2004) Posamentier et al. (1988) Posamentier and Vail (1988) Posamentier et al. (1992) Posamentier and Allen (1993) Postel and Richter (2003) Postma (1990) Postma (1995) Postman (1985) Powell (1998) Preissmann and Cunge (1961) Preissmann and Werner (1961) Prins (1969a) Prins (1969b) Prins and De Vries (1971) Proffitt and Sutherland (1983) Provansal et al. (2014) Pusey (2011) Pyrce and Ashmore (2003) Qian et al. (2015) Qian et al. (2016) Qin et al. (2016) Quick et al. (2020) RHDHV (2018) Royal Haskoning DHV (2019) Rijkswaterstaat (2018) RWS (2019) Doornekamp (2019b) Rijkswaterstaat and Deltares (2022) Rijkswaterstaat (1968) RWS, Directie Bovenrivieren (1968) RWS, Directie Limburg (1968) Rijkswaterstaat (1973) RWS, Directie Limburg (1979) Rijkswaterstaat Zuid Nederland (2019) Raaijmakers et al. (2012) Radecki-Pawlik (2015) Radice et al. (2009) Rădoane et al. (2008) Rahuel et al. (1989) Rahuel (1993) Rakha and Kamphuis (1997) Ramamurthy et al. (2007) Ramshaw and Trapp (1978) Ranasinghe et al. (2011) Rathbun et al. (1971) Raudkivi and Ettema (1983) Ravenstijn (2009) Recking et al. (2009) Recking et al. (2012) Recking et al. (2016) Recking (2016) Recktenwald (2017a) Recktenwald (2017b) Redolfi et al. (2016) Redolfi (2021) Reeze et al. (2016) Reeze et al. (2017) Rehbock (1931) Reid and Frostick (1984) Reula (2004) Reynolds (1965) F.R.S. (1885) Reyns et al. (2014) Reyns et al. (2014) Rhebergen (2010) Rhoads and Welford (1991) Ribberink (1978) Ribberink and Van der Sande (1984) Ribberink (1984) Ribberink and Van der Sande (1985) Ribberink (1987) Ribberink (1998) Rodi (1982) Rodrigues et al. (2015) Rodrigues and Zumbrun (2016) Rodríguez-Amaya et al. (2020) Roelvink (2006) Roelvink and Reniers (2012) Roelvink Ronco et al. (2010) Roos (2004) Roos et al. (2007a) Roos et al. (2007b) Rorink Roseberry et al. (2012) Rosgen (1994) Rovira and Ibañez (2007) Rowiński and Radecki-Pawlik (2015) Roy (2005) Rozovskii (1957) Rubbioli (2016) Rubey (1933) Rubey (1952) Ruelle and Takens (1971) Rüther and Olsen (2007) Runge (1895) SOB (a) SOB (b) SOB (c) SOB (d) SOB (e) SOB (f) SOB (g) STOWA (2015) Saad (1994) Barré de Saint-Venant (1871) Salant et al. (2006) Saletti et al. (2015) Salt (2008) Sambrook Smith and Nicholas (2005) Sambrook Smith and Ferguson (1995) Sambrook Smith and Ferguson (1996) Samuels (1989) Sanders (2008) Sarker et al. (2014) Sarker (2022) Sarma (2005) Sarno et al. (2017) Savary and Zech (2007) Savitzky and Golay (1964) Sayre and Hubbell (1965) Schaefer (1967) Schaeffer (1987) Schalko et al. (2021) Van der Scheer et al. (2002) Scheffer et al. (2012) Scheingross et al. (2013) Scheingross et al. (2014) Schielen et al. (2005) Schielen and Blom (2018) Schielen et al. (1993) Schielen (1995a) Schielen (1995b) Schirmer et al. (2014) Schmidt and Wilcock (2008) Schmidt (1990) Schmidt and Ergenzinger (1992) Schoklitsch (1933) Schoklitsch (1937) Schoonman (1991) Schropp et al. (2000) Schumer and Jerolmack (2009) Schumer et al. (2009) Schuurman et al. (2013) Schuurman and Kleinhans (2015) Schwartz (2005) Schwartz (2008) Seal et al. (1997) Sebus (1923) Seizilles et al. (2013) Seizilles et al. (2014) Sekine and Parker (1992) Sekine and Kikkawa (1992) Seminara et al. (2002) Seminara (2006) Seminara and Tubino (1989) Seminara and Tubino (1992) Seminara et al. (1996) Serra and Vionnet (2005) Sharef (2006) Shaw et al. (2016) Shaw and Kellerhals (1982) Shen and Lu (1983) Shevchuk (2016) Shields (1936) Shimizu et al. (2009) Shimizu et al. (1996) Shores (2018) Shulits (1941) Shurman (2016) Sieben (2004) Sieben et al. (2005a) Sieben et al. (2005b) Sieben (2008a) Sieben (2008b) Sieben (2008c) Sieben (2009) Sieben (2010a) Sieben (2010b) Sieben (2010c) Sieben (2011a) Sieben (2011b) Sieben (2012) Sieben (2019) Sieben (2020) Sieben (2021) Sieben (2022a) Sieben (2022b) Sieben (2023) Sieben (1993) Sieben (1994) Sieben (1995) Sieben (1997) Sieben (1999a) Sieben (1999b) Siele et al. (2019) Silva et al. (2001) Silva and Jol (1999) Simon et al. (2005) Simon et al. (2007) Simon et al. (2008) Simons and Albertson (1963) Simons et al. (1965) Simoons (2012) Singer (2008) Singer (2010) Singh et al. (2009) Sinha and Parker (1996) Siteur et al. (2014) Siviglia et al. (2008) Siviglia et al. (2009) Siviglia et al. (2013) Siviglia et al. (2017a) Siviglia and Crosato (2016) Siviglia et al. (2017b) Siviglia et al. (2022) Sklar and Dietrich (2004) Sklar and Dietrich (2006) Sklar et al. (2006) Sklar and Dietrich (2008) Slingerland and Smith (2004) Slingerland and Smith (1998) Sloff and Stolker (2000) Sloff et al. (2003) Sloff (2006b) Sloff et al. (2006) Sloff (2006a) Sloff (2009) Sloff (2011) Sloff et al. (2011) Sloff and Mosselman (2012) Sloff et al. (2013b) Sloff et al. (2013a) Sloff et al. (2014) Sloff and Ottevanger (2017) Sloff (2019) Sloff (2020) Sloff (1992) Sloff (1993) Sloff et al. (1996) Smagorinsky (1963) Smale (2000) Small and Nicholls (2003) Smart (1984) Smith Smith and McLean (1977) Smith and Jol (1997) Snippen et al. (2005) Snow and Slingerland (1987) Snyder (1969) Soares-Frazão and Zech (1999) Soh and Berger (1984) Solari and Parker (2000) Song et al. (2012) Sonke et al. (2003) Sorber (1997) Soulsby (1997) Southard (1991) Southgate and Crosato (2013) Souzy and Marin (2022) Spanjaard (2004) Spinewine and Zech (2008) Spinewine et al. (2011) Sprong (2019) Spruyt (2010-2012) Spruyt et al. (2011) Spruyt and Fujisaki (2016) Spruyt and Ottevanger (2019) Spruyt et al. (2020) Spruyt and Ottevanger (2022) Staentzel et al. (2018) Stahl (2022) Stam (1998) Stanley (2001) Stecca et al. (2010) Stecca (2012) Stecca et al. (2014) Stecca et al. (2016) Stecca et al. (2017) Stecca and Hicks Stelling and Duinmeijer (2003) Stelling (1983) Stelling and Booij (1999) Stenfert (2017) Stenfert (2017) Sternberg (1875) Stevens (1988) Stewart (1979) Stewart and Wendroff (1984) Stoker (1992) Stolker and Verheij (2001a) Stolker and Verheij (2001b) Storti et al. (1992) Stouthamer and Berendsen (2001) Stouthamer et al. (2019) Straub (1940) STRAUSS (2008) Strickler (1923) Strikwerda (2004) Strikwerda (2007) Strogatz Struiksma (1980) Struiksma (1983a) Struiksma (1983b) Struiksma et al. (1985) Struiksma (1985a) Struiksma (1985b) Struiksma (1988) Struiksma and Crosato (1989) Struiksma et al. (1994) Struiksma (1999) Stuart (1960) Stuart and DiPrima (1978) Stuhmiller (1977) Stuparu and Ottevanger (2017) Styer (2007) Sumer and Fredsøe (2001) Sumer and Bakioglu (1984) Sumer and Fredsøe (1998) Sun et al. (2015) Surian et al. (2009) Sutherland et al. (2004) Suzuki (1976) Suzuki et al. (1979) Swamee (1988) Swanson and Turkel (1986) Swanson (1999) Swenson et al. (2000) Swenson et al. (2005) Swenson and Muto (2007) Symonds et al. (2017) Syvitski et al. (2000) Syvitski et al. (2005) Syvitski et al. (2009) Syvitski and Brakenridge (2013) Tal and Paola (2010) Talmon et al. (1995) Talstra (2011) Tan (1992) Tanner (1971) Tarekul Islam et al. (2006) Tassi et al. (2008) Tealdi et al. (2011) Termes (1986) Termes (1989) Thatcher and Harleman (1972) Thomas et al. (2011) Thompson and Campbell (1979) Thomson (1912) Thomson (1876) Thorn and Welford (1994) Tiessen et al. (2018) Tijssen et al. (2014) Tiselj and Petelin (1997) Tockner et al. Tolkmitt (1892) Tolman (1987) Tominaga et al. (1989) Tominaga and Nezu (1991) Tonnon and De Goede (2021) Toro (2001) Toro (2009) Toro et al. (2018) Toro et al. (2020) Toro-Escobar et al. (1996) Trampush et al. (2014) Travis et al. (1976) Trendelenburg (1868) Tritthart (2005) Tritthart and Gutknecht (2007) Tron et al. (2015) Tsubaki et al. (2018) Tsuchiya (1963) Tsujimoto and Saito Tsujimoto (1982) Tsujimoto (1989a) Tsujimoto and Motohashi (1989) Tsujimoto (1989b) Tsujimoto (1989c) Tsujimoto (1990a) Tsujimoto et al. (1990a) Tsujimoto et al. (1990b) Tsujimoto (1990b) M Tubino (2007) Tubino and Bertoldi (2008) Tubino (1991) Tubino et al. (1999) Tucker and Bras (1998) Tuijnder et al. (2009) Tuijnder and Ribberink (2010b) Tuijnder and Ribberink (2010a) Tuijnder (2010) Tuijnder et al. (2011) Tuijnder and Ribberink (2012b) Tuijnder and Ribberink (2012a) Tuijnder et al. (2012) Turkel (1987) Turkel (1993) Turkel (1999) Turowski et al. (2010) USDA (2007) Uchida et al. (2020) Udden (1914) Uijttewaal and Booij (2000) Uijttewaal et al. (2001) Uijttewaal et al. (2020) Uijttewaal et al. (2020) Uittenbogaard et al. (1992) Uittenbogaard (1993) UNESCO (1969a) UNESCO (1969b) Urban (2018) Utsugawa and Shirai (2016) Valiani and Caleffi (2008) Valiani and Caleffi (2009) Vanoni and Brooks (1957) VANZO et al. (2011) Vanzo et al. (2014) Vanzo et al. (2017) Vanzo et al. (2021) Vargas-Luna et al. (2014) Vargas-Luna (2016) Vargas-Luna et al. (2018) Västilä and Järvelä (2014) Vázquez-Tarrío et al. (2019) Vázquez-Tarrío et al. (2022) Veldkamp et al. (2017) Venditti et al. (2010a) Venditti et al. (2010b) Venditti et al. (2014) Venditti and Church (2014) Venditti et al. (2015) Veprek et al. (2007) Verbrugge and van den Born (2021) Verhaar (2003) Verhagen (2000-10) Verheul et al. (2009) Verhulst (2005) Verhulst (1990) Vermaas (1987) Vermeer (1990) Vermeer (1996) Verwer and Sanz-Serna (1984) Verwolf (1977) Vesipa et al. (2017) Vetsch et al. (2006) Villaret et al. (2013) Villemonte (1947) Viparelli et al. (2010a) Viparelli et al. (2010b) Viparelli et al. (2011) Viparelli et al. (2012) Viparelli et al. (2013) Viparelli et al. (2014) Viparelli et al. (2014) Viparelli et al. (2015) Viparelli et al. (2017) Visconti et al. (2012) Visser (2000) Visser et al. (1999) Voepel et al. (2013) Vogel et al. (2003) Vogel et al. (1992) Vollmer and Gölz (2006) Volp et al. (2015) Volp et al. (2016) Volp Vonwiller et al. (2018) Voogt and Vreugdenhil (1974) Vreugdenhil et al. (2001) Vreugdenhil and de Vries (1973) Vreugdenhil (1979) Vreugdenhil (1989) Vreugdenhil (1994) de Vriend and Geldof (1983) WAQ (2014) WSV (2023) Wainwright et al. (2015) Walling (1983) Walshe (1995) Walstra and Van Rijn (2003) Wang et al. (2008b) Wang et al. (2008a) Wang and Xu (2018a) Wang and Xu (2018b) Wang and Van der Kaaij (1994) Wang et al. (1995) Warrier (2014) Watanabe and Kuwamura (2006) Wathen et al. (1995) Watson (1960) Watson (1962) Werner et al. (2000) Werritty (2006) Wesselius and De Jong (2017) Wetser (2017) White and Nelson (2023) White (1999) Whiting et al. (1988) Wienk (2021) Wiersma (2015) Wiesemann et al. (2006) Wiggins (2003) Wijbenga (1990) Van der Wijk and Van der Mark (2020) Wilbers *and Ten Brinke* (2003) *Wilbers* (1996) *Wilbraham* (1848) *Wilcock et al.* (2001) *Wilcock and Crowe* (2003) *Wilcock and DeTemple* (2005) *Wilcock and McArdell* (1993) *Wilcock and McArdell* (1997) *Wilcock* (1998) *Wildt et al.* (2022) *Williams et al.* (2016) *Williams* (1978) *Williams and Roberts* (1989) *Wilson et al.* (2002) *Wilson et al.* (2014) *Wilson and Hay* (2016) *Winterwerp et al.* (2022) *Wohl et al.* (2005) *Wohl* (2013) *Wolcott* (1988) *Wolman and Leopold* (1957) *Wolman and Miller* (1960) *RWS, Directie Limburg* (1998) *Wong and Parker* (2006a) *Wong and Parker* (2006b) *Wong et al.* (2007) *Woodhouse et al.* (2012) *Wright and Parker* (2004) *Wright and Parker* (2005a) *Wright and Parker* (2005b) *Wright and Crosato* (2011) *Wu et al.* (2000) *Wu and Yang* (2004) *Wu* (2004) *Wu* (2007) *Wu et al.* (2011) *Wu et al.* (2019) *Wurms and Schröeder* (2012) *Xia et al.* (2004) *Yager et al.* (2015) *Yalin and Scheuerlein Yalin* (1964a) *Yalin* (1964b) *Yalin* (1985) *Yamaguchi et al. Yang et al.* (2001) *Yang* (2005) *Yang et al.* (2020) *Yatsu* (1955) *Ye and McCorquodale* (1997) *Yee et al.* (1985) *Yen* (2002) *Ylla Arbós et al.* (2019) *Ylla Arbós et al.* (2021) *Yossef* (2005) *Yossef et al.* (2006) *Yossef et al.* (2008b) *Yossef et al.* (2008a) *Yossef et al.* (2008c) *Yossef and Sloff* (2012) *Yossef et al.* (2018) *Yossef and Visser* (2018) *Yubero-Ferrero* (1998) *Zagonjolli et al.* (2017) *Zanotti et al.* (2007) *Zanré and Needham* (1994) *Zarrati et al.* (2004) *Zervakis* (2015) *Zhang et al.* (2002) *Zhang et al.* (2013) *Zhang et al.* (2017) *Zhang et al.* (2021) *Zhang and Kahawita* (1987) *Zhang and Kahawita* (1990) *Zhou et al.* (2017) *Zhu et al.* (2018) *Zijlema* (2015) *Zijlema* (2020) *Zima et al.* (2015) *Zimmerman and Kennedy* (1978) *Zolezzi and Seminara* (2001) *Zolezzi et al.* (2005) *Zolezzi et al.* (2006) *G. Zolezzi* (2009) *Zuijderwijk and De Jong* (2021) *ASCE Task Committee on Hydraulics and or River Width Adjustment* (1988a) *ASCE Task Committee on Hydraulics and or River Width Adjustment* (1988b) bfg (2006) col (2000) *Garca-Valencia* (2007) *Deltares* (2013) *Da Vinci* (ca. 1478–1518) *De Bruijn et al.* (2022) *De Bruyn* (1947) *DeConto and Pollard* (2016) *De Goede* (2011) *de Goede et al. de Goede* (2022) *De Jong* (2005) *De Jong and Yossef* (2016) *De Jong* (2018) *De Jong and Asselman* (2019) *De Jong et al.* (2019) *De Jong and Ottevanger* (2020) *De Jong* (2020) *De Jong et al.* (2021) *De Jong* (2021) *de Jong et al.* (1992) *De Lange et al.* (2021) *LANGE* (2022) *De Ruijsscher et al.* (2018) *De Ruijsscher et al.* (2019) *De Ruijsscher et al.* (2020a) *De Ruijsscher et al.* (2020b) *De Ruijsscher et al.* (2020c) *De Vriend* (2010) *de Vriend et al.* (2011) *De Vriend* (2015) *De Vries* (1966) *De Vriend* (1976) *De Vriend* (1977) *De Vriend* (1981) *De Vriend* (1981) *De Vriend and Struiksma* (1983) *De Vriend* (1985) *De Vriend* (1987) *DeVries* (2002) *De Vries et al.* (2014) *de Vries* (1947) *De Vries* (1959) *De Vries* (1959) *De Vries* (1965) *De Vries* (1966) *De Vries* (1969) *De Vries* (1971a) *De Vries* (1971b) *De Vries* (1973) *De Vries* (1974) *De Vries* (1975) *De Vries and Van der Zwaard* (1975) *De Vries* (1976) *De Vries* (1982) *De Vries* (1990) *De Vries* (1993a) *De Vries* (1993b) *De Wildt* (1981) *De Wildt* (1983) *De Wit* (2009) *de Zeeuw* (2017) dei (1947) *Den Haan* (2020) *Den Haan et al.* (2020) dhi (1970) dhi (1983) *Di Silvio* (2016) *Deltares* (2021) *Deltares* (2022b) for *Fredsøe* (1984) *Reid et al.* (1985) **?** *Nicholson et al.* (1997) *Deltares* (2020b) *RIZA* (2005) swe *Ten Brinke et al.* (2001) *Ten Brinke and Gölz* (2001) *Ten Brinke* (2005) *Ten Brinke* (2019) *ten Brinke* (1997) unk *Van Balen et al.* (2008) *Van Balen et al.* (2009) *van Balen et al.* (2010a) *van Balen* (2010) *van Balen et al.* (2010b) *van Balen* (a) *van Balen* (b) *Van Bendegom* (1947) *Van Bendegom* (1967) *Van Denderen et al.* (2018) *Van Denderen et al.* (2020) *Van Dijk* (2013) *Van Dijk et al.* (2014) *Van Dongen and Meijer* (2008) *Olav J. M. VAN DUIN* (2011) *van Duin et al.* (2013) *van Duin et al.* (2017) *van Genuchten and Alves* (1982) *Van Gerwen et al.* (2018) *Van Grondelle* (2021) *Van Heereveld* (2010) *Van Heijst and Postma* (2001) *Van Hoogenhuizen* (2021) *Van Houweninge and De Graauw* (1982) *Van Kessel et al.* (2011a) *Van Kessel et al.* (2011b) *Van Landeghem et al.* (2020) *Van Ledden* (2003) *Van Ledden et al.* (2004a) *Van Ledden et al.* (2004b) *Van Leer et al.* (1991) *Van Leeuwen, Tristan* (2005) *Van Linge* (2017) *Van Niekerk et al.* (1992) *Van Os* (2020) *Van Prooijen and Uijttewaal* (2002) *Van Prooijen and Winterwerp* (2010) *Van Prooijen* (2012) *Van Putten* (2021) *van Rijn et al. Van Rijn* (2007) *Van Rijn* (1984a) *Van Rijn* (1984b) *Van Rijn* (1987) *Van Rijn et al.* (1993) *van Rooijen et al.* (2020) *Van Schijndel and Jagers* (2002) *Van Tets* (2020) *Van Vuren et al.* (2006) *Van Vuren and Sloff* (2006) *Van Vuren and Ottevanger* (2006) *Van Vuren et al.* (2008) *Van Vuren et al.* (2015) *Van Weerdenburg* (2018) *Van Winden et al.* (2018) *Van de Guchte et al.* (2017) *Van de Lageweg* (2013) *Van de Ven* (2003) *Van den Berg et al.* (1995) *Van den Ende* (1992) *Van Kaaij and Chavarrias* (2020) *van der Mark* (2004) *Van der Mark et al.* (2008) *Van der Mark et al.* (2011) *Van der Mark and Mosselman* (2013) *Van der Mark and Mosselman* (2013) *Van der Mark et al.* (2015) *Van der Mark and Vijververg* (2015) *Van der Mark and Lemans* (2020) *Van der Mark et al.* (2020) *Van der Mark and Van der Wijk* (2021) *Meulen et al.* (2006) *Van der Meulen* (2021) *Van der Mheen and Prins* (2015) *Van der Pijl* (2019) *van der Pijl Schrier* (2004) *van der Stelt* (2012) *Van der Vat* (2021) *Van der Veen and Agtersloot* (2021) *van der Ven* (1979) *Van der Wal* (2013) *Van der Wegen and Jaffe* (2014) *Van der Wegen et al.* (2021) *Van der Wijk et al.* (2019) *Van der Zwaard* (1974) *Van der Zwaard* (1981) *Von Kármán* (1930)

References

(), *Tech. rep.*

(a), *SOBEK Kalman*.

(b), *SOBEK asciiparser*.

(c), *SOBEK flow*.

(d), *SOBEK manual*.

(e), *SOBEK morphodynamics*.

(f), *SOBEK salt intrusion*.

(g), *SOBEK water quality*.

(), Fortran format, *Tech. rep.*

(), Depth-averaged shallow water equations, *Tech. rep.*

(), *Tech. rep.*

(1925), Memoria detallada de los estudios del rio magdalena obras proyectadas para su arreglo y resumen del presupuesto, *Tech. rep.*, Ministerio de obras publicas colombia.

(1947), De puzzle van het panama kanaal, *De Ingenieur*, *36*, 95--96.

(1970), Opzet boven waal onderzoek, *Tech. Rep. M932*, WL delft hydraulics.

(1983), Overlaat in de groene rivier te pannerden, *Tech. Rep. M1905*, WL Delft Hydraulics.

(1985), De invloed van knooppuntrelaties op de bodemligging bij splitsingspunten, *Tech. Rep R2166*, Delft Hydraulics Laboratory, Delft, the Netherlands.

(1990), sediment transport: the ackers and white theory revised, *Tech. Rep. SR237*, HR Wallingford.

(2000), Manual de rios navegables, *Tech. rep.*, Ministerio de transporte colombia.

(2006), *Messkonzepte und Modellierung in der Gew ssermorphologie*.

(2014), Waqbank, user manual, *Tech. rep.*, Deltares, Delft, the Netherlands.

(2019), *RCEM 2019*.

(2019), *Rivierkundig Beoordelingskader voor ingrepen in de Grote Rivieren*, Rijkswaterstaat.

Aalto, R. (2002), Geomorphic form and process of sediment flux within an active orogen: Denudation of the bolivian andes and sediment conveyance across the Beni foreland., Ph.D. thesis, University of Washington, USA.

Abbe, T. B., and D. R. Montgomery (2003), Patterns and processes of wood debris accumulation in the queets river basin, washington, *Geomorphology*, *51*(1!!e!!3), 81 -- 107, doi:http://dx.doi.org/10.1016/S0169-555X(02)00326-4, interactions between Wood and Channel Forms and Processes.

Abgrall, R., and S. Karni (2009), Two-layer shallow water system: A relaxation approach, *SIAM J. Sci. Comput.*, *31*(3), 1603--1627, doi:10.1137/06067167X.

Achoui, D. (2020), Belemmerende waterdiepte, *Tech. Rep.*, HAL24K, 31 pp.

Ackers, P., and F. G. Charlton (1970), Meander geometry arising from varying flows, *J. Hydrol.*, *11*, 230--252, doi:10.1016/0022-1694(70)90064-8.

Ackers, P., and W. R. White (1973), Sediment transport: new approach and analysis, *Journal of the Hydraulics Division*, *99*(hy11), 2041--2061.

Acoustics, G. (2007), *UltraLab ULS HF5-A*.

Adami, L. (2016), Long term morphodynamics of alternate bars in straightened rivers: a multiple perspective, Ph.D. thesis, University of Trento, Trento, Italy.

Afentoulis, V., A. Papadimitriou, K. Belibassakis, and V. Tsoukala (2022), A coupled model for sediment transport dynamics and prediction of seabed morphology with application to 1dh/2dh coastal engineering problems, *Oceanologia*, doi:https://doi.org/10.1016/j.oceano.2022.03.007.

Agtersloot, R., and A. Sieben (2020), Kentallen bodemdynamiek Maas, verkenning traject km 176-227, *Tech. rep.*, Agtersloot Hydraulisch Advies and Rijkswaterstaat, the Netherlands, 13 pp.

Agtersloot, R. C., C. H. Michels, and R. van der Veen (2019), Jaarlijkse actualisatie modellen rijntakken 2019, *Tech. Rep. 11203714-004-ZWS-0005*, Agtersloot Hydraulisch Advies, 90 pp.

Ahmed, K. B., and M. Sanchez (2011), A study of the factors and processes involved in the sedimentation of Tarbela reservoir, Pakistan, *Environmental Earth Sciences*, *62*(5), 927--933, doi:10.1007/s12665-010-0578-3.

Ahnert, F. (1987), Approaches to dynamic equilibrium in theoretical simulations of slope development, *Earth Surf. Process. Landf.*, *12*(1), 3--15, doi:10.1002/esp.3290120103.

Ahnert, F. (1994), Equilibrium, scale and inheritance in geomorphology, *Geomorphology*, *11*(2), 125--140, doi:10.1016/0169-555X(94)90077-9.

Akimoto, T., and E. Yamamoto (2017), Detection of transition times from single-particle-tracking trajectories, *Phys. Rev. E*, *96*, 052,138, doi:10.1103/PhysRevE.96.052138.

Akkerman, G. J., M. A. van Heereveld, H. J. Barneveld, and R. J. Smedes (2006), Sustainable navigation rhine delta branches, a reconnaissance ofstrategies, in *Proceedings of the 3rd International Conference on Fluvial Hydraulics (River Flow), San José, Costa Rica, 5-7 September*, edited by R. M. L. Ferreira, Taylor and Francis, Leiden, NL.

Alexander, J. S., R. C. Wilson, and W. R. Green (2012), A brief history and summary of the effects of river engineering and dams on the mississippi river system and delta, *Tech. Rep. 1375*, US Geological Survey.

Alexy, M. (2008), Entwicklung eines 1-d-feststofftransportmodells für den Niederrhein, *Wasserwirtschaft*, *98*, 23--26.

Alexy, M. (2018), Eindimensionales Feststofftransportmodell für den Niederrhein (Rhein-km 640 bis 866), *techreport B3953.02.30.10152*, Bundesanstalt für Wasserbau, Karlsruhe, Germany., 74 pp., (in German).

Allen, J. R. L. (1965), Sedimentation to the lee of small underwater sand waves: an experimental study, *J. Geol.*, *73*, 95--116.

Allen, J. R. L. (1968a), *Current Ripples. Their relation to patterns of water and sediment motion.*, 433 pp., North Holland Publishing Company, Amsterdam, the Netherlands.

Allen, J. R. L. (1968b), The nature and origin of bed-form hierarchies, *Sedimentology*, *10*(3), 161--182, doi:10.1111/j.1365-3091.1968.tb01110.x.

Allen, J. R. L. (1969), The maximum slope-angle attainable by surfaces underlain by bulked equal spheroids with variable dimensional ordering, *Geol. Soc. Am. Bull.*, *80*(10), 1923--1930, doi:10.1130/0016-7606(1969)80[1923:TMSABS]2.0.CO;2.

Allen, J. R. L. (1970a), The avalanching of granular solids on dune and similar slopes, *J. Geol.*, *78*(3), 326--351.

Allen, J. R. L. (1970b), A quantitative model of grain size and sedimentary structures in lateral deposits, *Geol. J.*, *7*(1), 129--146, doi:10.1002/gj.3350070108.

Allen, J. R. L. (1978), *Fluvial Sedimentology*, vol. Memoir 5, chap. Van Bendegom: A neglected innovator in meander studies, pp. 199--209, Canadian Society of Petroleum Geologists, Department of Geography, University of Calgary, Calgary, Canada.

Allen, J. R. L. (1985), *Principles of Physical Sedimentology*, 272 pp., Springer Netherlands, Dordrecht, the Netherlands, doi:10.1007/978-94-010-9683-6.

Allen, P. (2008), From landscapes into geological history, *Nature*, *451*, 274--6, doi:10.1038/nature06586.

Allgower, E. L., and K. Georg (1990), *Introduction to Numerical Continuation Methods*.

Alvarado Ortega, M. (2013), *Río Magdalena, navegación marítima y fluvial (1986-2008)*, Ediciones Uninorte, Barranquilla, Colombia.

Alvarez, L. V., M. W. Schmeeckle, and P. E. Grams (2017), A detached eddy simulation model for the study of lateral separation zones along a large canyon-bound river, *Journal of Geophysical Research: Earth Surface*, *122*(1), 25--49, doi:https://doi.org/10.1002/2016JF003895.

Ambagts, L., W. Jansen, N. de Jong, A. Kosters, C. Oerlemans, and A. Slockers (2017), Sedimentation in the mouth of the Magdalena river; improving navigability in the port of Barranquilla, Master's thesis, Delft University of Technology, Delft, the Netherlands.

Ambagts, L. R. (2019), Flow over and aroundsubmerged groynes, *MSc. Thesis*, Delt University of Technology, Delft, the Netherlands.

Ambati, V. (2008), Forecasting water waves and currents: A space-time approach, Ph.D. thesis, University of Twente, Netherlands, doi:10.3990/1.9789036526326, 10.3990/1.9789036526326.

An, C., Y. Cui, X. Fu, and G. Parker (2017a), Gravel-bed river evolution in earthquake-prone regions subject to cycled hydrographs and repeated sediment pulses, *Earth Surf. Process. Landf.*, pp. n/a--n/a, doi:10.1002/esp.4195, eSP-16-0141.R3.

An, C., X. Fu, G. Wang, and G. Parker (2017b), Effect of grain sorting on gravel bed river evolution subject to cycled hydrographs: Bed load sheets and breakdown of the hydrograph boundary layer, *J. Geophys. Res., Earth Surface*, *122*(8), 1513--1533, doi:10.1002/2016JF003994.

An, C., A. J. Moodie, H. Ma, X. Fu, Y. Zhang, K. Naito, and G. Parker (2018), Morphodynamic model of the lower Yellow river: flux or entrainment form for sediment mass conservation?, *Earth Surf. Dyn.*, *6*(4), 989--1010, doi:10.5194/esurf-6-989-2018.

An, C., G. Parker, M. A. Hassan, and X. Fu (2019), Can magic sand cause massive degradation of a gravel-bed river at the decadal scale? shi-ting river, china, *Geomorphology*, *327*, 147--158, doi:https://doi.org/10.1016/j.geomorph.2018.10.026.

An, C., M. A. Hassan, C. Ferrer-Boix, and X. Fu (2021), Effect of stress history on sediment transport and channel adjustment in graded gravel-bed rivers, *Earth Surface Dynamics*, *9*(2), 333--350, doi:10.5194/esurf-9-333-2021.

Ancey, C. (2010), Stochastic modeling in sediment dynamics: Exner equation for planar bed incipient bed load transport conditions, *J. Geophys. Res., Earth Surface*, *115*(F2), F00A11, doi:10.1029/2009JF001260.

Ancey, C. (2020a), Bedload transport: a walk between randomness and determinism. part 1. the state of the art, *Journal of Hydraulic Research*, *58*(1), 1--17, doi:10.1080/00221686.2019.1702594.

Ancey, C. (2020b), Bedload transport: a walk between randomness and determinism. part 2. challenges and prospects, *Journal of Hydraulic Research*, *58*(1), 18--33, doi:10.1080/00221686.2019.1702595.

Ancey, C., and J. Heyman (2014), A microstructural approach to bed load transport: Mean behaviour and fluctuations of particle transport rates, *J. Fluid Mech.*, *744*, 129--168, doi:10.1017/jfm.2014.74.

Ancey, C., and I. Pascal (2020), Estimating mean bedload transport rates and their uncertainty, *Journal of Geophysical Research: Earth Surface*, *125*(7), e2020JF005,534, doi:https://doi.org/10.1029/2020JF005534, e2020JF005534 10.1029/2020JF005534.

Ancey, C., F. Bigillon, P. Frey, J. Lanier, and R. Ducret (2002), Saltating motion of a bead in a rapid water stream, *Phys. Rev. E*, *66*, 036,306, doi:10.1103/PhysRevE.66.036306.

Ancey, C., T. Böhm, M. Jodeau, and P. Frey (2006), Statistical description of sediment transport experiments, *Phys. Rev. E*, *74*, 011,302, doi:10.1103/PhysRevE.74.011302.

Ancey, C., A. C. Davison, T. Böhm, M. Jodeau, and P. Frey (2008), Entrainment and motion of coarse particles in a shallow water stream down a steep slope, *J. Fluid Mech.*, *595*, 83--114, doi:10.1017/S0022112007008774.

Ancey, C., P. Bohorquez, and J. Heyman (2015), Stochastic interpretation of the advection-diffusion equation and its relevance to bed load transport, *J. Geophys. Res., Earth Surface*, *120*(12), 2529--2551, doi:10.1002/2014JF003421.

Anderson, H. L. (1986), Metropolis, Monte Carlo, and the MANIAC, *Los Alamos Science*, pp. 96--107.

Anderson, P. L., and M. M. Meerschaert (1998), Modeling river flows with heavy tails, *Water Resour. Res.*, *34*(9), 2271--2280, doi:10.1029/98WR01449.

Andrews, E. D. (1980), Effective and bankfull discharges of streams in the Yampa River basin, Colorado and Wyoming, *J. Hydrol.*, *46*(3), 311--330, doi:10.1016/0022-1694(80)90084-0.

Andrews, E. D. (1983), Entrainment of gravel from naturally sorted riverbed material, *Geol. Soc. Am. Bull.*, *94*(10), 1225--1231, doi:10.1130/0016-7606(1983)94⟨1225:EOGFNS⟩2.0.CO;2.

Andrews, E. D., and D. C. Erman (1986), Persistence in the size distribution of surficial bed material during an extreme snowmelt flood, *Water Resour. Res.*, *22*(2), 191--197, doi:10.1029/WR022i002p00191.

A.P. Luijendijk, J. J. A. M. v., G. Passacantando, and G. Mayerle (2009), Morphological modeling of the construction phases for the venice inlets, in *Coastal Structures 2007: (In 2 Volumes)*, pp. 1321--1329, World Scientific.

Arailopoulos, I. (2014), Morphodynamic modelling with suspended sediment transport in river bends, Master's thesis, Delft University of Technology.

Arcadis (2011), Inventarisatie en interpretatie ondergrondgegevens Maas, *Tech. Rep. C03021.910426.0100*, Arcadis, opdrachtgever: Rijkswaterstaat Limburg.

Arcadis15 (2015), Plan maestro fluvial de Colombia 2015, *Tech. rep.*, Arcadis15.

Ardron, K. H. (1980), One-dimensional two-fluid equations for horizontal stratified two-phase flow, *Int. J. Multiphase Flow*, *6*(4), 295--304, doi:10.1016/0301-9322(80)90022-1.

Arkesteijn, L. (), to be determined, *Nature or Science :D*.

Arkesteijn, L., A. Blom, and R. J. Labeur (2017), The morphodynamic steady state of a river in its normal flow and backwater segments, *Geophys. Res. Lett.*, (in preparation).

Arkesteijn, L., A. Blom, M. J. Czapiga, V. Chavarrías, and R. J. Labeur (2019), The quasi-equilibrium longitudinal profile in backwater reaches of the engineered alluvial river: A space-marching method, *J. Geophys. Res., Earth Surface*, *124*(11), 2542--2560, doi:10.1029/2019JF005195.

Arkesteijn, L., A. Blom, and R. J. Labeur (2021), A rapid method for modeling transient river response under stochastic controls with applications to sea level rise and sediment nourishment, *Journal of Geophysical Research: Earth Surface*, *126*(12), e2021JF006,177, doi:https://doi.org/10.1029/2021JF006177, e2021JF006177 2021JF006177.

Armanini, A. (1995), Non-uniform sediment transport: Dynamics of the active layer, *J. Hydraul. Res.*, *33*(5), 611--622, doi:10.1080/00221689509498560.

Armanini, A. (2017), *Principles of River Hydraulics*, Springer International Publishing.

Armanini, A., and G. di Silvio (1988), A one-dimensional model for the transport of a sediment mixture in non-equilibrium conditions, *J. Hydraul. Res.*, *26*(3), 275--292, doi:10.1080/00221688809499212.

Armanini, A., and G. di Silvio (1989), On the coexistance of bedload and suspended transport for a uniform grainsize material, in *Proceedings of the International Symposium of Sediment Transport Modeling*, edited by S. S. Y. Wang, pp. 581 -- 587.

Armanini, A., V. Cavedon, and M. Righetti (2015), A probabilistic/deterministic approach for the prediction of the sediment transport rate, *Adv. Water Resour.*, *81*, 10--18, doi:10.1016/j.advwatres.2014.09.008.

Armi, L. (1986), The hydraulics of two flowing layers with different densities, *J. Fluid Mech.*, *163*, 27--58, doi:10.1017/S0022112086002197.

Arnaud, F., H. Piégay, L. Schmitt, A. J. Rollet, V. Ferrier, and D. Béal (2015), Historical geomorphic analysis (1932{2011) of a by-passed river reach in process-based restoration perspectives: The Old Rhine downstream of the Kembs diversion dam (France, Germany), *Geomorphology*, *236*, 163--177, doi:https://doi.org/10.1016/j.geomorph.2015.02.009.

Arnaud, F., H. Piégay, D. Béal, P. Collery, L. Vaudor, and A.-J. Rollet (2017), Monitoring gravel augmentation in a large regulated river and implications for process-based restoration, *Earth Surf. Processes Landf.*, *42*(13), 2147--2166, doi:https://doi.org/10.1002/esp.4161.

Arneson, L. A., L. W. Zevenbergen, P. F. Lagasse, and P. E. Clopper (2012), Evaluating scour at bridges, *Tech. Rep. FHWA-HIF-12-003 (HEC-18)*, U.S. Department of Transportation, Federal Highway Administration.

Arnott, R. W. C., and B. M. Hand (1989), Bedforms, primary structures and grain fabric in the presence of suspended sediment rain, *J. Sediment. Petrol.*, *59*(6), 1062--1069.

ASCE Task Committee on Hydraulics, B. M., and M. or River Width Adjustment (1988a), River width adjustment. I: Processes and mechanics, *Journal of Hydraulic Engineering*, *124*(9), 882--902.

ASCE Task Committee on Hydraulics, B. M., and M. or River Width Adjustment (1988b), River width adjustment. II: Modelling, *Journal of Hydraulic Engineering*, *124*(9), 903--917.

Ashida, K., and M. Michiue (1971), An investigation of river bed degradation downstream of a dam, in *Proc. of the 14th IAHR World Congress, 29 August--3 September, Paris, France*, vol. 3, pp. 247--255.

Ashida, K., and M. Michiue (1972), Study on hydraulic resistance and bed-load transport rate in alluvial streams, *Proc. Jpn. Soc. Civ. Eng.*, *206*, 59--69, doi:10.2208/jscej1969.1972.206_59.

Ashida, K., and M. Michiue (1973), Studies on bed-load transport rate in open channel flows, in *internationa symposium on river mechanics Bangkok, Thailand, 9--12 January*.

Ashida, K., S. Egashira, B. Liu, and M. Umemoto (1990), Sorting and bed topography in meander channels, *Annuals Disaster Prevention Institute Kyoto University*, *33 B-2*, 261--279, (in Japanese).

Ashmore, P., S. Peirce, and P. Leduc (2018), Expanding the ‘‘active layer’’: Discussion of Church and Haschenburger (2017) What is the ‘‘active layer’’? Water Resources Research 53(1), 5--10, *Water Resour. Res.*, *54*(3), 1425--1427, doi:10.1002/2017WR022438.

Ashmore, P. E., R. I. Ferguson, K. L. Prestegaard, P. J. Ashworth, and C. Paola (1992), Secondary flow in anabranch confluences of a braided, gravel-bed stream, *Earth Surf. Process. Landf.*, *17*(3), 299--311, doi:10.1002/esp.3290170308.

Asselman, N., and P. de Grave (2021), Eindevaluatie pilot Langsdammen in de Waal; functie hoogwaterveiligheid, *Rapport 11204644*, Deltares, Delft, the Netherlands, september.

Asselman, N., H. J. Barneveld, F. Klijn, A. van Winden, and R. Postma (2018), Het verhaal van de maas, *Tech. rep.*, Publicatie Platform Rivierkunde van Rijkswaterstaat.

Atwater, B. F. (1987), Evidence for great holocene earthquakes along the outer coast of washington state, *Science*, *236*(4804), 942--944, doi:10.1126/science.236.4804.942.

Audusse, Emmanuel, Boyaval, S bastien, Goutal, Nicole, Jodeau, Magali, and Ung, Philippe (2015), Numerical simulation of the dynamics of sedimentary river beds with a stochastic exner equation, *ESAIM: Proc.*, *48*, 321--340, doi:10.1051/proc/201448015.

Axler, S. (2015), *Linear Algebra Done Right*, Undergraduate Texts in Mathematics, Springer, Cham, doi:10.1007/978-3-319-11080-6.

Azhar, F. (2018), Morphodynamic changes around a bridge pier, Master’s thesis, UNESCO-IHE.

Baar, A. W., J. de Smit, W. S. J. Uijttewaal, and M. G. Kleinhans (2018), Sediment transport of fine sand to fine gravel on transverse bed slopes in rotating annular flume experiments, *Water Resour. Res.*, *54*(1), 19--45, doi:10.1002/2017WR020604.

Baar, A. W., M. Boechat Albernaz, W. M. van Dijk, and M. G. Kleinhans (2019), Critical dependence of morphodynamic models of fluvial and tidal systems on empirical downslope sediment transport, *Nature Communications*, *10*(1), 4903, doi:10.1038/s41467-019-12753-x.

Baatjes, J. A. (2002), Vloeistofmechanica, *Tech. rep.*, TU Delft.

Babovic, V., and A. W. Minns (2022), Hydroinformatics opening new horizons: union of computational hydraulics and artificial intelligence, in *Michael Abbott’s Hydroinformatics: Poiesis of New Relationships with Water*, IWA Publishing, doi:10.2166/9781789062656_0033.

Bacchi, V., A. Recking, N. Eckert, P. Frey, G. Piton, and M. Naaim (2014), The effects of kinetic sorting on sediment mobility on steep slopes, *Earth Surf. Process. Landf.*, *39*(8), 1075--1086, doi:10.1002/esp.3564.

Backert, M., M. Ford, and F. Malartre (2010), Architecture and sedimentology of the Kerinitis Gilbert-type fan delta, Corinth Rift, Greece, *Sedimentology*, *57*(2), 543--586, doi:10.1111/j.1365-3091.2009.01105.x.

Bagnold, R. A. (1941), *The physics of wind blown sand and desert dunes*, 265 pp., Methuen, London.

Bagnold, R. A. (1973), The nature of saltation and of 'bed-load' transport in water, *Proc. R. Soc. Lond. A.*, *332*, 473--504.

van Balen, W., W. S. J. Uijttewaal, and K. Blanckaert (2008), LES and RANS computations of schematized river bends, in *Procedings of the 4th International Conference on Fluvial Hydraulics (River Flow), 3-5 September, Cesme, Izmir, Turkey*, edited by M. Altinakar, M. A. Kokpinar, İsmail Aydin, Şevket Cokgor, and S. Kirgoz, Kubaba Congress Department and Travel Services, Ankara, Turkey.

van Balen, W., W. S. J. Uijttewaal, and K. Blanckaert (2009), Large-eddy simulation of a mildly curved open-channel flow, *J. Fluid Mech.*, *630*, 413--442, doi:10.1017/S0022112009007277.

Ballio, F., D. Pokrajac, A. Radice, and S. A. H. Sadabadi (2018), Lagrangian and eulerian description of bed load transport, *J. Geophys. Res., Earth Surface*, *123*(2), 384--408, doi:10.1002/2016JF004087.

Ballio, F., A. Radice, S. L. Fathel, and D. J. Furbish (2019), Experimental censorship of bed load particle motions and bias correction of the associated frequency distributions, *J. Geophys. Res., Earth Surface*, *124*(1), 116--136, doi:10.1029/2018JF004710.

Balmforth, N. J., and S. Mandre (2004), Dynamics of roll waves, *J. Fluid Mech.*, *514*, 1--33, doi:10.1017/S0022112004009930.

Balmforth, N. J., and A. Vakil (2012), Cyclic steps and roll waves in shallow water flow over an erodible bed, *J. Fluid Mech.*, *695*, 35--62, doi:10.1017/jfm.2011.555.

Banks, J., J. Brooks, G. Cairns, G. Davis, and P. Stacey (1992), On Devaney's definition of chaos, *The American Mathematical Monthly*, *99*(4), 332--334, doi:10.2307/2324899.

Baptist, M. (2005), Modelling floodplain biogeomorphology, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Bardají, T., C. J. Dabrio, J. L. Goy, L. Somoza, and C. Zazo (1990), Pleistocene fan deltas in southeastern Iberian Peninsula: Sedimentary controls and sea-level changes, in *Coarse-Grained Deltas*, chap. 7, pp. 129--151, Blackwell Publishing Ltd., doi:10.1002/9781444303858.ch7.

Bardoel, J. W. S. (2010), Dredging history of the river Waal and expected future dredging works, Master's thesis, Delft University of Technology.

Barker, B., M. A. Johnson, P. Noble, L. M. Rodrigues, and K. Zumbrun (2017a), Note on the stability of viscous roll waves, *C. R. Mec.*, *345*(2), 125--129, doi:10.1016/j.crme.2016.11.001.

Barker, B., M. A. Johnson, P. Noble, L. M. Rodrigues, and K. Zumbrun (2017b), Stability of viscous St. Venant roll waves: From onset to infinite Froude number limit, *J. Nonlinear Sci.*, *27*(1), 285--342, doi:10.1007/s00332-016-9333-6.

Barker, T., and J. M. N. T. Gray (2017), Partial regularisation of the incompressible μ-rheology for granular flow, *J. Fluid Mech.*, *828*, 5--32, doi:10.1017/jfm.2017.428.

Barker, T., D. G. Schaeffer, P. Bohorquez, and J. M. N. T. Gray (2015), Well-posed and ill-posed behaviour of the μ-rheology for granular flow, *J. Fluid Mech.*, *779*, 794--818, doi:10.1017/jfm.2015.412.

Barneveld, H. (2018), Ruimte voor levende rivieren: Effect grootschalige rivierverruiming op bodemerosie waal, *Tech. rep.*, HKV and Deltares.

Barneveld, H. (2023), Baggerwerk sambeek-grave uit v1.96, *Tabel 30-1-2023*, Wageningen University & Research, 1 pp.

Barneveld, H., M. Boersema, F. Schuurman, and H. de Vriend (2021), Het verhaal van het sediment, pUC_630145_31.

Barneveld, H. J. (1988), Numerieke methoden voor morfologische berekeningen tijdens kortdurende hoogwatergolven, Master's thesis, Delft University of Technology, (in Dutch).

Barré de Saint-Venant, A. J. C. (1871), Théorie du mouvement non permanent des eaux, avec application aux crues des rivières et à l'introduction des marées dans leur lit, *Comptes Rendus des séances de l'Académie des Sciences*, *73*, 237--240, (in French).

Barry, J. J., J. M. Buffington, and J. G. King (2004), A general power equation for predicting bed load transport rates in gravel bed rivers, *Water Resour. Res.*, *40*(10), n/a--n/a, doi:10.1029/2004WR003190, w10401.

Barry, J. J., J. M. Buffington, and J. G. King (2007), Correction to ''a general power equation for predicting bed load transport rates in gravel bed rivers'', *Water Resour. Res.*, *43*(8), doi:10.1029/2007WR006103.

Barton, C. M., A. Lee, M. A. Janssen, S. van der Leeuw, G. E. Tucker, C. Porter, J. Greenberg, L. Swantek, K. Frank, M. Chen, and H. R. A. Jagers (2022), How to make models more useful, *Proceedings of the National Academy of Sciences*, *119*(35), e2202112,119, doi:10.1073/pnas.2202112119.

Bassi, R., A. Rinaldo, and G. Seminara (2022), The intrusion of ecology into hydrology and morphodynamics, *Rendiconti Lincei. Scienze Fisiche e Naturali*, doi:10.1007/s12210-022-01072-x.

Bastiaansen, R., O. Jaïbi, V. Deblauwe, M. B. Eppinga, K. Siteur, E. Siero, S. Mermoz, A. Bouvet, A. Doelman, and M. Rietkerk (2018), Multistability of model and real dryland ecosystems through spatial self-organization, *Proceedings of the National Academy of Sciences*, *115*(44), 11,256--11,261, doi:10.1073/pnas.1804771115.

Batalla, R. J. (2003), Sediment deficit in rivers caused by dams and instream gravel mining: A review with examples from ne spain, *Cuaternario y geomorfología: Revista de la Sociedad Española de Geomorfología y Asociación Española para el Estudio del Cuaternario*, *17*(3), 79--91.

Batchelor, G. K. (1970), *An Introduction to Fluid Dynamics*, 615 pp., Cambridge University Press, Cambridge, United Kingdom.

Bates, P. D., S. N. Lane, and R. I. Ferguson (Eds.) (2005), *Computational Fluid Dynamics: Applications in Environmental Hydraulics*, John Wiley & Sons, Chichester, United Kingdom.

Bates, P. D., M. S. Horritt, and T. J. Fewtrell (2010), A simple inertial formulation of the shallow water equations for efficient two-dimensional flood inundation modelling, *Journal of Hydrology*, *387*(1), 33--45, doi:https://doi.org/10.1016/j.jhydrol.2010.03.027.

Bathurst, J. C. (1985), Flow resistance estimation in mountain rivers, *J. Hydraul. Eng.*, *111*(4), 625--643, doi:10.1061/(ASCE)0733-9429(1985)111:4(625).

Battjes, J., and R. J. Labeur (2017), *Unsteady flow in open channels*, 288 pp., Cambridge University Press, Cambridge, United Kingdom.

Battjes, J. A., and R. J. Labeur (2014), *Open channel flow*, TU Delft.

Baumanis, C., and W. Kim (2016), Reverse migration of lithofacies boundaries and shoreline in response to sea-level rise, *Basin Res.*, doi:10.1111/bre.12209.

Baur, T., and H. Jagers (2002), Grensproject Bovenrijn / Grenzprojekt Niederrhein: report no. 2 : investigation of individual engineering measures with 2D morphological model (part 1), *rapport*, WL Delft Hydraulics, Delft.

Baydoun., I. (2018), Analytical formula for the roots of the general complex cubic polynomial.

Bechteler, W. (2003), Modellversuche zum Transportverhalten von gerundetem und gebrochenem Material, *Tech. rep.*, Bundeswehr University Munich.

Becker, A. (2015), Sediment in (be)weging : deel 2 (periode 2000-2012), *rapport deltares*, Deltares, Delft, 121 p. pp.

Becker, A. (2017a), 1D2D model of the Lower Rhine and the upper Dutch Rhine branches between Andernach and Nijmegen, Arnhem and Zutphen, *Tech. Rep. 11203685-002*, Deltares, Delft, the Netherlands, 130 pp.

Becker, A. (2017b), Advies uitvoering en monitoring 2e suppletie Bovenrijn, *rapport deltares*, Deltares, Delft, 37, [50] p. pp.

Becker, A. (2017c), Advies uitvoering en monitoring 2e suppletie Bovenrijn, *Tech. Rep. 11200877-000-ZWS-0003*, Deltares, Delft, the Netherlands, 100 pp.

Becker, A. (2021), Slim suppleren Boven-Waal, *rapport Deltares 11206792-014-ZWS-0001*, Deltares, Delft, 156 pp.

Becker, A., S. Giri, A. Paarlberg, C. J. Sloff, P. van Denderen, and M. Zagonjoli (2022), Eindevaluatie suppletie Boven-Rijn. Deelrapport 1: Data en effecten, *rapport Deltares, (in preparation) 11208437-000-ZWS-0007*, Deltares, Delft.

Beckers, F., A. Heredia, M. Noack, W. Nowak, S. Wieprecht, and S. Oladyshkin (2020), Bayesian calibration and validation of a large-scale and time-demanding sediment transport model, *Water Resour. Res.*, *56*(7), e2019WR026,966, doi:10.1029/2019WR026966, e2019WR026966 10.1029/2019WR026966.

Beeler, M., R. W. Gosper, and R. C. Schroeppel (1972), HAKMEM, *MIT AI Memo 239*, Artificial Intelligence Laboratory, Massachusetts Institute of Technology, Cambridge, MA, United States, 107 pp.

Begin, Z. B. (1988), Application of a diffusion-erosion model to alluvial channels which degrade due to base-level lowering, *Earth Surf. Process. Landf.*, *13*(6), 487--500, doi:10.1002/esp.3290130603.

Begin, Z. B., D. F. Meyer, and S. A. Schumm (1981), Development of longitudinal profiles of alluvial channels in response to base-level lowering, *Earth Surf. Process. Landf.*, *6*(1), 49--68, doi:10.1002/esp.3290060106.

Begnudelli, L., A. Valiani, and B. F. Sanders (2010), A balanced treatment of secondary currents, turbulence and dispersion in a depth-integrated hydrodynamic and bed deformation model for channel bends, *Adv. Water Resour.*, *33*(1), 17--33, doi:10.1016/j.advwatres.2009.10.004.

Belanger, J. B. (1828), *Sur la solution numèrique e quelques problèmes relaties au mouvement permanent des eaux courantes*, Chez Carilian-Goeury, (in French).

Bell, J. B., J. A. Trangenstein, and G. R. Shubin (1986), Conservation laws of mixed type describing three-phase flow in porous media, *SIAM J. Appl. Math.*, *46*(6), 1000--1017, doi:10.1137/0146059.

Bell, R. G., and A. J. Sutherland (1983), Nonequilibrium bedload transport by steady flows, *J. Hydraul. Eng.*, *109*(3), 351--367, doi:10.1061/(ASCE)0733-9429(1983)109:3(351).

Belleudy, P., A. Valette, and B. Graff (2010), Passive hydrophone monitoring of bedload in river beds: First trials of signal spectral analyses., in *Bedload-surrogate monitoring technologies: U.S. Geological Survey Scientific Investigations Report 2010-509*, edited by J. Gray, J. Laronne, and J. Marr.

van Bendegom, L. (1947), Eenige beschouwingen over riviermorphofogie en rivierverbetering, *De Ingenieur*, *59*(4), 1--11, (in Dutch).

van Bendegom, L. (1967), Algemene waterbouwkunde. deel i: De natuur, *Tech. rep.*, Afd. der Weg- en Waterbouwkunde, Technische Hogeschool Delft, (in Dutch).

Benjamin, T. B., and J. E. Feir (1967), The disintegration of wave trains on deep water part 1. theory, *J. Fluid Mech.*, *27*(3), 417--430, doi:10.1017/S002211206700045X.

Bennett, J. P., and C. F. Nordin (1977), Simulation of sediment transport and armouring, *Hydrol. Sci. Bull.*, *22*(4), 555--569, doi:10.1080/02626667709491760.

Benson, M. A., and D. M. Thomas (1966), A definition of dominant discharge, *Int. Assoc. Sci. Hydrol. Bull.*, *11*(2), 76--80, doi:10.1080/02626666609493460.

Berends, K. (2014), Nodal point relations in sobek-3, *Tech. rep.*, Deltares, Delft, the Netherlands.

Berends, K., R. Daggenvoorde, and K. Sloff (2020), Morphological models for IRM: Meuse 1D, *Tech. Rep. 11203684-015-ZWS-0016*, Deltares and HKV.

Berends, K., A. Fujisaki, and B. Domhof (2021), Pilot zesde generatie 1D SOBEK model voor de Maas : toepassing FM2PROF, *rapport deltares*, Deltares, Delft, 72 p. pp.

Berends, K., J. Dijkstra, A. Spruyt, and M. Latella (2022), State of the art and research trends in fluvial vegetation resistance modelling: With a focus on implementation in Rijkswaterstaat hydraulic models, *Tech. Rep. 11208033-018-ZWS-0002*, Deltares, Delft, 68 pp.

Berezowsky, M., and A. A. Jiménez (1994), A simplified method to simulate the time evolution of the river bed armoring process, *Journal of Hydraulic Research*, *32*(4), 517--532, doi:10.1080/00221686.1994.9728353.

van den Berg, M. W., W. Groenewoud, G. Lorenz, P. Lubbers, D. Brus, and S. Kroonenberg (1995), Patterns and velocities of recent crustal movements in the dutch part of the roer valley rift system, *Geologie en Mijnbouw 73 (1995) 157-168.*, *73*.

Berkhof, A., J. Kabout, R. Loeve, M. van de Paverd, and D. Verhoeven (2018), MIRT onderzoek Duurzame Bodemligging Rijntakken; Eindrapportage, ‘‘De Rivierbodem is de basis van alle belangen’’. Eindrapport MIRT onderzoek inclusief kostenramingen, Bijlage 1., *Tech. rep.*, Arcadis, IenW, and Rijkswaterstaat Oost-Nederland, (in Dutch).

Berkhout, W. A. (2003), Modelling of large-scale morphological processes in sand-gravel rivers. analytical and numerical analysis of graded morphological processes in the river meuse, Master's thesis, Universiteit Twente.

Bernard, R. S. (1993), STREMR: Numerical model for depth-averaged incompressible flow, *Tech. Rep. REMR-HY-11*, Army Engineer Waterways Experiment Station Vicksburg Ms Hydraulics Lab.

Bernard, R. S., and M. L. Schneider (1992), Depth-averaged numerical modeling for curved channels, *Tech. Rep. HL-92-9*, Army Engineer Waterways Experiment Station Vicksburg Ms Hydraulics Lab.

Bernardara, P., D. Schertzer, E. Sauquet, I. Tchiguirinskaia, and M. Lang (2008), The flood probability distribution tail: how heavy is it?, *Stochastic Environmental Research and Risk Assessment*, *22*(1), 107--122, doi:10.1007/s00477-006-0101-2.

Bernhardt, C., A. Guillerme, and E. Vonau (2009), L'émergence des politiques de développement durable dans un contexte transfrontalier : L'exemple du rhin supérieur (1914-2000), *Tech. rep.*, MEDD.

Bertagni, M. B. (2019), Linear and weakly nonlinear analyses of morphological instabilities, Ph.D. thesis, Politecnico Torino.

Bertagni, M. B., and C. Camporeale (2018), Finite amplitude of free alternate bars with suspended load, *Water Resour. Res.*, *54*(12), 9759--9773, doi:10.1029/2018WR022819.

Berthon, C., B. Boutin, and R. Turpault (2015), Shock profiles for the Shallow-Water Exner models, *Adv. Appl. Math. Mech.*, *7*(3), 267--294, doi:10.4208/aamm.2013.m331.

Bertin, S., H. Friedrich, P. Delmas, E. Chan, and G. Gimel'farb (2014), Dem quality assessment with a 3d printed gravel bed applied to stereo photogrammetry, *The Photogrammetric Record*, *29*(146), 241--264, doi:10.1111/phor.12061.

Bertin, S., H. Friedrich, P. Delmas, E. Chan, and G. Gimel-farb (2015), Digital stereo photogrammetry for grain-scale monitoring of fluvial surfaces: Error evaluation and workflow optimisation, *ISPRS Journal of Photogrammetry and Remote Sensing*, *101*, 193--208, doi:10.1016/j.isprsjprs.2014.12.019.

Bertin, X., A. Oliveira, and A. B. Fortunato (2009), Simulating morphodynamics with unstructured grids: Description and validation of a modeling system for coastal applications, *Ocean Modelling*, *28*(1), 75--87, doi:https://doi.org/10.1016/j.ocemod.2008.11.001, the Sixth International Workshop on Unstructured Mesh Numerical Modelling of Coastal, Shelf and Ocean Flows.

Bertoldi, W., and M. Tubino (2005), Bed and bank evolution of bifurcating channels, *Water Resour. Res.*, *41*(7), W07,001, doi:10.1029/2004WR003333.

Bertoldi, W., and M. Tubino (2007), River bifurcations: Experimental observations on equilibrium configurations, *Water Resour. Res.*

Bertoldi, W., A. Pasetto, and L. Zanoni (2005), Experimental observations on channel bifurcations evolving to an equilibrium state, in *5th IAHR Symposium*.

Bertoldi, W., L. Zanoni, S. Miori, R. Repetto, and M. Tubino (2009), Interaction between migrating bars and bifurcations in gravel bed rivers, *Water Resour. Res.*, *45*(6), W06,418, doi:10.1029/2008WR007086.

Bertoldi, W., A. Siviglia, S. Tettamanti, M. Toffolon, D. Vetsch, and S. Francalanci (2014), Modeling vegetation controls on fluvial morphological trajectories, *Geophys. Res. Lett.*, *41*(20), 7167--7175, doi:10.1002/2014GL061666.

Best, J. (2005), The fluid dynamics of river dunes: A review and some future research directions, *J. Geophys. Res., Earth Surface*, *110*(F4), F04S02, doi:10.1029/2004JF000218.

Best, J. (2019), Anthropogenic stresses on the world's big rivers, *Nature Geoscience*, *12*(1), 7--21, doi:10.1038/s41561-018-0262-x.

Bettess, R., and A. Frangipane (2003), A one-layer model to predict the time development of static armour, *J. Hydraul. Res.*, *41*(2), 179--194, doi:10.1080/00221680309499960.

Bettess, R., and W. R. White (1983), Meandering and braiding of alluvial channels, *Proc. Inst. Civ. Eng.*, *75*(3), 525--538, doi:10.1680/iicep.1983.1443.

Bialik, R. J., V. I. Nikora, M. Karpiński, and P. M. Rowiński (2015), Diffusion of bedload particles in open-channel flows: distribution of travel times and second-order statistics of particle trajectories, *Environ. Fluid Mech.*, *15*(6), 1281--1292, doi:10.1007/s10652-015-9420-5.

Biedenharn, D. S., C. C. Watson, and C. R. Thorne (2008), *Sedimentation Engineering: Processes, Measurements, Modeling, and Practice*, chap. Fundamentals of Fluvial Geomorphology, pp. 355--386, American Society of Civil Engineers, doi:10.1061/9780784408148.ch06.

Bijkerk, J. F., J. Veen, G. Postma, D. Mike!!e!!, W. Strien, and J. Vries (2014), The role of climate variation in delta architecture: lessons from analogue modelling, *Basin Research*, *26*(3), 351--368, doi:10.1111/bre.12034.

Bijkerk, J. F., J. T. Eggenhuisen, I. A. Kane, N. Meijer, C. N. Waters, P. B. Wignall, and W. D. McCaffrey (2016), Fluvio-marine sediment partitioning as a function of basin water depth, *Journal of Sedimentary Research*, *86*(3), 217--235.

Bijlsma, A., V. Chavarrias, and M. Genseberger (), 3d modelonderzoek verdiepingvaargeul naar kornwerderzand, *Tech. rep.*, Deltares, Delft, the Netherlands.

Binnenvaartkrant (2021), Honderd jaar stuwen op de maas, https://binnenvaartkrant.nl/honderd-jaar-stuwen-op-de-maas.

Biondini, G., and T. Trogdon (2017), Gibbs phenomenon for dispersive PDEs on the line, *SIAM J. Appl. Math.*, *77*(3), 813--837, doi:10.1137/16M1090892.

Bird, E. (2008), *Coastal Geomorphology*, John Wiley & Sons, Chichester, United Kingdom.

Birkhoff, G. (1954), Classification of partial differential equations, *Journal of the Society for Industrial and Applied Mathematics*, *2*(1), 57--67, doi:10.1137/0102005.

Bispen, G., K. R. Arun, M. Lukáčová-Medvid'ová, and S. Noelle (2014), Imex large time step finite volume methods for low froude number shallow water flows, *Communications in Computational Physics*, *16*(2), 307{347, doi:10.4208/cicp.040413.160114a.

Blanckaert, K. (2009), Saturation of curvature-induced secondary flow, energy losses, and turbulence in sharp open-channel bends: Laboratory experiments, analysis, and modeling, *J. Geophys. Res., Earth Surface*, *114*(F3), F03,015, doi:10.1029/2008JF001137.

Blanckaert, K. (2010), Topographic steering, flow recirculation, velocity redistribution, and bed topography in sharp meander bends, *Water Resour. Res.*, *46*(W09506), 1--23, doi:10.1029/2009WR008303.

Blanckaert, K., and H. J. de Vriend (2003), Nonlinear modeling of mean flow redistribution in curved open channels, *Water Resour. Res.*, *39*(12), 1375, doi:10.1029/2003WR002068.

Blanckaert, K., and W. H. Graf (2001), Mean flow and turbulence in open-channel bend, *Journal of Hydraulic Engineering*, *127*(10), 835--847, doi:10.1061/(ASCE)0733-9429(2001)127:10(835).

Blanckaert, K., and W. H. Graf (2004), Momentum transport in sharp open-channel bends, *J. Hydraul. Eng.*, *130*(3), 186--198, doi:10.1061/(ASCE)0733-9429(2004)130:3(186).

Blanckaert, K., and H. J. de Vriend (2004), Secondary flow in sharp open-channel bends, *J. Fluid Mech.*, *498*, 353--380, doi:10.1017/S0022112003006979.

Blanckaert, K., M. G. Kleinhans, S. J. McLelland, W. S. J. Uijttewaal, B. J. Murphy, A. van de Kruijs, D. R. Parsons, and Q. Chen (2013), Flow separation at the inner (convex) and outer (concave) banks of constant-width and widening open-channel bends, *Earth Surface Processes and Landforms*, *38*(7), 696--716, doi:https://doi.org/10.1002/esp.3324.

Blench, T. (1966), *Mobile-Bed Fluviology*, University of Alberta, Canada, Edmonton, Alberta, Canada.

Blevins, K. W. (1982), A comparison of the finite-difference methods for the solution of the transient heat conduction equation in inhomogeneous media, Master's thesis, Air Force Institute of Technology, Air University.

Blokland, T. (1985), Turbulentiemetingen in een gekromde goot, *Master Thesis R/1985/H/7*, Delft University of Technology, Delft, the Netherlands, 340 pp.

Blom, A. (2000), Flume experiments with a trimodal sediment mixture - Data report Sand Flume experiments 99/00,, *resreport CiT: 2000R-004/MICS-013*, Civil Engineering & Management, University of Twente.

Blom, A. (2008), Different approaches to handling vertical and streamwise sorting in modeling river morphodynamics, *Water Resour. Res.*, *44*(3), W03,415, doi:10.1029/2006WR005474.

Blom, A. (2016), Bed degradation in the Rhine River, *WaterViewer, Delft University of Technology*.

Blom, A., and V. Chavarrías (2014), An analytical solution to river profile concavity and downstream fining, in *Absract presented at the 47th Fall Meeting of the AGU, San Francisco, CA, United States, 13--19 December*, EP53C-3670, American Geophysical Union.

Blom, A., and M. Kleinhans (1999), Non-uniform sediment in morphological equilibrium situations - Data report Sand Flume experiments 97/98,, *resreport CiT 99R-002/MICS-001*, Civil Engineering and Management, University of Twente.

Blom, A., and M. G. Kleinhans (2006), Modelling sorting over the lee face of individual bed forms, in *Proceedings of the 3rd International Conference on Fluvial Hydraulics (River Flow), San José, Costa Rica, 5-7 September*, edited by R. M. L. Ferreira, pp. 807--816, Taylor and Francis, Leiden, NL.

Blom, A., and G. Parker (2004), Vertical sorting and the morphodynamics of bed-form dominated rivers: A modeling framework, *J. Geophys. Res., Earth Surface*, *109*(F2), F02,007, doi:10.1029/2003JF000069.

Blom, A., J. S. Ribberink, and H. J. de Vriend (2003), Vertical sorting in bed forms: Flume experiments with a natural and a trimodal sediment mixture, *Water Resour. Res.*, *39*(2), 1025, doi:10.1029/2001WR001088.

Blom, A., G. Parker, J. S. Ribberink, and H. J. de Vriend (2006), Vertical sorting and the morphodynamics of bed-form-dominated rivers: An equilibrium sorting model, *J. Geophys. Res., Earth Surface*, *111*(F1), F01,006, doi:10.1029/2004JF000175.

Blom, A., J. S. Ribberink, and G. Parker (2008), Vertical sorting and the morphodynamics of bed form-dominated rivers: A sorting evolution model, *J. Geophys. Res., Earth Surface*, *113*(F1), F01,019, doi:10.1029/2006JF000618.

Blom, A., E. Viparelli, and V. Chavarrías (2015a), Gravel wedge progradation in sand-gravel laboratory experiments: New insights on the gravel-sand transition, in *Absract presented at the 48th Fall Meeting of the AGU, San Francisco, CA, United States, 14--18 December*, EP13C-03, American Geophysical Union.

Blom, A., E. Viparelli, and V. Chavarrías (2015b), The role of size-selective transport and abrasion in river profile concavity and downstream fining under alluvial and equilibrium conditions, in *Abstract presented in the 8th conference on Gravel Bed Rivers*.

Blom, A., E. Viparelli, and V. Chavarrías (2016a), The graded alluvial river: Profile concavity and downstream fining, *Geophys. Res. Lett.*, *43*(12), 6285--6293, doi:10.1002/2016GL068898.

Blom, A., E. Viparelli, and V. Chavarrías (2016b), Equilibrium, quasi-equilibrium, and transient river longitudinal profiles, in *Proceedings of the 31st IUGG Conference on Mathematical Geophysics, Paris, France, 6--10 June*, p. 52.

Blom, A., V. Chavarrías, R. I. Ferguson, and E. Viparelli (2017a), Advance, retreat, and halt of abrupt gravel-sand transitions in alluvial rivers, *Geophys. Res. Lett.*, *44*(19), 9751--9760, doi:10.1002/2017GL074231.

Blom, A., L. Arkesteijn, V. Chavarrías, and E. Viparelli (2017b), The equilibrium alluvial river under variable flow and its channel-forming discharge, *J. Geophys. Res., Earth Surface*, *122*(10), 1924--1948, doi:10.1002/2017JF004213.

Blom, A., V. Chavarrías, and E. Viparelli (2017c), The dynamics of a gravel-sand transition, in *10th Symposium on River, Coastal and Estuarine Morphodynamics, Trento-Padova, Italy 15--22 September*, edited by S. Lanzoni, M. Redolfi, and G. Zolezzi, p. 158.

Blom, A., L. Arkestijn, V. Chavarrías, and E. Viparelli (2017d), Response of the alluvial river through adjustment of slope, surface texture, and width, in *Absract presented at the 50th Fall Meeting of the AGU, New Orleans, LA, United States, 11--15 December*, EP31E-06, American Geophysical Union.

Blondeaux, P., and G. Seminara (1985), A unified bar-bend theory of river meanders, *J. Fluid Mech.*, *157*, 449--470, doi:10.1017/S0022112085002440.

Blondeaux, P., M. Colombini, G. Seminara, and G. Vittori (2018), *Introduction to Morphodynamics of Sedimentary Patterns*, no. 1 in Morphodynamics of Sedimentary Patterns, Genova University Press.

Blott, S. J., and K. Pye (2001), Gradistat: a grain size distribution and statistics package for the analysis of unconsolidated sediments, *Earth Surf. Process. Landf.*, *26*(11), 1237--1248, doi:10.1002/esp.261.

Blöschl, G., J. Hall, A. Viglione, R. A. P. Perdigão, J. Parajka, B. Merz, D. Lun, B. Arheimer, G. T. Aronica, A. Bilibashi, M. Boháč, O. Bonacci, M. Borga, I. Čanjevac, A. Castellarin, G. B. Chirico, P. Claps, N. Frolova, D. Ganora, L. Gorbachova, A. Gül, J. Hannaford, S. Harrigan, M. Kireeva, A. Kiss, T. R. Kjeldsen, S. Kohnová, J. J. Koskela, O. Ledvinka, N. Macdonald, M. Mavrova-Guirguinova, L. Mediero, R. Merz, P. Molnar, A. Montanari, C. Murphy, M. Osuch, V. Ovcharuk, I. Radevski, J. L. Salinas, E. Sauquet, M. Šraj, J. Szolgay, E. Volpi, D. Wilson, K. Zaimi, and N. Živković (2019), Changing climate both increases and decreases european river floods, *Nature*, *573*(7772), 108--111.

Blum, M. D., and T. E. Törnqvist (2000), Fluvial responses to climate and sea-level change: a review and look forward, *Sedimentology*, *47*, 2--48, doi:10.1046/j.1365-3091.2000.00008.x.

Boersema (2020), *NCR Days 2020 Nijmegen, the Netherlands, 13-14 February*.

Boesch, D. F., M. N. Josselyn, A. J. Mehta, J. T. Morris, W. Nuttle, C. A. Simenstad, and D. J. P. Swift (1994), Scientific assessment of coastal wetland loss, restoration and management in Louisiana, *J. Coast. Res.*, (Special Issue 20), 1--103.

Bohorquez, P., and C. Ancey (2015), Stochastic-deterministic modeling of bed load transport in shallow water flow over erodible slope: Linear stability analysis and numerical simulation, *Adv. Water Resour.*, *83*, 36--54, doi:10.1016/j.advwatres.2015.05.016.

Bohorquez, P., and C. Ancey (2016), Particle diffusion in non-equilibrium bedload transport simulations, *Appl. Math. Modell.*, *40*(17), 7474 -- 7492, doi:10.1016/j.apm.2016.03.044.

Bolla Pittaluga, M., R. Repetto, and M. Tubino (2003), Channel bifurcation in braided rivers: Equilibrium configurations and stability, *Water Resour. Res.*, *39*(3), 1046, doi:10.1029/2001WR001112, 1046.

Bolla Pittaluga, M., R. Luchi, and G. Seminara (2014), On the equilibrium profile of river beds, *J. Geophys. Res., Earth Surface*, *119*(2), 317--332, doi:10.1002/2013JF002806.

Bolla Pittaluga, M., N. Tambroni, A. Canestrelli, R. Slingerland, S. Lanzoni, and G. Seminara (2015a), Where river and tide meet: The morphodynamic equilibrium of alluvial estuaries, *J. Geophys. Res., Earth Surface*, *120*(1), 75--94, doi:10.1002/2014JF003233.

Bolla Pittaluga, M., G. Coco, and M. G. Kleinhans (2015b), A unified framework for stability of channel bifurcations in gravel and sand fluvial systems, *Geophys. Res. Lett.*, *42*(18), 7521--7536, doi:10.1002/2015GL065175.

Bolwidt, L., M. S. L. van Hal, and M. Roukema (2017), *Hoog en laag water op de Rijn en de Maas*, Rijkswaterstaat.

Bom, S. (2017), Scour holes in heterogeneous subsoil: A numerical study on hydrodynamical processes in the development of the scour holes, Master's thesis, Delft University of Technology.

Bomers, A., R. M. J. Schielen, and S. J. M. H. Hulscher (2019), The influence of grid shape and grid size on hydraulic river modelling performance, *Environ. Fluid Mech.*, doi:10.1007/s10652-019-09670-4.

Bonasoundas, M. (1973), Strömungvorgang und Kolkproblem am runden Brückenpfeiler, *Tech. Rep. 28*, Versuchsanstalt für Wasserbouw der Technischen Universität München - Oskar v. Miller Institut.

Bonilla-Porras, J. A., A. Armanini, and A. Crosato (2021), Extended einstein's parameters to include vegetation in existing bedload predictors, *Advances in Water Resources*, *152*, 103,928, doi:https://doi.org/10.1016/j.advwatres.2021.103928.

Booij, R. (2003a), Measurements and large eddy simulations of the flows in some curved flumes, *J. Turbul.*, *4*, N8, doi:10.1088/1468-5248/4/1/008.

Booij, R. (2003b), Modelling the flow in curved tidal channels and rivers, in *Proceedings of the International Conference on Estuaries and Coasts, November 9-11, Hangzhou, China*.

Booij, R., and J. G. S. Pennekamp (1983), Simulation of main flow and secondary flow in a curved open channel, *Tech. Rep. 10-83*, Laboratory of Fluid Mechanics, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands, 62 pp.

Booij, R., and J. G. S. Pennekamp (1984), Measurements of the rate of adjustement of the secondary flow in a curved open channel with varying discharge, *Tech. Rep. 15-84*, Laboratory of Fluid Mechanics, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands, 44 pp.

Booß-Bavnbek, B., and J. Høyrup (Eds.) (2003), *Mathematics and War*, 463 pp., Birkhäuser, Basel, Switzerland.

Borah, D., C. V. Alonso, and S. N. Prasad (1982a), Routing graded sediments in streams: Formulations, *J. Hydraulics Div.*, *108*(HY12), 1486--1503.

Borah, D., C. V. Alonso, and S. N. Prasad (1982b), Routing graded sediments in streams: Applications, *J. Hydraulics Div.*, *108*(HY12), 1504--1517.

Borah, D. K. (1988), Discussion of ‘‘armoring and sorting simulation in alluvial rivers’’ by m. fazle karim and forrest m. holly, jr. (august, 1986, vol. 112, no. 8), *Journal of Hydraulic Engineering*, *114*(3), 344--346, doi:10.1061/(ASCE)0733-9429(1988)114:3(344).

Borges, J. L. (1964), El golem, in *El otro, el mismo*, Emecé, Buenos Aires, Argentina, (in Spanish).

Borges, J. L. (1977), Arte poética, in *Obra poética (1923--1976)*, Emecé, Buenos Aires, Argentina, (in Spanish).

Borsboom, M. (), Construction and analysis of d-flow fm-type discretizations, *Tech. rep.*, Deltares, Delft, the Netherlands.

Borsboom, M. (1997), Sobek morfologieschema, *Tech. rep.*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Borsboom, M. (2011-06-20), Verificatie nodig!!!, *Tech. rep.*, Deltares, Delft, the Netherlands, sOBEK-RE, SOBEK-RUR, 1Dondiepwatermodellering.pdf.

Borsboom, M. (2015), Morfac nieuws, *Tech. rep.*, Deltares, (in Dutch).

Borsboom, M. (2017), About the sensitivity of the d-flow fm 3d/2dv space discretization to horizontal wiggles, *Tech. rep.*, Deltares, Delft, the Netherlands.

Borsboom, M. (2019a), Design of an improved numerical implementation for the exner equation. version 0.3 with adaptations based on the review by victor chavarrias., *Tech. rep.*, Deltares, Delft, the Netherlands.

Borsboom, M. (2019b), About fully implicit time integration and nonlinear iterative solvers (per steady state or per time step), *Tech. rep.*, Deltares, Delft, the Netherlands, aboutimpltimeint&itersolvers-update_2019.p

Borsboom, M. (2020), The delft3d morphology implementation: effect of the morfac and of the exner discretization on the results, *Tech. rep.*, Deltares, Delft, the Netherlands., (in preparation).

Borsboom, M. (2021), Design of an improved numerical implementation of the exner equation.2d extention, d elft 3d-like time integration, numerical determination of jacobian, and suggestion for better(hence implicit) time integration of bed-slope corrections, *Tech. rep.*, Deltares, Delft, the Netherlands.

Borsbooma, M., D.-J. Walstraa, R. Ranasinghеb, and L. Lic (), Analysis of morphodynamic upscaling with the morphological acceleration (morfac) approach in steady ow. part 1. continuous model.

Bosch, T. (2014), Dutch water management in an era of revolution, restoration and the advance of Liberalism, 1795--1850, in *Two Centuries of Experience in Water Resources Management. A Dutch-U.S. Retrospective*, edited by J. Lonnquest, B. Toussaint, J. Joe Manous, and M. Ertsen, chap. 2, pp. 11--49, Institute for Water Resources, US Army Corps of Engineers and Rijkswaterstaat, Ministry of Infrastructure and the Environment.

Bouchaud, J.-P., and A. Georges (1990), Anomalous diffusion in disordered media: Statistical mechanisms, models and physical applications, *Phys. Rep.*, *195*(4), 127--293, doi:10.1016/0370-1573(90)90099-N.

Bouchut, F., J. Delgado-Sánchez, E. Fernández-Nieto, A. Mangeney, and G. Narbona-Reina (2022), A bed pressure correction of the friction term for depth-averaged granular flow models, *Applied Mathematical Modelling*, *106*, 627--658, doi:10.1016/j.apm.2022.01.034.

Bouratsis, P., P. Diplas, C. L. Dancey, and N. Apsilidis (2013), High-resolution 3-d monitoring of evolving sediment beds, *Water Resour. Res.*, *49*(2), 977--992, doi:10.1002/wrcr.20110.

Boussinesq, J. (1901), *Théorie analytique de la chaleur: mise en harmonie avec la thermodynamique et avec la théorie mécanique de la lumière*, vol. 1, 333 pp., Gauthier-Villars, Paris, (in French).

Boussinesq, J. (1903), *Théorie analytique de la chaleur: mise en harmonie avec la thermodynamique et avec la théorie mécanique de la lumière*, vol. 2, 625 pp., Gauthier-Villars, Paris, (in French).

Box, G. E. P. (1976), Science and statistics, *J. Am. Stat. Assoc.*, *71*(356), 791--799.

Boyer, J., C. Duvail, P. L. Strat, B. Gensous, and M. Tesson (2005), High resolution stratigraphy and evolution of the Rhône delta plain during Postglacial time, from subsurface drilling data bank, *Mar. Geol.*, *222-223*(Supplement C), 267--298, doi:10.1016/j.margeo.2005.06.017.

Braat, L., T. van Kessel, J. R. F. W. Leuven, and M. G. Kleinhans (2017), Effects of mud supply on large-scale estuary morphology and development over centuries to millennia, *Earth Surf. Dyn.*, *5*(4), 617--652, doi:10.5194/esurf-5-617-2017.

Braat, L., J. R. F. W. Leuven, I. R. Lokhorst, and M. G. Kleinhans (2019), Effects of estuarine mudflat formation on tidal prism and large-scale morphology in experiments, *Earth Surface Processes and Landforms*, *44*(2), 417--432, doi:https://doi.org/10.1002/esp.4504.

Bradley, D. N. (2017), Direct observation of heavy-tailed storage times of bed load tracer particles causing anomalous superdiffusion, *Geophys. Res. Lett.*, *44*(24), 12,227--12,235, doi:10.1002/2017GL075045.

Bradley, D. N., and G. E. Tucker (2012), Measuring gravel transport and dispersion in a mountain river using passive radio tracers, *Earth Surf. Process. Landf.*, *37*(10), 1034--1045, doi:10.1002/esp.3223.

Bradley, D. N., G. E. Tucker, and D. A. Benson (2010), Fractional dispersion in a sand bed river, *J. Geophys. Res., Earth Surface*, *115*(F1), F00A09, doi:10.1029/2009JF001268.

Bradshaw, P. (1987), Turbulent secondary flows, *Annu. Rev. Fluid Mech.*, *19*(1), 53--74, doi:10.1146/annurev.fl.19.010187.000413.

Brakenhoff, L., R. Schrijvershof, J. van der Werf, B. Grasmeijer, G. Ruessink, and M. van der Vegt (2020), From ripples to large-scale sand transport: The effects of bedform-related roughness on hydrodynamics and sediment transport patterns in delft3d, *Journal of Marine Science and Engineering*, *8*(11), doi:10.3390/jmse8110892.

Bravard, J.-P., G. M. Kondolf, and H. Piégay (1999), Environmental and societal effects of river incision and remedial strategies, in *Incised River Channels*, edited by A. Simon and S. E. Darby, pp. 303--341, Wiley, Chichester.

Bravo-Espinosa, M., W. R. Osterkamp, and V. L. Lopes (2003), Bedload transport in alluvial channels, *J. Hydraul. Eng.*, *129*(10), 783--795, doi:10.1061/(ASCE)0733-9429(2003)129:10(783).

Bray, D. I. (1975), Representative discharges for gravel-bed rivers in alberta, canada, *J. Hydrol.*, *27*(1), 143--153, doi:10.1016/0022-1694(75)90103-1.

Breda, A., D. Mellere, and F. Massari (2007), Facies and processes in a Gilbert-delta-filled incised valley (Pliocene of Ventimiglia, NW Italy), *Sediment. Geol.*, *200*(1-2), 31--55, doi:10.1016/j.sedgeo.2007.02.008.

Breda, A., D. Mellere, F. Massari, and A. Asioli (2009), Vertically stacked Gilbert-type deltas of Ventimiglia (NW Italy): The Pliocene record of an overfilled Messinian incised valley, *Sediment. Geol.*, *219*, 58--76, doi:10.1016/j.sedgeo.2009.04.010.

Bregman, M. C. (2018), A new modelling method forrepresenting the effect of spiralflow on the bed shear stress, Master's thesis.

Bressan, A. (2011), Hyperbolic conservation laws, in *Mathematics of Complexity and Dynamical Systems*, edited by R. A. Meyers, chap. 44, pp. 729--739, Springer, New York, NY, United States, doi:10.1007/978-1-4614-1806-1_44.

Bresse, J. A. C. (1860), *Cours de Mécanique Appliquée*, Mallet Bachelier, (in French).

Breusers, H. N. C. (1966), Conformity and time scale in two-dimensional local scour, *Tech. Rep. 40*, Delft Hydraulics Laboratory, Delft, the Netherlands, 8 pp.

Breusers, H. N. C., and W. H. P. Schukking (1971), Begin van beweging van bodemmateriaal, *Tech. Rep. S159-1*, Delft Hydraulics Laboratory, Delft, the Netherlands, 43 pp.

Breusers, H. N. C., and W. H. P. Schukking (1976), Begin van beweging van bodemmateriaal, literatuur 1971-1974, *Tech. Rep. S159-2*, Delft Hydraulic Laboratory, Delft, the Netherlands, 33 pp.

Breusers, H. N. C., G. Nicollet, and H. W. Shen (1977), Local scour around cylindrical piers, *J. Hydraul. Res.*, *15*(3), 211--252, doi:10.1080/00221687709499645.

Bridge, J. S. (1992), A revised model for water flow, sediment transport, bed topography and grain size sorting in natural river bends, *Water Resour. Res.*, *28*(4), 999--1013, doi:10.1029/91WR03088.

Bridge, J. S. (1993), The interaction between channel geometry, water flow, sediment transport and deposition in braided rivers, *Geological Society, London, Special Publications*, *75*(1), 13--71, doi:10.1144/GSL.SP.1993.075.01.02.

Bridge, J. S., and S. J. Bennett (1992), A model for the entrainment and transport of sediment grains of mixed sizes, shapes, and densities, *Water Resour. Res.*, *28*(2), 337--363, doi:10.1029/91WR02570.

Bridge, J. S., and D. F. Dominic (1984), Bed load grain velocities and sediment transport rates, *Water Resour. Res.*, *20*(4), 476--490, doi:10.1029/WR020i004p00476.

Bridge, J. S., and J. Jarvis (1976), Flow and sedimentary processes in the meandering river south esk, glen clova, scotland, *Earth Surface Processes*, *1*(4), 303--336, doi:https://doi.org/10.1002/esp.3290010402.

ten Brinke, W. (2019), Effecten morfologische ontwikkelingen op functies Rijn en Maas, *Tech. Rep. B19.01*, Blueland Consultancy BV.

ten Brinke, W. B. M. (2005), *The Dutch Rhine: A restrained river*, 229 pp., Veen Magazines, Amsterdam, the Netherlands.

Brock, R. R. (1967), Development of roll waves in open channels, *Tech. Rep. KH-R-16*, W. M. Keck Laboratory of Hydraulics and Water Resources, Division of Engineering and Applied Science California Institute of Technology, Pasadena, CA, United States, 226 pp.

Brock, R. R. (1969), Development of roll-wave trains in open channels, *J. Hydraul. Div.*, *95*(HY4), 1401--1427.

Broomans, P. (2003), Numerical accuracy in solutions of the shallow-water equations, Master's thesis, Delft University of Technology.

Brown, A. G., L. Lespez, D. A. Sear, J.-J. Macaire, P. Houben, K. Klimek, R. E. Brazier, K. V. Oost, and B. Pears (2018), Natural vs anthropogenic streams in europe: History, ecology and implications for restoration, river-rewilding and riverine ecosystem services, *Earth Sci. Rev.*, *180*, 185--205, doi:10.1016/j.earscirev.2018.02.001.

Brown, P. P., and D. F. Lawler (2003), Sphere drag and settling velocity revisited, *J. Environ. Eng.*, *129*(3), 222--231, doi:10.1061/(ASCE)0733-9372(2003)129:3(222).

Brownlie, W. R. (1983), Flow depth in sand-bed channels, *J. Hydraul. Eng.*, *109*(7), 959--990, doi:10.1061/(ASCE)0733-9429(1983)109:7(959).

de Bruijn, H. E. (1911), Invloed van de afsluiting van de Zuiderzee op de vloedhoogte buiten den afsluitdijk, *De Ingenieur*, *26*(1), 28--30, (in Dutch).

de Bruijn, K. M., F. L. M. Diermanse, O. M. Weiler, J. S. De Jong, and M. Haasnoot (2022), Protecting the rhine-meuse delta against sea level rise: What to do with the river's discharge?, *Journal of Flood Risk Management*, *n/a*(n/a), e12,782, doi:https://doi.org/10.1111/jfr3.12782.

Brundrett, E., and W. D. Baines (1964), The production and diffusion of vorticity in duct flow, *J. Fluid Mech.*, *19*(3), 375--394, doi:10.1017/S0022112064000799.

Brunner, G. W. (2016), Hec-ras, river analysis system hydraulic reference manual, *Tech. Rep. CPD-69*, US Army Corps of Engineers Hydrologic Engineering Center, Davis, CA, United States, 547 pp.

de Bruyn, M. (1947), Het vrijmaken van de nederlandse vaarwegen als onderdeel van wederopbouw, *De Ingenieur*, *36*, 85--88.

Buffington, J. M. (2012), *Gravel-bed Rivers: Processes, Tools, Environments*, chap. Changes in Channel Morphology over Human Time Scales, pp. 435--463, John Wiley & Sons, Chichester, United Kingdom.

Buffington, J. M., and D. R. Montgomery (1997), A systematic analysis of eight decades of incipient motion studies, with special reference to gravel-bedded rivers, *Water Resour. Res.*, *33*(8), 1993--2029, doi:10.1029/96WR03190.

Buffington, J. M., and D. R. Montgomery (1999), Effects of sediment supply on surface textures of gravel-bed rivers, *Water Resour. Res.*, *35*(11), 3523--3530, doi:10.1029/1999WR900232.

Bui, L. H. N., and L. T. Bui (2020), Modelling bank erosion dependence on natural and anthropogenic factors | case study of ganh hao estuary, bac lieu - ca mau, vietnam, *Environmental Technology & Innovation*, *19*, 100,975, doi:https://doi.org/10.1016/j.eti.2020.100975.

Buijse, T., E. Mosselman, J. S. de Jong, and M. Weeber (2019a), Langsdammen beoordeling monitoring en synthese, *rapport*, Deltares, Delft.

Buijse, T., G. Geerling, C. Chrzanowski, M. Dorenbosch, and B. Peters (2019b), Natuurvriendelijke oevers langs de Maas toestand en trend na 10 jaar ontwikkeling, *rapport*, Deltares, Bureau Drift and Bureau Waardenburg, 92 p. pp.

Bulle, H. (1926), Untersuchungen über die Geschiebeableitung bei der Spaltung von Wasserläufen: Modellversuche aus dem Flussbaulaboratoriumder Technischen Hochschule zu Karlsruhe, *VDI Verlag, Berlin.*, (in German).

Burge, L. M. (2006), Stability, morphology and surface grain size patterns of channel bifurcation in gravel-cobble bedded anabranching rivers, *Earth Surf. Process. Landf.*, *31*(10), 1211--1226, doi:10.1002/esp.1325.

Burkhalter, J. E., and E. L. Koschmieder (1974), Steady supercritical Taylor vortices after sudden starts, *Phys. Fluids*, *17*(11), 1929--1935, doi:10.1063/1.1694646.

Busnelli, M. M., G. S. Stelling, and M. Larcher (2001), Numerical morphological modeling of open-check dams, *Journal of Hydraulic Engineering*, *127*(2), 105--114, doi:10.1061/(ASCE)0733-9429(2001)127:2(105).

Busse, F. H. (1978), Non-linear properties of thermal convection, *Rep. Prog. Phys.*, *41*(12), 1929--1967.

Butcher, J. C. (1996), A history of Runge-Kutta methods, *Appl. Numer. Math.*, *20*(3), 247--260, doi:10.1016/0168-9274(95)00108-5.

Butcher, J. C., and G. Wanner (1996), Runge-Kutta methods: Some historical notes, *Appl. Numer. Math.*, *22*(1), 113--151, doi:10.1016/S0168-9274(96)00048-7.

Cai, S., Z. Wang, F. Fuest, Y. J. Jeon, C. Gray, and G. E. Karniadakis (2021), Flow over an espresso cup: inferring 3-d velocity and pressure fields from tomographic background oriented schlieren via physics-informed neural networks, *Journal of Fluid Mechanics*, *915*, A102, doi:10.1017/jfm.2021.135.

Call, B. C., P. Belmont, J. C. Schmidt, and P. R. Wilcock (2017), Changes in floodplain inundation under nonstationary hydrology for an adjustable, alluvial river channel, *Water Resour. Res.*, *53*(5), 3811--3834, doi:10.1002/2016WR020277.

Callander, R. A. (1969), Instability and river channels, *J. Fluid Mech.*, *36*, 465--480, doi:10.1017/S0022112069001765.

Camenen, B., C. Béraud, J. le Coz, and A. Paquier (2017), 1d morphodynamic modelling using a simplified grain size description, *J. Hydraul. Res.*, *0*(0), 1--13, doi:10.1080/00221686.2017.1312575.

Camporeale, C., P. Perona, A. Porporato, and L. Ridolfi (2007), Hierarchy of models for meandering rivers and related morphodynamic processes, *Rev. Geophys.*, *45*(1), n/a--n/a, doi:10.1029/2005RG000185, rG1001.

Canestrelli, A., A. Siviglia, M. Dumbser, and E. F. Toro (2009), Well-balanced high-order centred schemes for non-conservative hyperbolic systems. applications to shallow water equations with fixed and mobile bed, *Adv. Water Resour.*, *32*(6), 834--844, doi:10.1016/j.advwatres.2009.02.006.

Canestrelli, A., M. Dumbser, A. Siviglia, and E. F. Toro (2010), Well-balanced high-order centered schemes on unstructured meshes for shallow water equations with fixed and mobile bed, *Adv. Water Resour.*, *33*(3), 291--303, doi:https://doi.org/10.1016/j.advwatres.2009.12.006.

Canestrelli, A., S. Fagherazzi, and S. Lanzoni (2012), A mass-conservative centered finite volume model for solving two-dimensional two-layer shallow water equations for fluid mud propagation over varying topography and dry areas, *Adv. Water Resour.*, *40*, 54--70, doi:10.1016/j.advwatres.2012.01.009.

Canestrelli, A., A. Spruyt, B. Jagers, R. Slingerland, and M. Borsboom (2016), A mass-conservative staggered immersed boundary model for solving the shallow water equations on complex geometries, *International Journal for Numerical Methods in Fluids*, *81*(3), 151--177, doi:https://doi.org/10.1002/fld.4180.

Cao, Z., and P. A. Carling (2002a), Mathematical modelling of alluvial rivers: Reality and myth. Part 1: General review, *Proceedings of the Institution of Civil Engineers Water & Maritime Engineering*, *154*(3), 207--219.

Cao, Z., and P. A. Carling (2002b), Mathematical modelling of alluvial rivers: Reality and myth. Part 2: Special issues, *Proceedings of the Institution of Civil Engineers Water & Maritime Engineering*, *154*(4), 297--307.

Cao, Z., and P. A. Carling (2003), On evolution of bed material waves in alluvial rivers, *Earth Surf. Process. Landf.*, *28*(4), 437--441, doi:10.1002/esp.493.

Cao, Z., R. Day, and S. Egashira (2002), Coupled and decoupled numerical modeling of flow and morphological evolution in alluvial rivers, *J. Hydraul. Eng.*, *128*(3), 306--321, doi:10.1061/(ASCE)0733-9429(2002)128:3(306).

Cao, Z., G. Pender, S. Wallis, and P. Carling (2004), Computational dam-break hydraulics over erodible sediment bed, *J. Hydraul. Eng.*, *130*(7), 689--703, doi:10.1061/(ASCE)0733-9429(2004)130:7(689).

Cao, Z., P. Hu, and G. Pender (2011), Multiple time scales of fluvial processes with bed load sediment and implications for mathematical modeling, *J. Hydraul. Eng.*, *137*(3), 267--276, doi:10.1061/(ASCE)HY.1943-7900.0000296.

Cao, Z.-x., P. Hu, G. Pender, and H.-h. Liu (2016), Non-capacity transport of non-uniform bed load sediment in alluvial rivers, *Journal of Mountain Science*, *13*(3), 377--396, doi:10.1007/s11629-015-3710-8.

Caponi, F., and A. Siviglia (2018), Numerical modeling of plant root controls on gravel bed river morphodynamics, *Geophys. Res. Lett.*, *45*(17), 9013--9023, doi:10.1029/2018GL078696.

Carlin, M. (2021), The response of river bartopography to the hydrologicalflow regime, Ph.D. thesis.

Carling, Gölz, Orr, and Radecki-Pawlik (2000a), The morphodynamics of fluvial sand dunes in the River Rhine, near Mainz, Germany. I. Sedimentology and morphology, *Sedimentology*, *47*(1), 227--252, doi: 10.1046/j.1365-3091.2000.00290.x.

Carling, Williams, Göz, and Kelsey (2000b), The morphodynamics of fluvial sand dunes in the River Rhine, near Mainz, Germany. II. Hydrodynamics and sediment transport, *Sedimentology*, *47*(1), 253--278, doi: 10.1046/j.1365-3091.2000.00291.x.

Carling, P. (1988), The concept of dominant discharge applied to two gravel-bed streams in relation to channel stability thresholds, *Earth Surf. Process. Landf.*, *13*(4), 355--367, doi:10.1002/esp.3290130407.

Carling, P. A. (1999), Subaqueous gravel dunes, *J. Sediment. Res.*, *69*(3), 534--545, doi:10.2110/jsr.69.534.

Carling, P. A., K. Richardson, and H. Ikeda (2005), A flume experiment on the development of subaqueous fine-gravel dunes from a lower-stage plane bed, *J. Geophys. Res., Earth Surface*, *110*(F4), F04S05, doi:10.1029/2004JF000205.

Carniello, L., A. Defina, and L. D'Alpaos (2012), Modeling sand-mud transport induced by tidal currents and wind waves in shallow microtidal basins: Application to the Venice Lagoon (Italy), *Estuarine Coastal Shelf Sci.*, *102*, 105--115, doi:10.1016/j.ecss.2012.03.016.

Carraro, F., A. Valiani, and V. Caleffi (2018a), Efficient analytical implementation of the DOT riemann solver for the de Saint Venant-Exner morphodynamic model, *Adv. Water Resour.*, *113*, 189--201, doi: 10.1016/j.advwatres.2018.01.011.

Carraro, F., D. Vanzo, V. Caleffi, A. Valiani, and A. Siviglia (2018b), Mathematical study of linear morphodynamic acceleration and derivation of the MASSPEED approach, *Adv. Water Resour.*, *117*, 40--52, doi:10.1016/j.advwatres.2018.05.002.

Carson, R. (1951), *The Sea Around Us*, 250 pp., Oxford University Press, Cambridge, United Kingdom.

Caruso, A., R. Vesipa, C. Camporeale, L. Ridolfi, and P. J. Schmid (2016), River bedform inception by flow unsteadiness: A modal and nonmodal analysis, *Phys. Rev. E*, *93*, 053,110, doi:10.1103/PhysRevE.93.053110.

Carver, M. B., and H. W. Hinds (1978), The method of lines and the advective equation, *Simulation*, *31*(2), 59--69, doi:10.1177/003754977803100205.

Castro, M., J. Macías, and C. Parés (2001), A Q-scheme for a class of systems of coupled conservation laws with source term. application to a two-layer 1-d shallow water system, *ESAIM: Mathematical Modelling and Numerical Analysis*, *35*(1), 107â€\127, doi:10.1051/m2an:2001108.

Castro, M. J., E. D. Fernández-Nieto, A. M. Ferreiro, J. A. García-Rodríguez, and C. Parés (2009), High order extensions of Roe schemes for two-dimensional nonconservative hyperbolic systems, *J. Sci. Comput.*, *39*(1), 67--114, doi:10.1007/s10915-008-9250-4.

Castro-Bolinaga, C. F., P. Diplas, and R. J. Bodnar (2016), Dynamic vs. quasi-steady modeling of morphodynamic processes: A physics-based selection criterion, in *River Flow 2016*.

Castro Díaz, M. J., E. D. Fernández Nieto, J. M. González Vida, and C. Parés Madroñal (2011), Numerical treatment of the loss of hyperbolicity of the two-layer shallow-water system, *J. Sci. Comput.*, *48*(1-3), 16--40, doi:10.1007/s10915-010-9427-5.

Casulli, V. (2014), A semi-implicit numerical method for the free-surface navier{stokes equations, *International Journal for Numerical Methods in Fluids*, *74*(8), 605--622, doi:10.1002/fld.3867.

Casulli, V., and P. Zanolli (2002), Semi-implicit numerical modeling of nonhydrostatic free-surface flows for environmental problems, *Mathematical and Computer Modelling*, *36*(9), 1131--1149, doi:10.1016/S0895-7177(02)00264-9.

Caviedes, C. N. (1984), El nino 1982-83, *Geographical Review*, *74*(3), 267--290, doi:10.2307/214939.

Caviedes-Voullime, D., P. García-Navarro, and J. Murillo (2012), Influence of mesh structure on 2d full shallow water equations and scs curve number simulation of rainfall/runoff events, *J. Hydrol.*, *448-449*, 39 -- 59, doi:https://doi.org/10.1016/j.jhydrol.2012.04.006.

Cayocca, F. (2001), Long-term morphological modeling of a tidal inlet: the arcachon basin, france, *Coastal Eng.*, *42*(2), 115--142, doi:http://dx.doi.org/10.1016/S0378-3839(00)00053-3.

Cerna, M., and A. F. Harvey (2000), The fundamentals of fft-based signal analysisand measurement, *Tech. rep.*, National Instrument.

Chalons, C., and A. Del Grosso (), Exploring different possibilities for second-order well-balanced lagrange-projection numerical schemes applied to shallow water exner equations, *International Journal for Numerical Methods in Fluids*, *n/a*(n/a), doi:https://doi.org/10.1002/fld.5064.

Chan, T. (1984), Stability analysis of finite difference schemes for the advection-diffusion equation, *SIAM J. Numer. Anal.*, *21*(2), 272--284, doi:10.1137/0721020.

Chang, W.-Y., G. Constantinescu, and W. F. Tsai (2017), On the flow and coherent structures generated by a circular array of rigid emerged cylinders placed in an open channel with flat and deformed bed, *J. Fluid Mech.*, *831*, 1--40, doi:10.1017/jfm.2017.558.

Chapra, S. C., and R. P. Canale (2010), *NUMERICAL METHODS FOR ENGINEERS*, McGraw-Hill.

Charru, F. (2006), Selection of the ripple length on a granular bed sheared by a liquid flow, *Phys. Fluids*, *18*, 121,508, doi:10.1063/1.2397005.

Charru, F., and E. J. Hinch (2006), Ripple formation on a particle bed sheared by a viscous liquid. Part 1. Steady flow, *J. Fluid Mech.*, *550*, 111--121, doi:10.1017/S002211200500786X.

Charru, F., H. Mouilleron, and O. Eiff (2004), Erosion and deposition of particles on a bed sheared by a viscous flow, *J. Fluid Mech.*, *519*, 55--80, doi:10.1017/S0022112004001028.

Chatanantavet, P., and G. Parker (2009), Physically based modeling of bedrock incision by abrasion, plucking, and macroabrasion, *J. Geophys. Res., Earth Surface*, *114*(F4), F04,018, doi:10.1029/2008JF001044.

Chatanantavet, P., E. Lajeunesse, G. Parker, L. Malverti, and P. Meunier (2010), Physically based model of downstream fining in bedrock streams with lateral input, *Water Resour. Res.*, *46*(2), W02,518, doi: 10.1029/2008WR007208.

Chaudhry, M. H. (2008), *Open-Channel Flow*, Springer, Boston, MA, doi:10.1007/978-0-387-68648-6.

Chaudhry, M. H. (2010), *Applied Hydraulic Transients*, Springer.

Chavarrías, V., L. Arkesteijn, and A. Blom (2019), A well-posed alternative to the Hirano active layer model for rivers with mixed-size sediment, *Journal of Geophysical Research: Earth Surface*, *124*(11), 2491--2520, doi:10.1029/2019JF005081.

Chavarrias, V. (), Implementation of an implicit one-dimensional solver in delft3d fm, *Tech. rep.*, Deltares, Delft, the Netherlands.

Chavarrías, V. (2019a), A regularization strategy for the two-dimensional active layer model, *techreport 11203684-006*, Deltares, Delft, the Netherlands, 82 pp.

Chavarrías, V. (2019b), Obtaining well-posedness in mathematical modelling of fluvial morphodyamics, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Chavarrías, V. (2020), Modelling laboratory groynes: set-up of a delft 3d-fm model, *Tech. Rep. 11205235-015-ZWS-0001*, Deltares, Delft, the Netherlands, 162 pp.

Chavarrias, V. (2020), Analysis of the 2019 measurements in monster and maasgeul, *Tech. rep.*, Deltares, Delft, the Netherlands.

Chavarrias, V. (2021a), Preparación del modelo numérico del río magdalena en las inmediaciones del puente pumarejo, *Memo 11205950-000-ZWS-0020*, Deltares, Delft, the Netherlands, 13 pp.

Chavarrias, V. (2021b), Improving the modelling of flow over groynes, *Tech. Rep. 11206793-013-ZWS-0001*, Deltares, Delft, the Netherlands.

Chavarrias, V. (2021c), Estudio de las causas de la sedimentación del río magdalena en las inmediaciones del puente pumarejo, *Memo 11205950-000-ZWS-0023*, Deltares, Delft, the Netherlands, 13 pp.

Chavarrias, V. (2022a), Sedimentación en las inmediaciones del puente Pumarejo: Análisis, soluciones y modelización, *Tech. Rep. 11205950-000-ZWS-0027*, Deltares, Delft, the Netherlands, 172 pp.

Chavarrias, V. (2022b), Obtaining morphodynamic analytical solutions, *Memo v 1.0*, Deltares, Delft, the Netherlands.

Chavarrias, V. (2022c), Testing of a new morphodynamic scheme, *Tech. rep.*, Deltares, Delft, the Netherlands.

Chavarrías, V., and A. Blom (2019), Modelling degradational rivers, in *Proceedings of the NCR days, Utrecht, the Netherlands, 31 January--1 February*, edited by E. Stouthamer, H. Middelkoop, M. Kleinhans, M. van der Perk, and M. Straatsma, 43-2019, pp. 40--41, Netherlands Center for River studies.

Chavarrías, V., and W. Ottevanger (2016), Mathematical analysis of the well-posedness of the Hirano active layer concept in 2D models, *Tech. Rep. 1230044-000-ZWS-0035*, Deltares, Delft, the Netherlands.

Chavarrías, V., and W. Ottevanger (2019), Morphological development of the bifurcation at pannerden: Measurements, simulations and improving of graded-sediment modelling, *Tech. Rep. 11203682-007-ZWS-0005*, Deltares, Delft, the Netherlands, 71 pp.

Chavarrías, V., and W. Ottevanger (2020), Status of the ‘‘bend effect’’ issue, *Memo*, Deltares, Delft, the Netherlands.

Chavarrias, V., and W. Ottevanger (2021), Modelling morphodynamics in the presence of immobile sediment: Model testing and sensitivity analysis, *Tech. Rep. 11206793-014-ZWS-0002*, Deltares, Delft, the Netherlands, 63 pp.

Chavarrias, V., and W. Ottevanger (2022), Modelling study of the sediment transport along the meuse river during the flood wave of 2021, *Memo 11208012-013-ZWS-0001*, Deltares, Delft, the Netherlands.

Chavarrías, V., and W (2017), A strategy to avoid ill-posedness in mixed sediment morphodynamics, in *10th Symposium on River, Coastal and Estuarine Morphodynamics, Trento-Padova, Italy 15--22 September*, edited by S. Lanzoni, M. Redolfi, and G. Zolezzi, p. 166.

Chavarrias, V., A. van Dongeren, H. Kernkamp, W. Ottevanger, and M. F. M. Yossef (), Flow in river bends: 3d and 2d modelling, in *River Flow 2020: Proceedings of the 10th Conference on Fluvial Hydraulics (Delft, Netherlands, 7-10 July 2020)*.

Chavarrías, V., L. Arkesteijn, and A. Blom (), A well-posed model for mixed-size sediment processes, *J. Geophys. Res., Earth Surface*, (to be submitted).

Chavarrías, V., A. Blom, C. Orrú, and E. Viparelli (2013a), Laboratory experiment of a mixed-sediment gilbert delta under varying base level, in *Proceedings of the 8th Symposium on River, Coastal and Estuarine Morphodynamics, Santander, Spain, 9--13 June*, edited by G. Coco, B. Blanco, M. Olabarrieta, and R. Tinoco, p. 114, Universidad de Cantabria, Santander, Spain.

Chavarrías, V., A. Blom, C. Orrú, E. Viparelli, and J. P. Martín-Vide (2013b), Streamwise variation in stratigraphy in a laboratory Gilbert delta in response to a varying base level, in *Proceedings of the NCR days, Delft, the Netherlands, 3--4 October*, edited by A. Crosato, 37-2013, pp. 3.5--3.6, Netherlands Center for River studies.

Chavarrías, V., G. Stecca, E. Viparelli, and A. Blom (2014a), Ellipticity in modelling mixed sediment river morphodynamics, in *Proceedings of the NCR days, Enschede, the Netherlands, 2--3 October*, edited by D. C. M. Augustijn and J. J. Warmink, 38-2014, pp. 25--26, Netherlands Center for River studies.

Chavarrías, V., E. Viparelli, and A. Blom (2014b), Size stratification in a laboratory Gilbert delta due to a varying base level: Measurement, and numerical modelling., in *Absract presented at the 47th Fall Meeting of the AGU, San Francisco, CA, United States, 15--19 December*, EP53C-3669, American Geophysical Union.

Chavarrías, V., C. Orrú, E. Viparelli, J. P. Martín-Vide, and A. Blom (2014c), Size stratification in a Gilbert delta due to a varying base level: flume experiments, in *Proceedings of the EGU General Assembly, Vienna, Austria, 27 April -- 2 May*, 15595, European Geophysical Union.

Chavarrías, V., G. Stecca, A. Siviglia, and A. Blom (2015a), Ellipticity of the saint-venant-hirano model for mixed-sediment river morphodynamics, in *Proceedings of the 9th symposium of River, Coastal, and Estuarine Morphodynamics, Iquitos, Perú, 30 Aug -- 3 Sep*.

Chavarrías, V., G. Stecca, A. Siviglia, R. J. Labeur, and A. Blom (2015b), Limitations when modelling mixed-sediment river morphodynamics, in *Proceedings of the NCR days, Nijmegen, the Netherlands, 1--2 October*, edited by H. J. R. Lenders, F. P. L. Collas, G. W. Geerling, and R. S. E. W. Leuven, 39-2015, pp. 97--100, Netherlands Center for River studies.

Chavarrías, V., A. Blom, and G. Stecca (2016), Ill-posedness of the saint-venant-hirano model, in *Proceedings of the 31st IUGG Conference on Mathematical Geophysics, Paris, France, 6--10 June*, p. 56.

Chavarrías, V., W. Ottevanger, R. J. Labeur, and A. Blom (2017), Ill-posedness in modelling 2d river morphodynamics, in *Proceedings of the NCR days, Wageningen, the Netherlands, 1--3 February*, edited by A. J. F. Hoitink, T. V. de Ruijsscher, T. J. Geertsema, B. Makaske, J. Wallinga, J. H. J. Candel, and J. Poelman, 41-2017, pp. 74--76, Netherlands Center for River studies.

Chavarrías, V., G. Stecca, and A. Blom (2018a), Ill-posedness in modelling mixed-sediment river morphodynamics, *Adv. Water Resour.*, *114*, 219--235, doi:10.1016/j.advwatres.2018.02.011.

Chavarrías, V., W. Ottevanger, R. Schielen, and A. Blom (2018b), Ill-posedness in 2D mixed sediment river morphodynamics, *Tech. Rep. RWS 4500268550, TUD 17363*, Delft University of Technology, Delft, the Netherlands.

Chavarrías, V., B. Astrid, O. Clara, M.-V. J. Pedro, and V. Enrica (2018c), A sand-gravel gilbert delta subject to base level change, *J. Geophys. Res., Earth Surface*, *123*(5), 1160--1179, doi:10.1029/2017JF004428.

Chavarrías, V., G. Stecca, R. J. Labeur, and A. Blom (2018d), A well-posed model for mixed-sediment river morphodynamics, in *Proceedings of the 9th International Conference on Fluvial Hydraulics (River FLow), Lyon-Villeurbanne, France, September 5--8*, edited by A. Paquier and N. Rivière, 05060, EDP Sciences, doi:10.1051/e3sconf/20184005060.

Chavarrías, V., W. Ottevanger, R. M. J. Schielen, and A. Blom (2018e), Secondary flow and bed slope effects contributing to ill-posedness in river modelling, in *Proceedings of the NCR days, Delft, the Netherlands, 8--9 February*, edited by Y. H. K. D. Berends, I. Niesten, and E. Mosselman, 42-2018, pp. 84--85, Netherlands Center for River studies.

Chavarrías, V., R. Schielen, W. Ottevanger, and A. Blom (2019a), Ill posedness in modelling two-dimensional morphodynamic problems: Effects of bed slope and secondary flow, *J. Fluid Mech.*, *868*, 461--500, doi:10.1017/jfm.2019.166.

Chavarrías, V., G. Stecca, A. Siviglia, and A. Blom (2019b), A regularization strategy for modeling mixed-sediment river morphodynamics, *Adv. Water Resour.*, *127*, 291--309, doi:10.1016/j.advwatres.2019.04.001.

Chavarrías, V., W. Ottevanger, R. Schielen, and A. Blom (2019c), A well-posed model for 2d mixed-size sediment morphodynamics, in *11th Symposium on River, Coastal and Estuarine Morphodynamics, Auckland, New Zealand 16--21 November*, edited by H. Friedrich and K. Bryan, p. 30.

Chavarrías, V., F. Platzek, and M. Yossef (2019d), Laboratory experiment for submerged groynes: results from preliminary numerical simulations, *Tech. Rep. 11203682-005*, Deltares, Delft, the Netherlands, 33 pp.

Chavarrias, V., S. Giri, and K. Sloff (2020), Hydraulics and environmental modelling application for large scaleriver system: II modelling cascade system of tenryuu river (subproject b3 & b4), *Tech. Rep. 11204511-0004*, Deltares, Delft, the Netherlands., 63 pp.

Chavarrías, V., W. Ottevanger, and E. Mosselman (2020a), Morphodynamic modelling over alluvial and non-alluvial layers. literature review, update to Tuijnder concept, *Tech. Rep. 11205235-016-ZWS-0006_v0.1*, Deltares, Delft, the Netherlands, 73 pp.

Chavarrías, V., M. Busnelli, and K. Sloff (2020b), Morphological models for IRM: Rhine branches 1D, *Tech. Rep. 11203684-015-ZWS-0011*, Deltares, Delft, the Netherlands, in cooperation with RHDHV., 175 pp.

Chavarrías, V., W. Ottevanger, K. Sloff, and E. Mosselman (2021a), Modelling morphodynamic changes over fixed layers, in *Proceedings of the NCR days, Enschede, the Netherlands, 11--12 February*, edited by J. J. Warmink, A. Bomers, V. Kitsikoudis, R. P. van Denderen, and F. Huthoff, 46-2021, pp. 96--97, Netherlands Center for River studies.

Chavarrías, V., W. Ottevanger, K. Sloff, and E. Mosselman (2021b), Modelling morphodynamic development in the presence of immobile sediment, *Geomorphology*.

Chavarrías, V., K. Sloff, and E. Mosselman (2021c), Eindevaluatie pilot Langsdammen in de Waal; morphology and maintenance, *techreport 11204644*, Deltares, Delft, the Netherlands.

Chavarrías, V., E. de Goede, B. Jagers, W. Ottevanger, J. Reyns, and P. K. Tonnon (2022), Quantification of accuracy in morphodynamic modelling, in *Proceedings of the NCR days, Delft, the Netherlands, 13--14 April*, edited by A. Blom, L. M. Stancanelli, J. A. Dercksen, C. Y. Arbós, M. K. Chowdhury, S. M. Ahrendt, C. Piccoli, K. Sloff, J. H. Slinger, and R. M. J. Schielen, 49-2022, pp. 86--87, Netherlands Center for River studies, in Blom22.

Chavarrías, V., W. Ottevanger, K. Sloff, and E. Mosselman (2022), Modelling morphodynamic development in the presence of immobile sediment, *Geomorphology*, *410*, 108,290, doi:https://doi.org/10.1016/j.geomorph.2022.108290.

Chavarrias, V., A. Omer, and M. Yosef (2022), Improving the modelling of flow over groynes: Modelling of laboratory cases, *Tech. Rep. 11208034-013-ZWS-0002*, Deltares, Delft, the Netherlands, 49 pp.

Chavaz, F., and S. Gygax (1964), La iie correction des eaux du jura, *Bull. tech. Suisse romande*, *9*, 1--12.

Chbab, E. H. (1996), How extreme were the 1995 flood waves on the rivers Rhine and Meuse?, *Phys. Chem. Earth.*, *20*(5-6), 455--458, doi:http://dx.doi.org/10.1016/S0079-1946(96)00005-5.

Chen, D., and G. H. Jirka (1995), Experimental study of plane turbulent wakes in a shallow water layer, *Fluid Dyn. Res.*, *16*(1), 11--41, doi:10.1016/0169-5983(95)00053-G.

Chen, D., and G. H. Jirka (1997), Absolute and convective instabilities of plane turbulent wakes in a shallow water layer, *J. Fluid Mech.*, *338*, 157--172, doi:10.1017/S0022112097005041.

Chen, S.-C., and S.-H. Peng (2006), Two-dimensional numerical model of two-layer shallow water equations for confluence simulation, *Adv. Water Resour.*, *29*(11), 1608--1617, doi:10.1016/j.advwatres.2005.12.001.

Chen, S.-C., S.-H. Peng, and H. Capart (2007), Two-layer shallow water computation of mud flow intrusions into quiescent water, *J. Hydraul. Res.*, *45*(1), 13--25, doi:10.1080/00221686.2007.9521739.

Chen, S.-C., C.-N. Yang, and C.-Y. Tsou (2017), Bedform development and its effect on bed stabilization and sediment transport based on a flume experiment with non-uniform sediment, *Int. J. Sediment Res.*, *32*(3), 305--312, doi:10.1016/j.ijsrc.2017.05.003.

Chen, S.-H. (2015), *Hydraulic Structures*, 1029 pp., Springer-Verlag Berlin-Heidelberg, Heidelgberg, Germany, doi:10.1007/978-3-662-47331-3.

Cheng, M., and H.-C. Chang (1992), Subharmonic instabilities of finite-amplitude monochromatic waves, *Phys. Fluids A*, *4*(3), 505--523, doi:10.1063/1.858324.

Cheng, Y., and A. M. F. da Silva (2019), Empirical equation for determination of alternate bar height, *J. Hydraul. Eng.*, *145*(11), 04019,037, doi:10.1061/(ASCE)HY.1943-7900.0001633.

Cheviron, B., and R. Moussa (2016), Determinants of modelling choices for 1-d free-surface flow and morphodynamics in hydrology and hydraulics: a review, *Hydrol. Earth Syst. Sci.*, *20*(9), 3799--3830, doi:10.5194/hess-20-3799-2016.

Chien, N., and Z. Wan (1999), *Mechanics of Sediment Transport*, ASCE press, Reston, Virginia, US., doi:10.1061/9780784404003.

Chiew, Y. (1992), Scour protection at bridge piers, *Journal of Hydraulic Engineering*, *118*(9), 1260--1269, doi:10.1061/(ASCE)0733-9429(1992)118:9(1260).

Chiew, Y.-M., and G. Parker (1994), Incipient sediment motion on non-horizontal slopes, *J. Hydraul. Res.*, *32*(5), 649--660, doi:10.1080/00221689409498706.

Chin, C. O., B. W. Melville, and A. J. Raudkivi (1994), Streambed armoring, *Journal of Hydraulic Engineering*, *120*(8), 899--918, doi:10.1061/(ASCE)0733-9429(1994)120:8(899).

Chivers, I., and J. Sleightholme (2012), *Introduction to programming with fortran*, Springer-Verlag London.

Cho, A. (2012), Higgs boson makes its debut after decades-long search, *Science*, *337*(6091), 141--143, doi:10.1126/science.337.6091.141.

Choi, Y., and C. Merkle (1991), Time-derivative preconditioning for viscous flows, *Tech. Rep. 91-1652*, AIAA, Washington, DC, United States, doi:10.2514/6.1991-1652.

Choi, Y.-H., and C. L. Merkle (1993), The application of preconditioning in viscous flows, *J. Comput. Phys.*, *105*(2), 207--223, doi:10.1006/jcph.1993.1069.

Chorin, A. J. (1967), A numerical method for solving incompressible viscous flow problems, *J. Comput. Phys.*, *2*(1), 12--26, doi:10.1016/0021-9991(67)90037-X.

Chorin, A. J. (1968), Numerical solution of the navier-stokes equations, *Math. Comp.*, *22*, 745--762, doi:10.1090/S0025-5718-1968-0242392-2.

Chorley, R. J., and B. A. Kennedy (1971), *Physical geography: a systems approach*, 370 pp., Prentice Hall.

Chow, V. T. (1959), *Open-Channel Hydraulics*, 680 pp., McGraw-Hill, New York, NY, United States.

Chrzanowski, C., and T. Buijse (2019), Factsheets monitoring en ontwikkeling Maasoevers 2008 { 2017, *Bijlage bij rapport*, Deltares, Delft, 61 p. pp.

Chrzanowski, C., M. Weeber, G. Geerling, T. Buijse, M. Dorenbosch, and B. Peters (2019), Achtergrondrapport 'Natuurvriendelijke oevers langs de Maas: toestand en trend na 10 jaar ontwikkeling', *rapport*, Deltares, Bureau Drift and Bureau Waardenburg, 79 p. pp.

Chu, V. H., J. Wu, and R. E. Khayat (1991), Stability of transverse shear flows in shallow open channels, *J. Hydraul. Eng.*, *117*(10), 1370--1388, doi:10.1061/(ASCE)0733-9429(1991)117:10(1370).

Church, M. (2006), Bed material transport and the morphology of alluvial river channels, *Annu. Rev. Earth Planet. Sci.*, *34*, doi:10.1146/annurev.earth.33.092203.122721.

Church, M. (2013), Steep headwater channels, in *Treatise on Geomorphology*, *Fluvial Geomorphology*, vol. 9, edited by J. Shroder and E. Wohl, pp. 528--549, Academic Press, San Diego, CA, United States.

Church, M. (2015), Channel stability: Morphodynamics and the morphology of rivers, in *Rivers - physical, fluvial and environmental processes*, edited by A. Radecki-Pawlik and P. Rowiński, chap. 12, pp. 281--321, Springer, Switzerland, doi:10.1007/978-3-319-17719-9_12.

Church, M., and R. I. Ferguson (2015), Morphodynamics: Rivers beyond steady state, *Water Resour. Res.*, *51*(4), 1883--1897, doi:10.1002/2014WR016862.

Church, M., and D. Ham (2004), Atlas of the alluvial gravel-bed reach of Fraser River in the Lower Mainland, *Tech. rep.*, Department of Geography, The University of British Columbia, Vancouver, British Columbia.

Church, M., and J. K. Haschenburger (2017), What is the ‘‘active layer’’?, *Water Resour. Res.*, *53*(1), 5--10, doi:10.1002/2016WR019675.

Church, M., and D. G. McLean (1992), *The variability of large alluvial rivers*, chap. Sedimentation in lower Fraser River, British Columbia: implications for management, pp. 221--241, ASCE Press, New York.

Church, M., and K. Rood (1983), Catalogue of alluvial river channel regime data, *Tech. rep.*, Department of Geography University of British Columbia, Vancouver, 99 pp.

Cihan, K., and A. H. Hafizoğullari (2021), Reduction of propeller jet flow scour around a pile structure by using collar plate, *Ocean Engineering*, *234*, 109,322, doi:https://doi.org/10.1016/j.oceaneng.2021.109322.

CIRIA, CUR, and CETMEF (2007), *The rock manual, the use of rock in hydraulic engineering*, C683, CIRIA, London, Uniter Kingdom.

Clare, M. C., S. C. Kramer, C. J. Cotter, and M. D. Piggott (2022), Calibration, inversion and sensitivity analysis for hydro-morphodynamic models through the application of adjoint methods, *Computers & Geosciences*, *163*, 105,104, doi:https://doi.org/10.1016/j.cageo.2022.105104.

Clark, M. (2002), Dealing with uncertainty: adaptive approaches to sustainable river management, *Aquat. Conserv. Mar. Freshwater Ecosyst.*, *12*(4), 347--363.

Coates, D. R., and J. D. Vitek (Eds.) (1980), *Thresholds in Geomorphology*, 498 pp., George Allen and Unwin.

Colebrook, C. F. (1939), Turbulent flow in pipes, wtih particular reference to the transition region between the smooth and rough pipe laws, *Journal of the Institution of Civil Engineers*, *11*(4), 133--156, doi:10.1680/ijoti.1939.13150.

Colella, A. (1988), Fault-controlled marine Gilbert-type fan deltas, *Geology*, *16*(11), 1031--1034, doi:10.1130/0091-7613(1988)016\<1031:FCMGTF\>2.3.CO;2.

Colina Alonso, A., R. van Weerdenburg, B. van Maren, and Y. Huismans (2020), Modelling sand-mud interaction in delft3d: Investigation of sand-mud modules in delft3d and delft3d-fm, *techreport 11205286-010-ZWS-0001*, Deltares, Delft, the Netherlands.

Colina Alonso, A., D. S. van Maren, P. M. J. Herman, R. J. A. van Weerdenburg, Y. Huismans, S. J. Holthuijsen, L. L. Govers, A. I. Bijleveld, and Z. B. Wang (2022), The existence and origin of multiple equilibria in sand-mud sediment beds, *Geophysical Research Letters*, *49*(22), e2022GL101,141, doi:https://doi.org/10.1029/2022GL101141, e2022GL101141 2022GL101141.

Collaboration, C. (2012), Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC, *Physics Letters B*, *716*, 30--61, doi:10.1016/j.physletb.2012.08.021.

Collas, F. P. L., N. Y. Flores, R. van Aalderen, F. Bosman, M. M. Schoor, L. N. H. Verbrugge, N. van Kessel, W. Romeijn, B. Achterkamp, W. Liefveld, A. D. Buijse, and R. S. E. W. Leuven (2020), Rapportage natuurgegevens langsdammen waal 2016 - 2020, *Rapport*, Rapport Radboud Universiteit, Rijkswaterstaat, Sportvisserij Nederland, Hengelsport Federatie Midden Nederland, Deltares, Bureau Waardenburg en Universiteit Twente, Reeks Verslagen Dierecologie en Fysiologie Radboud Universiteit, Nijmegen, september.

Colombini, M. (1993), Turbulence-driven secondary flows and formation of sand ridges, *J. Fluid Mech.*, *254*, 701--719, doi:10.1017/S0022112093002319.

Colombini, M. (2004), Revisiting the linear theory of sand dune formation, *J. Fluid Mech.*, *502*, 1--16, doi:10.1017/S0022112003007201.

Colombini, M. (2014), A decade's investigation of the stability of erodible stream beds, *J. Fluid Mech.*, *756*, 1--4, doi:10.1017/jfm.2014.391.

Colombini, M. (2022), Stability, resonance and role of turbulent stresses in 1d alluvial flows, *Environmental Fluid Mechanics*, doi:10.1007/s10652-022-09853-6.

Colombini, M., and C. Carbonari (2017), Sorting waves in heterogenous sediment mixtures, in *Proceedings of the 10th Symposium on River, Coastal and Estuarine Morphodynamics, Trento - Padova, Italy, 15-22 September*, edited by S. Lanzoni, M. Redolfi, and G. Zolezzi, p. 168.

Colombini, M., and G. Parker (1995), Longitudinal streaks, *J. Fluid Mech.*, *304*, 161--183, doi:10.1017/S0022112095004381.

Colombini, M., and A. Stocchino (2005), Coupling or decoupling bed and flow dynamics: Fast and slow sediment waves at high Froude numbers, *Phys. Fluids*, *17*(3), 036,602, doi:10.1063/1.1848731.

Colombini, M., and A. Stocchino (2008), Finite-amplitude river dunes, *J. Fluid Mech.*, *611*, 283--306, doi:10.1017/S0022112008002814.

Colombini, M., and A. Stocchino (2011), Ripple and dune formation in rivers, *J. Fluid Mech.*, *673*, 121--131, doi:10.1017/S0022112011000048.

Colombini, M., and A. Stocchino (2012), Three-dimensional river bed forms, *J. Fluid Mech.*, *695*, 63--80, doi:10.1017/jfm.2011.556.

Colombini, M., and M. Tubino (1991), Finite amplitude free-bars: a fully nonlinear spectral solution, in *Proceedings of the Euromech 262 Colloquium, Wallingford, UK, 26-29 June 1990*, edited by R. Soulsby and R. Bettess, pp. 163--169, Balkema, Rotterdam, the Netherlands.

Colombini, M., G. Seminara, and M. Tubino (1987), Finite-amplitude alternate bars, *J. Fluid Mech.*, *181*, 213--232, doi:10.1017/S0022112087002064.

COMBY, E. (2015), Pour qui l'eau ? les contrastes spatio-temporels des discours sur le rhône (france) et le sacramento (etats-unis), Ph.D. thesis, Universite de Lyon.

Consorcio Estudio Canal de Barranquilla (2020), Estudios y diseños mejoramiento en la infraestructura y navegación del canal de acceso al puerto de Barranquilla hasta el sector PIMSA, *Tech. Rep. contrato consultoría 828--2017*.

Copeland, R., P. Soar, and C. Thorne (2005), Channel-forming discharge and hydraulic geometry width predictors in meandering sand-bed rivers, in *Impacts of Global Climate Change*, pp. 1--12, doi:10.1061/40792(173)568.

Copernicus, N. (1543), *De revolutionibus orbium coelestium*, 405 pp., Johannes Petreius, Nuremberg, Holy Roman Empire, (in Latin).

Cordier, F., P. Tassi, N. Claude, A. Crosato, S. Rodrigues, and D. Pham Van Bang (2019), Numerical study of alternate bars in alluvial channels with nonuniform sediment, *Water Resources Research*, *55*(4), 2976--3003, doi:10.1029/2017WR022420.

Cordier, S., M. H. Le, and T. M. de Luna (2011), Bedload transport in shallow water models: Why splitting (may) fail, how hyperbolicity (can) help, *Adv. Water Resour.*, *34*(8), 980--989, doi:10.1016/j.advwatres.2011.05.002.

Corenblit, D., A. Baas, T. Balke, T. Bouma, F. Fromard, V. Garófano-Gómez, E. González, A. M. Gurnell, B. Hortobágyi, F. Julien, D. Kim, L. Lambs, J. A. Stallins, J. Steiger, E. Tabacchi, and R. Walcker (2015), Engineer pioneer plants respond to and affect geomorphic constraints similarly along water-terrestrial interfaces world-wide, *Global Ecol. Biogeogr.*, *24*(12), 1363--1376, doi:10.1111/geb.12373.

Cormagdalena, U. del Norte, and Ideha (2012), Evolución morfológica al comportamiento de las orillas y canal navegable utilizando el modelo matem'atico MIKE-21c, *Tech. Rep. E-040-002-12*, Cormagdalena, Universidad del Norte, Ideha, 97 pp., (in Spanish).

Corner, G. D., E. Nordahl, K. Munch-Ellingsen, and K. R. Robertsen (1990), *Morphology and Sedimentology of an Emergent Fjord-Head Gilbert-Type Delta: Alta Delta, Norway*, pp. 153--168, Blackwell Publishing Ltd., doi:10.1002/9781444303858.ch8.

Correia, L. R. P., B. G. Krishnappan, and W. H. Graf (1992), Fully coupled unsteady mobile boundary flow model, *J. Hydraul. Eng.*, *118*(3), 476--494, doi:10.1061/(ASCE)0733-9429(1992)118:3(476).

Cosner, C. (1991), On the definition of ellipticity for systems of partial differential equations, *Journal of Mathematical Analysis and Applications*, *158*(1), 80--93, doi:10.1016/0022-247X(91)90268-5.

Cotino, A. (), Discretization of the momentum advection in the shallow-wate requations, *Tech. rep.*, Eindhoven University of Technology, Eindhoven, the Netherlands.

Cotteleer, A., and C. F. van der Mark (2019), Real-time validation of covadem derived water depths: By using locations with a fixated riverbed, *Hydro International*.

Cotteleer, A., H. Raven, and A. Bons (2019), Validation of squat formulas for inland vessels, in *Smart Rivers 2019*.

Courant, R., and D. Hilbert (1989), *Methods of Mathematical Physics, Volume 2: Differential Equations*, 852 pp., John Wiley & Sons, New York, NY, United States.

Courant, R., K. Friedrichs, and H. Lewy (1928), Über die partiellen Differenzengleichungen der mathematischen Physik, *Mathematische Annalen*, *100*, 32--74, (in German).

Cox, J. R., Y. Huismans, S. M. Knaake, J. R. F. W. Leuven, N. E. Vellinga, M. van der Vegt, A. J. F. Hoitink, and M. G. Kleinhans (2021), Anthropogenic effects on the contemporary sediment budget of the lower rhine-meuse delta channel network, *Earth's Future*, *9*(7), e2020EF001,869, doi:https://doi.org/10.1029/2020EF001869, e2020EF001869 2020EF001869.

Crank, J., and P. Nicolson (1947), A practical method for numerical evaluation of solutions of partial differential equations of the heat-conduction type, *Proc. Camb. Phil. Soc.*, *43*, 50--67.

Crickmore, M. J., and G. H. Lean (1962a), The measurement of sand transport by means of radioactive tracers, *Proc. Roy. Soc. London Serie A*, *266*(1326), 402--421, doi:10.1098/rspa.1962.0069.

Crickmore, M. J., and G. H. Lean (1962b), The measurement of sand transport by the time-integration method with radioactive tracers, *Proc. Roy. Soc. London Serie A*, *270*(1340), 27--47.

Crosato, A. (1990), Simulation of meandering river processes, *Tech. Rep. 90-3*, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands, 112 pp.

Crosato, A. (Ed.) (2013), *Proceeding NCR days*.

Crosato, A., and E. Mosselman (2009), Simple physics-based predictor for the number of river bars and the transition between meandering and braiding, *Water Resour. Res.*, *45*(3), W03,424, doi:10.1029/2008WR007242.

Crosato, A., and E. Mosselman (2020), An integrated review of river bars for engineering, management and transdisciplinary research, *Water*, *12*(2), doi:10.3390/w12020596.

Cross, M. C., and P. C. Hohenberg (1993), Pattern formation outside of equilibrium, *Rev. Mod. Phys.*, *65*, 851--1112, doi:10.1103/RevModPhys.65.851.

Crowe, C. T., D. F. Elger, B. C. Williams, and J. A. Roberson (2009), *Engineering fluid mechanics*, 9 ed., 597 pp.

CSO (2013), Rapportage resultaten vks, *Tech. rep.*, CSO.

Cui, Y. (2007), The unified gravel-sand (TUGS) model: Simulating sediment transport and gravel/sand grain size distributions in gravel-bedded rivers, *Water Resour. Res.*, *43*(10), W10,436, doi:10.1029/2006WR005330.

Cui, Y., and G. Parker (1998), The arrested gravel front: stable gravel-sand transitions in rivers. Part 2: General numerical solution, *J. Hydraul. Res.*, *36*(2), 159--182, doi:10.1080/00221689809498631.

Cui, Y., and G. Parker (2005), Numerical model of sediment pulses and sediment-supply disturbances in mountain rivers, *J. Hydraul. Eng.*, *131*(8), 646--656, doi:10.1061/(ASCE)0733-9429(2005)131:8(646).

Cui, Y., G. Parker, T. E. Lisle, J. Gott, M. E. Hansler-Ball, J. E. Pizzuto, N. E. Allmendinger, and J. M. Reed (2003a), Sediment pulses in mountain rivers: 1. Experiments, *Water Resour. Res.*, *39*(9), 1239, doi:10.1029/2002WR001803.

Cui, Y., G. Parker, J. Pizzuto, and T. E. Lisle (2003b), Sediment pulses in mountain rivers: 2. Comparison between experiments and numerical predictions, *Water Resour. Res.*, *39*(9), 1240, doi:10.1029/2002WR001805.

Cui, Y., G. Parker, C. Braudrick, W. E. Dietrich, and B. Cluer (2006a), Dam removal express assessment models (DREAM). part 1: Model development and validation, *J. Hydraul. Res.*, *44*(3), 291--307, doi:10.1080/00221686.2006.9521683.

Cui, Y., C. Braudrick, W. E. Dietrich, B. Cluer, and G. Parker (2006b), Dam removal express assessment models (DREAM). part 2: Sample runs/sensitivity tests, *J. Hydraul. Res.*, *44*(3), 308--323, doi:10.1080/00221686.2006.9521684.

Culling, W. E. H. (1960), Analytical theory of erosion, *J. Geol.*, *68*(3), 336--344, doi:10.1086/626663.

Cunge, J. A., and W. H. Hager (2015), Alexandre Preissmann: His scheme and his career, *J. Hydraul. Res.*, *53*(4), 413--422, doi:10.1080/00221686.2015.1076894.

Cunge, J. A., and N. Perdreau (1973), Mobile bed fluvial mathematical models, *La Houille Blanche*, *7*, 562--581.

Curtis, K. E., C. E. Renshaw, F. J. Magilligan, and W. B. Dade (2010), Temporal and spatial scales of geomorphic adjustments to reduced competency following flow regulation in bedload-dominated systems, *Geomorphology*, *118*, 105--117, doi:10.1016/j.geomorph.2009.12.012.

Czapiga, M., A. Blom, and E. Viparelli (2021), Efficacy of longitudinal training walls to mitigate riverbed erosion, *Powerpoint presentation*, Delft University of Technology, Delft, the Netherlands.

Czapiga, M. J., A. Blom, and E. Viparelli (2022), Efficacy of longitudinal training walls to mitigate riverbed erosion, *Water Resources Research*.

Dabrio, C. J., T. Bardají, C. Zazo, and J. L. Goy (1991), Effects of sea-level changes on a wave-worked Gilbert-type delta (Late Pliocene, Aguilas Basin, SE Spain), *Cuadernos de Geología Ibérica*, *15*, 103--137.

Dade, W. B., and P. F. Friend (1998), Grain-size, sediment-transport regime, and channel slope in alluvial rivers, *J. Geol.*, *106*(6), 661--676, doi:10.1086/516052.

Dade, W. B., C. E. Renshaw, and F. J. Magilligan (2011), Sediment transport constraints on river response to regulation, *Geomorphology*, *126*, 245--251, doi:http://doi.org/10.1016/j.geomorph.2010.11.007.

Dafermos, C. M. (2010), *Hyperbolic Conservation Laws in Continuum Physics*, no. 325 in Grundlehren der mathematischen Wissenschaften, 3 ed., 708 pp., Springer-Verlag Berlin-Heidelberg, Heidelgberg, Germany.

Dafermos, C. M. (2016), Introduction to the theory of hyperbolic conservation laws, in *Handbook of Numerical Methods for Hyperbolic Problems*, *Handbook of Numerical Analysis*, vol. 17, edited by R. Abgrall and C.-W. Shu, chap. 1, pp. 1--18, Elsevier, Amsterdam, the Netherlands, doi:10.1016/bs.hna.2016.08.003.

Dalton, C., and J. M. Szabo (1977), Drag on a group of cylinders, *Journal of Pressure Vessel Technology*, *99*(1), 152--157, doi:10.1115/1.3454500.

Damsma, T., and M. van Koningsveld (2016), Covadem voor rivieronderhoud { bevindingen proof of concept traject, *Memo*, Van Oord, 4 pp.

d'Angremond, K., and F. C. van Roode (2004), *Breakwaters and closure dams*, Spon Press, London.

Darby, S. E., A. M. Alabyan, and M. J. Van de Wiel (2002), Numerical simulation of bank erosion and channel migration in meandering rivers, *Water Resources Research*, *38*(9), 2--1--2--21, doi:https://doi.org/10.1029/2001WR000602.

Dargahi, B. (1990), Controlling mechanism of local scouring, *Journal of Hydraulic Engineering*, *116*(10), 1197--1214, doi:10.1061/(ASCE)0733-9429(1990)116:10(1197).

Darmofal, D. L., and P. J. Schmid (1996), The importance of eigenvectors for local preconditioners of the euler equations, *J. Comput. Phys.*, *127*(2), 346--362, doi:10.1006/jcph.1996.0180.

Davidson, P. (2004), *Turbulence: An Introduction for Scientists and Engineers*, 1 ed., 678 pp., Oxford University Press.

Day, T. J. (1980), A study of the transport of graded sediments, *techreport IT 190*, HRS Wallingford.

de Goede, E. (2022), Overzicht van villemonte formules, *Tech. rep.*, Deltares.

de Goede, E., T. Wagner, R. de Graaff, and B. Sheets (), Modelling of ice growth and transport on a regionalscale, with application to fountain lake, minnesota, usa, in *Proceedings of the 33 th International Conference on Ocean, Offshore and Arctic Engineering; OMAE14 June 8-13, 2014, San Francisco, CA, USA*.

De Goede, E. D. (2020), Historical overview of 2d and 3d hydrodynamic modelling of shallow water flows in the netherlands, *Ocean Dynamics*.

de Jong, R. J., N. Struiksma, and D. Wilkens (1992), Scale model investigation of water intake sunsari morang irrigation ii project, *Tech. rep.*, Delft Hydraulics Laboratory, Delft, the Netherlands.

de Vriend, H. J., and H. J. Geldof (1983), Main flow velocity in short river bends, *J. Hydraul. Eng.*, *109*(7), 991--1011, doi:10.1061/(ASCE)0733-9429(1983)109:7(991).

de Vriend, H. J., H. Havinga, B. C. van Prooijen, P. J. Visser, and Z. B. Wang (2011), River engineering, *Tech. rep.*, TU Delft.

de Vries, J. W. (1947), De maasverbetering voltooid, *De Ingenieur*, *32*, 75--80.

de Zeeuw, R. C. (2017), Monitoring maasoevers 2017, *Tech. rep.*, Shore Monitoring and Research B.V., 46 pp.

Deakin, R. E., and D. G. Kildea (1999), A note on standard deviation and rms, *Australian Surveyor*, *44*(1), 74--79, doi:10.1080/00050351.1999.10558776.

DeConto, R. M., and D. Pollard (2016), Contribution of antarctica to past and future sea-level rise, *Nature*, *531*, 591--597, doi:10.1038/nature17145.

Decyk, V. K., and H. Gardner (), Object-oriented design patterns in fortran95, *Tech. rep.*

Decyk, V. K., and H. J. Gardner (2007), A factory pattern in fortran 95, in *ICCS 2007, Part I, LNCS 4487, pp. ,*, edited by Y. S. et al., pp. 583--590, Springer-Verlag Berlin Heidelberg.

Decyk, V. K., and H. J. Gardner (2008), Object-oriented design patterns in fortran 90/95: mazev1, mazev2 and mazev3, *Computer Physics Communications*, *178*(8), 611 -- 620, doi:https://doi.org/10.1016/j.cpc.2007.11.013.

Defina, A. (2003), Numerical experiments on bar growth, *Water Resour. Res.*, *39*(4), 1092, doi:10.1029/2002WR001455, 1092.

Deigaard, R. (1980), Longitudinal and transverse sorting of grain sizes in alluvial rivers, Ph.D. thesis, Institute of Hydrodynamics and Hydraulic Engineering, Technical University of Denmark.

Deigaard, R. (1982), Longitudinal sorting of grain sizes in alluvial rivers, *Euromech 156: mechanics of sediment transport Istanbul, 12-14 July, Istambul, Turkey*.

Deigaard, R., and J. Fredsøe (1978), Longitudinal grain sorting by current in alluvial streams, *Nord. Hydrol.*, *9*(1), 7--16, doi:10.2166/nh.1978.002.

Delaunay, B. (1934), Sur la sphère vide, *Bulletin de l'Académie des Sciences de l'URSS. Classe des sciences mathématiques et na*, *6*, 739--800, (in French).

Delft, G. (1989), Laboratoriumonderzoek met betrekking tot de zogenaamde sleepemmermonsters van het pannerdensch kanaal, *Tech. Rep. CO-310420*, Grondmechanica Delft.

Delis, A., I. K. Nikolos, and M. Kazolea (), Performance and comparison of cell-centered and node-centered unstructured finite volume discretizations for shallow water free surface flows, *Archives of Computational Methods in Engineering*, *18*(1), 57--118, doi:10.1007/s11831-011-9057-6.

Dellacherie, S. (2010), Analysis of godunov type schemes applied to the compressible euler system at low mach number, *Journal of Computational Physics*, *229*(4), 978--1016, doi:https://doi.org/10.1016/j.jcp.2009.09.044.

Deltares (2013), *Delft3D-FLOW, User Manual*, Rotterdamseweg 185, p.o. box 177, 2600 MH Delft, The Netherlands, 681 pp., 3.15.30059 ed.

Deltares (2015), D-flow fm interactor getting started, deltares (unpublished).

Deltares (2020a), Blue earth data, *Web page*, Deltares, Delft, the Netherlands, http://blueearthdata.org/.

Deltares (2020b), *RGFGRID, User Manual*, Bousinesqweg 1, P.O. box 177, 2600 MH Delft, The Netherlands, 144 pp., delft3d fm suite 2020 ed.

Deltares (2021), Delft3D Flexible Mesh Suite, *Tech. Rep.*, Deltares, Delft, the Netherlands, 496 pp.

Deltares (2022a), Focus on the future, fast forward now. strategic agenda 2022-2025, *Tech. rep.*, Deltares, Delft, the Netherlands.

Deltares (2022b), D-Flow Flexible Mesh: Technical reference manual, *Tech. rep.*, Deltares, Delft, the Netherlands.

Denaro, F. M. (2023), Cfd course evidence of issues in the discretization of quasilinear and conservative forms: Burgers equation.

van Denderen, P. R., R. M. J. Schielen, A. Blom, S. J. M. H. Hulscher, and M. G. Kleinhans (2018), Morphodynamic assessment of side channel systems using a simple one-dimensional bifurcation model and a comparison with aerial images, *Earth Surf. Processes Landforms*, *43*(6), 1169--1182, doi:10.1002/esp.4267.

van Denderen, P. R., E. Kater, L. Jans, and R. Schielen (2020), The initial morphological impact of the longitudinal dams, in *Proceedings of the NCR days, Nijmegen, the Netherlands, 13--14 February*, edited by M. Boersema, R. Schielen, E. van Eijsbergen, and J. G. Rinsema, 44-2020, pp. 41--42, Netherlands Center for River studies.

Devaney, R. L. (1989), *An Introduction to Chaotic Dynamical Systems*, 336 pp., Addison-Wesley, Boston, MA, United States.

Devauchelle, O., L. Malverti, E. Lajeunesse, P.-Y. Lagrée, C. Josserand, and K.-D. N. Thu-Lam (2010), Stability of bedforms in laminar flows with free surface: from bars to ripples, *J. Fluid Mech.*, *642*, 329â€\348, doi:10.1017/S0022112009991790.

DeVries, P. (2002), Bedload layer thickness and disturbance depth in gravel bed streams, *JOURNAL OF HYDRAULIC ENGINEERING*, doi:10.1061/~ASCE!0733-9429~2002!128:11~983!

Dewals, B., S. Erpicum, P. Archambeau, and M. Porotton (2015), Application of the morphological acceleration factor in fluvial hydraulics, in *Proc. of the 36th IAHR World Congress, 28 June--3 July, The Hague, the Netherlands*.

Dey, S. (1999), Sediment threshold, *Appl. Math. Modell.*, *23*(5), 399--417, doi:10.1016/S0307-904X(98)10081-1.

Dey, S. (2014), *Fluvial Hydrodynamics, Hydrodynamic and Sediment Transport Phenomena*, Springer-Verlag Berlin-Heidelberg, Heidelgberg, Germany, doi:10.1007/978-3-642-19062-9.

Dhamotharan, S., A. Wood, G. Parker, and H. Stefan (1980), Bedload transport in a model gravel strem, *Tech. Rep. 190*, St. Anthony Falls Hydraulic Laboratory, University of Minnesota, Minneapolis, MN, United States, 71 pp.

DHI (2017), MIKE 21C, Scientific documentation, *Manual*, DHI, 104 pp.

Dhont, B., and C. Ancey (2018), Are bedload transport pulses in gravel bed rivers created by bar migration or sediment waves?, *Geophys. Res. Lett.*, *45*(11), 5501--5508, doi:10.1029/2018GL077792.

Díaz, M. J. C., E. D. Fernández-Nieto, and A. M. Ferreiro (2008), Sediment transport models in shallow water equations and numerical approach by high order finite volume methods, *Computers & Fluids*, *37*(3), 299--316, doi:http://dx.doi.org/10.1016/j.compfluid.2007.07.017.

Díaz, M. J. C., E. D. Fernández-Nieto, A. M. Ferreiro, and C. Parés-Madroñal (2009), Two-dimensional sediment transport models in shallow water equations. a second order finite volume approach on unstructured meshes, *Computer Methods in Applied Mechanics and Engineering*, *198*(33-36), 2520--2538, doi:http://dx.doi.org/10.1016/j.cma.2009.03.001.

Die Moran, A., K. El Kadi Abderrezzak, E. Mosselman, H. Habersack, F. Lebert, D. Aelbrecht, and E. Laperrousaz (2013), Physical model experiments for sediment supply to the Old Rhine through induced bank erosion, *Int. J. Sediment Res.*, *28*(4), 431--447, doi:https://doi.org/10.1016/S1001-6279(14)60003-2.

Dierx, R. (2018), Validating a 2d water depth chart for cooperative water depth measurement, B.Sc thesis, University of Twente, The Netherlands.

Dietrich, W. E., and J. D. Smith (1983), Influence of the point bar on flow through curved channels, *Water Resources Research*, *19*(5), 1173--1192, doi:10.1029/WR019i005p01173.

Dietrich, W. E., and J. D. Smith (1984), Bed load transport in a river meander, *Water Resour. Res.*, *20*(10), 1355--1380, doi:10.1029/WR020i010p01355.

Dietrich, W. E., J. D. Smith, and T. Dunne (1979), Flow and sediment transport in a sand bedded meander, *The Journal of Geology*, *87*(3), 305--315.

Dietrich, W. E., J. W. Kirchner, H. Ikeda, and F. Iseya (1989), Sediment supply and the development of the coarse surface layer in gravel-bedded rivers, *Nature*, *340*, 215--217, doi:10.1038/340215a0.

van Dijk, W. M., F. Schuurman, W. I. van de Lageweg, and M. G. Kleinhans (2014), Bifurcation instability and chute cutoff development in meandering gravel-bed rivers, *Geomorphology*, *213*, 277--291, doi:10.1016/j.geomorph.2014.01.018.

Dingle, E. H., M. Attal, and H. D. Sinclair (2017), Abrasion-set limits on himalayan gravel flux, *Nature*, *544*, 471--474, doi:10.1038/nature22039.

Dinh, T., R. Nourgaliev, and T. Theofanous (2003), Understanding the ill-posed two-fluid model, in *Proceedings of the 10th international topical meeting on nuclear reactor thermal-hydraulics (NURETH-03)*, Citeseer.

Disco, C., and J. van den Ende (2003), ‘‘Strong, invincible arguments’’? Tidal models as management instruments in twentieth-century Dutch coastal engineering, *Technology and Culture*, *44*(3), 502--535, doi:10.1353/tech.2003.0108.

Disco, N., and B. Toussaint (2014), From projects to systems: the emergence of a national hydraulic technocracy, 1900--1970, in *Two Centuries of Experience in Water Resources Management. A Dutch-U.S. Retrospective*, edited by J. Lonnquest, B. Toussaint, J. Joe Manous, and M. Ertsen, chap. 6, pp. 155--204, Institute for Water Resources, U.S. Army Corps of Engineers and Rijkswaterstaat, Ministry of Infrastructure and the Environment.

Doelman, A. (1991), Finite-dimensional models of the ginsburg-landau equation, *Nonlinearity*, *4*(2), 231.

Doets, I. J. E. (2015), The effect of islands in the rio magdalenaon discharge and sediment transport into the canal del dique, colombia, Master's thesis.

Dogan, E., S. Tripathi, D. A. Lyn, and R. S. Govindaraju (2009), From flumes to rivers: Can sediment transport in natural alluvial channels be predicted from observations at the laboratory scale?, *Water Resour. Res.*, *45*(8), doi:10.1029/2008WR007637.

Donchyts, G., F. Baart, A. Dam, and B. Jagers (2013), The joy of interactive modelling.

Donchyts, G., F. Baart, A. van Dam, and B. Jagers (2014), Benefits of the use of natural user interfaces in water simulations, in *Proceedings of the 7th International Congress on Environmental Modelling and Software (iEMSs), At San Diego, California, USA*, edited by editor.

Dong, T. Y., J. A. Nittrouer, E. Il'icheva, M. Pavlov, B. McElroy, M. J. Czapiga, H. Ma, and G. Parker (2016), Controls on gravel termination in seven distributary channels of the Selenga River Delta, Baikal Rift basin, Russia, *Geol. Soc. Am. Bull.*, doi:10.1130/B31427.1.

van Dongen, B., and D. Meijer (2008), Zomerbedveranderingen van de maas (1889 { 2007), *Tech. Rep. 10314 / 4500103893*, Meander.

Doornekamp, J. (2019a), Rivierkundig beoordelingskader voor ingrepen in de grote rivieren, *Tech. rep.*, Ministerie van Infrastructuur en Waterstaat, Rijkswaterstaat Water, Verkeer en Leefomgeving, (in Dutch).

Doornekamp, J. (2019b), Rivierkundig beoordelingskader voor ingrepen in de grote rivieren, *Tech. rep.*, Ministerie van Infrastructuur en Waterstaat, Rijkswaterstaat Water, Verkeer en Leefomgeving, (in Dutch).

Downs, P., and K. Gregory (2004), *River channel management: towards sustainable catchment hydrosystems*, Arnold, London.

Doyle, M. W., and C. A. Shields (2008), An alternative measure of discharge effectiveness, *Earth Surf. Process. Landf.*, *33*(2), 308--316, doi:10.1002/esp.1543.

Doyle, M. W., D. Shields, K. F. Boyd, P. B. Skidmore, and D. Dominick (2007), Channel-forming discharge selection in river restoration design, *J. Hydraul. Eng.*, *133*(7), 831--837, doi:10.1061/(ASCE)0733-9429(2007)133:7(831).

DÃ©pret, T., J. Riquier, and H. PiÃ©gay (2017), Evolution of abandoned channels: Insights on controlling factors in a multi-pressure river system, *Geomorphology*, *294*, 99 -- 118, doi:10.1016/j.geomorph.2017.01.036, anthropogenic Sedimentation.

Drake, T. G., R. L. Shreve, W. E. Dietrich, P. J. Whiting, and L. B. Leopold (1988), Bedload transport of fine gravel observed by motion-picture photography, *J. Fluid Mech.*, *192*, 193--217, doi:10.1017/S0022112088001831.

Drazin, P., and W. Reid (1982), *Hydrodynamic Stability*, Cambridge monographs on mechanics and applied mathematics, 2 ed., Cambridge University Press, Cambridge, United Kingdom.

Dressler, R. F. (1949), Mathematical solution of the problem of roll-waves in inclined opel channels, *Commun. Pure Appl. Math.*, *2*(2-3), 149--194, doi:10.1002/cpa.3160020203.

Drew, D., L. Cheng, and R. T. Lahey (1979), The analysis of virtual mass effects in two-phase flow, *Int. J. Multiphase Flow*, *5*(4), 233--242, doi:10.1016/0301-9322(79)90023-5.

Drew, D. A., and S. L. Passman (1999), *Theory of Multicomponent Fluids*, vol. 135, Springer New York, doi:10.1007/b97678.

Du, Q., M. Gunzburger, R. B. Lehoucq, and K. Zhou (2012), Analysis and approximation of nonlocal diffusion problems with volume constraints, *SIAM Rev.*, *54*(4), 667--696, doi:10.1137/110833294.

Duan, G. J. (1998), Simulation of alluvial channel migration processes with a two-dimensional numerical model, Ph.D. thesis, Cener for Computational Hydroscience and Engineering, The University of Mississippi.

Duan, J. G. (2004), Simulation of flow and mass dispersion in meandering channels, *J. Hydraul. Eng.*, *130*(10), 964--976, doi:10.1061/(ASCE)0733-9429(2004)130:10(964).

Duan, J. G., and P. Y. Julien (2005), Numerical simulation of the inception of channel meandering, *Earth Surface Processes and Landforms*, *30*(9), 1093--1110, doi:https://doi.org/10.1002/esp.1264.

Duan, J. G., and P. Y. Julien (2010), Numerical simulation of meandering evolution, *J. Hydrol.*, *391*(1), 34--46, doi:10.1016/j.jhydrol.2010.07.005.

Duan, J. G., S. S. Y. Wang, and Y. Jia (2001), The applications of the enhanced CCHE2D model to study the alluvial channel migration processes, *J. Hydraul. Res.*, *39*(5), 469--480, doi:10.1080/00221686.2001.9628272.

Duizendstra, D. (1999), Sedimenttransport in de Grensmaas: Transportcapaciteit en aanbod van sediment., *Tech. Rep. werkdocument 99.158X*, Rijkswaterstaat RIZA.

Duizendstra, H. D. (2001), Determination of the sediment transport in an armoured gravel-bed river, *Earth Surface Processes and Landforms*, *26*(13), 1381--1393, doi:10.1002/esp.302.

Duizendstra, H. D., and C. Flokstra (1998), Graded sediment in SOBEK, *Tech. Rep. Q2347*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Duizendstra, H. D., and M.Laguzzi (1996), A modified numerical scheme implemented in SOBEK-GRA, *Tech. Rep. Q2128*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Dulal, K. P., K. Kobayashi, Y. Shimizu, and G. Parker (2010), Numerical computation of free meandering channels with the application of slump blocks on the outer bends, *J. Hydro-environ. Res.*, *3*(4), 239--246, doi:10.1016/j.jher.2009.10.012.

Dumbser, M., and V. Casulli (2013), A staggered semi-implicit spectral discontinuous Galerkin scheme for the shallow water equations, *Applied Mathematics and Computation*, *219*(15), 8057--8077, doi:10.1016/j.amc.2013.02.041.

Dumbser, M., and E. F. Toro (2011), A simple extension of the Osher Riemann solver to non-conservative hyperbolic systems, *J. Sci. Comput.*, *48*(1), 70--88, doi:10.1007/s10915-010-9400-3.

Dunbar, D., D. A. van der A, P. Scandura, and T. O'Donoghue (2023), An experimental and numerical study of turbulent oscillatory flow over an irregular rough wall, *Journal of Fluid Mechanics*, *955*, A33, doi:10.1017/jfm.2022.1090.

Dunne, K. B. J., and D. J. Jerolmack (2018), Evidence of, and a proposed explanation for, bimodal transport states in alluvial rivers, *Earth Surf. Dyn.*, *6*(3), 583--594, doi:10.5194/esurf-6-583-2018.

Duró, G., A. Crosato, M. G. Kleinhans, T. G. Winkels, H. A. Woolderink, and W. S. Uijttewaal (2020), Distinct patterns of bank erosion in a navigable regulated river, *Earth Surface Processes and Landforms*, *45*(2), 361--374, doi:https://doi.org/10.1002/esp.4736.

Duró, G. (2020), Bank erosion in regulated navigable rivers, Ph.D. thesis.

Duró, G., A. Crosato, M. Kleinhans, and W. Uijttewaal (2018), On the morphological evolution of restored banks: Case study of the meuse river, *E3S Web Conf.*, *40*, 02,021, doi:10.1051/e3sconf/20184002021.

Dutta, S., and M. H. Garcia (2018), Nonlinear distribution of sediment at river diversions: Brief history of the bulle effect and its implications, *Journal of Hydraulic Engineering*, *144*(5), 03118,001, doi:10.1061/(ASCE)HY.1943-7900.0001449.

Dutta, S., D. Wang, P. Tassi, and M. H. Garcia (2017), Three-dimensional numerical modeling of the bulle effect: the nonlinear distribution of near-bed sediment at fluvial diversions, *Earth Surf. Process. Landf.*, doi:10.1002/esp.4186.

Džubáková, K., P. Molnar, K. Schindler, and M. Trizna (2015), Monitoring of riparian vegetation response to flood disturbances using terrestrial photography, *Hydrol. Earth Syst. Sci.*, *19*(1), 195--208, doi:10.5194/hess-19-195-2015.

E. Bladé, G. C. E. E. J. P. E. V.-C. J. D. A. C., L. Cea (2014), Iber: herramienta de simulación numérica del flujo en ríos, *Rev. int. métodos numér. cálc. diseño ing.*, *30*(1), 1--10.

Eça, L., C. M. Klaij, G. Vaz, M. Hoekstra, and F. S. Pereira (2016), On code verification of rans solvers, *Journal of Computational Physics*, *310*, 418--439, doi:https://doi.org/10.1016/j.jcp.2016.01.002.

Eckhaus, W. (1965), *Studies in Non-Linear Stability Theory*, *Springer Tracts in Natural Phylosphy*, vol. 6, 117 pp., Springer-Verlag, New York, NY, United States, doi:10.1007/978-3-642-88317-0.

Eckhaus, W. (1992), On modulation equations of the ginzburg-landau type, in *Proceedings of the second international conference on industrial and applied mathematics*, edited by J. Robert E. O'Malley, chap. 7, pp. 83--98, SIAM, Philadelphia, United States.

Eckhaus, W., and G. Iooss (1989), Strong selection or rejection of spatially periodic patterns in degenerate bifurcations, *Physica D*, *39*(1), 124--146, doi:10.1016/0167-2789(89)90043-2.

Eckhaus, W., and R. Kuske (1997), Pattern formation in systems with slowly varying geometry, *SIAM J. Appl. Math.*, *57*(1), 112--152, doi:10.1137/S0036139994277531.

Eden, S., and S. Tunstall (2006), Ecological versus social restoration? how urban river restoration challenges but also fails to challenge the science-policy nexus in the United Kingdom, *Environment and Planning C*, *24*(5), 661.

Edler, T. (2020), Gravel weirs in the river Meuse: A 2D morphological modelling approach, Master's thesis, Université Côte d'Azur, France.

Edmonds, D. A., and R. L. Slingerland (2008), Stability of delta distributary networks and their bifurcations, *Water Resour. Res.*, *44*(9), W09,426, doi:10.1029/2008WR006992.

Edmonds, D. A., J. B. Shaw, and D. Mohrig (2011), Topset-dominated deltas: A new model for river delta stratigraphy, *Geology*, *39*(12), 1175--1178, doi:10.1130/G32358.1.

eekhout, J., and T. Hoitink (2014), Morfodynamiek van nederlandse laaglandbeken, *Tech. rep.*, STOWA.

Eelkema, M. (2021), Afvoermetingen Hoogwater Maas & Waal, *Tech. Rep. AV200163 juli 2021 v1 definitief*, Aqua Vision B.V.

Egashira, S., and K. Ashida (1992), Unified view of the mechanics of debris flow and bed-load, in *Advances in Micromechanics of Granular Materials*, *Studies in Applied Mechanics*, vol. 31, edited by H. H. Shen, M. Satake, M. Mehrabadi, C. S. Chang, and C. S. Campbell, pp. 391--400, Elsevier, Amsterdam, the Netherlands, doi:10.1016/B978-0-444-89213-3.50046-8.

Egiazaroff, I. V. (1965), Calculation of nonuniform sediment concentrations, *J. Hydraulics Div.*, *91*(4), 225--247.

Egiazaroff, I. V. (1967a), Discussion to "sediment transport mechanics: initiation of motion", *J. Hydraulics Div.*, *93*, 281--287.

Egiazaroff, I. V. (1967b), Closure to "calculation of nonuniform sediment concentrations", *J. Hydraulics Div.*, *93*, 245--253.

Einfeldt, B. (), The carbuncle phenomenon in shallow water simulations.

Einstein, A. (1905), Über die von der molekularkinetischen Theorie der Wärme geforderte Bewegung von in ruhenden Flüssigkeiten suspendierten Teilchen, *Ann. Phys.*, *322*(8), 549--560, doi:10.1002/andp.19053220806, (in German).

Einstein, H. A. (1936), Der Geschiebetrieb als Wahrscheinlichkeitsproblem, Ph.D. thesis, Eidgenössische Technische Hochschule Zürich, Zürich, Switzerland, doi:10.3929/ethz-a-000092036, (in German).

Einstein, H. A. (1942), Formulas for the transportation of bed load, *Transactions of the American Society of Civil Engineers*, *107*(1), 561--577.

Einstein, H. A. (1950), The bed-load function for sediment transportation in open channel flows, *Tech. Bull. 1026*, US Department of Agriculture, Soil Conservation Service, Washington, DC, United States, 70 pp.

Einstein, H. A. (1971), *River Mechanics*, vol. 1, chap. On secondary currents and sediment motion, pp. 18--1--18--10, Fort Collins, CO.

Einstein, H. A., and N. Chien (1953), Transport of sediment mixtures with large ranges of grain sizes, *Tech. Rep. MRD Sediment Series 2*, Institute of Engineering Research, University of California, Berkeley, CA, United States, 75 pp.

Einstein, H. A., and N. Chien (1955), Effects of heavy sediment concentration near the bed on velocity and sediment distribution, *Tech. rep.*, Institute of Engineering Research University of California, 76 pp.

Einstein, H. A., and H. Li (1958), Secondary currents in straight channels, *EOS, Trans. Am. Geophys. Union*, *39*(6), 1085--1088, doi:10.1029/TR039i006p01085.

Einstein, H. A., and H. W. Shen (1964), A study on meandering in straight alluvial channels, *Journal of Geophysical Research*, *69*(24), 5239--5247, doi:10.1029/JZ069i024p05239.

Einstein, H. A., A. G. Anderson, and J. W. Johnson (1940), A distinction between bed-load and suspended load in natural streams, *EOS, Trans. Am. Geophys. Union*, *21*(2), 628--633, doi:10.1029/TR021i002p00628.

Eke, E., G. Parker, and Y. Shimizu (2014a), Numerical modeling of erosional and depositional bank processes in migrating river bends with self-formed width: Morphodynamics of bar push and bank pull, *Journal of Geophysical Research: Earth Surface*, *119*(7), 1455--1483, doi:https://doi.org/10.1002/2013JF003020.

Eke, E., M. J. Czapiga, E. Viparelli, Y. Shimizu, J. Imran, T. Sun, and G. Parker (2014b), Coevolution of width and sinuosity in meandering rivers, *Journal of Fluid Mechanics*, *760*, 127{174, doi:10.1017/jfm.2014.556.

El Kadi Abderrezzak, K., A. D. Moran, P. Tassi, R. Ata, and J.-M. Hervouet (2016), Modelling river bank erosion using a 2D depth-averaged numerical model of flow and non-cohesive, non-uniform sediment transport, *Adv. Water Resour.*, *93*, 75 -- 88, doi:doi.org/10.1016/j.advwatres.2015.11.004, numerical modelling of river morphodynamics.

Elder, J. W. (1959), The dispersion of marked fluid in turbulent shear flow, *J. Fluid Mech.*, *5*(4), 544--560, doi:10.1017/S0022112059000374.

Eleftherakis, D. (2013), Classifying sediments on dutch riverbeds using multi-beam echo-sounder systems, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Eleftherakis, D., E. Mosselman, A. Amiri-Simkooei, S. Giri, M. Snellen, and D. G. Simons (2010), Identifying changes in river bed morphology and bed sediment composition using multi-beam echo-sounder measurements, in *Proc. 10th European Conf. Underwater Acoustics, Istanbul, Turkey, July 5--9*, vol. 2, pp. 1365--1373.

Elling, V. (2009), The carbuncle phenomenon is incurable, *Acta Mathematica Scientia*, *29*(6), 1647--1656, doi:https://doi.org/10.1016/S0252-9602(10)60007-0, mathematics Dedicated to professor James Glimm on the occasion of his 75th birthday.

Elman, H. C. (1999), Preconditioning for the steady-state navier--stokes equations with low viscosity, *SIAM J. Sci. Comput.*, *20*(4), 1299--1316, doi:10.1137/S1064827596312547.

Elshobaki, M., A. Valiani, and V. Caleffi (2018a), Junction riemann problem for 1-d shallow water equations with bottom discontinuities and channel width variations, *Journal of Hyperbolic Differential Equations*, *15*(2), 191--217.

Elshobaki, M., A. Valiani, and V. Caleffi (2018b), Numerical modelling of open channel junctions using the riemann problem approach, *Journal of Hydraulic Research*, *57*(5), 662--674, doi:10.1080/00221686.2018.1534283.

Emmanouil, A. (2017), Analysis of the measured data of sediment nourishments in the rhine river, Master's thesis, TUD.

Emmett, W. W., and M. G. Wolman (2001), Effective discharge and gravel-bed rivers, *Earth Surf. Process. Landf.*, *26*(13), 1369--1380, doi:10.1002/esp.303.

en Jan van Kester, E. de. G. (2013), Toepasbaarheid van kleine roostercellen in waqua voor overlaten, *Memo 1207880-006-ZWS-0009*, Deltares, Delft, the Netherlands.

van den Ende, J. (1992), Tidal calculations in the Netherlands, *IEEE Annals Hist. Comput.*, *14*(3), 23--33.

Engelund, F. (1970), Instability of erodible beds, *J. Fluid Mech.*, *42*(2), 225--244, doi:10.1017/S0022112070001210.

Engelund, F. (1974), Flow and bed topography in channel bends, *J. Hydraulics Div.*, *100*(11), 1631--1648.

Engelund, F. (1975), Instability of flow in a curved alluvial channel, *J. Fluid Mech.*, *72*(1), 145--160, doi:10.1017/S002211207500300X.

Engelund, F., and E. Hansen (1967), Monograph on sediment transport in alluvial streams, *Tech. Rep.*, Hydraulics Laboratory, Technical University of Denmark, Copenhagen, Denmark, 63 pp.

Engelund, F., and O. Skovgaard (1973), On the origin of meandering and braiding in alluvial streams, *J. Fluid Mech.*, *57*(2), 289--302, doi:10.1017/S0022112073001163.

Engelund, F., , and J. Fredsøe (1982), Sediment ripples and dunes, *Annu. Rev. Fluid Mech.*, *14*(1), 13--37, doi:10.1146/annurev.fl.14.010182.000305.

Englert, F., and R. Brout (1964), Broken symmetry and the mass of gauge vector mesons, *Phys. Rev. Lett.*, *13*, 321--323, doi:10.1103/PhysRevLett.13.321.

Enrile, F., G. Besio, and A. Stocchino (2020), Eulerian spectrum of finite-time lyapunov exponents in compound channels, *Meccanica*, *55*(9), 1821--1828, doi:10.1007/s11012-020-01217-y.

ENW (2021), Hoogwater 2021 Feiten en Duiding, *Rapport*, Expertise Netwerk Waterveiligheid.

Erdogan, M. E., and P. C. Chatwin (1967), The effects of curvature and buoyancy on the laminar dispersion of solute in a horizontal tube, *J. Fluid Mech.*, *29*(3), 465--484, doi:10.1017/S0022112067000977.

erik mosselman (2009), Flow resistance of bed forms and groynes under design flood conditions, *Tech. Rep. 1200103-025-ZWS-0007*, Deltares, Delft, the Netherlands.

Escarameia, M., and R. W. P. May (1995), Stability of riprap and concrete blocks in highly turbulent flows, *Proceedings of the Institution of Civil Engineers - Water, Maritime and Energy*, *112*(3), 227--237, doi:10.1680/iwtme.1995.27885.

Esfahanian, V., H. M. Darian, and S. M. I. Gohari (2013), Assessment of WENO schemes for numerical simulation of some hyperbolic equations using GPU, *Comput. Fluids*, *80*, 260--268, doi:10.1016/j.compfluid.2012.02.031.

Eslami, S., P. Hoekstra, H. W. J. Kernkamp, N. Nguyen Trung, D. Do Duc, H. Nguyen Nghia, T. Tran Quang, A. van Dam, S. E. Darby, D. R. Parsons, G. Vasilopoulos, L. Braat, and M. van der Vegt (2021), Dynamics of salt intrusion in the mekong delta: results of field observations and integrated coastal--inland modelling, *Earth Surface Dynamics*, *9*(4), 953--976, doi:10.5194/esurf-9-953-2021.

Eustice, J. (1910), Flow of water in curved pipes, *Proc. Roy. Soc. London*, *84*(568), 107--118, doi:10.1098/rspa.1910.0061.

Eustice, J. (1911), Experiments on stream-line motion in curved pipes, *Proc. Roy. Soc. London*, *85*(576), 119--131.

Ewe, A., and C. Lauschke (2012), Flussmorphologische entwicklung der grenzoder, in *Geomorphologische Prozesse unserer Flussgebiete*, edited by B. für Gewässerkunde, 15, pp. 56--65, 15. Gewässermorphologisches Kolloquium in Koblenz, doi:10.5675/BfG_Veranst_2013.3.

Exner, F. M. (1920), Zur Physik der Dünen, *Akad. Wiss. Wien Math. Naturwiss*, *129*(2a), 929--952, (in German).

Exner, F. M. (1925), Über die Wechselwirkung zwischen Wasser und Geschiebe in Flüssen, *Akad. Wiss. Wien Math. Naturwiss*, *134(2a)*, 165--203, (in German).

Ezz, H., E. Viparelli, A. Moussa, and G. Parker (2012), Modeling delta growth concurrently with self-formed channels. preliminary results on lake nasser delta, sudan and egypt., in *Proceedings of the American Geopshysical Union Fall Meeting, San Francisco, United States*.

Faddeev, D. K., and V. N. Faddeeva (1963), *Computational methods of linear algebra*, W. H. Freeman and Company.

Fairbanks, R. G. (1989), A 17, 000-year glacio-eustatic sea level record: influence of glacial melting rates on the Younger Dryas event and deep-ocean circulation, *Nature*, *342*(6250), 637--642.

Falcon, M. (1984), Secondary flow in curved open channels, *Annu. Rev. Fluid Mech.*, *16*(1), 179--193, doi:10.1146/annurev.fl.16.010184.001143.

Falconer, R. A. (1980), Modelling of planform influence on circulation in harbours, in *Proc. 17th Int. Conference on Coastal Eng., 23-28 March, Sydney, Australia*, pp. 2726--2744, doi:10.1061/9780872622647.164.

Fan, N., A. Singh, M. Guala, E. Foufoula-Georgiou, and B. Wu (2016), Exploring a semimechanistic episodic Langevin model for bed load transport: Emergence of normal and anomalous advection and diffusion regimes, *Water Resour. Res.*, *52*(4), 2789--2801, doi:10.1002/2015WR018023.

Fan, N., Y. Xie, and R. Nie (2017), Bed load transport for a mixture of particle sizes: Downstream sorting rather than anomalous diffusion, *J. Hydrol.*, *553*, 26--34, doi:10.1016/j.jhydrol.2017.07.012.

Fargue, L. (1894), Expériences relatives à l'action de l'eau courante sur un fond de sable, *Annales des Pont et Chaussées*, *64*, 427--466, (in French).

Fasolato, G., P. Ronco, and G. Di Silvio (2009), How fast and how far do variable boundary conditions affect river morphodynamics?, *J. Hydraul. Res.*, *47*(3), 329--339, doi:10.1080/00221686.2009.9522004.

Fasolato, G., P. Ronco, E. J. Langendoen, and G. Di Silvio (2011), Validity of uniform flow hypothesis in one-dimensional morphodynamic models, *J. Hydraul. Eng.*, *137*(2), 183--195, doi:10.1061/(ASCE)HY.1943-7900.0000291.

Fathel, S. L., D. J. Furbish, and M. W. Schmeeckle (2015), Experimental evidence of statistical ensemble behavior in bed load sediment transport, *J. Geophys. Res., Earth Surface*, *120*(11), 2298--2317, doi:10.1002/2015JF003552.

Fedele, J. J., and C. Paola (2007), Similarity solutions for fluvial sediment fining by selective deposition, *J. Geophys. Res., Earth Surface*, *112*(F2), F02,038, doi:10.1029/2005JF000409.

Federici, B., and C. Paola (2003), Dynamics of channel bifurcations in noncohesive sediments, *Water Resour. Res.*, *39*(6), 1162, doi:10.1029/2002WR001434.

Federici, B., and G. Seminara (2003), On the convective nature of bar instability, *J. Fluid Mech.*, *487*, 125--145, doi:10.1017/S0022112003004737.

Feng, J., and C. Merkle (1990), Evaluation of preconditioning methods for time-marching systems, *Tech. Rep. 90-0016*, AIAA, Washington, DC, United States, 10 pp., doi:10.2514/6.1990-16.

Fenton, J. (2010), Computational hydraulics, *Tech. rep.*, TU Wien, Institut für Wasserbau und Ingenieurhydrologie.

Fenton, J. D. (2015), *Rivers - physical, fluvial and environmental processes*, chap. 1: Basic Physical Processes in Rivers, pp. 3--50, Springer, doi:10.1007/978-3-319-17719-9.

Fenton, J. D., and J. E. Abbott (1977), Initial movement of grains on a stream bed: The effect of relative protrusion, *Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Sciences*, *352*(1671), 523--537, doi:10.1098/rspa.1977.0014.

Ferguson, R. (2007), Flow resistance equations for gravel- and boulder-bed streams, *Water Resources Research*, *43*(5), W05,427, doi:10.1029/2006WR005422.

Ferguson, R., and P. Ashworth (1991), Slope-induced changes in channel character along a gravel-bed stream: The Allt Dubhaig, Scotland, *Earth Surf. Process. Landf.*, *16*(1), 65--82, doi:10.1002/esp.3290160108.

Ferguson, R., and M. Church (2009), A critical perspective on 1-d modeling of river processes: Gravel load and aggradation in lower fraser river, *Water Resour. Res.*, *45*(11), W11,424, doi:10.1029/2009WR007740.

Ferguson, R., T. Hoey, S. Wathen, and A. Werritty (1996), Field evidence for rapid downstream fining of river gravels through selective transport, *Geology*, *24*(2), 179--182, doi:10.1130/0091-7613(1996)024⟨0179:FEFRDF⟩2.3.CO;2.

Ferguson, R. I. (2003), Emergence of abrupt gravel to sand transitions along rivers through sorting processes, *Geology*, *31*(2), 159--162, doi:10.1130/0091-7613(2003)031⟨0159:EOAGTS⟩2.0.CO;2.

Ferguson, R. I., and M. Church (2004), A simple universal equation for grain settling velocity, *Journal of Sedimentary Research*, *74*(6), 933--937, doi:10.1306/051204740933.

Ferguson, R. I., T. B. Hoey, S. J. Wathen, A. Werritty, R. I. Hardwick, and G. H. Sambrook Smith (1998), *Gravel-Bed Rivers in the Environment*, chap. Downstream fining of river gravels: integrated field, laboratory and modeling study, pp. 85--114, Water Resources Publications, LLC.

Ferguson, R. I., D. J. Bloomer, T. B. Hoey, and A. Werritty (2002), Mobility of river tracer pebbles over different timescales, *Water Resour. Res.*, *38*(5), 1045, doi:10.1029/2001WR000254.

Ferguson, R. I., D. J. Bloomer, and M. Church (2011), Evolution of an advancing gravel front: observations from vedder canal, british columbia, *Earth Surf. Process. Landf.*, *36*(9), 1172--1182, doi: 10.1002/esp.2142.

Ferguson, R. I., M. Church, C. D. Rennie, and J. G. Venditti (2015), Reconstructing a sediment pulse: Modeling the effect of placer mining on Fraser River, Canada, *J. Geophys. Res., Earth Surface*, *120*(7), 1436--1454, doi:10.1002/2015JF003491.

Fernandez, J., and A. Guerra-Merchan (1996), A coarsening-upward megasequence generated by a Gilbert-type fan-delta in a tectonically controlled context (Upper Miocene, Guadix-Baza Basin, Betic Cordillera, southern Spain), *Sediment. Geol.*, *105*(3), 191--202, doi:doi:10.1016/0037-0738(95)00137-9.

Fernandez-Luque, R., and R. van Beek (1976), Erosion and transport of bed-load sediment, *J. Hydraul. Res.*, *14*(2), 127--144, doi:10.1080/00221687609499677.

Fernández-Nieto, C. E. E. D., T. M. de Luna, and G. Narbona-Reinay (), A two-layer shallow water model for bedload sediment transport: convergence to saint-venant-exner model.

Fernández Nieto, E. D. (2003), Aproximación numérica de leyes de conservación hiperbólicas no homogéneas. Aplicación a las ecuaciones de aguas someras., Ph.D. thesis, University of Sevilla, Sevilla, Spain, (in Spanish).

Ferrer-Boix, C., and M. A. Hassan (2014), Influence of the sediment supply texture on morphological adjustments in gravel-bed rivers, *Water Resour. Res.*, *50*(11), 8868--8890, doi:10.1002/2013WR015117.

Ferrer-Boix, C., and M. A. Hassan (2015), Channel adjustments to a succession of water pulses in gravel bed rivers, *Water Resour. Res.*, *51*(11), 8773--8790, doi:10.1002/2015WR017664.

Ferrer-Boix, C., J. P. Martín-Vide, and G. Parker (2013a), Bed material sorting in a prograding delta composed of sand-gravel mixture, *Sedimentology*, -, --, in review.

Ferrer-Boix, C., J. P. Martín-Vide, and G. Parker (2013b), Sorting of a sand-gravel mixture in a Gilbert-type delta, in *The 8th symposium on River, Coastal and Estuarine Morphodynamics*, edited by G. Coco, B. Blanco, M. Olaberrieta, and R. Tinoco.

Ferrer-Boix, C., J. P. Martín-Vide, and G. Parker (2014), Channel evolution after dam removal in a poorly sorted sediment mixture: Experiments and numerical model, *Water Resour. Res.*, *50*(11), 8997--9019, doi:10.1002/2014WR015550.

Ferrer-Boix, C., J. P. Martín-Vide, and G. Parker (2015), Sorting of a sand-gravel mixture in a Gilbert-type delta, *Sedimentology*, *65*(5), 1446--1465, doi:10.1111/sed.12189.

Ferrer-Boix, C., S. M. Chartrand, M. A. Hassan, J. P. Martín-Vide, and G. Parker (2016), On how spatial variations of channel width influence river profile curvature, *Geophys. Res. Lett.*, *43*(12), 6313--6323, doi:10.1002/2016GL069824.

Finnie, J., B. Donnell, J. Letter, and R. S. Bernard (1999), Secondary flow correction for depth-averaged flow calculations, *J. Eng. Mech.*, *125*(7), 848--863, doi:10.1061/(ASCE)0733-9399(1999)125:7(848).

Fioole, A. (2005), Nadere analyse sedimentbalans : Rijn-maasmonding 1990-2000, rIZA werkdocument: 2006.002X.

Fioole, A., E.-J. Houwing, and T. Visser (2002), Sedimentbalans 1960-2000 zwevend stofvracht rijn en maas, rIZA werkdocument ; 2002.197X.

Fischer, H. B. (1967), The mechanics of dispersion in natural streams, *J. Hydraulics Div.*, *96*(6), 187--216.

Fischer, H. B. (1969), The effect of bends on dispersion in streams, *Water Resour. Res.*, *5*(2), 496--506, doi:10.1029/WR005i002p00496.

Fischer, H. B. (1973), Longitudinal dispersion and turbulent mixing in open-channel flow, *Annu. Rev. Fluid Mech.*, *5*(1), 59--78, doi:10.1146/annurev.fl.05.010173.000423.

Fleischmann, A. S., R. C. D. Paiva, W. Collischonn, M. V. Sorribas, and P. R. M. Pontes (2016), On river-floodplain interaction and hydrograph skewness, *Water Resour. Res.*, *52*(10), 7615--7630, doi: 10.1002/2016WR019233.

Flierman, M., and N. van der Sleen (2021), Factsheets BasisRivierbodemLigging kaarten - versie 1.7, *Note*, Rijkswaterstaat, Utrecht, the Netherlands.

Flokstra, C. (1977), The closure problem for depth-averaged 2-D flow, in *Proc. 18th IAHR World Congress, 15--19 August, Baden-Baden, Germany*, p. 580.

Flores, N. Y., F. P. L. Collas, and R. S. E. W. Leuven (2021), Shore channel sedimentary processess, passability by migrating fish and habitat suitability, *Tech. rep.*, Radboud University, Nijmegen, the Netherlands.

Forstner, U., and W. Salomons (2010), Sediment research, management and policy, *J. Soils Sediments*, *10*(8), 1440--1452, doi:10.1007/s11368-010-0310-7.

Forterre, Y., and O. Pouliquen (2003), Long-surface-wave instability in dense granular flows, *J. Fluid Mech.*, *486*, 21--50, doi:10.1017/S0022112003004555.

Fortunato, A. B., and A. Oliveira (2007), Improving the stability of a morphodynamic modeling system, *J. Coast. Res.*, *50*, 486--490.

Foufoula-Georgiou, E., and P. Passalacqua (2013), *Treatise on Geomorphology*, vol. 2, chap. Nonlocal Transport Theories in Geomorphology: Mathematical Modeling of Broad Scales of Motion, pp. 98--116, Elsevier.

Foufoula-Georgiou, E., and C. Stark (2010), Introduction to special section on stochastic transport and emergent scaling on earth's surface: Rethinking geomorphic transport-stochastic theories, broad scales of motion and nonlocality, *J. Geophys. Res., Earth Surface*, *115*(F2), F00A01, doi:10.1029/2010JF001661.

Fowler, A. C. (1997), *Mathematical Models in the Applied Sciences*, Cambridge Texts in Applied Mathematics, 424 pp., Cambridge University Press, Cambridge, United Kingdom.

Fraccarollo, L., and E. F. Toro (1995), Experimental and numerical assessment of the shallow water model for two-dimensional dam-break type problems, *J. Hydraul. Res.*, *33*(6), 843--864, doi:10.1080/00221689509498555.

Francalanci, S., and L. Solari (2007), Gravitational effects on bed load transport at low Shields stress: Experimental observations, *Water Resour. Res.*, *43*(3), W03,424, doi:10.1029/2005WR004715.

Francalanci, S., and L. Solari (2008), Bed-load transport equation on arbitrarily sloping beds, *J. Hydraul. Eng.*, *134*(1), 110--115, doi:10.1061/(ASCE)0733-9429(2008)134:1(110).

Francalanci, S., L. Solari, and M. Toffolon (2009), Local high-slope effects on sediment transport and fluvial bed form dynamics, *Water Resour. Res.*, *45*(5), W05,426, doi:10.1029/2008WR007290.

Fredsøe, J. (1978), Meandering and braiding of rivers, *J. Fluid Mech.*, *84*(4), 609--624, doi:10.1017/S0022112078000373.

Fredsoe, J. (1982), Shape and dimensions of stationary dunes in rivers, *Journal of the Hydraulics Division*, pp. 932--947.

Fredsøe, J. (1984), Turbulent boundary layer in wave-current motion, *Journal of Hydraulic Engineering*, *110*(8), 1103--1120.

Friedkin, J. F. (1945), A laboratory study of the measndering of alluvial rivers, *Tech. rep.*, US Army Corps of Engineers.

Friedman, A. (1963), Existence of smooth solutions of the cauchy problem for differential systems of any type, *Indiana Univ. Math. J.*, *12*, 335--374.

Friedrichs, C. T., and L. D. Wright (2004), Gravity-driven sediment transport on the continental shelf: implications for equilibrium profiles near river mouths, *Coastal Eng.*, *51*(8-9), 795--811, doi:10.1016/j.coastaleng.2004.07.010.

Frigo, A. L., R.-D. Zentgraf, and T. B. Bleninger (2019), Two-dimensional vessel-current interaction model for inland waterways assessment, *Journal of Waterway, Port, Coastal, and Ocean Engineering*, *145*(1), 04018,036, doi:10.1061/(ASCE)WW.1943-5460.0000494.

Frings, R. (2007), From gravel to sand, Ph.D. thesis, Utrecht University.

Frings, R. (2022), De bodemsamenstelling van de Maas in 1983 en 2020, *Tech. Rep. only data - report to follow*, Rijkswaterstaat.

Frings, R., and M. Kleinhans (2008), Complex variations in sediment transport at three large river bifurcations during discharge waves in the river rhine, *Sedimentology*, *55*(5), 1145--1171, doi:10.1111/j.1365-3091.2007.00940.x.

Frings, R. M. (2008), Downstream fining in large sand-bed rivers, *Earth Sci. Rev.*, *87*(1--2), 39--60, doi:10.1016/j.earscirev.2007.10.001.

Frings, R. M. (2011), Sedimentary characteristics of the gravel-sand transition in the River Rhine, *J. Sediment. Res.*, *81*(1), 52--63, doi:10.2110/jsr.2011.2.

Frings, R. M., and W. B. M. T. Brinke (2017), Ten reasons to set up sediment budgets for river management, *International Journal of River Basin Management*, *0*(0), 1--6, doi:10.1080/15715124.2017.1345916.

Frings, R. M., B. M. Berbee, G. Erkens, M. G. Kleinhans, and M. J. P. Gouw (2009), Human-induced changes in bed shear stress and bed grain size in the River Waal (The Netherlands) during the past 900 years, *Earth Surf. Process. Landf.*, *34*(4), 503--514, doi:10.1002/esp.1746.

Frings, R. M., W. Ottevanger, and K. C. J. Sloff (2011a), Downstream fining processes in sandy lowland rivers, *Journal of Hydraulic Research*, *49*(2), 178--193, doi:10.1080/00221686.2011.561000.

Frings, R. M., H. Schüttrumpf, and S. Vollmer (2011b), Verification of porosity predictors for fluvial sand-gravel deposits, *Water Resources Research*, *47*(7), doi:10.1029/2010WR009690.

Frings, R. M., R. Döring, C. Beckhausen, and H. Schüttrumpf (2012), Sedimentologisch-morphologischer atlas des niederrheins, *Tech. rep.*, Institute of Hydraulic Engineering and Water Resources Management RWTH Aachen University, (in German).

Frings, R. M., N. Gehres, M. Promny, H. Middelkoop, H. Schüttrumpf, and S. Vollmer (2014a), Today's sediment budget of the rhine river channel, focusing on the upper rhine graben and rhenish massif, *Geomorphology*, *204*, 573--587, doi:10.1016/j.geomorph.2013.08.035.

Frings, R. M., R. Düring, C. Beckhausen, H. Schüttrumpf, and S. Vollmer (2014b), Fluvial sediment budget of a modern, restrained river: The lower reach of the Rhine in Germany, *Catena*, *122*(0), 91--102, doi:10.1016/j.catena.2014.06.007.

Frings, R. M., K. Banhold, and I. Evers (2015), Sedimentbilanz des Oberen Rheindeltas für den Zeitraum 1991-2010, *Tech. Rep. 2015.019*, Institut für Wasserbau und Wasserwirtschaft, RWTH Aachen, Aachen, Deutschland, (in German).

Frings, R. M., G. Hillebrand, N. Gehres, K. Banhold, S. Schriever, and T. Hoffmann (2019), From source to mouth: Basin-scale morphodynamics of the Rhine River, *Earth Sci. Rev.*, *196*, doi:10.1016/j.earscirev.2019.04.002.

F.R.S., P. O. R. L. (1885), Lvii. on the dilatancy of media composed of rigid particles in contact. with experimental illustrations, *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, *20*(127), 469--481, doi:10.1080/14786448508627791.

F.R.S., P. O. R. L. (2001), Large-scale circulation and flushing characteristics of the north sea under various climate forcings, *Clim. Res.*, *18*, 47--57.

Fujisaki, A., R. Agtersloot, and A. Becker (2023), B&o-modellen en deelmodellen maas., *Tech. Rep. 11208053-002-ZWS-0005*, Deltares, Delft, the Netherlands.

Furbish, D. J., and M. W. Schmeeckle (2013), A probabilistic derivation of the exponential-like distribution of bed load particle velocities, *Water Resour. Res.*, *49*(3), 1537--1551, doi:10.1002/wrcr.20074.

Furbish, D. J., P. K. Haff, J. C. Roseberry, and M. W. Schmeeckle (2012a), A probabilistic description of the bed load sediment flux: 1. Theory, *J. Geophys. Res., Earth Surface*, *117*(F3), F03,031, doi: 10.1029/2012JF002352.

Furbish, D. J., J. C. Roseberry, and M. W. Schmeeckle (2012b), A probabilistic description of the bed load sediment flux: 3. The particle velocity distribution and the diffusive flux, *J. Geophys. Res., Earth Surface*, *117*(F3), F03,033, doi:10.1029/2012JF002355.

Furbish, D. J., A. E. Ball, and M. W. Schmeeckle (2012c), A probabilistic description of the bed load sediment flux: 4. Fickian diffusion at low transport rates, *J. Geophys. Res., Earth Surface*, *117*(F3), F03,034, doi:10.1029/2012JF002356.

Furbish, D. J., M. W. Schmeeckle, R. Schumer, and S. L. Fathel (2016), Probability distributions of bed load particle velocities, accelerations, hop distances, and travel times informed by jaynes's principle of maximum entropy, *J. Geophys. Res., Earth Surface*, *121*(7), 1373--1390, doi:10.1002/2016JF003833.

Furbish, D. J., S. L. Fathel, M. W. Schmeeckle, D. J. Jerolmack, and R. Schumer (2017), The elements and richness of particle diffusion during sediment transport at small timescales, *Earth Surf. Process. Landf.*, *42*(1), 214--237, doi:10.1002/esp.4084.

G. Zolezzi, M. T., W. Bertoldi (2009), Morphological analysis and prediction of river bifurcations, in *Braided Rivers: processes ...*

Gabriel, T., E. Köhne, S. Kloss, A. Anlauf, E. Gölz, P. Faulhaber, G. Puhlmann, and T. Gröger (2009), Sohlstabilisierungskonzept für die elbe von mühlberg bis zur saalemündung,, *Tech. rep.*, WSD Ost, WSA Dresden, BAW und BfG, (in German).

Gabriel, T., E. Kühne, P. Faulhaber, M. Promny, and P. Horchler (2011), Sohlenstabilisierung und erosions eindämmung am beispiel der elbe, *WasserWirtschaft*, *6*, 2011, doi:10.1365/s35147-011-0081-0.

Gad, A. (2008), Water culture in Egypt, in *Water culture and water conflict in the Mediterranean area*, edited by M. El Moujabber, M. Shatanawi, G. Trisorio-Liuzzi, M. Ouessar, P. Laureano, and R. Rodríguez, no. A 83 in Options Méditerranéennes, pp. 85--96, CIHEAM.

Galappatti, G., and C. B. Vreugdenhil (1985), A depth-integrated model for suspended sediment transport, *Journal of Hydraulic Research*, *23*(4), 359--377, doi:10.1080/00221688509499345.

Galay, V. J. (1983), Causes of river bed degradation, *Water Resour. Res.*, *19*(5), 1057--1090, doi:10.1029/WR019i005p01057.

Galloway, W. E. (1975), *Process framework for describing the morphologic and stratigraphic evolution of deltaic depositional systems*, pp. 87--98, Houston Geological Society.

Galloway, W. E. (1989), Genetic stratigraphic sequences in basin analysis; I, architecture and genesis of flooding-surface bounded depositional units, *AAPG Bull.*, *73*(2), 125--142.

Galvin, C. J. (1965), Discussion: Sand transport studies with radioactive tracers, by D. W. Hubbell and W. W. Sayre, *J. Hydraulics Div.*, *91*, 173--178.

Ganti, V., M. M. Meerschaert, E. Foufoula-Georgiou, E. Viparelli, and G. Parker (2010), Normal and anomalous diffusion of gravel tracer particles in rivers, *J. Geophys. Res., Earth Surface*, *115*(F2), F00A12, doi:10.1029/2008JF001222.

Ganti, V., C. Paola, and E. Foufoula-Georgiou (2013), Kinematic controls on the geometry of the preserved cross sets, *J. Geophys. Res., Earth Surface*, *118*(3), 1296--1307, doi:10.1002/jgrf.20094.

Gao, X., C. Narteau, and O. Rozier (2016), Controls on and effects of armoring and vertical sorting in aeolian dune fields: A numerical simulation study, *Geophys. Res. Lett.*, *43*(6), 2614--2622, doi: 10.1002/2016GL068416.

Garca-Valencia, C. (Ed.) (2007), *Atlas del golfo de Urab: una mirada al Caribe de Antioquia y Choc*, Serie de Publicaciones Especiales de Invemar N 12. Santa Marta, Colombia.

Garcia, M., and G. Parker (1991), Entrainment of bed sediment into suspension, *J. Hydraul. Eng.*, *117*(4), 414--435, doi:10.1061/(ASCE)0733-9429(1991)117:4(414).

García-García, F., J. Fernández, C. Viseras, and J. M. Soria (2006), High frequency cyclicity in a vertical alternation of Gilbert-type deltas and carbonate bioconstructions in the late Tortonian, Tabernas Basin, Southern Spain, *Sediment. Geol.*, *192*(3-4), 123--139, doi:10.1016/j.sedgeo.2006.03.025.

García-Navarro, P., P. Brufau, J. Burguete, and J. Murillo (2008), The shallow water equations: An example of hyperbolic system, *Monografías de la Real Academia de Ciencias de Zaragoza*, *31*, 89--119.

Gardiner, J. L. (1988), Environmentally sound river engineering: examples from the Thames catchment, *Regulated Rivers: Research & Management*, *2*(3), 445--469.

Gardner, W. A. (1994), *Cyclostationarity in communications and signal processing*, The Institute of Electrical and Electronics Engineers, Inc., New York.

Garegnani, G., G. Rosatti, and L. Bonaventura (2011), Free surface flows over mobile bed: Mathematical analysis and numerical modeling of coupled and decoupled approaches, *Commun. Appl. Ind. Math.*, *2*(1), e371, doi:10.1685/journal.caim.371.

Garegnani, G., G. Rosatti, and L. Bonaventura (2013), On the range of validity of the Exner-based models for mobile-bed river flow simulations, *J. Hydraul. Res.*, *51*(4), 380--391, doi:10.1080/00221686.2013.791647.

Garg, V., B. Setia, and D. V. S. Verma (2005), Reduction of scour around a bridge pier by multiple collar plates, *ISH Journal of Hydraulic Engineering*, *11*(3), 66--80, doi:10.1080/09715010.2005.10514802.

Garres-Díaz, J., E. Fernández-Nieto, and G. Narbona-Reina (2022), A semi-implicit approach for sediment transport models with gravitational effects, *Applied Mathematics and Computation*, *421*, 126,938, doi: https://doi.org/10.1016/j.amc.2022.126938.

Gasparini, N. M., G. E. Tucker, and R. L. Bras (2004), Network-scale dynamics of grain-size sorting: implications for downstream fining, stream-profile concavity, and drainage basin morphology, *Earth Surf. Process. Landf.*, *29*(4), 401--421, doi:10.1002/esp.1031.

Gasparini, N. M., K. X. Whipple, and R. L. Bras (2007), Predictions of steady state and transient landscape morphology using sediment-flux-dependent river incision models, *J. Geophys. Res., Earth Surface*, *112*(F3), F03S09, doi:10.1029/2006JF000567.

Gastel, B., and R. A. Day (2016), *How to Write and Publish a Scientific Paper*.

Gaster, M. (1962), A note on the relation between temporally-increasing and spatially-increasing disturbances in hydrodynamic stability, *J. Fluid Mech.*, *14*(2), 222--224, doi:10.1017/S0022112062001184.

Gavrilakis, S. (1992), Numerical simulation of low-Reynolds-number turbulent flow through a straight square duct, *J. Fluid Mech.*, *244*, 101--129, doi:10.1017/S0022112092002982.

van Gerwen, W., B. W. Borsje, J. H. Damveld, and S. J. M. H. Hulscher (2018), Modelling the effect of suspended load transport and tidal asymmetry on the equilibrium tidal sand wave height, *Coastal Eng.*, *136*, 56 -- 64, doi:https://doi.org/10.1016/j.coastaleng.2018.01.006.

Gessler, J. (1965), The beginning of bedload movement of mixtures investigates as natural armoring channels, *Tech. Rep. 69*, Swiss Federal Institute of Technology, Zürich, Switzerland.

Gessner, F. B. (1973), The origin of secondary flow in turbulent flow along a corner, *J. Fluid Mech.*, *58*(1), 1--25, doi:10.1017/S0022112073002090.

Gessner, F. B., and J. B. Jones (1965), On some aspects of fully-developed turbulent flow in rectangular channels, *J. Fluid Mech.*, *23*(4), 689--713, doi:10.1017/S0022112065001635.

Ghamry, H. K., and P. M. Steffler (2002a), Effect of applying different distribution shapes for velocities and pressure on simulation of curved open channels, *J. Hydraul. Eng.*, *128*(11), 969--982, doi: 10.1061/(ASCE)0733-9429(2002)128:11(969).

Ghamry, H. K., and P. M. Steffler (2002b), Two dimensional vertically averaged and moment equations for rapidly varied flows, *J. Hydraul. Res.*, *40*(5), 579--587, doi:10.1080/00221680209499902.

Gibbs, J. W. (1898), Fourier's series, *Nature*, *59*(1522), 200, doi:10.1038/059200b0.

Gibbs, J. W. (1899), Fourier's series, *Nature*, *59*(1539), 606, doi:10.1038/059606a0.

Gibbs, R. J., M. D. Matthews, and D. A. Link (1971), The relationship between sphere size and settling velocity, *J. Sediment. Res.*, *41*(1), 7--18, doi:10.1306/74D721D0-2B21-11D7-8648000102C1865D.

Gibling, M. R., and N. S. Davies (2012), Palaeozoic landscapes shaped by plant evolution, *Nature Geosci*, *5*(2), 99--105.

Gibson, A. H. (1934), Tidal estuaries: Forecasting by model experiments, *Nature*, *133*(3374), 969--972, doi:10.1038/133969a0.

Gijón Mancheño, A., W. Jansen, J. C. Winterwerp, and W. S. J. Uijttewaal (2021), Predictive model of bulk drag coefficient for a nature-based structure exposed to currents, *Scientific Reports*, *11*(1), 3517, doi:10.1038/s41598-021-83035-0.

Gilbert, G. K. (1877), *Report on the Geology of the Henry Mountains*, 160 pp., US Geographical and Geological Survey of the Rocky Mountain Regio, US Government Printing Office, Washington, DC, United States.

Gilbert, G. K. (1885), The topographic features of lake shores, *US Geological Survey Annual Report*, *5*, 75--123.

Gilbert, G. K. (1890), Lake Bonneville, *US Geological Survey Monograph 1*, US Government Printing Office, Washington, DC, United States, 438 pp.

Gilbert, G. K. (1914), The transportation of debris by running water, *US Geological Survey Professional Paper 86*, US Government Printing Office, Washington, DC, United States, 263 pp.

Gill, M. A. (1968), Discussion of ''Dominant discharges at Platte/Missouri confluence'' by R. R. Marlette and R. H. Walker, *J. Waterways Harbors Div.*, *94*, 338.

Gill, M. A. (1971), Height of sand dunes in open channel flows, *J. Hydraulics Div.*, *97*(12), 2067--2074.

Giri, S., and Y. Shimizu (2006), Numerical computation of sand dune migration with free surface flow, *Water Resour. Res.*, *42*(10), W10,422, doi:10.1029/2005WR004588.

Giri, S., S. V. Vuren, W. Ottevanger, K. Sloff, and A. Sieben (2008), A preliminary analysis of bedform evolution in the waal during 2002-2003 flood event using delft3d, in *Marid 2008. Third international workshop on marine and river dune dynamics 1-3 April 2008, Leeds, UK*, edited by D. Parsons, T. Garlan, and J. Best.

Giri, S., A. Thompson, G. Donchyts, K. Oberhagemann, E. Mosselman, and J. Alam (2021), Stabilization of the lower jamuna river in bangladesh-hydraulic and morphological assessment, *Geosciences*, *11*(9), doi: 10.3390/geosciences11090389.

Giuliani, Y., P. C. Klingeman, and J.-P. Bravard (1994), Les impacts morphodynamiques sur un cours d'eau soumis Ã un amÃ©nagement hydroÃ©lectrique Ã dÃ©rivation : le rhÃ´ne en chautagne (france) / morphodynamic impacts on a river affected by a hydro-electric diversion scheme : the rhÃ´ne in the chautagne region of france, *GÃ©ocarrefour*, *69*(1), 73--87, doi:10.3406/geoca.1994.4240.

Gómez-Bueno, I., S. Boscarino, M. Castro, C. Parés, and G. Russo (2023), Implicit and semi-implicit well-balanced finite-volume methods for systems of balance laws, *Applied Numerical Mathematics*, *184*, 18--48, doi:https://doi.org/10.1016/j.apnum.2022.09.016.

Goddard, J. D. (2003), Material instability in complex fluids, *Annu. Rev. Fluid Mech.*, *35*(1), 113--133, doi:10.1146/annurev.fluid.35.101101.161204.

Godfrey, A. G., R. W. Walters, and B. van Leer (1993), Preconditioning for the Navier-Stokes equations with finite-rate chemistry, *Tech. Rep. 1993-535*, AIAA, Washington, DC, United States, 23 pp.

Godin, G. (2022-05-01), The tide in eastern and western james bay, *Arctic*, *27*(2), 104--110.

Godunov, S. K. (1959), A difference method for numerical calculation of discontinuous solutions of the equations of hydrodynamics, *Mat. Sb.*, *47*(89), 271--306, (in Russian).

Godunov, S. K. (1999), Reminiscences about difference schemes, *J. Comput. Phys.*, *153*, 6--25.

de Goede, E. D. (2011), Validatie van Villemonte overlaatformulering in WAQUA met praktijkmetingen, *Tech. Rep. 1204153-001-ZWS-0001*, Deltares, Delft, 23 pp.

Gölz, E. (1990), Suspended sediment and bed load problems of the upper rhine, {*CATENA*}, *17*(2), 127--140, doi:10.1016/0341-8162(90)90003-V.

Gölz, E. (1994), Bed degradation-nature, causes, countermeasures, *Water Science & Technology*, *29*(3), 325--333.

Gölz, E. (2002), Iffezheim field test - three years experience with a petrographic tracer, *International Association of Hydrological Sciences, Publication*, *276*, 417--424.

Gomez, B. (1991), Bedload transport, *Earth Sci. Rev.*, *31*(2), 89--132, doi:10.1016/0012-8252(91)90017-A.

Gomez, B., R. L. Naff, and D. W. Hubbell (1989), Temporal variations in bedload transport rates associated with the migration of bedforms, *Earth Surf. Process. Landf.*, *14*(2), 135--156, doi:10.1002/esp.3290140205.

Gomez, B., B. J. Rosser, D. H. Peacock, D. M. Hicks, and J. A. Palmer (2001), Downstream fining in a rapidly aggrading gravel bed river, *Water Resour. Res.*, *37*(6), 1813--1823, doi:10.1029/2001WR900007.

Gomez, B., S. E. Coleman, V. W. K. Sy, D. H. Peacock, and M. Kent (2007), Channel change, bankfull and effective discharges on a vertically accreting, meandering, gravel-bed river, *Earth Surf. Process. Landf.*, *32*(5), 770--785, doi:10.1002/esp.1424.

Gonzalez, C., and H. E. Taha (2022), A variational theory of lift, *Journal of Fluid Mechanics*, *941*, A58, doi:10.1017/jfm.2022.348.

Goodwin, P. (2004), Analytical solutions for estimating effective discharge, *J. Hydraul. Eng.*, *130*(8), 729--738, doi:10.1061/(ASCE)0733-9429(2004)130:8(729).

Gottlieb, S., J.-H. Jung, and S. Kim (2011), A review of david gottlieb's work on the resolution of the gibbs phenomenon, *Communications in Computational Physics*, *9*(3), 497{519, doi:10.4208/cicp.301109.170510s.

Govedarska, A., M. Wittkea, and P. Dietz (2017), ''steinzeit'' am Rhein, *Binnenschifffahrt*, (3), (in German).

Grabowski, W. J., and S. A. Berger (1976), Solutions of the Navier-Stokes equations for vortex breakdown, *J. Fluid Mech.*, *75*(3), 525--544, doi:10.1017/S0022112076000360.

Graf, W. H., and Z. Qu (2004), Flood hydrographs in open channels, *Proceedings of the Institution of Civil Engineers - Water Management*, *157*(1), 45--52, doi:10.1680/wama.2004.157.1.45.

Grams, P. E., and P. R. Wilcock (2007), Equilibrium entrainment of fine sediment over a coarse immobile bed, *Water Resources Research*, *43*(10), doi:10.1029/2006WR005129.

Grant, W. D., and O. S. Madsen (1982), Movable bed roughness in unsteady oscillatory flow, *J. Geophys. Res., C: Oceans*, *87*(C1), 469--481, doi:10.1029/JC087iC01p00469.

Grass, A. J. (1970), Initial instability of fine bed sand, *Journal of the Hydraulics Division*, *96*(3), 619--632.

Gray, J. M. N. T., and C. Ancey (2011), Multi-component particle-size segregation in shallow granular avalanches, *J. Fluid Mech.*, *678*, 535--588, doi:10.1017/jfm.2011.138.

Gray, J. M. N. T., and B. P. Koekelaar (2010), Large particle segregation, transport and accumulation in granular free-surface flows, *J. Fluid Mech.*, *652*, 105--137, doi:10.1017/S002211201000011X.

Greco, M., M. Iervolino, and A. Vacca (2008), Boundary conditions in a two-layer geomorphological model: Application to a hydraulic jump over a mobile bed, *J. Hydraul. Res.*, *46*(6), 856--860, doi:10.1080/00221686.2008.9521933.

Greco, M., M. Iervolino, A. Leopardi, and A. Vacca (2012), A two-phase model for fast geomorphic shallow flows, *Int. J. Sediment Res.*, *27*(4), 409--425, doi:10.1016/S1001-6279(13)60001-3.

Gregory, K. (2006), The human role in changing river channels, *Geomorphology*, *79*(3), 172--191.

Gresho, P. M., and R. L. Lee (1981), Don't suppress the wiggles: They're telling you something!, *Computers & Fluids*, *9*(2), 223--253, doi:https://doi.org/10.1016/0045-7930(81)90026-8.

Grijsen, J. G., and C. B. Vreugdenhil (1976), Numerical representation of flood waves in rivers, in *Proceedings of the International symposium on Unsteady flow in Open Channels, Newcastle-upon-Tune, 12--15 April*.

Grill, G., B. Lehner, M. Thieme, B. Geenen, D. Tickner, F. Antonelli, S. Babu, P. Borrelli, L. Cheng, H. Crochetiere, H. Ehalt Macedo, R. Filgueiras, M. Goichot, J. Higgins, Z. Hogan, B. Lip, M. E. McClain, J. Meng, M. Mulligan, C. Nilsson, J. D. Olden, J. J. Opperman, P. Petry, C. Reidy Liermann, L. Sáenz, S. Salinas-Rodríguez, P. Schelle, R. J. P. Schmitt, J. Snider, F. Tan, K. Tockner, P. H. Valdujo, A. van Soesbergen, and C. Zarfl (2019), Mapping the world's free-flowing rivers, *Nature*, *569*(7755), 215--221.

Groenewege, R. J. L. (2022), Multi-model simulation of wadi flash floods and disaster risk assessment, *Tech. rep.*, Deltares, Delft, the Netherlands.

van Grondelle, B. (2021), River system behaviour along the river ijssel, Master's thesis, Delft University of Technology.

Gruijters, S. H. L., J. G. Veldkamp, J. Gunnink, and J. H. A. Bosch (2001), The lithological and sedimentological structure of the pannerdensche kop bifurcation, *Tech. rep.*, Geological Survey of the Netherlands (TNO).

Guala, M., A. Singh, N. BadHeartBull, and E. Foufoula-Georgiou (2014), Spectral description of migrating bed forms and sediment transport, *J. Geophys. Res., Earth Surface*, *119*(2), 123--137, doi:10.1002/2013JF002759.

van de Guchte, C., M. Hegnauer, J. S. de Jong, J. S. Verkade, and M. F. M. Yossef (2017), Definitieve memo spoedadvies stuw Grave, *rapport*, Deltares, Delft, 31 p. pp.

Guerin, T., X. Bertin, and G. Dodet (2016), A numerical scheme for coastal morphodynamic modelling on unstructured grids, *Ocean Modelling*, *104*, 45--53, doi:https://doi.org/10.1016/j.ocemod.2016.04.009.

Guerit, L., F. Métivier, O. Devauchelle, E. Lajeunesse, and L. Barrier (2014), Laboratory alluvial fans in one dimension, *Phys. Rev. E*, *90*, 022,203, doi:10.1103/PhysRevE.90.022203.

Guerrero, M., and A. Lamberti (2011), Flow field and morphology mapping using ADCP and multibeam techniques: Survey in the Po River, *J. Hydraul. Eng.*, *137*(12), 1576--1587, doi:10.1061/(ASCE)HY.1943-7900.0000464.

Guerrero, M., and A. Lamberti (2013), Bed-roughness investigation for a 2-D model calibration: the San Martín case study at Lower Paraná, *Int. J. Sediment Res.*, *28*(4), 458--469, doi:10.1016/S1001-6279(14)60005-6.

Guerrero, M., M. Re, L. D. Kazimierski, A. N. Menéndez, and R. Ugarelli (2013a), Effect of climate change on navigation channel dredging of the Paraná River, *International Journal of River Basin Management*, *11*(4), 439--448, doi:10.1080/15715124.2013.819005.

Guerrero, M., M. Nones, R. Saurral, N. Montroull, and R. N. Szupiany (2013b), Paraná River morphodynamics in the context of climate change, *International Journal of River Basin Management*, *11*(4), 423--437, doi:10.1080/15715124.2013.826234.

Guerrero, M., F. Latosinski, M. Nones, R. N. Szupiany, M. Re, and M. G. Gaeta (2015), A sediment fluxes investigation for the 2-D modelling of large river morphodynamics, *Adv. Water Resour.*, *81*, 186--198, doi:10.1016/j.advwatres.2015.01.017, fluvial Eco-Hydraulics And Morphodynamics.

Guglielmini, D. (1697), *Della natura de' fiumi trattato fisico-matematico*, Bologna.

Gundlach, C., and J. M. Martin-Garcia (2005), Hyperbolicity of second-order in space systems of evolution equations, *Class. Quant. Grav.*, *23*, S387--S404, doi:10.1088/0264-9381/23/16/S06.

Guo, J. (2015), Sidewall and non-uniformity corrections for flume experiments, *J. Hydraul. Res.*, *53*(2), 218--229, doi:10.1080/00221686.2014.971449.

Guo, L., M. van der Wegen, J. A. Roelvink, and Q. He (2014), The role of river flow and tidal asymmetry on 1-d estuarine morphodynamics, *J. Geophys. Res., Earth Surface*, *119*(11), 2315--2334, doi:10.1002/2014JF003110.

Guo, L., M. van der Wegen, D. Roelvink, and Q. He (2015a), Exploration of the impact of seasonal river discharge variations on long-term estuarine morphodynamic behavior, *Coastal Eng.*, *95*, 105--116, doi:10.1016/j.coastaleng.2014.10.006.

Guo, L., M. van der Wegen, D. J. A. Roelvink, Z. B. Wang, and Q. He (2015b), Long-term, process-based morphodynamic modeling of a fluvio-deltaic system, part i: The role of river discharge, *Cont. Shelf Res.*, *109*, 95--111, doi:10.1016/j.csr.2015.09.002.

Guo, L., M. Wegen, Z. B. Wang, D. Roelvink, and Q. He (2016), Exploring the impacts of multiple tidal constituents and varying river flow on long-term, large-scale estuarine morphodynamics by means of a 1-d model, *J. Geophys. Res., Earth Surface*, *121*(5), 1000--1022, doi:10.1002/2016JF003821.

Gupta, A. (Ed.) (2022), *Large Rivers: Geomorphology and Management*, 1028 pp., John Wiley & Sons, Ltd., jamuna, Erik Mosselman.

Guralnik, G. S., C. R. Hagen, and T. W. B. Kibble (1964), Global conservation laws and massless particles, *Phys. Rev. Lett.*, *13*, 585--587, doi:10.1103/PhysRevLett.13.585.

Gurnell, A. (2014), Plants as river system engineers, *Earth Surf. Process. Landf.*, *39*(1), 4--25, doi:10.1002/esp.3397.

Gutierrez, R. R., J. D. Abad, D. R. Parsons, and J. L. Best (2013), Discrimination of bed form scales using robust spline filters and wavelet transforms: Methods and application to synthetic signals and bed forms of the río paraná, argentina, *J. Geophys. Res., Earth Surface*, *118*(3), 1400--1418, doi:10.1002/jgrf.20102.

Gutknecht, M. H. (), A brief introduction to krylov space methods for solving linear systems, *Tech. rep.*, ETH Zurich.

Guy, H. P., D. B. Simons, and E. V. Richardson (1966), Summary of alluvial channel data from flume experiments, 1956-61, *Tech. Rep. 462-I*, USGS, US Government Printing Office, Washington, DC, United States, 96 pp.

H., B., E. Mosselman, V. Chavarrías, and T. Hoitink (2022), Linear stability analysis put into practice for river bed waves with lengths larger than the water depth., in *AGU 2022 fall meeting, Chicago, Illinois, USA & online, 12-16 December 2022*.

den Haan, R.-J. (2020), Games to collaboratively explore environmental complexity: Designing the virtual river game, Ph.D. thesis, University of Twente, Netherlands, doi:10.3990/1.9789036549653.

den Haan, R. J., M. C. van der Voort, F. Baart, K. D. Berends, M. C. van den Berg, M. W. Straatsma, A. J. P. Geenen, and S. J. M. H. Hulscher (2020), The virtual river game: Gaming using models to collaboratively explore river management complexity, *Environmental Modelling & Software*, *134*, 104,855, doi:https://doi.org/10.1016/j.envsoft.2020.104855.

Haberman, R. (2004), *Applied Partial Differential Equations*, 4 ed., 769 pp., Pearson Prentice Hall, Upper Saddle River, NJ, United States.

Habersack, H. M. (2001), Radio-tracking gravel particles in a large braided river in New Zealand: A field test of the stochastic theory of bed load transport proposed by Einstein, *Hydrol. Process.*, *15*(3), 377--391, doi:10.1002/hyp.147.

Hack, J. T. (1957), Studies of longitudinal stream profiles in virginia and maryland, *Tech. Rep. 294-B*, US Department of the Interior, Geological Survey, -- pp.

Hackney, C. R., S. E. Darby, D. R. Parsons, J. Leyland, R. Aalto, A. P. Nicholas, and J. L. Best (2017), The influence of flow discharge variations on the morphodynamics of a diffluence!!e!!confluence unit on a large river, *Earth Surf. Process. Landf.*, doi:10.1002/esp.4204.

Hackney, C. R., S. E. Darby, D. R. Parsons, J. Leyland, J. L. Best, R. Aalto, A. P. Nicholas, and R. C. Houseago (2020), River bank instability from unsustainable sand mining in the lower mekong river, *Nature Sustainability*, *3*(3), 217--225, doi:10.1038/s41893-019-0455-3.

Hadamard, J. S. (1923), *Lectures on Cauchy's problem in linear partial differential equations*, 316 pp., Yale University Press, New Haven, CT, United States.

Hager, W. H. (2003), Fargue, founder of experimental river engineering, *J. Hydraul. Res.*, *41*(3), 227--233, doi:10.1080/00221680309499967.

Hager, W. H., and U. Liiv (2008), Johann nikuradse - hydraulic experimenter, *J. Hydraul. Res.*, *46*(4), 435--444, doi:10.1080/00221686.2008.9521880.

Hajek, E. A., and D. A. Edmonds (2014), Is river avulsion style controlled by floodplain morphodynamics?, *Geology*, *42*(3), 199--202, doi:10.1130/G35045.1.

Hall, A. R. (1954), *The Scientific Revolution 1500--1800. The Formation of the Modern Scientific Attitude.*, 390 pp., Longmans, London, United Kingdom.

Hall, P. (2004), Alternating bar instabilities in unsteady channel flows over erodible beds, *J. Fluid Mech.*, *499*, 49--73, doi:10.1017/S0022112003006219.

Hall, P. (2006), Nonlinear evolution equations and the braiding of weakly transporting flows over gravel beds, *Stud. Appl. Math.*, *117*(1), 27--69, doi:10.1111/j.1467-9590.2006.00341.x.

Ham, D., and M. Church (2012), Morphodynamics of an extended bar complex, fraser river, british columbia, *Earth Surf. Process. Landf.*, *37*(10), 1074--1089, doi:10.1002/esp.3231.

Ham, D. G. (2005), Morphodynamics and sediment transport in a wandering gravel-bed channel: Fraser River, British Columbia, Ph.D. thesis, University of British Columbia.

Hamamori, A. (1962), A theoretical investigation on the fluctuation of bed-load transport, *Tech. Rep. 28-28*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Hamming, R. (1962), *Numerical Methods for Scientists and Engineers*, McGraw-Hill, New York, NY, United States.

Hanson, B. (2017), New style for AGU journals and books, *Eos*, *98*, doi:10.1029/2018EO079441, published on 09 August 2017.x.

Haque, M. I., and K. Mahmood (1983), Analytical determination of form friction factor, *J. Hydraul. Eng.*, *109*(4), 590--610, doi:10.1061/(ASCE)0733-9429(1983)109:4(590).

Harada, E., H. Gotoh, and N. Tsuruta (2015), Vertical sorting process under oscillatory sheet flow condition by resolved discrete particle model, *J. Hydraul. Res.*, *53*(3), 332--350, doi:10.1080/00221686.2014.994139.

Harari, Y. N. (2016), *Homo deus: A brief history of tomorrow*, 440 pp., Harvill Secker, London, United Kingdom.

Hardy, R. J., S. N. Lane, and D. Yu (2011), Flow structures at an idealized bifurcation: a numerical experiment, *Earth Surf. Process. Landf.*, *36*(15), 2083--2096, doi:10.1002/esp.2235.

Hariharan, G. (2019), *Wavelet Solutions for Reaction{Diffusion Problems in Science and Engineering*, Springer Singapore, doi:10.1007/978-981-32-9960-3.

Harlow, F. H., and A. A. Amsden (1975), Numerical calculation of multiphase fluid flow, *J. Comput. Phys.*, *17*(1), 19--52, doi:10.1016/0021-9991(75)90061-3.

Harms, J. M. (2021), Physical modelling of submerged groynes, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

Harten, A. (1983), High resolution schemes for hyperbolic conservation laws, *J. Comput. Phys.*, *49*(3), 357--393, doi:10.1016/0021-9991(83)90136-5.

Harten, A. (1984), On a class of high resolution total-variation-stable finite-difference schemes, *SIAM J. Numer. Anal.*, *21*(1), 1--23, doi:10.1137/0721001.

Harten, A., P. D. Lax, and B. van Leer (1983), On upstream differencing and Godunov-type schemes for hyperbolic conservation laws, *SIAM Rev.*, *25*(1), 35--61, doi:10.1137/1025002.

Haschenburger, J. K. (2011), The rate of fluvial gravel dispersion, *Geophys. Res. Lett.*, *38*(24), L24,403, doi:10.1029/2011GL049928.

Haschenburger, J. K. (2013), Tracing river gravels: Insights into dispersion from a long-term field experiment, *Geomorphology*, *200*, 121--131, doi:10.1016/j.geomorph.2013.03.033.

Haschenburger, J. K. (2017), Streambed disturbance over a long flood series, *River Research and Applications*, pp. n/a--n/a, doi:10.1002/rra.3134, rRA-16-0173.R1.

Haschenburger, J. K., and P. R. Wilcock (2003), Partial transport in a natural gravel bed channel, *Water Resour. Res.*, *39*(1), doi:10.1029/2002WR001532, sediment transport variability.

Hasegawa, K. (1977), Computer simulation of the gradual migration ofmeandering channels., *Proceedings of the Hokkaido Branch, Japan Society of Civil Engineering*, p. 197{202.

Hasegawa, K. (1981), Bank-erosion discharge based on a non-equlibrium theory, *Proc. Jpn. Soc. Civ. Eng.*, *316*, 37--50, doi:10.2208/jscej1969.1981.316_37, (in Japanese).

Hasegawa, K. (1983), Hydraulic study on the plane and riverbed shape and flow of alluvial meander, Ph.D. thesis, Hokkaido University, (in Japanese).

Hasegawa, K. (1989), Universal bank erosion coefficient for meandering rivers, *J. Hydraul. Eng.*, *115*(6), 744--765, doi:10.1061/(ASCE)0733-9429(1989)115:6(744).

Hass, R. (2000), *What Light Can Do: Essays on Art, Imagination, and the Natural World*, 496 pp., Ecco, New York, NY, United States.

Hassan, M. A., and M. Church (1994), Vertical mixing of coarse particles in gravel bed rivers: A kinematic model, *Water Resour. Res.*, *30*(4), 1173--1185, doi:10.1029/93WR03351.

Hassan, M. A., M. Church, and A. P. Schick (1991), Distance of movement of coarse particles in gravel bed streams, *Water Resour. Res.*, *27*(4), 503--511, doi:10.1029/90WR02762.

Hassan, M. A., A. P. Schick, and P. A. Shaw (1999), The transport of gravel in an ephemeral sandbed river, *Earth Surf. Process. Landf.*, *24*(7), 623--640, doi:10.1002/(SICI)1096-9837(199907)24:7⟨623::AID-ESP978⟩3.0.CO;2-2.

Hassan, M. A., H. Voepel, R. Schumer, G. Parker, and L. Fraccarollo (2013), Displacement characteristics of coarse fluvial bed sediment, *J. Geophys. Res., Earth Surface*, *118*(1), 155--165, doi:10.1029/2012JF002374.

Havinga, H. (2009), Suppletie bij spijk en lobith moet bodemerosie stoppen, *Land+Water*, -, --, (in Dutch).

Havinga, H. (2020), Towards sustainable river management of the Dutch Rhine River, *Water*, *12*(1827), doi:10.3390/w12061827.

Havlin, S., and D. Ben-Avraham (1987), Diffusion in disordered media, *Adv. Phys.*, *36*(6), 695--798, doi:10.1080/00018738700101072.

Hazewinkel, J. (2004), Lorentz linearization and its application in the study of the closure of the zuiderzee, *Tech. rep.*

Heays, K., H. Friedrich, and B. W. Melville (2010), Re-evaluation of image analysis for sedimentary process research, *Tech. rep.*, University of Auckland.

Heays, K. G., H. Friedrich, and B. W. Melville (2014a), Laboratory study of gravel-bed cluster formation and disintegration, *Water Resources Research*, *50*(3), 2227--2241, doi:10.1002/2013WR014208.

Heays, K. G., H. Friedrich, B. W. Melville, and R. Nokes (2014b), Quantifying the dynamic evolution of graded gravel beds using particle tracking velocimetry, *Journal of Hydraulic Engineering*, *140*(7), 04014,027, doi:10.1061/(ASCE)HY.1943-7900.0000850.

HEC-RAS (), Chapter 6 entering and editing geometric data; river ice, *Tech. rep.*

de Heer, A., and E. Mosselman (2004), Flow structure and bedload distribution at alluvial diversions, in *River Flow Conference*.

van Heereveld, M. A. (2010), Spoorbrug mook ontwerp bodem- en oeververdediging, *Tech. Rep. 9T0542.02/R0009/408540/VVDM/Nijm*, Royal Haskoning, Nijmegen, 39 pp.

van Heijst, M. W. I. M., and G. Postma (2001), Fluvial response to sea!!e!!?level changes: a quantitative analogue, experimental approach, *Basin Research*, *13*(3), 269--292, doi:10.1046/j.1365-2117.2001.00149.x.

Heller, V. (2011), Scale effects in physical hydraulic engineering models, *J. Hydraul. Res.*, *49*(3), 293--306, doi:10.1080/00221686.2011.578914.

von Helmholtz, H. (1868), Über discontinuierliche Flüssigkeits-Bewegungen, *Monatsberichte der Königlichen Preussische Akademie der Wissenschaften zu Berlin*, *23*, 215--228, (in German).

Hendriks, E. (2012), Laboratory test concerning a Gilbert-type delta, Master's thesis, TU Delft.

Herrero, A., and C. Berni (2016), Sand infiltration into a gravel bed: A mathematical model, *Water Resour. Res.*, *52*(11), 8956--8969, doi:10.1002/2016WR019394.

Hewitt, E., and R. E. Hewitt (1979), The Gibbs-Wilbraham phenomenon: An episode in Fourier analysis, *Arch. Hist. Exact Sci.*, *21*(2), 129--160, doi:10.1007/BF00330404.

Hey, R. D. (1987), *Sediment transport in gravel bed rivers*, chap. River Dynamics, Flow Regime and Sediment Transport, pp. 17--40, John Wiley & Sons, Chichester, United Kingdom.

Hey, R. D. (1996), Channel response and channel forming discharge, *Final Report R&D 6871-EN-01*, University of East Anglia, Norwich, UK., 108 pp.

Hey, R. D., and C. R. Thorne (1975), Secondary flows in river channels, *Royal Geographical Society*, *7*(3), 191--195.

Heyman, J., H. B. Ma, F. Mettra, and C. Ancey (2014), Spatial correlations in bed load transport: Evidence, importance, and modeling, *J. Geophys. Res., Earth Surface*, *119*(8), 1751--1767, doi:10.1002/2013JF003003.

Heyman, J., P. Bohorquez, and C. Ancey (2016), Entrainment, motion, and deposition of coarse particles transported by water over a sloping mobile bed, *J. Geophys. Res., Earth Surface*, *121*(10), 1931--1952, doi:10.1002/2015JF003672.

Hicks, D., E. Baynes, R. Measures, G. Stecca, J. Tunnicliffe, and H. Friedrich (2021), Morphodynamic research challenges for braided river environments: Lessons from the iconic case of new zealand, *Earth Surface Processes and Landforms*, *46*(1), 188--204, doi:https://doi.org/10.1002/esp.5014.

Higgs, P. W. (1964), Broken symmetries and the masses of gauge bosons, *Phys. Rev. Lett.*, *13*, 508--509, doi:10.1103/PhysRevLett.13.508.

Hill, K. M., L. DellAngelo, and M. M. Meerschaert (2010), Heavy-tailed travel distance in gravel bed transport: An exploratory enquiry, *J. Geophys. Res., Earth Surface*, *115*(F2), F00A14, doi:10.1029/2009JF001276.

Hill, K. M., J. Gaffney, S. Baumgardner, P. Wilcock, and C. Paola (2017), Experimental study of the effect of grain sizes in a bimodal mixture on bed slope, bed texture, and the transition to washload, *Water Resour. Res.*, pp. n/a--n/a, doi:10.1002/2016WR019172.

Hillebrand, G., and R. M. Frings (2017), Von der quelle zur mündung: Die sedimentbilanz des rheins im zeitraum 1991 - 2010, *Tech. Rep. II-22*, CHR, 282 pp.

Himat (1977), Proyecto cuenca magdalena cauca, *Tech. rep.*, Himat.

Hirano, M. (1971), River bed degradation with armoring, *Proc. Jpn. Soc. Civ. Eng.*, *195*, 55--65, doi:10.2208/jscej1969.1971.195_55.

Hirano, M. (1972), Studies on variation and equilibrium state of a river bed composed of nonuniform material, *Proc. Jpn. Soc. Civ. Eng.*, (207), 128--129, doi:10.2208/jscej1969.1972.207_51.

H.J.R. Lenders, G. G., F.P.L. Collas, and R. Leuven (Eds.) (2015), *Book of Abstracts Bridging gaps between river science, governance and management NCR*.

Hodge, R. A., T. B. Hoey, and L. S. Sklar (2011), Bed load transport in bedrock rivers: The role of sediment cover in grain entrainment, translation, and deposition, *Journal of Geophysical Research: Earth Surface*, *116*(F4), doi:10.1029/2011JF002032.

Hoeksema, R. (2006a), *Designed for dry feet : flood protection and land reclamation in the Netherlands*, American Society of Civil Engineers.

Hoeksema, R. J. (2006b), *Designed for Dry Feet: Flood protection and land reclamation in the Netherlands*, ASCE press, Reston, VA, United States.

Hoey, T. (1992), Temporal variations in bedload transport rates and sediment storage in gravel-bed rivers, *Progress in Physical Geography: Earth and Environment*, *16*(3), 319--338, doi:10.1177/030913339201600303.

Hoey, T. B., and R. I. Ferguson (1994), Numerical simulation of downstream fining by selective transport in gravel bed rivers: Model development and illustration, *Water Resour. Res.*, *30*(7), 2251--2260, doi:10.1029/94WR00556.

Hoffmans, G. J. C., and H. J. Verheij (1997), *Scour Manual*, 1 ed., A. A. Balkema, Rotterdam, the Netherlands.

Hoffmans, G. J. C., and H. J. Verheij (2021), *Scour Manual: current-related erosion*, 2 ed., CRC Press, Taylor and Francis.

Hoitink, A., T. de Ruijsscher, T. Geertsema, B. Makaske, J. Wallinga, and J. P. J.H.J. Candel (Eds.) (2017), *NCR days 2017, Book of abstracts*, NCR publication 41-2017.

Holden, H. (1987), On the riemann problem for a prototype of a mixed type conservation law, *Commun. Pure Appl. Math.*, *40*(2), 229--264, doi:10.1002/cpa.3160400206.

Holdermans, J. (2017), 170606 - grave benedenzijde - weekly report - version 2, *Tech. Rep. 154378_292*, Paans Van Oord, 3 pp.

Holley, E. R. (1971), Transverse mixing in rivers, *Tech. Rep. S132*, Delft Hydraulics Laboratory, Delft, the Netherlands, 96 pp.

Hollingshead, A. B. (1968), Measurements of the bed-load discharge of the elbow river, Ph.D. thesis, alberta.

Holly, F. M., and J. L. Rahuel (1990), New numerical/physical framework for mobile-bed modelling, *Journal of Hydraulic Research*, *28*(4), 401--416, doi:10.1080/00221689009499057.

Holmes, M. H. (2007), *Introduction to Numerical Methods in Differential Equations*, 52, Springer-Verlag New York, doi:10.1007/978-0-387-68121-4.

Holmes, M. H. (2013), *Introduction to Perturbation Methods*, *Texts in Applied Mathematics*, vol. 20, 2 ed., 438 pp., Springer-Verlag New York, doi:10.1007/978-1-4614-5477-9.

Holthuijsen, L. H. (2007), *WAVES IN OCEANIC ANDCOASTAL WATERS*, 1 ed., 405 pp., Cambridge University Press.

Hong-Yuan, L., and H. In-Song (1994), Investigation of saltating particle motions, *J. Hydraul. Eng.*, *120*(7), 831--845, doi:10.1061/(ASCE)0733-9429(1994)120:7(831).

Honsell (1885), Die korrection des oberrheines, *Tech. rep.*, Centralbureau fur Meteorologie und hydrographie.

van Hoogenhuizen, M. (2021), Beheer en onderhoud langsdammen, *Document RWS-2021/31925*, Rijkswaterstaat.

Horritt, M. S., and P. D. Bates (2002), Evaluation of 1d and 2d numerical models for predicting river flood inundation, *J. Hydrol.*, *268*(1), 87--99, doi:10.1016/S0022-1694(02)00121-X.

Hosseini-Sadabadi, S. A., A. Radice, and F. Ballio (2019), On reasons of the scatter of literature data for bed-load particle hops, *Water Resources Research*, *55*(2), 1698--1706, doi:10.1029/2018WR023350.

Hou, T. Y., and P. G. L. Floch (1994), Why nonconservative schemes converge to wrong solutions: Error analysis, *Math. Comput.*, *62*(206), 497--530, doi:10.2307/2153520.

Houssais, M., and E. Lajeunesse (2012), Bedload transport of a bimodal sediment bed, *J. Geophys. Res., Earth Surface*, *117*(F4), F04,015, doi:10.1029/2012JF002490.

Houssais, M., C. P. Ortiz, D. J. Durian, and D. J. Jerolmack (2015), Onset of sediment transport is a continuous transition driven by fluid shear and granular creep, *Nat. Commun.*, *6*, 6527, doi:10.1038/ncomms7527.

van Houweninge, G., and A. de Graauw (1982), The closure of tidal basins, *Coastal Eng.*, *6*(4), 331 -- 360, doi:10.1016/0378-3839(82)90006-0.

Hovda, S. (2017), Gibbs-like phenomenon inherent in a lumped element model of a rod, *Adv. Mech. Eng.*, *9*(8), 1--12, doi:10.1177/1687814017713703.

Howard, A. D. (1965), Geomorphological systems; equilibrium and dynamics, *Am. J. Sci.*, *263*(4), 302--312, doi:10.2475/ajs.263.4.302.

Howard, A. D. (1980), *Thresholds in Geomorphology*, chap. Thresholds in river regimes, pp. 227--258, Allen and Unwin, Boston.

Howard, A. D. (1982), Equilibrium and time scales in geomorphology: Application to sand-bed alluvial streams, *Earth Surf. Process. Landf.*, *7*(4), 303--325, doi:10.1002/esp.3290070403.

Howard, A. D. (1987), *River Channels*, chap. Chapter4: Modelling fluvial systems: rock, gravel and sand bed channels, pp. 69--94, Basil Blackwell, Oxford.

Howard, A. D., and T. R. Knutson (1984), Sufficient conditions for river meandering: A simulation approach, *Water Resour. Res.*, *20*(11), 1659--1667, doi:10.1029/WR020i011p01659.

Howe, J. W. (Ed.) (1940), *Proc. of the Hydraulics Conference*, University of Iowa, Iowa City, IA, United States.

Hsieh, T. Y., and J. C. Yang (2003), Investigation on the suitability of two-dimensional depth-averaged models for bend-flow simulation, *J. Hydraul. Eng.*, *129*(8), 597--612, doi:10.1061/(ASCE)0733-9429(2003)129:8(597).

Hsieh, T.-Y., and J.-C. Yang (2005), Numerical examination on the secondary-current effect for contaminant transport in curved channel, *J. Hydraul. Res.*, *43*(6), 644--659, doi:10.1080/00221680509500384.

Hu, C., and Q. Guo (2011), Near-bed sediment concentration distribution and basic probability of sediment movement, *J. Hydraul. Eng.*, *137*(10), 1269--1275, doi:10.1061/(ASCE)HY.1943-7900.0000382.

Hu, C., and Y. Hui (1996a), Bed-load transport. I: Mechanical characteristics, *J. Hydraul. Eng.*, *122*(5), 245--254, doi:10.1061/(ASCE)0733-9429(1996)122:5(245).

Hu, C., and Y. Hui (1996b), Bed-load transport. II: Stochastic characteristics, *J. Hydraul. Eng.*, *122*(5), 255--261, doi:10.1061/(ASCE)0733-9429(1996)122:5(255).

Hu, P., Z. xian Cao, G. Pender, and H. han Liu (2014), Numerical modelling of riverbed grain size stratigraphic evolution, *Int. J. Sediment Res.*, *29*(3), 329--343, doi:10.1016/S1001-6279(14)60048-2.

Huang, H. Q., G. C. Nanson, and S. D. Fagan (2002), Hydraulic geometry of straight alluvial channels and the principle of least action, *J. Hydraul. Res.*, *40*(2), 153--160, doi:10.1080/00221680209499858.

Huang, J., Y. Zhou, M. Niessner, J. R. Shewchuk, and L. J. Guibas (2018), Quadriflow: A scalable and robust method for quadrangulation, *Computer Graphics Forum*, *37*(5), 147--160, doi:https://doi.org/10.1111/cgf.13498.

Hubbell, D. W., and W. W. Sayre (1964), Sand transport studies with radioactive tracers, *J. Hydraul. Div.*, *90*(HY3), 39--68.

Hubbell, D. W., and W. W. Sayre (1965), Closure: Sand transport studies with radioactive tracers, *J. Hydraul. Div.*, (HY5), 139--149.

Hubbell, D. W., H. H. Stevens, J. V. Skinner, and J. P. Beverage (1985), New approach to calibrating bed load samplers, *J. Hydraul. Eng.*, *111*(4), 677--694, doi:10.1061/(ASCE)0733-9429(1985)111:4(677).

Hudson, J. (2001), Numerical techniques for morphodynamic modelling, Ph.D. thesis, THE UNIVERSITY OF READING.

Hudson, J., and P. K. Sweby (2003), Formulations for numerically approximating hyperbolic systems governing sediment transport, *J. Sci. Comput.*, *19*(1), 225--252, doi:10.1023/A:1025304008907.

Hudson, J., and P. K. Sweby (2005), A high-resolution scheme for the equations governing 2d bed-load sediment transport, *International Journal for Numerical Methods in Fluids*, *47*(10-11), 1085--1091, doi:10.1002/fld.853.

Huismans, Y., K. Berends, I. Niesten, and E. Mosselman (Eds.) (2018), *The future river: NCR DAYS 2018 Proceedings.*, publication 42-2018, Netherlands Centre for River studies.

Hume, D. (1748), *An Enquiry Concerning Human Understanding*, John Noon, London, United Kingdom.

Humphries, R., J. G. Venditti, L. S. Sklar, and J. K. Wooster (2012), Experimental evidence for the effect of hydrographs on sediment pulse dynamics in gravel-bedded rivers, *Water Resour. Res.*, *48*(1), W01,533, doi:10.1029/2011WR010419.

Hunter, R. E. (1985), A kinematic model for the structure of lee-side deposits, *Sedimentology*, *32*(3), 409--422, doi:10.1111/j.1365-3091.1985.tb00520.x.

Huppes, N. (2021), Eindevaluatie pilot Langsdammen in de Waal; toepasbaarheid elders, *Rapport 117822/21-011.411*, Witteveen+Bos, Rotterdam, the Netherlands, juli.

Huthoff, F., A. Paarlberg, H. Barneveld, and M. van der Wal (2011), Rivierkundig onderzoek WaalSamen: Pilotstudie langsdammen, *Tech. Rep. PR2096*, HKV Lijn in Water and Deltares, 131 pp.

Huthoff, F., A. Paarlberg, J. V. da Silva, and A. K. de Jong (2014), Globaal ontwerp langsdammen: Rijnsplitsingspuntengebied en overige rijntakken, *Tech. Rep. PR2758.20*, HKV Lijn in Water, 42 pp.

I en W (2018), Mirt onderzoek duurzame bodemligging rijntakken eindrapportage: "de rivierbodem is de basis van alle belangen". bijlage 1: Eindrapport mirt onderzoek inclusief kostenramingen, *Tech. rep.*, (in Dutch).

Ichim, I., and M. Rădoane (1990), Channel sediment variability along a river: A case study of the siret river (romania), *Earth Surf. Process. Landf.*, *15*(3), 211--225, doi:10.1002/esp.3290150304.

IDEAM (2018), Protocolo de modelación hidrológica e hidráulica, *ISBN 978-958-5489-09-7*, IDEAM, Bogotá, Colombia, 59 pp., (in Spanish).

Ikeda, H., and F. Iseya (1986), Longitudinal sorting process in heterogeneous sediment transportation, *Proc. 30th Japanese Conference on Hydraulics*, *30*, 217--222, doi:10.2208/prohe1975.30.217, (in Japanese).

Ikeda, H., and F. Iseya (1988), Experimental study of heterogeneous sediment transport, *Environmental Research Center Papers 12*, Environmental Research Center, University of Tsukuba, Tsukuba, 305 Japan.

Ikeda, S. (1984), Prediction of alternate bar wavelength and height, *J. Hydraul. Eng.*, *110*(4), doi:10.1061/(ASCE)0733-9429(1984)110:4(371).

Ikeda, S., and N. Izumi (1991), Stable channel cross sections of straight sand rivers, *Water Resour. Res.*, *27*(9), 2429--2438, doi:10.1029/91WR01220.

Ikeda, S., and T. Nishimura (1985), Bed topography in bends of sand-silt rivers, *J. Hydraul. Eng.*, *111*(11), 1397--1410, doi:10.1061/(ASCE)0733-9429(1985)111:11(1397).

Ikeda, S., and T. Nishimura (1986), Flow and bed profile in meandering sand-silt rivers, *J. Hydraul. Eng.*, *112*(7), 562--579, doi:10.1061/(ASCE)0733-9429(1986)112:7(562).

Ikeda, S., G. Parker, and K. Sawai (1981), Bend theory of river meanders. Part 1. Linear development, *J. Fluid Mech.*, *112*, 363--377, doi:10.1017/S0022112081000451.

Indah-Everts, S. N., and M. I. Hermans (2021), Eindevaluatie pilot Langsdammen in de Waal; interpretatie ais-data, *Rapport 32127-1-MO-rev.1.0*, Marin, Wageningen, the Netherlands, februari.

Infrasite.nl (2007), Groen licht voor hoger stuwpeil Maas en Maas-Waalkanaal, https://www.infrasite.nl/waterbouw-deltas/2007/09/27/groen-licht-voor-hoger-stuwpeil-maas-en-maas-waalkanaal/, accessed: 2023-02-06.

Intel (), *Intel Fortran Compiler 19.0 Developer Guide and Reference.*

Irving, M. (), 2d model parameterization of porcupine river training structures: Hydrodynamic and morphological impact assessment, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

Isaacson, E., and B. Temple (1992), Nonlinear resonance in systems of conservation laws, *SIAM J. Appl. Math.*, *52*(5), 1260--1278, doi:10.1137/0152073.

Isaacson, E., J. J. Stoker, and A. Troesch (1954), Numerical solution of flood prediction and river regulation problems, *Tech. Rep. II IMN-NYU 205*, New York University Institute for Mathematics and Mechanics, New York, NY, United States, 47 pp.

Iseya, F., and H. Ikeda (1987), Pulsations in bedload transport rates induced by a longitudinal sediment sorting: A flume study using sand and gravel mixtures, *Geografiska Annaler: Series A, Physical Geography*, *69*(1), 15--27, doi:10.1080/04353676.1987.11880193.

Israt, M. (2021), Bank erosion simulation in Delft3D Flexible Mesh combined with a flexible bank-line approach, *MSc. Thesis WSE-CEPD.21-07*, IHE Delft, Delft, the Netherlands.

Itoh, T., A. Ikeda, T. Nagayama, and T. Mizuyama (2017), Hydraulic model tests for propagation of flow and sediment in floods due to breaking of a natural landslide dam during a mountainous torrent, *Int. J. Sediment Res.*, doi:https://doi.org/10.1016/j.ijsrc.2017.10.001.

Itoh, T., A. Ikeda, T. Nagayama, and T. Mizuyama (2018), Hydraulic model tests for propagation of flow and sediment in floods due to breaking of a natural landslide dam during a mountainous torrent, *Int. J. Sediment Res.*, *33*(2), 107--116, doi:10.1016/j.ijsrc.2017.10.001.

Ivrii, V. Y., and V. M. Petkov (1974), Necessary conditions for the Cauchy problem for non-strictly hyperbolic equations to be well-posed, *Russ. Math. Surv.*, *29*(5), 1--70.

Iwagaki, Y. (1956), Hydrodynamical study on critical tractive force, *Trans. of JSCE*, *41*.

Iwantoro, A. P., M. van der Vegt, and M. G. Kleinhans (2021), Effects of sediment grain size and channel slope on the stability of river bifurcations, *Earth Surface Processes and Landforms*, *46*(10), 2004--2018, doi:https://doi.org/10.1002/esp.5141.

Iwasaki, T., J. Nelson, Y. Shimizu, and G. Parker (2017), Numerical simulation of large-scale bed load particle tracer advection-dispersion in rivers with free bars, *J. Geophys. Res., Earth Surface*, *122*(4), 847--874, doi:10.1002/2016JF003951, 2016JF003951.

Izbash, S. V., and K. Y. Khaldre (1970), *Hydraulics of river channel closure*, Butterworths, London, Uniter Kingdom.

Jaballah, M., B. Camenen, L. Pénard, and A. Paquier (2015), Alternate bar development in an alpine river following engineering works, *Adv. Water Resour.*, *81*, 103--113, doi:10.1016/j.advwatres.2015.03.003, fluvial Eco-Hydraulics And Morphodynamics.

Jaeggi, M. N. R. (1984), Formation and effects of alternate bars, *J. Hydraul. Eng.*, *110*(2), 142--156, doi:10.1061/(ASCE)0733-9429(1984)110:2(142).

Jafarinik, S., and E. Viparelli (2020), Alluvial morphodynamics of low-slope bedrock reaches transporting nonuniform bed material, *Water Resources Research*, *56*(10), e2020WR027,345, doi:https://doi.org/10.1029/2020WR027345, e2020WR027345 2020WR027345.

Jafarinik, S., R. H. a Moreira, and E. Viparelli (), Alluvial morphodynamics of bedrock reaches transporting mixed-size sand. laboratory experiments.

Jagers, B. (), *Tech. rep.*

Jagers, B. (2003), Modelling planform changes of braided rivers, Ph.D. thesis, University of Twente, Enschede, the Netherlands.

Jain, S. C. (1990), Armor or pavement, *J. Hydraul. Eng.*, *116*(3), 436--440.

Jain, S. C. (1992), Note on lag in bedload discharge, *J. Hydraul. Eng.*, *118*(6), 904--917, doi:10.1061/(ASCE)0733-9429(1992)118:6(904).

Jain, S. C., and J. F. Kennedy (1974), The spectral evolution of sedimentary bed forms, *J. Fluid Mech.*, *63*(2), 301--314, doi:10.1017/S0022112074001157.

James, F., M. Postel, and M. Sepúlveda (2000), Numerical comparison between relaxation and nonlinear equilibrium models. application to chemical engineering, *Physica D: Nonlinear Phenomena*, *138*(3), 316--333, doi:10.1016/S0167-2789(99)00203-1.

Jammers, S. M. M. (2017), Sediment transport over sills of longitudinal training dams, Master's thesis, Delft University of Technology, Delft, the Netherlands.

Jang, C.-L., and Y. Shimizu (2005a), Numerical simulation of relatively wide, shallow channels with erodible banks, *Journal of Hydraulic Engineering*, *131*(7), 565--575, doi:10.1061/(ASCE)0733-9429(2005)131:7(565).

Jang, C.-L., and Y. Shimizu (2005b), Numerical simulations of the behavior of alternate bars with different bank strengths, *Journal of Hydraulic Research*, *43*(6), 596--612, doi:10.1080/00221680509500380.

Jang, C.-L., and Y. Shimizu (2007), Vegetation effects on the morphological behavior of alluvial channels, *Journal of Hydraulic Research*, *45*(6), 763--772, doi:10.1080/00221686.2007.9521814.

Jansen, P. P., L. Van Bendegom, J. Van den Berg, M. De Vries, and A. Zanen (1979), *Principles of river engineering: the non-tidal alluvial river*, 509 pp., Pitman London.

Janson, T. (2022), Advies ijsstrategie, *Tech. rep.*, HBO Watermanagement, Hogeschool Rotterdam.

Javernick, L., D. M. Hicks, R. Measures, B. Caruso, and J. Brasington (2016), Numerical modelling of braided rivers with structure-from-motion-derived terrain models, *River Res. Appl.*, *32*(5), 1071--1081, doi:10.1002/rra.2918.

Javernick, L., M. Redolfi, and W. Bertoldi (2018), Evaluation of a numerical model's ability to predict bed load transport observed in braided river experiments, *Adv. Water Resour.*, *115*, 207--218, doi:10.1016/j.advwatres.2018.03.012.

Jeffreys, H. (1925), The flow of water in an inclined channel of rectangular section, *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, *49*(293), 793--807, doi:10.1080/14786442508634662.

Jefimenko, O. D. (1996), Direct calculation of time dilation, *Am. J. Phys*, *64*(6), 812--814, doi:http://dx.doi.org/10.1119/1.18181.

Jerolmack, D. J., and T. A. Brzinski (2010), Equivalence of abrupt grain-size transitions in alluvial rivers and eolian sand seas: A hypothesis, *Geology*, *38*(8), 719--722, doi:10.1130/G30922.1.

Jerolmack, D. J., and D. Mohrig (2005), A unified model for subaqueous bed form dynamics, *Water Resour. Res.*, *41*(12), W12,421, doi:10.1029/2005WR004329.

Jervey, M. (1988), Quantitative geological modeling of siliciclastic rock sequences and their seismic expression, *Sea-Level Changes: An Integrated Approach: SEPM, Special Publication*, *42*, 47--69.

Jia, Y., and S. S. Y. Wang (1999), Numerical model for channel flow and morphological change studies, *J. Hydraul. Eng.*, *125*(9), 924--933, doi:10.1061/(ASCE)0733-9429(1999)125:9(924).

Jiang, G.-S., and C.-W. Shu (1996), Efficient implementation of Weighted ENO schemes, *J. Comput. Phys.*, *126*(1), 202--228, doi:10.1006/jcph.1996.0130.

Jiménez, J. (2018), Coherent structures in wall-bounded turbulence, *J. Fluid Mech.*, *842*, P1, doi:10.1017/jfm.2018.144.

Jin, Y.-C., and P. M. Steffler (1993), Predicting flow in curved open channels by depth-averaged method, *J. Hydraul. Eng.*, *119*(1), 109--124, doi:10.1061/(ASCE)0733-9429(1993)119:1(109).

Johannesson, H., and G. Parker (1989), Secondary flow in mildly sinuous channel, *J. Hydraul. Eng.*, *115*(3), 289--308, doi:10.1061/(ASCE)0733-9429(1989)115:3(289).

Johansson, C. E. (1976), Structural studies of frictional sediments, *Geografiska Annaler. Series A, Physical Geography*, *58*(4), 201--301.

John, F. (1955), A note on impropery problems in partial differential equations, *Commun. Pure Appl. Math.*, *8*(4), 591--594, doi:10.1002/cpa.3160080409.

John, F. (1960), Continuous dependence on data for solutions of partial differential equations with a prescribed bound, *Commun. Pure Appl. Math.*, *13*(4), 551--585, doi:10.1002/cpa.3160130402, wll posed data depends continuously on problem data.

Johnson, J. W. (1942), The importance of considering sidewall friction in bed-load investigations, *Civil Engineering*, *12*, 329--332.

Johnson, M. A., P. Noble, L. M. Rodrigues, and K. Zumbrun (2014), Behavior of periodic solutions of viscous conservation laws under localized and nonlocalized perturbations, *Inventiones mathematicae*, *197*(1), 115--213, doi:10.1007/s00222-013-0481-0.

Johnson, P. A. (1992), Reliability-based pier scour engineering, *J. Hydraul. Eng.*, *118*(10), 1344--1358, doi:10.1061/(ASCE)0733-9429(1992)118:10(1344).

de Jong, J. (2018), Become acquainted with d-flow flexible mesh: Extended grid generation, deltares (unpublished).

de Jong, J. (2020), Tussenoplevering maas-model j19_6-w2 intern, (modelschematisatie).

de Jong, J. (2021), Ontwikkeling zesde-generatie maas-model: Modelbouw, kalibratie en validatie, *Tech. Rep. 11200569-003-ZWS-0014*, Deltares, Delft, the Netherlands, 375 pp.

de Jong, J., and N. E. M. Asselman (2019), Topvervlakking Maas : het effect van golfvormen, bergingsgebieden en rivierverruiming, *rapport*, Deltares, Delft, 142 p. pp.

de Jong, J., and W. Ottevanger (2020), Analyse van de bodemhoogte Rijntakken van 1999 tot 2018, *Tech. Rep. 11202744-003-ZWS-0001*, Deltares, Delft, the Netherlands, 5 pp.

de Jong, J., and M. Yossef (2016), Riviermodellen in D-HYDRO - pilotapplicatie Rijntakken : Advies voor algemeen functioneel ontwerp voor de zesde generatie modellen van RWS, *rapport deltares*, Deltares, Delft, 57, [143] p. pp.

de Jong, J., J. van Kester, and E. de Goede (2019), Implementation, validation and application of bridge piers in D-Flow Flexible Mesh, *Tech. Rep. 11202220-003-ZWS-0004*, Deltares, Delft, the Netherlands.

de Jong, J., V. Chavarrias, and W. Ottevanger (2021), Eindevaluatie pilot Langsdammen in de Waal; hydromorphological data and observations, *Rapport Deltares 11204644*, Deltares, Delft, the Netherlands, september.

de Jong, W. (2005), Onzekerheidsanalyse bodemverandering Grensmaas: Een onderzoek naar de onzekerheid in de met SOBEK-graded gemodelleerde bodemverandering van de Grensmaas ten gevolge van de variatie in de afvoer., *rapport R0002/R/WDJ/Nij*, Royal Haskoning.

Jonoski, A. (2022), *Michael Abbott's Hydroinformatics: Poiesis of New Relationships with Water*, IWA Publishing, doi:10.2166/9781789062656.

Jop, P., Y. Forterre, and O. Pouliquen (2005), Crucial role of sidewalls in granular surface flows: Consequences for the rheology, *J. Fluid Mech.*, *541*, 167--192, doi:10.1017/S0022112005005987.

Jop, P., Y. Forterre, and O. Pouliquen (2006), A constitutive law for dense granular flows, *Nature*, *441*, 727--730, doi:10.1038/nature04801.

Joseph, D., and J. Saut (1990), Short-wave instabilities and ill-posed initial-value problems, *Theor. Comput. Fluid Mech.*, *1*(4), 191--227, doi:10.1007/BF00418002.

Juez, C., J. Murillo, and P. García-Navarro (2014), A 2d weakly-coupled and efficient numerical model for transient shallow flow and movable bed, *Adv. Water Resour.*, *71*, 93--109, doi:http://dx.doi.org/10.1016/j.advwatres.2014.05.014.

Juez, C., C. Ferrer-Boix, J. Murillo, M. A. Hassan, and P. García-Navarro (2016), A model based on hirano-exner equations for two-dimensional transient flows over heterogeneous erodible beds, *Advances in Water Resources*, *87*, 1--18, doi:https://doi.org/10.1016/j.advwatres.2015.10.013.

Juez, C., M. A. Hassan, and M. J. Franca (2018), The origin of fine sediment determines the observations of suspended sediment fluxes under unsteady flow conditions, *Water Resour. Res.*, *54*(8), 5654--5669, doi:10.1029/2018WR022982.

Julien, P. Y. (1995), Sand-dune geometry of large rivers during floods, *J. Hydraul. Eng.*, *121*(9), 657--663, doi:10.1061/(ASCE)0733-9429(1995)121:9(657).

Julien, P. Y., G. J. Klaassen, W. B. M. ten. Brinke, A. W. E. Wilbers, and L. van. Bendegom (2002), Case study: Bed resistance of Rhine River during 1998 flood, *Journal of Hydraulic Engineering*, *128*(12), 1042--1050, doi:10.1061/(ASCE)0733-9429(2002)128:12(1042).

Kabanikhin, S. I. (2008), Definitions and examples of inverse and ill-posed problems, *J. Inv. Ill-Posed Problems*, *16*, 317--357, doi:10.1515/JIIP.2008.019.

Kabiri-Samani, A., and A. Javaheri (2012), Discharge coefficients for free and submerged flow over piano key weirs, *J Hydraul Res*, *50*(1), 114--120, doi:10.1080/00221686.2011.647888.

Kakinuma, T., and Y. Shimizu (2014), Large-scale experiment and numerical modeling of a riverine levee breach, *J. Hydraul. Eng.*, *140*(9), 04014,039, doi:10.1061/(ASCE)HY.1943-7900.0000902.

Kalinske, A. A. (1947), Movement of sediment as bed load in rivers, *EOS, Trans. Am. Geophys. Union*, *28*(4), 615--620, doi:10.1029/TR028i004p00615.

Kalkwijk, J. P. T., and R. Booij (1986), Adaptation of secondary flow in nearly-horizontal flow, *J. Hydraul. Res.*, *24*(1), 19--37, doi:10.1080/00221688609499330.

Kalkwijk, J. P. T., and H. J. de Vriend (1980), Computation of the flow in shallow river bends, *J. Hydraul. Res.*, *18*(4), 327--342, doi:10.1080/00221688009499539.

Kamphuis, J. W. (1974), Determination of sand roughness for fixed beds, *J. Hydraul. Res.*, *12*(2), 193--203, doi:10.1080/00221687409499737.

Kantoush, S. A., and T. Sumi (2010), River morphology and sediment management strategies for sustainable reservoir in japan and european alps, *Ann Disas Prev Res Inst Kyoto Univ*, *53*(B), 821--839.

Kantz, H., and T. Schreiber (2003), *Nonlinear Time Series Analysis*, 2 ed., Cambridge University Press, doi:10.1017/CBO9780511755798.

Kapoor, S., and A. Narayanan (2022), Leakage and the reproducibility crisis in ml-based science, doi:10.48550/ARXIV.2207.07048.

Karim, F. (1999), Bed-form geometry in sand-bed flows, *Journal of Hydraulic Engineering*, *125*(12), 1253--1261, doi:10.1061/(ASCE)0733-9429(1999)125:12(1253).

Karim, M. F., and F. M. Holly (1986), Armoring and sorting simulation in alluvial rivers, *Journal of Hydraulic Engineering*, *112*(8), 705--715, doi:10.1061/(ASCE)0733-9429(1986)112:8(705).

Karim, M. F., F. M. Holly, and J. F. Kennedy (1983), Bed armouring procedures in IALLUVIAL and application to the Missouri River, *Tech. Rep. 269*, Iowa Institute for Hydraulic Research, University of Iowa, Iowa City, IA, United States.

Karl-Erich Lindenschmidt (), *River Ice Processes and Ice Flood Forecasting; A Guide for Practitioners and Students*, doi:10.1007/978-3-030-28679-8.

von Kármán, T. (1930), Mechanische Ähnlichkeit und turbulenz, *Nachrichten von der Gesellschaft der Wissenschaften zu Göttingen, Fachgruppe 1 (Mathematik)*, *5*.

Karmineke, R. (2004), Rhein { radar { atlas, der rhein von km 150 (rheinfelden) bis km 1033 (hoek von holland), *Tech. rep.*, ATLAS SCHIFFAHRT & VERLAG GmbH, rhine map kilometer.

Kassem, A. A., and M. H. Chaudhry (2002), Numerical modeling of bed evolution in channel bends, *J. Hydraul. Eng.*, *128*(5), 507--514, doi:10.1061/(ASCE)0733-9429(2002)128:5(507).

Kasvi, E., P. Alho, E. Lotsari, Y. Wang, A. Kukko, H. Hyyppä, and J. Hyyppä (2015), Two-dimensional and three-dimensional computational models in hydrodynamic and morphodynamic reconstructions of a river bend: sensitivity and functionality, *Hydrological Processes*, *29*(6), 1604--1629, doi:https://doi.org/10.1002/hyp.10277.

Kater, E. (2014), P-map rijntakken rws-on 1999-2014: Gis-modules en datasets gemiddelde zomerbedhoogten per hectometervak, nautisch kilometervak en riviertraject, *Tech. rep.*, Rijkswaterstaat, Oost-Nederland, (in Dutch).

Katz, R. W., M. B. Parlange, and P. Naveau (2002), Statistics of extremes in hydrology, *Adv. Water Resour.*, *25*(8-12), 1287--1304, doi:http://dx.doi.org/10.1016/S0309-1708(02)00056-8.

Kaye, C. A., and E. S. Barghoorn (1964), Late Quaternary sea-level change and crustal rise at Boston, Massachusetts, with notes on the autocompaction of peat, *Geol. Soc. Am. Bull.*, *75*(2), 63--80, doi: 10.1130/0016-7606(1964)75[63:LQSCAC]2.0.CO;2.

Keizer, K. (2016), Determination whether a large scale tesla valve could be applicable as a fish passage, additional thesis, Delft University of Technology.

Kellermann, J. (2011), *Information 2011, Wasser und Schifffahrtsdirektion Süd*, chap. Langfristige Sohlentwicklungen in der Donau zwischen Straubing und Hofkirchen, pp. 72--77, Wasser und Schifffahrtsverwaltung des Bundes.

Kelvin, W. T. (1871), Hydrokinetic solutions and observations, *Philos. Mag.*, *42*(281), 362--377, doi:10.1080/14786447108640585.

Kemp, B. (2022), Causes and effects of different hydrodynamics and morphodynamics of a 1d and 2d meuse model: a 2021 july flood case study, Master's thesis, Wageningen University.

Kennedy, J. F. (1963), The mechanics of dunes and antidunes in erodible-bed channels, *J. Fluid Mech.*, *16*(4), 521--544, doi:10.1017/S0022112063000975.

Kerssens, P. J. M. (1978), morphological computations for suspended sediment transport, *Tech. Rep. S 78 part VI*, Delft Hydraulics Laboratory, Delft, the Netherlands, 101 pp.

Kesseli, J. E. (1941), The concept of the graded river, *J. Geol.*, *49*(6), 561--588.

van Kessel, T., J. Vanlede, and J. de Kok (2011a), Development of a mud transport model for the Scheldt estuary, *Cont. Shelf Res.*, *31*(10, Supplement), S165--S181, doi:10.1016/j.csr.2010.12.006.

van Kessel, T., H. Winterwerp, B. van Prooijen, M. van Ledden, and W. Borst (2011b), Modelling the seasonal dynamics of SPM with a simple algorithm for the buffering of fines in a sandy seabed, *Cont. Shelf Res.*, *31*(10, Supplement), S124--S134, doi:10.1016/j.csr.2010.04.008.

Ketcheson, D. I., and M. Q. de Luna (2021), Numerical simulation and entropy dissipative cure of the carbuncle instability for the shallow water circular hydraulic jump, *arXiv*, doi:10.48550/arXiv.2103.09664.

Kim, W., D. Mohrig, R. Twilley, C. Paola, and G. Parker (2009), Is it feasible to build new land in the Mississippi River delta?, *EOS, Trans. Am. Geophys. Union*, *90*(42), 373--374, doi:10.1029/2009EO420001.

Kimiaghalam, N., M. Goharrokhi, S. P. Clark, and H. Ahmari (2015), A comprehensive fluvial geomorphology study of riverbank erosion on the red river in winnipeg, manitoba, canada, *Journal of Hydrology*, *529*, 1488--1498, doi:https://doi.org/10.1016/j.jhydrol.2015.08.033.

King, H. W. (1918), Exclusion of heavy silt from channels by vaned pitching, *Tech. rep.*

King, H. W. (1933), Silt exclusion from distributaries, *Tech. rep.*

Kinneging, N., M. Snellen, D. Eleftherakis, D. Simons, E. Mosselman, and A. Sieben (2012), River bed classification using multi-beam echo-sounder backscatter data, in *Proc. Hydro12 - Taking care of the sea, Rotterdam, the Netherlands, 13--15 November*, edited by T. A. G. P. van Dijk, Hydrographic Society Benelux.

Kitanidis, P. K., and J. F. Kennedy (1984), Secondary current and river-meander formation, *J. Fluid Mech.*, *144*, 217--229, doi:10.1017/S0022112084001580.

Klaassen, G. J. (1987), Armoured river beds during floods, *Tech. Rep. 394*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Klaassen, G. J. (1990a), Sediment transport in armoured rivers during floods, *Tech. Rep 118*, Delft Hydraulics Laboratory, Delft, the Netherlands, 10 pp.

Klaassen, G. J. (1990b), Experiments with graded sediments in a straight flume : report on experimental investigations, *Tech. Rep. Q0788*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Klaassen, G. J. (1991), Experiments on the effect of gradation and vertical sorting on sediment transport phenomena in the dune phase, in *Proc. Grain Sorting Seminar, Ascona, Switzerland*, pp. 127--145.

Klaassen, G. J., and N. Struiksma (1981), Morfologische verschijnselen grensmaas, *Tech. rep.*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Klaassen, G. J., H. Tukker, J. Driegen, and G. van der Woude (1986), Morfologie afgepleisterde beddingen: proeven met hoogwatergolven, *Tech. Rep. M2061/Q212*, Delft Hydraulics Laboratory, Delft, the Netherlands, (in Dutch).

Kleinhans, M., A. Wilbers, and W. Ten Brinke (2007), Opposite hysteresis of sand and gravel transport upstream and downstream of a bifurcation during a flood in the river rhine, the netherlands, *Netherlands Journal of Geosciences/Geologie en Mijnbouw*, *86*(3), 273--285.

Kleinhans, M., A. Verkade, T. van Wessel, M. Bastings, W. Marra, T. van Gog, W. van Westrenen, and M. Reichwein (2015), Moon, mars and mundus: primary school children discover the nature and science of planet earth from experimentation and extra-terrestrial perspectives, *Neth. J. Geosci.*, pp. 1--12.

Kleinhans, M. G. (2004), Sorting in grain flows at the lee side of dunes, *Earth Sci. Rev.*, *65*(1!!e!!2), 75--102, doi:10.1016/S0012-8252(03)00081-3.

Kleinhans, M. G. (2005), Grain-size sorting in grainflows at the lee side of deltas, *Sedimentology*, *52*(2), 291--311, doi:10.1111/j.1365-3091.2005.00698.x.

Kleinhans, M. G., and L. C. van Rijn (2002), Stochastic prediction of sediment transport in sand-gravel bed rivers, *J. Hydraul. Eng.*, *128(4)*, 412--425.

Kleinhans, M. G., A. W. E. Wilbers, A. de Swaaf, and J. H. van den Berg (2002), Sediment supply-limited bedforms in sand-gravel bed rivers, *J. Sediment. Res.*, *72*(5), 629--640, doi:10.1306/030702720629.

Kleinhans, M. G., C. J. Buskes, and H. W. de Regt (2005), Terra incognita: explanation and reduction in earth science, *International Studies in the Philosophy of Science*, *19*(3), 289--317.

Kleinhans, M. G., H. R. A. Jagers, E. Mosselman, and C. J. Sloff (2008), Bifurcation dynamics and avulsion duration in meandering rivers by one-dimensional and three-dimensional models, *Water Resour. Res.*, *44*.

Kleinhans, M. G., C. J. Buskes, and H. W. de Regt (2009), 9 philosophy of earth science, *Philosophies of the Sciences*, p. 213.

Kleinhans, M. G., M. F. P. Bierkens, and M. van der Perk (2010), Hess opinions on the use of laboratory experimentation: "hydrologists, bring out shovels and garden hoses and hit the dirt", *Hydrol. Earth Syst. Sci.*, *14*(2), 369--382, doi:10.5194/hess-14-369-2010.

Kleinhans, M. G., R. I. Ferguson, S. N. Lane, and R. J. Hardy (2013), Splitting rivers at their seams: bifurcations and avulsion, *Earth Surf. Process. Landf.*, *38*(1), 47--61, doi:10.1002/esp.3268.

Kleinhans, M. G., W. M. van Dijk, W. I. van de Lageweg, D. C. J. D. Hoyal, H. Markies, M. van Maarseveen, C. Roosendaal, W. van Weesep, D. van Breemen, R. Hoendervoogt, and N. Cheshier (2014), Quantifiable effectiveness of experimental scaling of river- and delta morphodynamics and stratigraphy, *Earth Sci. Rev.*, *133*, 43--61, doi:10.1016/j.earscirev.2014.03.001.

Kleinhans, M. G., J. R. F. W. Leuven, L. Braat, and A. Baar (2017), Scour holes and ripples occur below the hydraulic smooth to rough transition of movable beds, *Sedimentology*, *64*(5), 1381--1401, doi: https://doi.org/10.1111/sed.12358.

Klonsky, L., and R. M. Vogel (2011), Effective measures of ''effective'' discharge, *J. Geol.*, *119*(1), 1--14, doi:10.1086/657258.

Klösch, M., W. ten Brinke, M. Krapesch, and H. Habersack (2022), Sediment management in the rhine catchment: Inventory of knowledge, research and monitoring, and an advice on future sediment research, *Tech. Rep. Report No I-27 of the CHR*, International Commission for the Hydrology of the Rhine Basin.

Knaapen, M. A. F., and S. J. M. H. Hulscher (2003), Use of a genetic algorithm to improve predictions of alternate bar dynamics, *Water Resour. Res.*, *39*(9), 1231, doi:10.1029/2002WR001793, 1231.

Knight, D. W., M. Omran, and X. Tang (2007), Modeling depth-averaged velocity and boundary shear in trapezoidal channels with secondary flows, *J. Hydraul. Eng.*, *133*(1), 39--47, doi:10.1061/(ASCE)0733-9429(2007)133:1(39).

Knighton, A. (1999), The gravel-sand transition in a disturbed catchment, *Geomorphology*, *27*(3-4), 325--341, doi:10.1016/S0169-555X(98)00078-6.

Knowles, J. K., and E. Sternberg (1975), On the ellipticity of the equations of nonlinear elastostatics for a special material, *J. Elast.*, *5*(3), 341--361, doi:10.1007/BF00126996.

Knowles, J. K., and E. Sternberg (1976), On the failure of ellipticity of the equations for finite elastostatic plane strain, *Arch. Ration. Mech. Anal.*, *63*(4), 321--336, doi:10.1007/BF00279991.

Koch, F. G., and C. Flokstra (1980), Bed level computations for curved alluvial channels, *Tech. Rep. 240*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Koch, F. G., and C. Flokstra (1981), Bed level computations for curved alluvial channels, in *Proc. 19th IAHR World Congress, 2--7 February, New Delhi, India*.

Kodama, Y. (1994a), Downstream changes in the lithology and grain size of fluvial gravels, the watarase river, japan: evidence of the role of abrasion in downstream fining, *J. Sediment. Res.*, *64*(1), 68--75.

Kodama, Y. (1994b), Experimental study of abrasion and its role in producing downstream fining in gravel-bed rivers, *J. Sediment. Res.*, *64*(1), 76--85.

Koedijk, O. C. (2020), Richtlijnen vaarwegen 2020, *Tech. rep.*, Ministerie van Infrastructuur en Waterstaat, Rijkswaterstaat Water, Verkeer en Leefomgeving, (in Dutch).

Kok, M., R. Jongejan, M. Nieuwjaar, and I. Tánczos (2017), *Fundamentals of Flood Protection*, 144 pp.

Kolmogorov, A. N. (1941), Dissipation of energy in the locally isotropic turbulence, *Dokl. Akad. Nauk SSSR*, (translation by V. Levin, reprinted in Proc. R. Soc. Loud. A (1991) 434, 15--17).

Komar, P. D. (1987a), Selective gravel entrainment and the empirical evaluation of flow competence, *Sedimentology*, *34*(6), 1165--1176, doi:10.1111/j.1365-3091.1987.tb00599.x.

Komar, P. D. (1987b), Selective grain entrainment by a current from a bed of mixed sizes: A reanalysis, *J. Sediment. Petrol.*, *57*(2), 203--211.

Komarova, N. L., and A. C. Newell (1995), *Nonlinear Dynamics and Pattern Formation in the Natural Environment*, chap. 10: The mean flows driven by sandbar instabilities, pp. 147--167, Pitman research notes in mathematics series, Longman, Harlow, Essex, UK.

Komarova, N. L., and A. C. Newell (2000), Nonlinear dynamics of sand banks and sand waves, *J. Fluid Mech.*, *415*, 285--321, doi:10.1017/S0022112000008855.

Kondolf, G. M. (1997), Hungry water: Effects of dams and gravel mining on river channels, *Environ. Manage.*, *21*(4), 533--551, doi:10.1007/s002679900048.

Kondolf, G. M., and W. Matthews (1991), Management of coarse sediment in regulated rivers of california, *Tech. Rep. W-748*, UC Water Resources Center.

Kondolf, G. M., and J. T. Minear (2004), Coarse sediment augmentation on the Trinity River below Lewiston Dam: Geomorphic perspectives and review of past projects, *Tech. rep.*, Trinity River Restoration Program.

Kondolf, G. M., Y. Gao, G. W. Annandale, G. L. Morris, E. Jiang, J. Zhang, Y. Cao, P. Carling, K. Fu, Q. Guo, R. Hotchkiss, C. Peteuil, T. Sumi, H.-W. Wang, Z. Wang, Z. Wei, B. Wu, C. Wu, and C. T. Yang (2014), Sustainable sediment management in reservoirs and regulated rivers: Experiences from five continents, *Earth's Future*, *2*(5), 256--280, doi:10.1002/2013EF000184.

Koren, B. (1993), A robust upwind discretization method for advection, diffusion and source terms, in *Numerical Methods for Advection-Diffusion Problems*, edited by C. B. Vreugdenhil and B. Koren, pp. 117--138, Vieweg, Braunschweig-Wiesbaden.

Korteweg, D. J., and G. de Vries (1895), On the change of form of long waves advancing in a rectangular canal, and on a new type of long stationary waves, *Phil. Mag.*, *5*(39), 422--443.

Kostaschuk, R., D. Shugar, J. Best, D. Parsons, S. Lane, R. Hardy, and O. Orfeo (2009), Suspended sediment transport and deposition over a dune: Río Paraná, Argentina, *Earth Surf. Process. Landf.*, *34*(12), 1605--1611, doi:10.1002/esp.1847.

Kosters, A., A. Spruyt, and I. Niesten (2022), Ontwikkeling zesde-generatie Rijntakken model : modelbouw, kalibratie en validatie, *rapport deltares*, Deltares, Delft, 764 p. pp.

Kostic, S., and G. Parker (2003a), Progradational sand-mud deltas in lakes and reservoirs. Part 1. Theory and numerical modeling, *J. Hydraul. Res.*, *41*(2), 127--140, doi:10.1080/00221680309499956.

Kostic, S., and G. Parker (2003b), Progradational sand-mud deltas in lakes and reservoirs. Part 2. Experiment and numerical simulation, *J. Hydraul. Res.*, *41*(2), 141--152, doi:10.1080/00221680309499957.

Kothe, H. (2003), Existing sediment management guidelines: an overview, *J. Soils Sediments*, *3*(3), 139--143, doi:10.1065/jss2003.08.082.

Koyré, A. (1952), An unpublished letter of robert hooke to isaac newton, *Isis*, *43*(4), 312--337, doi:10.1086/348155.

Kragten (2018), Analyse Bodempeilingen Maas, *Handleiding GDV083-0001*, Kragten, 22 p. pp.

Kramer, S. C., and G. S. Stelling (2008), A conservative unstructured scheme for rapidly varied flows, *International Journal for Numerical Methods in Fluids*, *58*(2), 183--212, doi:https://doi.org/10.1002/fld.1722.

Kranenburg, C. (1992), On the evolution of roll waves, *J. Fluid Mech.*, *245*, 249--261, doi:10.1017/S0022112092000442.

Kranenburg, W. M. (a), Evaluatie van het osr-model voor zoutindringing in de rijn-maasmonding (i), *Tech. Rep. 1209459*, Deltares, Delft, the Netherlands, 47 pp.

Kranenburg, W. M. (b), Evaluatie van het osr-model voor zoutindringing in de rijn-maasmonding (ii), *Tech. Rep. 1209459*, Deltares, Delft, the Netherlands, 47 pp.

Kranenburg, W. M. (c), Osr-simulaties voor zoutindringing in de rijn-maasmonding zomer 2003, *Tech. Rep. 1220070*, Deltares, Delft, the Netherlands, 66 pp.

Kremer, J. N., J. M. Vaudrey, D. S. Ullman, D. L. Bergondo, N. LaSota, C. Kincaid, D. L. Codiga, and M. J. Brush (2010), Simulating property exchange in estuarine ecosystem models at ecologically appropriate scales, *Ecological Modelling*, *221*(7), 1080--1088, doi:https://doi.org/10.1016/j.ecolmodel.2009.12.014, special Issue on Advances in Modeling Estuarine and Coastal Ecosystems: Approaches, Validation, and Applications.

Kroon, T., G. Prinsen, J. Hunink, M. Visser, and H. van den Boogaard (2015), 100 jaar reeks LHM en LSM : beschrijving van de invoer, *rapport deltares*, Deltares, Delft, 74 p. pp.

Kubatko, E. J., and J. J. Westerink (2007), Exact discontinuous solutions of exner's bed evolution model: Simple theory for sediment bores, *J. Hydraul. Eng.*, *133*(3), 305--311, doi:10.1061/(ASCE)0733-9429(2007)133:3(305).

Kuhnle, R. A. (1992), *Dynamics of Gravel-bed rivers*, chap. Fractional Transport Rates of Bedload on Goodwin Creek, pp. 141--155, John Wiley & Sons, Chichester, United Kingdom.

Kuhnle, R. A. (1993), Incipient motion of sand-gravel sediment mixtures, *J. Hydraul. Eng.*, *119*(12), 1400--1415, doi:10.1061/(ASCE)0733-9429(1993)119:12(1400).

Kuhnle, R. A., and J. B. Southard (1988), Bed load transport fluctuations in a gravel bed laboratory channel, *Water Resour. Res.*, *24*(2), 247--260, doi:10.1029/WR024i002p00247.

Kuhnle, R. A., and J. C. Willis (1992), Mean size distribution of bed load on goodwin creek, *J. Hydraul. Eng.*, *118*(10), 1443--1446, doi:10.1061/(ASCE)0733-9429(1992)118:10(1443).

Kuhnle, R. A., D. G. Wren, and E. J. Langendoen (2014), Predicting bed load transport of sand and gravel on goodwin creek, *J. Hydro-environ. Res.*, *8*(2), 153--163, doi:10.1016/j.jher.2013.11.005.

Kuijper, K. (2015), Analyse debiet- en zoutmetingen Hollandsche IJssel, *Tech. Rep. 1220106-003-HYE-0004*, Deltares, Delft, the Netherlands.

Kuijper, K. (2016), Analyse van de zoutmetingen in november 2015 langs de Hollandsche IJssel: Afleiding dispersiecoefficient, *Tech. Rep. 1220106-003-HYE-0004*, Deltares, Delft, the Netherlands.

Kumbaro, A., and M. Ndjinga (2011), Influence of interfacial pressure term on the hyperbolicity of a general multifluid model, *J. Comput. Multiphase Flows*, *3*(3), 177--195, doi:10.1260/1757-482X.3.3.177.

Kummu, M., H. de Moel, P. J. Ward, and O. Varis (2011), How close do we live to water? a global analysis of population distance to freshwater bodies, *PLoS ONE*, *6*(6), 1--13.

Kuroki, M., and T. Kishi (1984), Regime criteria on bars and braids in alluvial straight channels, *Proceedings of the Japanese Society of Civil Engineers*, *342*, 87--96, (in Japanese).

Kurstjens, G. (2019), Effect van langsdammen opstroomdalflora langs de Waal vier jaar na aanleg, *Tech. rep.*, Ontwikkeling+beheer natuurkwaliteit, ARK natuur ontwikkeling, Staatsbosbeheer, WWF, 35 pp., (in Dutch).

Kutta, W. (1901), Beitrag zur näherungsweisen Integration totaler Differentialgleichungen, *Z. Math. Phys.*, *46*, 435--453, (in German).

Kyong, O. B. (2018), Flowchart on choosing optimal method of observing transverse dispersion coefficient for solute transport in open channel flow, *Sustainability*, *10*, doi:doi:10.3390/su10051332.

Kyong, O. B., and W. S. Il (2016), On the methods for determining the transverse dispersion coefficient in river mixing, *Adv. Water Resour.*, *90*, 1--9, doi:10.1016/j.advwatres.2016.01.009.

Laan, S., V. Chavarrias, Y. Huismans, and R. van der Wijk (), Verzilting hollandsche ijssel en lek: Evaluatie en systeemanalyse op basis van metingen, *Tech. Rep. 11206830-017-ZWS-0001*, Deltares, Delft, the Netherlands, 68 pp.

Labbe, J. M., K. S. Hadley, A. M. Schipper, R. S. E. W. Leuven, and C. Perala-Gardiner (2011), Influence of bank materials, bed sediment, and riparian vegetation on channel form along a gravel-to-sand transition reach of the Upper Tualatin River, Oregon, USA, *Geomorphology*, *125*(3), 374 -- 382, doi:10.1016/j.geomorph.2010.10.013.

Lacey, G. (1930), Stable channels in alluvium, *Min. Proc. Inst. Civ. Eng.*, *229*, 259--292, doi:10.1680/imotp.1930.15592.

Lai, S. Y. J., Y.-T. Hsiao, and F.-C. Wu (2017), Asymmetric effects of subaerial and subaqueous basement slopes on self-similar morphology of prograding deltas, *J. Geophys. Res., Earth Surface*, *122*(12), 2506--2526, doi:10.1002/2017JF004244.

Lajeunesse, E., L. Malverti, and F. Charru (2010), Bed load transport in turbulent flow at the grain scale: Experiments and modeling, *J. Geophys. Res., Earth Surface*, *115*(F4), F04,001, doi:10.1029/2009JF001628.

Lajeunesse, E., O. Devauchelle, M. Houssais, and G. Seizilles (2013), Tracer dispersion in bedload transport, *Adv. Geosci.*, *37*, 1--6, doi:10.5194/adgeo-37-1-2013.

Lajeunesse, E., O. Devauchelle, F. Lachaussée, and P. Claudin (2017), Bedload transport in laboratory rivers: The erosion-deposition model, in *Gravel-Bed Rivers: Process and Disasters*, edited by D. Tsutsumi and J. B. Laronne, chap. 15, pp. 415--438, Wiley-Blackwell, Hoboken, NJ, United States, doi:10.1002/9781118971437.ch15.

Lajeunesse, E., O. Devauchelle, and F. James (2018), Advection and dispersion of bed load tracers, *Earth Surf. Dyn.*, *6*(2), 389--399, doi:10.5194/esurf-6-389-2018.

Lamb, H. (1945), *Hydrodynamics*, 6 ed., Dover Publications, New York, NY, United States.

Lamb, M. P., and J. G. Venditti (2016), The grain size gap and abrupt gravel-sand transitions in rivers due to suspension fallout, *Geophys. Res. Lett.*, *43*(8), 3777--3785, doi:10.1002/2016GL068713.

Lamb, M. P., W. E. Dietrich, and L. S. Sklar (2008), A model for fluvial bedrock incision by impacting suspended and bed load sediment, *J. Geophys. Res., Earth Surface*, *113*(F3), F03,025, doi:10.1029/2007JF000915.

Lamb, M. P., J. A. Nittrouer, D. Mohrig, and J. Shaw (2012), Backwater and river plume controls on scour upstream of river mouths: Implications for fluvio-deltaic morphodynamics, *J. Geophys. Res., Earth Surface*, *117*(F1), F01,002, doi:10.1029/2011JF002079.

Landau, L. D. (1944), On the problem of turbulence, *C. R. Acad. Sci. URSS*, *44*, 311--314, (in Russian, translated to English in Collected Papers of L.D. Landau, (1965), Ed. D. Ter Haar, Pergamom).

van Landeghem, K., I. Yiannoukos, C. McCarron, J. Morgan, and B. Clayton-Smith (2020), The influence of gravel mixed with sand on the formation and development of ripples, in *Proceedings of the European Geophysical Union (EGU) General Assembly, 4--8 May*.

Lane, E. W. (1954), The importance of fluvial morphology in hydraulic engineering, *Tech. rep.*, US Department of the Interior, Bureau of Reclemation.

Lane, E. W. (1955), The importance of fluvial morphology in hydraulic engineering, *Proc. Am. Soc. Civ. Eng.*, *81*(754), 1--17.

Lane, E. W. (1957), A study of the shape of channels formed by natural streams flowing in erodible material.

LANGE, B. B. D. (2022), Sediment nourishments inthe river waal to mitigatebed degradationa numerical modelling study, Master's thesis.

Lange, C., and A. Newell (1974), A stability criterion for envelope equations, *SIAM J. Appl. Math.*, *27*(3), 441--456, doi:10.1137/0127034.

de Lange, S. I., S. Naqshband, and A. J. F. Hoitink (2021), Quantifying hydraulic roughness from field data: Can dune morphology tell the whole story?, *Water Resources Research*, *57*(12), e2021WR030,329, doi:https://doi.org/10.1029/2021WR030329, e2021WR030329 2021WR030329.

Langendoen, E. J., A. Mendoza, J. D. Abad, P. Tassi, D. Wang, R. Ata, K. El Kadi Abderrezzak, and J.-M. Hervouet (2016), Improved numerical modeling of morphodynamics of rivers with steep banks, *Adv. Water Resour.*, *93*, 4--14, doi:10.1016/j.advwatres.2015.04.002.

Langham, J., M. J. Woodhouse, A. J. Hogg, and J. C. Phillips (2021), Linear stability of shallow morphodynamic flows, *Journal of Fluid Mechanics*, *916*, A31, doi:10.1017/jfm.2021.235.

Lanzoni, S. (2000a), Experiments on bar formation in a straight flume: 1. Uniform sediment, *Water Resour. Res.*, *36*(11), 3337--3349, doi:10.1029/2000WR900160.

Lanzoni, S. (2000b), Experiments on bar formation in a straight flume: 2. Graded sediment, *Water Resour. Res.*, *36*(11), 3351--3363, doi:10.1029/2000WR900161.

Lanzoni, S., and G. Seminara (2006), On the nature of meander instability, *J. Geophys. Res., Earth Surface*, *111*(F4), F04,006, doi:10.1029/2005JF000416.

Lanzoni, S., and M. Tubino (1999), Grain sorting and bar instability, *J. Fluid Mech.*, *393*, 149--174, doi:10.1017/S0022112099005583.

Lanzoni, S., A. Siviglia, A. Frascati, and G. Seminara (2006), Long waves in erodible channels and morphodynamic influence, *Water Resour. Res.*, *42*(6), doi:10.1029/2006WR004916.

Lanzoni, S., M. Redolfi, and G. Zolezzi (Eds.) (2017a), *Proceedings of the event RCEM2017 10th Symposium on River, Coastal and Estuarine Morphodynamics, Trento - Padova, 15--22 September 2017.*

Lanzoni, S., A. Ferdousi, and N. Tambroni (2017b), River banks and channel axis curvature: effects on the longitudinal dispersion in alluvial rivers, *Adv. Water Resour.*, pp. --, doi:10.1016/j.advwatres.2017.10.033.

Lanzoni, S., A. Ferdousi, and N. Tambroni (2018), River banks and channel axis curvature: Effects on the longitudinal dispersion in alluvial rivers, *Adv. Water Resour.*, *113*, 55--72, doi:10.1016/j.advwatres.2017.10.033.

Laplace, P. S. (1814), *Essai philosophique sur les probabilités*, 96 pp., Courcier, Paris, France, (in French).

Latteux, B. (1995), Techniques for long-term morphological simulation under tidal action, *Mar. Geol.*, *126*(126), 129--141, doi:10.1016/0025-3227(95)00069-B.

Lauer, J. W., and G. Parker (2008), Modeling framework for sediment deposition, storage, and evacuation in the floodplain of a meandering river: Theory, *Water Resour. Res.*, *44*(4), W04,425, doi:10.1029/2006WR005528.

Lauer, J. W., G. Parker, and W. E. Dietrich (2008), Response of the strickland and fly river confluence to postglacial sea level rise, *J. Geophys. Res., Earth Surface*, *113*(F1), F01S06, doi:10.1029/2006JF000626.

Lauer, J. W., C. Li, E. Viparelli, and H. Piegay (2014), Mast-1d: A size-specific sediment transport and tracer model with off-channel storage, in *Proceedings World Environmental and Water Resources Congress, Portland, OR, United States.*

Lauer, J. W., E. Viparelli, and H. Piégay (2016), Morphodynamics and sediment tracers in 1-D (MAST-1D): 1-D sediment transport that includes exchange with an off-channel sediment reservoir, *Adv. Water Resour.*, *93, Part A*, 135--149, doi:10.1016/j.advwatres.2016.01.012.

Launder, B. E., and D. B. Spalding (1974), The numerical computation of turbulent flows, *Computer Methods in Applied Mechanics and Engineering*, *3*(2), 269--289, doi:10.1016/0045-7825(74)90029-2.

Laurens, F. (2020), Estimating navigable areas in scarce data river environments: A Chindwin case study, M.Sc thesis, TU Delft, The Netherlands., available from http://resolver.tudelft.nl/uuid:828da8d0-513a-4f7b-9c8e

Laursen, E. M., and A. Toch (1956), Scour around bridge piers and abutments, *Bulletin 4*, Iowa Institute of Hydraulic Research, State University of Iowa, Iowa, United States, 63 pp.

Lawrence, G. A. (1990), On the hydraulics of Boussinesq and non-Boussinesq two-layer flows, *J. Fluid Mech.*, *215*, 457--480, doi:10.1017/S0022112090002713.

Lax, P. D. (1957), Asymptotic solutions of oscillatory initial value problems, *Duke Math. J.*, *24*(4), 627--646, doi:10.1215/S0012-7094-57-02471-7.

Lax, P. D. (1958), Differential equations, difference equations and matrix theory, *Commun. Pure Appl. Math.*, *11*(2), 175--194, doi:10.1002/cpa.3160110203.

Lax, P. D. (1980), On the notion of hyperbolicity, *Commun. Pure Appl. Math.*, *33*(3), 395--397.

Le, T. B., A. Crosato, and W. S. J. Uijttewaal (2018a), Long-term morphological developments of river channels separated by a longitudinal training wall, *Adv. Water Resour.*, *113*, 73--85, doi:10.1016/j.advwatres.2018.01.007.

Le, T. B., A. Crosato, E. Mosselman, and W. S. J. Uijttewaal (2018b), On the stability of river bifurcations created by longitudinal training walls. numerical investigation, *Adv. Water Resour.*, *113*, 112--125, doi:10.1016/j.advwatres.2018.01.012.

Lebedev, V. I. (1991), On formulae for roots of cubic equation, *Sov. J. Numer. Anal. Math. Modelling*, *6*(4), 315--324.

Leclair, S. F., and J. S. Bridge (2001), Quantitative interpretation of sedimentary structures formed by river dunes, *J. Sediment. Res.*, *71*(5), 713--716.

van Ledden, M. (2003), Sand-mud segregation in estuaries and tidal basins, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

van Ledden, M., Z.-B. Wang, H. Winterwerp, and H. de Vriend (2004a), Sand--mud morphodynamics in a short tidal basin, *Ocean Dyn.*, *54*(3), 385--391, doi:10.1007/s10236-003-0050-y.

van Ledden, M., W. G. M. van Kesteren, and J. C. Winterwerp (2004b), A conceptual framework for the erosion behaviour of sand-mud mixtures, *Cont. Shelf Res.*, *24*(1), 1--11, doi:10.1016/j.csr.2003.09.002.

Lee, D. T. L., and A. Yamamoto (1994), Wavelet analysis, theory and application, *Hewlett-Packard Journal*, pp. 44--52.

Lee, H.-Y., and A. J. Odgaard (1986), Simulation of bed armoring in alluvial channels, *J. Hydraul. Eng.*, *112*(9), 794--801, doi:10.1061/(ASCE)0733-9429(1986)112:9(794).

Lee, J., and J. Ahn (2023), Analysis of bed sorting methods for one dimensional sediment transport model, *Sustainability*, *15*(3), doi:10.3390/su15032269.

Lee, M. M. (2006), Acheloös Peplophoros: A lost statuette of a River God in feminine dress, *Hesperia: The Journal of the American School of Classical Studies at Athens*, *75*(3), 317--325.

Leeder, M. R., T. Harris, and M. J. Kirkby (1998), Sediment supply and climate change: implications for basin stratigraphy, *Basin Research*, *10*(1), 7--18, doi:10.1046/j.1365-2117.1998.00054.x.

van Leer, B., W.-T. Lee, and P. L. Roe (1991), Characteristic time-stepping or local preconditioning of the Euler equations, *Tech. Rep. 1991-1552*, AIAA, Washington, DC, United States, 260--282 pp.

Legleiter, C. J., and P. C. Kyriakidis (2006), Forward and inverse transformations between Cartesian and channel-fitted coordinate systems for meandering rivers, *Math. Geol.*, *38*(8), 927--958, doi:10.1007/s11004-006-9056-6.

Leijnse, T. (2018), Computationally efficient modelling of compound flooding due to tropical cyclones with the explicit inclusion of wave-driven processes: Research into the required processes and the implementation within the sfincs model, Master's thesis, Delft University of Technology.

Leijnse, T., M. van Ormondt, K. Nederhoff, and A. van Dongeren (2021), Modeling compound flooding in coastal systems using a computationally efficient reduced-physics solver: Including fluvial, pluvial, tidal, wind- and wave-driven processes, *Coastal Engineering*, *163*, 103,796, doi:https://doi.org/10.1016/j.coastaleng.2020.103796.

Lely, C. W. (1926), De Verbetering van de Maas voor Groote Afvoeren, *Tech. rep.*, Rijkswaterstaat.

Lenau, C. W., and J. A. T. Hjelmfelt (1992), River bed degradation due to abrupt outfall lowering, *J. Hydraul. Eng.*, *118*(6), doi:10.1061/(ASCE)0733-9429(1992)118:6(918).

Lensky, N. G., Y. Dvorkin, V. Lyakhovsky, I. Gertman, and I. Gavrieli (2005), Water, salt, and energy balances of the dead sea, *Water Resources Research*, *41*(12), doi:https://doi.org/10.1029/2005WR004084.

Lenzi, M. A., L. Mao, and F. Comiti (2006), Effective discharge for sediment transport in a mountain river: Computational approaches and geomorphic effectiveness, *J. Hydrol.*, *326*(1!!e!!4), 257--276, doi:10.1016/j.jhydrol.2005.10.031.

Leopold, L. B. (1992), *Sediment Size that Determines Channel Morphology*, chap. 14, p. 15, John Wiley & Sons, Chichester, United Kingdom.

Leopold, L. B., and T. Maddock (1953), The hydraulic geometrv of stream channels and some physiographic implications, *Professional Paper 252*, US Department of the Interior, Geological Survey.

Leopold, L. B., and M. G. Wolman (1957), River channel patterns: Braided, meandering and straigh, *Professional Paper 282-B*, US Department of the Interior, Geological Survey.

Leopold, L. B., W. W. Emmett, and R. M. Myrick (1966), Channel and hillslope processes in a semiarid area, New Mexico, *Professional Paper 352-G*, USGS, US Government Printing Office, Washington, DC, United States, 193--249 pp.

Lesser, G. R. (2009), An approach to medium-term coastal morphological modelling, Ph.D. thesis, Delft University of Technology.

Lesser, G. R., J. A. Roelvink, J. A. T. M. van Kester, and G. S. Stelling (2004), Development and validation of a three-dimensional morphological model, *Coastal Eng.*, *51*(8--9), 883--915, doi:10.1016/j.coastaleng.2004.07.014.

LeVeque, R. J. (2004), *Finite Volume Methods for Hyperbolic Problems*, no. 31 in Cambridge Texts in Applied Mathematics, Cambridge University Press, Cambridge, United Kingdom, doi:10.1017/CBO9780511791253.

Li, C., M. J. Czapiga, E. C. Eke, E. Viparelli, and G. Parker (2014a), Variable shields number model for river bankfull geometry: bankfull shear velocity is viscosity-dependent but grain size-independent, *J. Hydraul. Res.*, *53*(1), 36--48, doi:10.1080/00221686.2014.939113.

Li, C., M. J. Czapiga, E. C. Eke, E. Viparelli, and G. Parker (2016a), Closure to "Variable Shields number model for river bankfull geometry: bankfull shear velocity is viscosity-dependent but grain size-independent" by Chuan Li, Matthew J. Czapiga, Esther C. Eke, Enrica Viparelli, and Gary Parker, J. Hydraulic Res. 53(1), 2015, 36-48,, *J. Hydraul. Res.*, *54*(2), 234--237, doi:10.1080/00221686.2015.1137088.

Li, F., and Q. Zheng (2016a), Probabilistic modelling of flood events using the entropy copula, *Advances in Water Resources*, *97*, 233--240, doi:10.1016/j.advwatres.2016.09.016.

Li, F., and Q. Zheng (2016b), Probabilistic modelling of flood events using the entropy copula, *Adv. Water Resour.*, *97*, 233--240, doi:10.1016/j.advwatres.2016.09.016.

Li, J., Z. Cao, K. Hu, G. Pender, and Q. Liu (2017a), A depth-averaged two-phase model for debris flows over erodible beds, *Earth Surf. Process. Landf.*, doi:10.1002/esp.4283.

Li, J., Z. Cao, K. Hu, G. Pender, and Q. Liu (2018), A depth-averaged two-phase model for debris flows over erodible beds, *Earth Surf. Process. Landf.*, *43*(4), 817--839, doi:10.1002/esp.4283.

Li, L. (2010), A fundamental study of the morphological acceleration factor, Master's thesis, Delft University of Technology.

Li, M. Z. (1994), Direct skin friction measurements and stress partitioning over movable sand ripples, *J. Geophys. Res., C: Oceans*, *99*(C1), 791--799, doi:10.1029/93JC02445.

Li, W., H. J. de Vriend, Z. Wang, and D. S. van Maren (2013), Morphological modeling using a fully coupled, total variation diminishing upwind-biased centered scheme, *Water Resour. Res.*, *49*(6), 3547--3565, doi:10.1002/wrcr.20138.

Li, W., Z. Wang, H. J. de Vriend, and D. S. van Maren (2014b), Long-term effects of water diversions on the longitudinal flow and bed profiles, *J. Hydraul. Eng.*, *140*(6), 1--10, doi:10.1061/(ASCE)HY.1943-7900.0000856.

Li, W., D. S. van Maren, Z. B. Wang, H. J. de Vriend, and B. Wu (2014c), Peak discharge increase in hyperconcentrated floods, *Adv. Water Resour.*, *67*, 65--77, doi:10.1016/j.advwatres.2014.02.007.

Li, W., Z. Su, D. S. van Maren, Z. Wang, and H. J. de Vriend (2017b), Mechanisms of hyperconcentrated flood propagation in a dynamic channel-floodplain system, *Adv. Water Resour.*, pp. --, doi:10.1016/j.advwatres.2017.05.012.

Li, Z., Z. Cao, H. Liu, and G. Pender (2016b), Graded and uniform bed load sediment transport in a degrading channel, *Int. J. Sediment Res.*, *31*(4), 376 -- 385, doi:http://dx.doi.org/10.1016/j.ijsrc.2016.01.004.

Liang, M., C. Van Dyk, and P. Passalacqua (2016), Quantifying the patterns and dynamics of river deltas under conditions of steady forcing and relative sea level rise, *J. Geophys. Res., Earth Surface*, *121*(2), 465--496, doi:10.1002/2015JF003653, 2015JF003653.

Lien, H. C., T. Y. Hsieh, J. C. Yang, and K. C. Yeh (1999), Bend-flow simulation using 2D depth-averaged model, *J. Hydraul. Eng.*, *125*(10), 1097--1108, doi:10.1061/(ASCE)0733-9429(1999)125:10(1097).

Lin, S. P. (1974), Finite amplitude side-band stability of a viscous film, *J. Fluid Mech.*, *63*(3), 417--429, doi:10.1017/S0022112074001704.

Lin, W., and D. M. Gray (1971), Calculation of backwater curves by the runge-kutta method, *Tech. rep.*, Division of Hydrology, college od engineering university of saskatachewan, saskatoon, canada.

Lindenschmidt, K.-E. (2017), Rivice|a non-proprietary, open-source, one-dimensional river-ice model, *Water*, *9*(5), doi:10.3390/w9050314.

Lindhart, M. (2015), Stratified secondary circulation in the Rio Magdalena, Colombia, Master's thesis.

Lindhart, M., E. Mosselman, and H. Avila (2015), Stratified secondary circulation in the rio magdalena, colombia, in *Proceedings of the 9th symposium of River, Coastal, and Estuarine Morphodynamics, Iquitos, Perú, 30 Aug -- 3 Sep.*

van Linge, B. W. (2017), Hydraulic evaluation of longitudinal training dams, Master's thesis, Delft University of Technology, Delft, the Netherlands.

Liska, R., and B. Wendroff (1997), Analysis and computation with stratified fluid models, *J. Comput. Phys.*, *137*(1), 212--244, doi:10.1006/jcph.1997.5806.

Liska, R., L. Margolin, and B. Wendroff (1995), Nonhydrostatic two-layer models of incompressible flow, *Comput. Math. Appl.*, *29*(9), 25--37, doi:10.1016/0898-1221(95)00035-W.

Lisle, I. G., C. W. Rose, W. L. Hogarth, P. B. Hairsine, G. C. Sander, and J.-Y. Parlange (1998), Stochastic sediment transport in soil erosion, *J. Hydrol.*, *204*(1), 217--230, doi:10.1016/S0022-1694(97)00123-6.

Lisle, T., Y. Cui, G. Parker, J. Pizzuto, and A. Dodd (2001), The dominance of dispersion in the evolution of bed material waves in grave-bed rivers, *Earth Surf. Processes Landf.*, *26*, 1409--1420, doi:10.1002/esp.300.

Lisle, T. E., H. Ikeda, and F. Iseya (1991), Formation of stationary alternate bars in a steep channel with mixed-size sediment: A flume experiment, *Earth Surf. Process. Landf.*, *16*(5), 463--469, doi:10.1002/esp.3290160507.

Little, W. C. (1972), The role of sediment gradation on channel armoring, Ph.D. thesis, Georgia Institueof Technology, Atlanta, GA, United States.

Litty, C., and F. Schlunegger (2017), Controls on pebbles' size and shape in streams of the swiss alps, *J. Geol.*, *125*(1), 101--112, doi:10.1086/689183.

Litwin Miller, K., M. D. Reitz, and D. J. Jerolmack (2014), Generalized sorting profile of alluvial fans, *Geophys. Res. Lett.*, *41*(20), 7191--7199, doi:10.1002/2014GL060991.

Liu, J., J. B. Schneider, and J. P. Gollub (1995), Three-dimensional instabilities of film flows, *Phys. Fluids*, *7*(1), 55--67, doi:10.1063/1.868782.

Liu, T.-P. (1987), Nonlinear resonance for quasilinear hyperbolic equation, *J. Math. Phys.*, *28*(11), 2593--2602, doi:10.1063/1.527751.

Liu, W. K., S. Li, and H. S. Park (2022), Eighty years of the finite element method: Birth, evolution, and future, *Archives of Computational Methods in Engineering*, *29*(6), 4431--4453, doi:10.1007/s11831-022-09740-9.

Liu, X.-D., S. Osher, and T. Chan (1994), Weighted essentially non-oscillatory schemes, *J. Comput. Phys.*, *115*(1), 200--212, doi:10.1006/jcph.1994.1187.

Logan, J. D. (2015), *Applied Partial Differential Equations*, Undergraduate Texts in Mathematics, Springer.

Lokin, L. (2020), Dune dynamics under high and low flows, *CE&M research report 2020R-003WEM-003, ISSN:1568-4652*, University of Twente, 60 pp.

Lokin, L. R., J. J. Warmink, A. Bomers, and S. J. M. H. Hulscher (2022), River dune dynamics during low flows, *Geophysical Research Letters*, *49*(8), e2021GL097,127, doi:https://doi.org/10.1029/2021GL097127, e2021GL097127 2021GL097127.

Long, R. R. (1956), Long waves in a two-fluid system, *J. Meteor.*, *13*(1), 70--74, doi:10.1175/1520-0469(1956)013⟨0070:LWIATF⟩2.0.CO;2.

Long, W., J. T. Kirby, and Z. Shao (2008), A numerical scheme for morphological bed level calculations, *Coastal Eng.*, *55*(2), 167--180, doi:10.1016/j.coastaleng.2007.09.009.

Longhitano, S. G. (2008), Sedimentary facies and sequence stratigraphy of coarse-grained Gilbert-type deltas within the Pliocene thrust-top Potenza Basin (southern Apennines, Italy), *Sediment. Geol.*, *210*, 87--110, doi:10.1016/j.sedgeo.2008.07.004.

Lonnquest, J., B. Toussaint, J. Joe Manous, and M. Ertsen (Eds.) (2014), *Two Centuries of Experience in Water Resources Management. A Dutch-U.S. Retrospective.*, Institute for Water Resources, U.S. Army Corps of Engineers and Rijkswaterstaat, Ministry of Infrastructure and the Environment.

Lopez Dubon, S., and S. Lanzoni (2019), Meandering evolution and width variations: A physics-statistics-based modeling approach, *Water Resour. Res.*, *55*, doi:10.1029/2018WR023639.

Lorentz, H. A. (1926), *Verslag van de commissie Lorentz*, Algemene Landsdrukkerij, 's-Gravenhage, the Netherlands, (in Dutch).

Lorenz, E. N. (1963), Deterministic nonperiodic flow, *J. Atmos. Sci.*, *20*(2), 130--141, doi:10.1175/1520-0469(1963)020⟨0130:DNF⟩2.0.CO;2.

Lorenzo-Trueba, J., and V. R. Voller (2010), Analytical and numerical solution of a generalized Stefan problem exhibiting two moving boundaries with application to ocean delta formation, *Journal of Mathematical Analysis and Applications*, *366*(2), 538--549, doi:10.1016/j.jmaa.2010.01.008.

Lorenzo-Trueba, J., V. R. Voller, T. Muto, W. Kim, C. Paola, and J. B. Swenson (2009), A similarity solution for a dual moving boundary problem associated with a coastal-plain depositional system, *J. Fluid Mech.*, *628*, 427--443, doi:10.1017/S0022112009006715.

Lorenzo-Trueba, J., V. R. Voller, and C. Paola (2013), A geometric model for the dynamics of a fluvially dominated deltaic system under base-level change, *Computers & Geosciences*, *53*(0), 39--47, doi:10.1016/j.cageo.2012.02.010, <ce:title>Modeling for Environmental Change</ce:title>.

Love, E., and W. J. Rider (2013), On the convergence of finite difference methods for PDE under temporal refinement, *Comput. Math. Appl.*, *66*(1), 33--40, doi:10.1016/j.camwa.2013.04.019.

Lowe, D. R. (1976), Grain flow and grain flow deposits, *J. Sediment. Res.*, *46*(1), 188--199, doi:10.1306/212F6EF1-2B24-11D7-8648000102C1865D.

Luchi, R., G. Zolezzi, and M. Tubino (2010), Modelling mid-channel bars in meandering channels, *Earth Surf. Process. Landf.*, *35*(8), 902--917, doi:10.1002/esp.1947.

LUCHINI, P., and F. CHARRU (2010), The phase lead of shear stress in shallow-water flow over a perturbed bottom, *Journal of Fluid Mechanics*, *665*, 516{539, doi:10.1017/S0022112010004313.

Luchini, P., and F. Charru (2019), On the large difference between benjamin's and hanratty's formulations of perturbed flow over uneven terrain, *Journal of Fluid Mechanics*, *871*, 534{561, doi:10.1017/jfm.2019.312.

Luijendijk, A. P., M. A. de Schipper, and R. Ranasinghe (2019), Morphodynamic acceleration techniques for multi-timescale predictions of complex sandy interventions, *Journal of Marine Science and Engineering*, *7*(3), doi:10.3390/jmse7030078.

Luque, R. F. (1974), Erosion and transport of bed-load sediment, Ph.D. thesis, Delft University of Technology.

Luu, X. L., H. Takebayashi, and S. Egashira (2004), Characteristics of sediment sorting predicted by two different exchange layer models, *Jap. Soc. Fluid Mech.*, *A225*, 248--249.

Luu, X. L., S. Egashira, and H. Takebayashi (2006), A new treatment of the exchange layer thickness to evaluate sediment sorting and armoring, *J. Appl. Mech.*, *9*, 1025--1030, doi:10.2208/journalam.9.1025.

Lyczkowski, R. W., C. W. Slobrig, D. Gidaspow, and E. D. Hughes (1975), Characteristics and stability analyses of transient one-dimensional two phase flow equations and their finite difference approximations, *Tech. Rep. 75-WA/HT-23*, ASME, 57 pp.

Lyczkowski, R. W., D. Gidaspow, C. W. Solbrig, and E. D. Hughes (1978), Characteristics and stability analyses of transient one-dimensional two-phase flow equations and their finite difference approximations, *Nucl. Sci. Eng.*, *66*(3), 378--396, doi:10.13182/NSE78-4.

Lyn, D. A. (1987), Unsteady sediment transport modeling, *J. Hydraul. Eng.*, *113*(1), 1--15, doi:10.1061/(ASCE)0733-9429(1987)113:1(1).

Lyn, D. A. (1993), Turbulence measurements in open-channel flows over artificial bed forms, *J. Hydraul. Eng.*, *119*(3), 306--326, doi:10.1061/(ASCE)0733-9429(1993)119:3(306).

Lyn, D. A., and M. Altinakar (2002), St. Venant-Exner equations for near-critical and transcritical flows, *J. Hydraul. Eng.*, *128*(6), 579--587, doi:10.1061/(ASCE)0733-9429(2002)128:6(579).

Lyn, D. A., and P. Goodwin (1987), Stability of a general Preissmann scheme, *J. Hydraul. Eng.*, *113*(1), 16--28, doi:10.1061/(ASCE)0733-9429(1987)113:1(16).

M Tubino, W. B. (2007), Bifurcations in gravel-bed streams, *Developments in Earth Surface Processes*.

Ma, H., J. A. Nittrouer, K. Naito, X. Fu, Y. Zhang, A. J. Moodie, Y. Wang, B. Wu, and G. Parker (2017), The exceptional sediment load of fine-grained dispersal systems: Example of the yellow river, china, *Science Advances*, *3*(5), doi:10.1126/sciadv.1603114.

MacArthur, R., D. T. Williams, and W. A. Thomas (1990), Status and new capabilities of computer program hec-6 'scour and deposition in rivers and reservoirs', *Tech. rep.*, Hydrologic Engineering Center Davis.

Mackin, J. H. (1948), Concept of the graded river, *Geol. Soc. Am. Bull.*, *59*(5), 463--512, doi:10.1130/0016-7606(1948)59.

MacQueen, J., et al. (1967), Some methods for classification and analysis of multivariate observations, in *Proceedings of the fifth Berkeley symposium on mathematical statistics and probability*, vol. 1, p. 14, California, USA.

Madsen, P. A., M. Rugbjerg, and I. R. Warren (1988), Subgrid modelling in depth integrated flows, *21st International Conference on Coastal Engineering*.

Maerker, C. (2013), Die numerische simulation von nassbaggerstrategien im kontext der optimierung von unterhaltungsmanahmen für die schifffahrt, Ph.D. thesis, Universität der Bundeswehr München.

Mahadevan, A., J. Oliger, and R. Street (1996), A nonhydrostatic mesoscale ocean model. part i: Well-posedness and scaling, *Journal of Physical Oceanography*, *26*(9), 1868--1880, doi:10.1175/1520-0485(1996)026⟨1868:ANMOMP⟩2.0.CO;2.

Mahiques, A. (2019), Así movieron mi casa para dar más espacio al río, *Ballena Blanca*, pp. 47--53.

Maljaars, J. (2013), Stroomsnelheden rond kribben: Vergelijking van WAQUA-modelresultaten met metingen, *BSc. Thesis*, Delft University of Technology.

Malmon, D. V., T. Dunne, and S. L. Reneau (2002), Predicting the fate of sediment and pollutants in river floodplains, *Environmental Science & Technology*, *36*(9), 2026--2032, doi:10.1021/es010509+.

Malmon, D. V., T. Dunne, and S. L. Reneau (2003), Stochastic theory of particle trajectories through alluvial valley floors, *J. Geol.*, *111*(5), 525--542, doi:10.1086/376764.

Malone, T., and A. D. Parr (2008), Bend losses in rectangular culverts, *Tech. Rep. K-TRAN: KU-05-5*, Kansas Department of Transportation and Kansas State University.

Manning, R. (1891), On the flow of water in open channels and pipes, *Transactions of the Institution of Civil Engineers of Ireland*, *20*, 161--207.

Marchesin, J. (2018), Analysis of data from the longitudinal training dams Waal river, *Tech. rep.*, Université de Tours, Tours, France, 35 pp.

MarCom Working Group 180 (2015), Guidelines for protecting berthing structures from scour caused by ships, *Tech. rep.*, PIANC.

Marion, A., and L. Fraccarollo (1997), Experimental investigation of mobile armoring development, *Water Resources Research*, *33*(6), 1447--1453, doi:10.1029/97WR00705.

Markus, A. (), Design patterns and fortran 90/95, *Tech. rep.*, Delft Hydraulic Laboraotory, Delft, the Netherlands.

van der Mark, C. F., and M. Lemans (2020), Operational 2D water depth prediction using echo sounder data of inland ships, in *River Flow 2020: Proceedings of the 10th Conference on Fluvial Hydraulics (Delft, Netherlands, 7-10 July 2020)*, edited by W. Uijttewaal, M. Franca, D. Valero, V. Chavarrias, C. Ylla Arbós, R. Schielen, and A. Crosato, CRC press.

van der Mark, C. F., and E. Mosselman (2013), Effects of helical flow in one-dimensional modelling of sediment distribution at river bifurcations, *Earth Surface Processes and Landscape*.

van der Mark, C. F., and T. Vijververg (2015), Validatie: vergelijking tussen covadem metingen en rijkswaterstaat metingen, *Memo 1208679-000-ZWS-0008*, Deltares, Delft, the Netherlands, 32 pp.

van der Mark, C. F., A. Blom, and S. J. M. H. Hulscher (2008), Quantification of variability in bedform geometry, *J. Geophys. Res., Earth Surface*, *113*(F3), F03,020, doi:10.1029/2007JF000940.

van der Mark, C. F., R. A. M. van der Sligte, A. Becker, E. Mosselman, and H. J. Verheij (2011), Morfologische effectstudie KRW-maatregelen IJssel, *rapport 147 p.*, Deltares, Delft.

van der Mark, C. F., T. Vijververg, and W. Ottevanger (2015), Paper 114 { validation of actual depth measurements by inland vessels, in *Smart Rivers 2015, Buenos Aeres, Argentina*.

van der Mark, R., and R. van der Wijk (2021), Eindevaluatie pilot Langsdammen in de Waal; functie vaarweg, *Rapport 11204644*, Deltares, Delft, the Netherlands, september.

van der Mark, R., M. den. Toom, R. van der. Wijk, and K. Sloff (2020), Verwachtingen waterdiepte rijntakken, *Deltares rapport 11205272-006-ZWS-0008*, Deltares, Delft, the Netherlands.

Marr, J. G., J. B. Swenson, C. Paola, and V. R. Voller (2000), A two-diffusion model of fluvial stratigraphy in closed depositional basins, *Basin Res.*, *12*(3-4), 381--398, doi:10.1111/j.1365-2117.2000.00134.x.

Marra, W. A., D. R. Parsons, M. G. Kleinhans, G. M. Keevil, and R. E. Thomas (2014), Near-bed and surface flow division patterns in experimental river bifurcations, *Water Resour. Res.*, *50*(2), 1506--1530, doi:10.1002/2013WR014215.

Martin, L. R., K. P. Purohit, and D. J. Jerolmack (2014), Sedimentary bed evolution as a mean-reverting random walk: Implications for tracer statistics, *Geophys. Res. Lett.*, *41*(17), 6152--6159, doi: 10.1002/2014GL060525.

Martin, R. L., D. J. Jerolmack, and R. Schumer (2012), The physical basis for anomalous diffusion in bed load transport, *J. Geophys. Res., Earth Surface*, *117*(F1), F01,018, doi:10.1029/2011JF002075.

Martín-Vide, J. P., C. Ferrer-Boix, and A. Ollero (2010), Incision due to gravel mining: Modeling a case study from the Gállego River, Spain, *Geomorphology*, *117*(3), 261--271, doi:10.1016/j.geomorph.2009.01.019.

Martínez-Aranda, S., J. Murillo, and P. García-Navarro (2021), Comparison of new efficient 2D models for the simulation of bedload transport using the augmented roe approach, *Advances in Water Resources*, *153*, 103,931, doi:10.1016/j.advwatres.2021.103931.

Martinez-Ortiz, C., P. Martinez Lavanchy, L. Sesink, B. G. Olivier, J. Meakin, M. de Jong, and M. Cruz (2022), Practical guide to software management plans, doi:10.5281/zenodo.7248877.

Martini, I., E. Ambrosetti, and F. Sandrelli (2017), The role of sediment supply in large-scale stratigraphic architecture of ancient Gilbert-type deltas (Pliocene Siena-Radicofani Basin, Italy), *Sediment. Geol.*, *350*, 23 -- 41, doi:10.1016/j.sedgeo.2017.01.006.

Martín-Vide, J. P., S. Capape, and C. Ferrer-Boix (2019), Transient scour and fill. the case of the pilcomayo river, *Journal of Hydrology*, *576*, 356--369, doi:https://doi.org/10.1016/j.jhydrol.2019.06.041.

Martín-Vide, J. P., C. M. S. Fael, F. N. nez González, C. Ferrer-Boix, C. A. V. Santos, A. Prats-Puntí, and V. Chavarrias (2022), A large bridge pier in an alluvial channel: Local scourversus morphological effects and the role of physical models, *Journal of Hydraulic Engineering*, doi:10.1061/(ASCE)HY.1943-7900.0001993.

Massera, G. (2020), Analysis of mixed-size sediment transport models: A study for the dutch rhine river, Master's thesis, University of Trento, Trento, Italy.

Mathijssen, A. J. T. M., M. Lisicki, V. N. Prakash, and E. J. L. Mossige (2022), Culinary fluid mechanics and other currents in food science.

Matt Czapiga, A. B., and E. Viparelli (2021), Efficacy of longitudinal training walls to mitigate riverbed erosion, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

Mays, L. (Ed.) (2010a), *Ancient Water Technologies*, Springer, Dordrecht, doi:10.1007/978-90-481-8632-7.

Mays, L. W. (2010b), A brief history of roman water technology, in *Ancient Water Technologies*, edited by L. W. Mays, chap. 7, pp. 115--137, Springer, Dordrecht, the Netherlands, doi:10.1007/978-90-481-8632-7_7.

Mazure, J. P. (1963), Hydraulic research for the Zuiderzeeworks, in *Selected Aspects of Hydraulic Engineering. Liber Amicorum dedicated to Johannes Theodoor Thijsse, on occasion of his retirement as professor*, edited by A. A. van Douwen, pp. 119--150, Delft University of Technology, Delft, the Netherlands.

Mazzotti, S., A. Lambert, M. Van der Kooij, and A. Mainville (2009), Impact of anthropogenic subsidence on relative sea-level rise in the Fraser River delta, *Geology*, *37*(9), 771--774, doi:10.1130/G25640A.1.

McKie, C. W., C. Juez, B. D. Plumb, W. K. Annable, and M. J. Franca (2021), How large immobile sediments in gravel bed rivers impact sediment transport and bed morphology, *Journal of Hydraulic Engineering*, *147*(2), 04020,096, doi:10.1061/(ASCE)HY.1943-7900.0001842.

McLean, D., K. Oberhagemann, H. Wiebe, and S. Bennett (2016), River stabilization and development: Jamuna-padma and dependent areas, *Tech. rep.*, JV Northwest Hydraulic Consultants - Euroconsult Mott MacDonald.

McLean, D. G., M. Church, and B. Tassone (1999), Sediment transport along lower Fraser River: 1. measurements and hydraulic computations, *Water Resour. Res.*, *35*(8), 2533--2548, doi:10.1029/1999WR900101.

McNamara, J. P., and C. Borden (2004), Observations on the movement of coarse gravel using implanted motion-sensing radio transmitters, *Hydrol. Process.*, *18*(10), 1871--1884, doi:10.1002/hyp.1453.

Meijer, D. G. (2020a), Kennis- en data-inventarisatie voor bodemhoogteanalyses Maas; systeemrapportage morfologie Maas: Overzichtsrapport (fase 1), *Tech. Rep. 117.01-02*, RiQuest.

Meijer, D. G. (2020b), Kennis- en data-inventarisatie voor bodemhoogteanalyses Maas; systeemrapportage morfologie Maas: Analyserapport (fase 2), *Tech. Rep. 117.01-02*, RiQuest.

Menéndez, A., P. García, N. Badano, L. Kazimierski, and S. Guizzardi (2021), Prediction of sedimentation in an extended and heterogeneous navigation waterway, *Ribagua*, *8*(1), 13--33, doi:10.1080/23863781.2022.2116367.

Mens, M., R. van der Wijk, N. Kramer, J. Hunink, J. de Jong, B. Becker, P. Gijsbers, and C. ten Velden (2018), Hotspotanalyses voor het Deltaprogramma Zoetwater : inhoudelijke rapportage, *rapport deltares*, Deltares, Delft, 135 p. pp.

Merkin, J. H., and D. J. Needham (1986), On infinite period bifurcations with an application to roll waves, *Acta Mech.*, *60*(1), 1--16, doi:10.1007/BF01302938.

Merkle, C., and M. Athavale (1987), Time-accurate unsteady incompressible flow algorithms based on artificial compressibility, *Tech. Rep. 1987-1137*, AIAA, Washington, DC, United States, doi:10.2514/6.1987-1137.

Merrill, R. T. (1995), Principle of least astonishment, *Nature*, *374*(6524), 674--675, doi:10.1038/374674a0.

Métivier, F., E. Lajeunesse, and O. Devauchelle (2017), Laboratory rivers: Lacey's law, threshold theory, and channel stability, *Earth Surf. Dyn.*, *5*(1), 187--198, doi:10.5194/esurf-5-187-2017.

Metzler, R., and J. Klafter (2000), The random walk's guide to anomalous diffusion: A fractional dynamics approach, *Phys. Rep.*, *339*(1), 1--77, doi:10.1016/S0370-1573(00)00070-3.

Metzler, R., and J. Klafter (2004), The restaurant at the end of the random walk: recent developments in the description of anomalous transport by fractional dynamics, *J. Phys. A: Math. Gen.*, *37*(31), R161--R208.

Meulen, M. J. van der., M. Rijnveld, L. M. Gerrits, J. Joziasse, and M. W. van Heijst (2006), Handling sediments in dutch river management: The planning stage of the maaswerken river widening project, *J. Soils Sediments*, *6*(3), 163--172, doi:10.1065/jss2006.06.165.

Meyer-Peter, E., and R. Müller (1948), Formulas for bed-load transport, in *Proc. 2nd IAHR World Congress, 6--9 June, Stockholm, Sweden*, pp. 39--64.

van der Mheen, M., and J. Prins (2015), Morfologische ontwikkelingen in de grensmaas; analyse van bodemveranderingen als gevolg van de maaswerken met metingen en WAQMorf, *Tech. Rep. 1209376-000*, Deltares, Delft, the Netherlands.

MIKOS, M., G. PENDER, and T. HOEY (1999), Use of a modified hiding function in the simulation ofgraded sediment transport during degradation, in *Proc. 28th IAHR World Congress, 22--27 August, Graz, Austria*, vol. Volume: Hydraulic engineering for sustainable water resources management at the turn of the millennium, p. 7.

Miller, J. R., and J. B. Ritter (1996), An examination of the rosgen classification of natural rivers, *CATENA*, *27*(3), 295--299, doi:10.1016/0341-8162(96)00017-3.

Miller, K. L., T. Szabó, D. J. Jerolmack, and G. Domokos (2014), Quantifying the significance of abrasion and selective transport for downstream fluvial grain size evolution, *J. Geophys. Res., Earth Surface*, *119*(11), 2412--2429, doi:10.1002/2014JF003156, 2014JF003156.

Milliman, J. D., and J. P. M. Syvitski (1992), Geomorphic/tectonic control of sediment discharge to the ocean: The importance of small mountainous rivers, *J. Geol.*, *100*(5), 525--544.

Mi␣losz, C. (1988), *The collected poems, 1931-1987*, Ecco, New York, NY, United States.

Minns, A. W., A. Verwey, and I. R. Warren (2022), Computational hydraulics: stage for the hydroinformatics act, in *Michael Abbott's Hydroinformatics: Poiesis of New Relationships with Water*, IWA Publishing, doi:10.2166/9781789062656_0017.

Minns, T., A. Spruyt, and D. Kerkhoven (2020), Specificaties zesde-generatie modellen met D-HYDRO 2020 : generieke technische en functionele specificaties, *rapport*, Deltares, Delft, 93 p. pp.

Miori, S., R. Repetto, and M. Tubino (2006), A one-dimensional model of bifurcations in gravel bed channels with erodible banks, *Water Resour. Res.*

Miralles, S. C. (2017), Experiments de flux i sedimentació de llim fi, Ph.D. thesis, Technical University of Catalonia, (in Catalan).

Misri, R. L., R. J. Garde, and K. G. R. Raju (1984), Bed load transport of coarse nonuniform sediment, *J. Hydraul. Eng.*, *110*(3), 312--328, doi:10.1061/(ASCE)0733-9429(1984)110:3(312).

Miwa, H., and G. Parker (2012), Numerical simulation of low-flow channel evolution due to sediment augmentation, *Int. J. Sediment Res.*, *27*(3), 351--361, doi:10.1016/S1001-6279(12)60040-7.

Miyagawa, Y., T. Sumi, Y. Takemon, and S. Kobayashi (2017), Effects of sediment replenishment on riverbed material size distribution and attached algal biomass in the downstream reaches of a dam, *Hydrological Research Letters*, *11*(2), 114--120, doi:10.3178/hrl.11.114.

Mizohata, S. (1961), Some remarks on the Cauchy problem, *J. Math. Kyoto Univ.*, *1*(1), 109--127, doi:10.1215/kjm/1250525109.

Mogé, M., A. Emerson, and M. Genseberger (), Next steps for scalable delft3d fm for efficient modelling of shallow water and transport processes, *Tech. rep.*, Deltares, Delft, the Netherlands., 29 pp.

Mokrzycka, A. (2013), The impact of the change of river channel geometry on the size and range of backwater from the receiving body, *Scientific Journals of The Maritime University of Szczecin*, *33*(105), 69--74.

Molnar, P. (2004), Late cenozoic increase in accumulation rates of terrestrial sediment: How might climate change have affected erosion rates?, *Annu. Rev. Earth Planet. Sci.*, *32*(1), 67--89, doi: 10.1146/annurev.earth.32.091003.143456.

Moncada, A. T., J. Aguirre, J. C. Bolívar, and E. J. Flores (2009), Scour protection of circular bridge piers with collars and slots, *Journal of Hydraulic Research*, *47*(1), 119--126, doi:10.3826/jhr.2009.3244.

Monge, G. (1850), *Application de L'analyse a la géométrie*.

Montijn, R. (2021), Numerical study on the development of alternate bars in varying discharge conditions, Master's thesis.

Mooiman, J. (2017), Pid controller mass-spring-damper system, *Tech. rep.*, Deltares, Delft, the Netherlands.

MORGAN, D. S., A. DOELMAN, and T. J. KAPER (2000), Stationary periodic patterns in the id gray-scott model, *METHODS AND APPLICATIONS OF ANALYSIS*, *7*(1), 105--150.

Morgan, J. A., N. Kumar, A. R. Horner-Devine, S. Ahrendt, E. Istanbullouglu, and C. Bandaragoda (2020), The use of a morphological acceleration factor in the simulation of large-scale fluvial morphodynamics, *Geomorphology*, *356*, 107,088, doi:10.1016/j.geomorph.2020.107088.

Morris, P. H., and D. J. Williams (1996), Relative celerities of mobile bed flows with finite solids concentrations, *J. Hydraul. Eng.*, *122*, doi:10.1061/(ASCE)0733-9429(1996)122:6(311).

Morris, P. H., and D. J. Williams (1997), Exponential longitudinal profiles of streams, *Earth Surf. Process. Landf.*, *22*(2), 143--163, doi:10.1002/(SICI)1096-9837(199702)22:2⟨143::AID-ESP681⟩3.0.CO;2-Z.

Morris, P. H., and D. J. Williams (1999a), A worldwide correlation for exponential bed particle size variation in subaerial aqueous flows, *Earth Surf. Process. Landf.*, *24*(9), 835--847, doi:10.1002/(SICI)1096-9837(199908)24:9⟨835::AID-ESP15⟩3.0.CO;2-G.

Morris, P. H., and D. J. Williams (1999b), Worldwide correlations for subaerial aqueous flows with exponential longitudinal profiles, *Earth Surf. Process. Landf.*, *24*(10), 867--879, doi:10.1002/(SICI)1096-9837(199909)24:10⟨867::AID-ESP16⟩3.0.CO;2-L.

Morton, K. W., and D. F. Mayers (2005), *Numerical Solution of Partial Differential Equations*, 278 pp., Cambridge University Press, Cambridge, United Kingdom.

Mosquera-Machado, S., and S. Ahmad (2007), Flood hazard assessment of atrato river in colombia, *Water Resources Management*, *21*(3), 591--609, doi:10.1007/s11269-006-9032-4.

Mosselman, E. (1995), A review of mathematical models of river planform changes, *Earth Surf. Process. Landf.*, *20*(7), 661--670, doi:https://doi.org/10.1002/esp.3290200708.

Mosselman, E. (1998), Morphological modelling of rivers with erodible banks, *Hydrol. Process.*, *12*(8), 1357--1370, doi:10.1002/(SICI)1099-1085(19980630)12:8⟨1357::AID-HYP619⟩3.0.CO;2-7.

Mosselman, E. (2001), Morphological developments of side channels, *Tech. Rep. T2401*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Mosselman, E. (2005), Basic equations for sediment transport in CFD for fluvial morphodynamics, in *Computational Fluid Dynamics: Applications in Environmental Hydraulics*, edited by P. D. Bates, S. N. Lane, and R. I. Ferguson, chap. 4, pp. 71--89, John Wiley & Sons, Chichester, United Kingdom.

Mosselman, E. (2006), *Braided Rivers: Process, Deposits, Ecology and Management*, chap. Bank Protection and River Training Along the Braided Brahmaputra-Jamuna River, Bangladesh, pp. 277--287, Blackwell Publishing Ltd., Oxford, UK, doi:10.1002/9781444304374.ch13.

Mosselman, E. (2009), *Proceedings of the 6th Symposium on River Coastal and Estuarine Morphodynamics, 21-25 September, Santa Fe, Argentina.*, chap. Intrinsic steady alternate bars in alluvial channels. Part 2: Theoretical analysis, pp. 767--772, CRC Press.

Mosselman, E. (2010a), Knowledge for climate hsrr08 the effects of climate change on inland water transport via the port of rotterdam, *Tech. rep.*, Deltares.

Mosselman, E. (2010b), *Proceedings of the International Conference on Waterways of Russia: Engineering, Operation and Maintenance, Managements, 1-2 October, Saint Petersburg, Russia.*, chap. Intrinsic steady alternate bars in alluvial channels, pp. 31--36.

Mosselman, E. (2012), Fluvial morphology in flooding risk assessment and mitigation, in *Comprehensive Flood Risk Management*, edited by Klijn and Schweckendiek, Taylor & Francis Group, London.

Mosselman, E. (2013a), *Gravel-bed Rivers: Processes, Tools, Environments,*, chap. 9, Modelling Sediment Transport and Morphodynamics of Gravel-bed Rivers, pp. 101--115, John Wiley & Sons, Chichester, United Kingdom.

Mosselman, E. (2013b), Evaluatie WAQMorf, *Tech. Rep. 1205916-007*, Deltares, Delft, the Netherlands.

Mosselman, E. (2018a), Modelling in applied hydraulics: More accurate in decision-making than in science?, in *Advances in Hydroinformatics*, edited by P. Gourbesville, J. Cunge, and G. Caignaert, pp. 741--749, Springer Singapore, Singapore.

Mosselman, E. (2018b), Achtergronden van morfodynamische modellering en advies voor stowa, *Tech. rep.*, Deltares, Delft, the Netherlands.

Mosselman, E. (2019a), Advies zomerbedverdieping, *rapport deltares*, Deltares, Delft, 39 p. pp.

Mosselman, E. (2019b), The morphological factor, at riverlab byom-session 1 on may 9th, https://oss.deltares.nl/web/riverlab-models/literature.

Mosselman, E. (2020), Studies on river training, *Water*, *12*(11), doi:10.3390/w12113100.

Mosselman, E. (2022), The dutch rhine branches in the anthropocene { importance of events and seizing of opportunities, *Geomorphology*, *410*, 108,289, doi:https://doi.org/10.1016/j.geomorph.2022.108289.

Mosselman, E., and T. B. Le (2015), Five common mistakes in fluvial morphodynamic modeling, *Adv. Water Resour.*, *93(A)*, 15--20, doi:10.1016/j.advwatres.2015.07.025.

Mosselman, E., and K. Sloff (2002), Effect of local scour holes on macroscale river morphology, in *Proceedings of the XXth International Conference on Fluvial Hydraulics (River Flow), Louvain-la-Neuve, Belgium, 4-6 September*.

Mosselman, E., and K. Sloff (2007), The importance of floods for bed topography and bed sediment composition: numerical modelling of Rhine bifurcation at Pannerden, in *Gravel-Bed Rivers VI: From Process Understanding to River Restoration*, *Developments in Earth Surface Processes*, vol. 11, edited by H. Habersack, H. Piégay, and M. Rinaldi, chap. 7, pp. 161--179, Elsevier, doi:https://doi.org/10.1016/S0928-2025(07)11124-X.

Mosselman, E., and K. Sloff (2008), *Gravel-Bed Rivers VI: From Process Understanding to River Restoration*, vol. 11, chap. 7: The importance of floods for bed topography and bed sediment composition: numerical modelling of Rhine bifurcation at Pannerden, pp. 161--179, Elsevier B. V., doi:10.1016/S0928-2025(07)11124-X.

Mosselman, E., A. Sieben, K. Sloff, and A. Wolters (1999), Effect of spatial grain size variations on two-dimensional river bed morphology, in *Proc. of the 1st IAHR symposium on River, Coastal, and Estuarine Morphoynamics, Genova, Italy*.

Mosselman, E., T. Shishikura, and G. J. Klaassen (2000), Effect of bank stabilization on bend scour in anabranches of braided rivers, *Physics and Chemistry of the Earth, Part B: Hydrology, Oceans and Atmosphere*, *25*(7), 699--704, doi:https://doi.org/10.1016/S1464-1909(00)00088-5.

Mosselman, E., H. Barnevald, and H. de Vriend (2001), Morfologie en herinrichting, *Tech. rep.*, Delft Hydraulics Laboratory, Delft, the Netherlands, doi:10.13140/RG.2.1.1434.8007.

Mosselman, E., K. I. Hassan, and A. Sieben (2003), *Proceedings of the 3th Symposium on River Coastal and Estuarine Morphodynamics, 1-5 September, Barcelona, Spain.*, pp. 236--246, IAHR, Madrid.

Mosselman, E., P. Kerssens, F. van der Knaap, D. Schwanenberg, and K. Sloff (2004), Sustainable river fairway maintenance and improvement, *Tech. Rep. Q3757.00*, Delft Hydraulics Laboratory, Delft, the Netherlands, doi:10.13140/RG.2.1.3728.5606.

Mosselman, E., M. Tubino, and G. Zolezzi (2006), *Proceedings of the 3rd International Conference on Fluvial Hydraulics, Lisbon, Portugal, 6-8 September*, chap. The overdeepening theory in river morphodynamics: two decades of shifting interpretations, pp. 1175--1182, Taylor & Francis.

Mosselman, E., B. van Vuren, M. Yossef, W. Ottevanger, and C. Sloff (2007), Case studies duurzame vaardiepte Rijndelta, *rapport deltares*, WL Delft Hydraulics, Delft, 108 p. pp.

Mosselman, E., K. Sloff, and S. van Vuren (2008), Different sediment mixtures at constant flow conditions can produce the same celerity of bed disturbances, in *Procedings of the 4th International Conference on Fluvial Hydraulics (River Flow), 3-5 September, Cesme, Izmir, Turkey*, vol. 2, edited by M. Altinakar, M. A. Kokpinar, Ismail Aydin, Şevket Cokgor, and S. Kirgoz, pp. 1373--1377, Kubaba Congress Department and Travel Services, Ankara, Turkey.

Mosselman, E., G. Duró, E. van der Deijl, C. Eijsberg-Bak, and T. Buijse (2021a), Beheer van dynamische oevers, *Tech. Rep. 11205234-012-ZWS-0001*, Deltares and Witteveen + Bos, the Netherlands, 62 pp.

Mosselman, E., T. Buijse, E. van der Deijl, J. de Jong, V. Chavarrías, W. Ottevanger, N. Asselman., P. de Grave, R. van der Mark, R. van der Wijk, F. Collas, M. van der Vat, K. Sloff, L. Verbrugge, and R. van den Born (2021b), Eindevaluatie pilot Langsdammen in de Waal; hoofdrapport, *Rapport 11204644*, Deltares, Delft, the Netherlands, september.

Mulder-Noordermeer, E.-S. (2008), Lessen uit het verleden, reconstructie van de hydraulische karakteristieken van het hoogwater in 1926, *Tech. rep.*, Universiteit Twente, Enschede, the Netherlands.

Muñoz, D., D. Yin, R. Bakhtyar, H. Moftakhari, Z. Xue, K. Mandli, and C. Ferreira (2021), Inter-Model Comparison of Delft3D-FM and 2D HEC-RAS for Total Water Level Prediction in Coastal to Inland Transition Zones, *Journal of the American Water Resources Association*, *51*(1!!e!!3), 1--16, doi:http://dx.doi.org/10.1111/1752-1688.12952, interactions between Wood and Channel Forms and Processes.

Muñoz-Ruiz, M. L., and C. Parés (2008), *On Path-Conservative Numerical Schemes for Hyperbolic Systems of Balance Laws*, pp. 305--312, Springer-Verlag Berlin-Heidelberg, Heidelgberg, Germany, Berlin, Heidelberg, doi:10.1007/978-3-540-69777-0_36.

Murillo, J., and P. García-Navarro (2021), A solution of the junction riemann problem for 1d hyperbolic balance laws in networks including supersonic flow conditions on elastic collapsible tubes, *Symmetry*, *13*(9), doi:10.3390/sym13091658.

Murillo, J., P. Garcia-Navarro, and J. Burguete (2007), The influence of source terms on stability and conservation in 1d hyperbolic system of equations: Aplication to fixed and movable beds, in *Numerical Modelling of Hydrodynamics for Water Resources Proceedings of the Conference on Numerical Modelling of Hydrodynamic Systems (Zaragoza, Spain, 18-21 June 2007)*, edited by P. G. Navarro and E. Playan, CRC.

Murillo Muñoz, R., and R. Eduado (1998), Downstream fining of sediments in the meuse river, Master's thesis, International Institute for Infraestructural, Hydraulic and Environmental Engineering.

Murillo Muñoz, R., and G. J. Klaasen (2006), Downstream fining of sediments in the meuse river, in *River Flow 2006*.

Murray, A. B. (2007), Reducing model complexity for explanation and prediction, *Geomorphology*, *90*(3-4), 178--191, doi:10.1016/j.geomorph.2006.10.020.

Murray, A. B., and C. Paola (1994), A cellular model of braided rivers, *Nature*, *371*(54), 54--57, doi:10.1038/371054a0.

Murray, A. B., and C. Paola (1996), A new quantitative test of geomorphic models, applied to a model of braided streams, *Water Resour. Res.*, *32*(8), 2579--2587, doi:10.1029/96WR00604.

Murray, A. B., and C. Paola (1997), Properties of a cellular braided-stream model, *Earth Surf. Process. Landf.*, *22*(11), 1001--1025, doi:10.1002/(SICI)1096-9837(199711)22:11⟨1001::AID-ESP798⟩3.0.CO;2-O.

Murray, J. D. (1965a), On the mathematics of fluidization. Part 1. Fundamental equations and wave propagation, *J. Fluid Mech.*, *21*(3), 465--493, doi:10.1017/S0022112065000277.

Murray, J. D. (1965b), On the mathematics of fluidization. Part 2. Steady motion of fully developed bubbles, *J. Fluid Mech.*, *22*(1), 57--80, doi:10.1017/S0022112065000587.

Muthukumar, T. (2014), Partial differential equations, *Tech. rep.*

Muto, T., and R. J. Steel (1992), Retreat of the front in a prograding delta, *Geology*, *20*(11), 967--970, doi:10.1130/0091-7613(1992)020.

Muto, T., and R. J. Steel (1997), Principles of regression and transgression; the nature of the interplay between accommodation and sediment supply, *J. Sediment. Res.*, *67*(6), 994--1000, doi:10.1306/D42686A8-2B26-11D7-8648000102C1865D.

Muto, T., and J. B. Swenson (2005), Large-scale fluvial grade as a nonequilibrium state in linked depositional systems: Theory and experiment, *J. Geophys. Res., Earth Surface*, *110*(F3), F03,002, doi:10.1029/2005JF000284.

Muto, T., R. J. Steel, and J. B. Swenson (2007), Autostratigraphy: A framework norm for genetic stratigraphy, *J. Sediment. Res.*, *77*(1), 2--12, doi:10.2110/jsr.2007.005.

Na Ranong, C., J. Hapke, and W. Roetzel (2010), Numerical calculation of the transient behaviour of two pure cross-flow heat exchangers coupled by a circulating flow stream, *Heat Mass Transfer.*, *46*(10), 1069--1075, doi:10.1007/s00231-010-0681-8.

Nabi, M., H. J. Vriend, E. Mosselman, C. J. Sloff, and Y. Shimizu (2012), Detailed simulation of morphodynamics: 1. hydrodynamic model, *Water Resour. Res.*, *48*(12), doi:10.1029/2012WR011911.

Nabi, M., I. Kimura, and Y. Shimizu (2013a), The effect of discharge variability on river bedform, *Journal of Japan Society of Civil Engineers, Ser. A2 (Applied Mechanics)*, *69*(2), 553--562, doi:10.2208/jscejam.69.I_553.

Nabi, M., H. J. de Vriend, E. Mosselman, C. J. Sloff, and Y. Shimizu (2013b), Detailed simulation of morphodynamics: 2. sediment pickup, transport, and deposition, *Water Resources Research*, *49*(8), 4775--4791, doi:10.1002/wrcr.20303.

Nabi, M., H. J. de Vriend, E. Mosselman, C. J. Sloff, and Y. Shimizu (2013c), Detailed simulation of morphodynamics: 3. ripples and dunes, *Water Resources Research*, *49*(9), 5930--5943, doi:10.1002/wrcr.20457.

Nabi, M., I. Kimura, S. M. Hsu, S. Giri, and Y. Shimizu (2015), Computational modeling of dissipation and regeneration of fluvial sand dunes under variable discharges, *J. Geophys. Res., Earth Surface*, *120*(7), 1390--1403, doi:10.1002/2014JF003364, 2014JF003364.

Nabi, M., W. Ottevanger, and S. Giri (2017), *River Sedimentation*, chap. Computational modelling of secondary flow on unstructured grids, pp. 719--726, Taylor and Francis Group, London.

Naito, K., H. Ma, J. A. Nittrouer, Y. Zhang, B. Wu, Y. Wang, X. Fu, and G. Parker (2019), Extended Engelund-Hansen type sediment transport relation for mixtures based on the sand-silt-bed Lower Yellow River, China, *J. Hydraul. Res.*, pp. 1--16, doi:10.1080/00221686.2018.1555554.

Nakagawa, H. (1988), Stochastic approach to sediment transport problem, *J. Hydrosci. Hydraul. Eng.*, *6*(2), 55--74.

Nakagawa, H., and T. Tsujimoto (1979), Characteristic of sediment transport process on duned beds analyzed by stochastic approach, *Bull. Disas. Prev. Res. Inst. Kyoto Univ.*, *29*(261), 45--63.

Nakagawa, H., and T. Tsujimoto (1980a), Stochastic study on origin of small scale bed forms related to probabilistic characteristics of bed load movements, in *Proc. 3rd International Symposium on Stochastic Hydraulics, 5--7 August, Tokio, Japan*, pp. 359--370.

Nakagawa, H., and T. Tsujimoto (1980b), Sand bed instability due to bed load motion, *J. Hydraulics Div.*, *106*, 2029--2051.

Nakagawa, H., and T. Tsujimoto (1983), Time-lag appearing in unsteady flow with sand waves, *J. Hydrosci. Hydraul. Eng.*, *1*(1), 83--95.

Nakagawa, H., and T. Tsujimoto (1984), Spectral analysis of sand bed instability, *J. Hydraul. Eng.*, *110*(4), 467--483, doi:10.1061/(ASCE)0733-9429(1984)110:4(467).

Nakagawa, H., T. Tsujimoto, and S. Nakano (1982), Characteristics of sediment motion for respective grain sizes of sand mixtures, *Bull. Disas. Prev. Res. Inst. Kyoto Univ.*, *32*(286), 1--32.

Naqshband, S., J. S. Ribberink, D. Hurther, and S. J. M. H. Hulscher (2014), Bed load and suspended load contributions to migrating sand dunes in equilibrium, *J. Geophys. Res., Earth Surface*, *119*(5), 1043--1063, doi:10.1002/2013JF003043.

Naqshband, S., O. Duin, J. Ribberink, and S. Hulscher (2016), Modeling river dune development and dune transition to upper stage plane bed, *Earth Surf. Process. Landf.*, *41*(3), 323--335, doi:10.1002/esp.3789.

Nash, D. B. (1994), Effective sediment-transporting discharge from magnitude-frequency analysis, *J. Geol.*, *102*(1), 79--95.

NEDECO (1959), *River studies and recommendations of Niger and Benue*, 1000 pp., North-Holland Publ. Amsterdam.

NEDECO (1973), *Rio Magdalena and Canal del Dique Survey Project*, 1000 pp.

Needham, D. J. (1990), Wave hierarchies in alluvial river flows, *Geophys. Astrophys. Fluid Dyn.*, *51*(1-4), 167--194, doi:10.1080/03091929008219855.

Needham, D. J., and J. H. Merkin (1984), On roll waves down an open inclined channel, *Proc. Roy. Soc. London*, *394*(1807), 259--278, doi:10.1098/rspa.1984.0079.

Nelson, J. M., R. L. Shreve, S. R. McLean, and T. G. Drake (1995), Role of near-bed turbulence structure in bed load transport and bed form mechanics, *Water Resour. Res.*, *31*(8), 2071--2086, doi:10.1029/95WR00976.

Nemec, W. (1990a), *Coarse-Grained Deltas*, chap. Aspects of Sediment Movement on Steep Delta Slopes, pp. 29--73, Blackwell Publishing Ltd., Oxford, UK., doi:10.1002/9781444303858.ch3.

Nemec, W. (1990b), *Coarse-Grained Deltas*, chap. Deltas. Remarks on Terminology and Classification, pp. 1--12, Blackwell Publishing Ltd., Oxford, UK., doi:10.1002/9781444303858.ch1.

Nezu, I., and H. Nakagawa (1984), Cellular secondary currents in straight conduit, *J. Hydraul. Eng.*, *110*(2), 173--193, doi:10.1061/(ASCE)0733-9429(1984)110:2(173).

Nezu, I., H. Nakagawa, and A. Tominaga (1985), Secondary currents in a straight channel flow and the relation to its aspect ratio, in *Turbulent Shear Flows*, edited by L. J. S. Bradbury, F. Durst, B. E. Launder, F. W. Schmidt, and J. H. Whitelaw, chap. 4, pp. 246--260, Springer-Verlag Berlin-Heidelberg, Heidelgberg, Germany.

Niño, Y., and M. García (1994), Gravel saltation: 2. Modeling, *Water Resour. Res.*, *30*(6), 1915--1924, doi:10.1029/94WR00534.

Niño, Y., and M. García (1998), Experiments on saltation of sand in water, *J. Hydraul. Eng.*, *124*(10), 1014--1025, doi:10.1061/(ASCE)0733-9429(1998)124:10(1014).

Niño, Y., M. García, and L. Ayala (1994), Gravel saltation: 1. Experiments, *Water Resour. Res.*, *30*(6), 1907--1914, doi:10.1029/94WR00533.

Nicholson, J., I. Broker, J. Roelvink, D. Price, J. Tanguy, and L. Moreno (1997), Intercomparison of coastal area morphodynamic models, *Coastal Engineering*, *31*(1-4), 97--123.

van Niekerk, A., K. R. Vogel, R. L. Slingerland, and J. S. Bridge (1992), Routing of heterogeneous sediments over movable bed: Model development, *J. Hydraul. Eng.*, *118*(2), 246--262, doi:10.1061/(ASCE) 0733-9429(1992)118:2(246).

Niesten, I., W. Ottevanger, and A. Becker (2017), Riviersuppleties in de rijntakken, *Tech. rep.*, Deltares, Delft, the Netherlands.

Niesten, I., S. Giri, and W. Ottevanger (2019), Modelling sediment dynamicsin Tenryuu River. Overview of a large-scale and detailed modelling study., *Tech. Rep. 1002119-001-ZWS-0001*, Deltares, Delft, the Netherlands.

Niesten, I., A. Kosters, and A. Spruyt (2020), Ontwikkeling zesde-generatie rijntakken model: Modelbouw, kalibratie en validatie, *Tech Rep. concept 11205258-004-ZWS-0008*, Deltares, Delft, the Netherlands, 171 pp.

Nieuwstadt, F. T. M., B. J. Boersma, and J. Westerweel (2016), *Turbulence*, 284 pp., Springer, Switzerland.

Nikora, V., H. Habersack, T. Huber, and I. McEwan (2002), On bed particle diffusion in gravel bed flows under weak bed load transport, *Water Resour. Res.*, *38*(6), 1081, doi:10.1029/2001WR000513.

Nikuradse, J. (1930), Untersuchungen über turbulente Strömungen in nicht kreisförmigen Rohren, *Ingenieur-Archiv*, *1*(3), 306--332, doi:10.1007/BF02079937, (in German).

Nikuradse, J. (1933), Strömungsgesetze in rauhen Rohren, *VDI-Forschungsheft 361. Beilage zu ''Forschung auf dem Gebiete des Ingenieurwesens'' Ausgabe B Band 4.*, (in German).

Nittrouer, J. A., and E. Viparelli (2014), Sand as a stable and sustainable resource for nourishing the Mississippi River delta, *Nat. Geosci.*, *7*(5), 350--354, doi:10.1038/ngeo2142.

Nittrouer, J. A., D. Mohrig, M. A. Allison, and A.-P. B. Peyret (2011), The lowermost Mississippi River: a mixed bedrock-alluvial channel, *Sedimentology*, *58*(7), 1914--1934, doi:10.1111/j.1365-3091.2011.01245. x.

Nittrouer, J. A., J. Shaw, M. P. Lamb, and D. Mohrig (2012), Spatial and temporal trends for water-flow velocity and bed-material sediment transport in the lower Mississippi River, *Geol. Soc. Am. Bull.*, *124*(3-4), 400--414, doi:10.1130/B30497.1.

Oberbeck, A. (1879), über die wärmeleitung der flüssigkeiten bei berücksichtigung der strömungen infolge von temperaturdifferenzen, *Annalen der Physik*, *243*(6), 271--292, doi:10.1002/andp.18792430606.

Ockelford, A., S. Woodcock, and H. Haynes (2019), The impact of inter-flood duration on non-cohesive sediment bed stability, *Earth Surface Processes and Landforms*, *44*(14), 2861--2871, doi:https://doi.org/10. 1002/esp.4713.

Ockelford, A.-M. (1981), The impact of stress history on non cohesive sediment bed stability and bed structure, Ph.D. thesis, University of Glasgow.

Odgaard, A. J. (1984), Flow and bed topography in alluvial channel bend, *J. Hydraul. Eng.*, *110*(4), 521--536, doi:10.1061/(ASCE)0733-9429(1984)110:4(521).

Ogink, H. (2009), Validatie van hydrologische data van de Geul en de Geleenbeek, *rapport deltares*, Deltares, Delft, 94 p. pp.

Ogink, H. J. M., and C. Stolker (2004), Verbetering qf-relaties, *techreport Q3847*, Delft Hydraulics Laboratory, Delft, the Netherlands, 53 pp., (in Dutch).

Olav J. M. VAN DUIN, C. M. D.-J.-S. J. M. H. H., J. S. RIBBERINK (2011), Modelling non-equilibrium bed load in a parameterized dune evolution model, in *RCEM*.

Olesen, K. W. (1981), A numerical model for morphologic computations in rivers with non-uniform sediment, Master's thesis, Delft University of Technology, Delft, the Netherlands.

Olesen, K. W. (1982), Influence of secondary flow on meandering rivers, *Tech. Rep. 1-82*, Laboratory of Fluid Mechanics, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands, 67 pp.

Olesen, K. W. (1983), Alternate bars in and meandering of alluvial rivers, *Tech. Rep. 83-1*, WL Delft Hydraulics.

Olesen, K. W. (1985), Experiments with graded sediment in the DHL curved flume, *Tech. Rep. R657-XVIII/M1771*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Olesen, K. W. (1987), Bed topography in shallow river bends, Ph.D. thesis, Delft University of Technology.

Oliger, J., and A. Sundström (1978), Theoretical and practical aspects of some initial boundary value problems in fluid dynamics, *SIAM Journal on Applied Mathematics*, *35*(3), 419--446, doi:10.1137/0135035.

Olver, P. J., and C. Shakiban (2018), *Applied Linear Algebra*, Undergraduate Texts in Mathematics, Springer.

Omer, A. (2019), Modelling the morphological effects of longitudinal dams in the midden-waal, *Tech. Rep. 11203681-002-ZWS-0001*, Deltares, Delft, the Netherlands.

Omer, A., and M. Yossef (2020), Validation of Delft3D flexible mesh software, *Tech. Rep. 11205305-005-ZKS-0003*, Deltares, Delft, the Netherlands.

on Flow, A. T. C., and T. over Dunes (2002), Flow and transport over dunes, *Journal of Hydraulic Engineering*, *128*(8), 726--728, doi:10.1061/(ASCE)0733-9429(2002)128:8(726).

Oreskes, N., K. Shrader-Frechette, and K. Belitz (1994), Verification, validation, and confirmation of numerical models in the earth sciences, *Science*, *263*(5147), 641--646.

Orrú, C., V. Chavarrías, W. S. J. Uijttewaal, and A. Blom (2014a), Image analysis for measuring the size stratification in sand-gravel laboratory experiments, *Earth Surf. Dyn.*, *2*(1), 217--232, doi:10.5194/esurf-2-217-2014.

Orrú, C., V. Chavarrías, V. Ferrara, and A. Blom (2014b), A laboratory experiment on the evolution of a sand gravel reach under a lack of sediment supply, in *Absract presented at the 47th Fall Meeting of the AGU, San Francisco, CA, United States, 15--19 December*, EP52A-05, American Geophysical Union.

Orrú, C., V. Chavarrías, V. Ferrara, G. Stecca, and A. Blom (2015), A laboratory experiment on the evolution of a sand gravel reach under a lack of sediment supply, in *Proc. of the 36th IAHR World Congress, 28 June -- 3 July, The Hague, the Netherlands,*.

Orrú, C., A. Blom, and W. S. J. Uijttewaal (2016a), Armor breakup and reformation in a degradational laboratory experiment, *Earth Surf. Dyn.*, *4*(2), 461--470, doi:10.5194/esurf-4-461-2016.

Orrú, C., A. Blom, V. Chavarrías, V. Ferrara, and G. Stecca (2016b), A new technique for measuring the bed surface texture during flow and application to a degradational sand-gravel laboratory experiment, *Water Resour. Res.*, *52*(9), 7005--7022, doi:10.1002/2016WR018938.

Ortega y Gasset, J. (1937), *La rebelión de las masas*, Austral, Buenos Aires, Argentina, (in Spanish).

Orton, G. J. (1988), *A spectrum of Middle Ordovician fan deltas and braidplain deltas, North Wales: a consequence of varying fluvial clastic input*, pp. 23--49, Blackie and Son, London.

Orton, G. J., and H. G. Reading (1993), Variability of deltaic processes in terms of sediment supply, with particular emphasis on grain size, *Sedimentology*, *40*(3), 475--512, doi:10.1111/j.1365-3091.1993.tb01347.x.

van Os, W. J. (2020), Bed-load transport over inlet sills of longitudinal training walls, experimental study, *MSc. Thesis*, Delft University of Technology, 95 pp.

Ottevanger, W. (2005), Discontinuous finite element modeling of river hydraulics and morphology with application to the paraná river, Master's thesis, University of Twente.

Ottevanger, W. (2013a), Modelling and parametrizing the hydro- and morphodynamics of curved open channels, Ph.D. thesis, Delft University of Technology.

Ottevanger, W. (2013b), Streamline curvature in DFlow-FM, *Memo*, Deltares, Delft, the Netherlands.

Ottevanger, W. (2015), Operationeel maken invloed semi-harde lagen in splitsingspuntengebied, *Tech. Rep. 1220038-005*, Deltares, Delft, the Netherlands, 29 pp.

Ottevanger, W. (2017a), Kwaliteit berekende statistiek : Waal bodemligging en minimale diepte, *Tech. Rep. 1230041-011-ZWS-0001*, Deltares, Delft, the Netherlands.

Ottevanger, W. (2017b), Protocol voor conversie van Baseline 5 geodatabase naar Delft3D 4 morfologisch model, *rapport*, Deltares, Delft, 25 p. pp.

Ottevanger, W. (2021a), Morphological model for the river meuse: Case study for the reach sambeek-grave, *Tech. Rep. 11206793-014-ZWS-0004*, Deltares, Delft, the Netherlands, 54 pp.

Ottevanger, W. (2021b), Morphological model for the river meuse: Plan of action for 2021, *Tech. Rep. 11206793-014-ZWS-0001*, Deltares, Delft, the Netherlands, 32 pp.

Ottevanger, W. (2022a), Modelling of the bovenrijn nourishment: Comparison of two different transport layer approaches, *Tech. Rep. 11208034-014-ZWS-0002*, Deltares, Delft, the Netherlands, 45 pp.

Ottevanger, W. (2022b), Extension of the Meuse schematisation from Lixhe to Monsin, *Memo 11208053-002-ZWS-0012*, Deltares, Delft, the Netherlands.

Ottevanger, W., and V. Chavarrias (2022a), Morphological model for the river meuse: Case study for the reach sambeek-grave, *Tech. Rep. 11208033-002-ZWS-0003*, Deltares, Delft, the Netherlands, 181 pp.

Ottevanger, W., and V. Chavarrias (2022b), Morphological model for the river meuse: Case study for the reach lixhe-keizersveer, *Tech. Rep. 11208033-002-ZWS-0005*, Deltares, Delft, the Netherlands.

Ottevanger, W., and C. Martinez Barbosa (2020), Delft3d river bed morphodynamics including bed level assimilation: Covadem depth and multibeam bed level measurements, *Tech Rep. 11203766-001-HYE-0002*, Deltares, Delft, the Netherlands.

Ottevanger, W., and A. Spruyt (2018), hand-on morphology session sobek 3 delft3d fm, *Tech. rep.*, Deltares.

Ottevanger, W., and M. F. M. Yossef (2006), Voorspelinstrument duurzame vaarweg : roosteruitbreiding met Beneden Merwede en Nieuwe Merwede, *rapport*, WL Delft Hydraulics, Delft.

Ottevanger, W., K. Blanckaert, and W. S. J. Uijttewaal (2012), Processes governing the flow redistribution in sharp river bends, *Geomorphology*, *163-164*, 45--55, doi:10.1016/j.geomorph.2011.04.049.

Ottevanger, W., K. Blanckaert, W. S. J. Uijttewaal, and H. J. de Vriend (2013), Meander dynamics: A reduced-order nonlinear model without curvature restrictions for flow and bed morphology, *J. Geophys. Res., Earth Surface*, *118*(2), 1118--1131, doi:10.1002/jgrf.20080.

Ottevanger, W., S. Giri, and C. J. Sloff (2015), Sustainable fairway Rhinedelta II : effects of yearly bed stabilisation nourishments, Delta Program measures and training walls, *rapport*, Deltares, Delft, 162 p. pp.

Ottevanger, W., A. Visser, and R. van der Wijk (2016), Deelmodel Rijn-Maasmonding WAQUA : ontwikkeling en verificatie, *rapport deltares*, Deltares, Delft, 70 p. pp.

Ottevanger, W., E. Verschelling, and S. Giri (2020), Initiële modelbouw morfologisch model voor de maas, *Tech Rep. concept 11205234-003-ZWS-0001*, Deltares, Delft, the Netherlands, 165 pp.

Ottevanger, W., V. Chavarrias, S. Giri, and E. van der Deijl (2021), Morphological model for the river meuse: Model setup, input visualisation, and future steps, *Tech Rep. 11206792-003-ZWS-0002*, Deltares, Delft, the Netherlands.

Ouwehand, C. (1958), Some notes on the god Susa-no-o, *Monumenta Nipponica*, *14*(3-4), 384--407, doi:10.2307/2382776.

Overmars, W. (2020), Een waal verhaal; 1500-1700 emmerich-nijmegen; historisch-morfologische atlasvan de rhein en de waal, Ph.D. thesis, VRIJE UNIVERSITEIT.

Owens, P. (2005), Conceptual models and budgets for sediment management at the river basin scale, *J. Soils Sediments*, *5*(4), 201--212, doi:10.1065/jss2005.05.133.

Owens, P., S. Apitz, R. Batalla, A. Collins, M. Eisma, H. Glindemann, S. Hoornstra, H. Kothe, J. Quinton, K. Taylor, B. Westrich, S. White, and H. Wilkinson (2004), Synthesis of the sednet work package 2 outcomes, *J. Soils Sediments*, *4*(4), 219--222, doi:10.1007/BF02991115.

Paarlberg, A. (2009), Verificatie WAQmorf; vergelijking resultaten WAQmorf en Delft2D enadvies gebruik vuistregel, *Tech. Rep. PR1720.10*, HKV, 75 pp.

Paarlberg, A., J.-H. Beks, and B. Bultink (2020), Experiment belemmerende waterdiepte waal, *Memo PR4136.10*, HKV, Lelystad, the Netherlands, in cooperation with RWS, 21 pp.

Paarlberg, A. J., C. M. Dohmen-Janssen, S. J. M. H. Hulscher, and P. Termes (2009), Modeling river dune evolution using a parameterization of flow separation, *J. Geophys. Res., Earth Surface*, *114*(F1), F01,014, doi:10.1029/2007JF000910.

Paarlberg, A. J., A. Y. A. Omer, and M. F. M. Yossef (2021), Eindevaluatie pilot Langsdammen in de Waal; Delft3D simulations, *Report HKV Lijn in Water and Deltares PR4153.10 (HKV), 11204644 (Deltares)*, HKV Lijn in Water and Deltares, september.

Paine, T. (1776), *The American Crisis*, Pennsylvania Journal.

Paintal, A. S. (1971), Concept of critical shear stress in loose boundary open channels, *Journal of Hydraulic Research*, *9*(1), 91--113, doi:10.1080/00221687109500339.

Palmsten, M. L., J. L. Kozarek, and J. Calantoni (2015), Video observations of bed form morphodynamics in a meander bend, *Water Resour. Res.*, *51*(9), 7238--7257, doi:10.1002/2014WR016321.

Paola, C. (1988), *New Perspectives in Basin Analysis*, chap. Subsidence and Gravel Transport in Alluvial Basins, pp. 231--243, Springer New York, New York, NY, doi:10.1007/978-1-4612-3788-4_11.

Paola, C. (1996), *Incoherent Structure: Turbulence as a Metaphor for Stream Braiding*, p. 760, John Wiley & Sons.

Paola, C. (2000), Quantitative models of sedimentary basin filling, *Sedimentology*, *47*(s1), 121--178, doi:10.1046/j.1365-3091.2000.00006.x.

Paola, C. (2001), *Gravel-bed rivers V*, chap. Modelling stream braiding over a range of scales, pp. 11--46, New Zealand Hydrological Society Inc., Wellington., retrieved from the University of Minnesota Digital Conservancy.

Paola, C., and M. Leeder (2011), Environmental dynamics: Simplicity versus complexity, *Nature*, *469*, 38--39, doi:10.1038/469038a.

Paola, C., and J. M. Martin (2012), Mass-balance effects in depositional systems, *J. Sediment. Res.*, *82*(6), 435--450, doi:10.2110/jsr.2012.38.

Paola, C., and D. Mohrig (1996), Palaeohydraulics revisited: palaeoslope estimation in coarse-grained braided rivers, *Basin Res.*, *8*(3), 243--254, doi:10.1046/j.1365-2117.1996.00253.x.

Paola, C., and R. Seal (1995), Grain size patchiness as a cause of selective deposition and downstream fining, *Water Resour. Res.*, *31*(5), 1395--1407, doi:10.1029/94WR02975.

Paola, C., and V. R. Voller (2005), A generalized Exner equation for sediment mass balance, *J. Geophys. Res., Earth Surface*, *110*(F4), F04,014, doi:10.1029/2004JF000274.

Paola, C., P. L. Heller, and C. L. Angevine (1992a), The large-scale dynamics of grain-size variation in alluvial basins, 1: Theory, *Basin Res.*, *4*(2), 73--90, doi:10.1111/j.1365-2117.1992.tb00145.x.

Paola, C., G. Parker, R. Seal, S. K. Sinha, J. B. Southard, and P. R. Wilcock (1992b), Downstream fining by selective deposition in a laboratory flume, *Science*, *258*(5089), 1757--1760, doi:10.1126/science.258.5089.1757.

Paola, C., J. Mullin, C. Ellis, D. C. Mohrig, J. B. Swenson, G. Parker, T. Hickson, P. L. Heller, L. Pratson, J. Syvitski, et al. (2001), Experimental stratigraphy, *GSA Today*, *11*(7), 4--9.

Paola, C., K. Straub, D. Mohrig, and L. Reinhardt (2009), The unreasonable effectiveness of stratigraphic and geomorphic experiments, *Earth Sci. Rev.*, *97*(1-4), 1--43, doi:10.1016/j.earscirev.2009.05.003.

Paola, C., R. R. Twilley, D. A. Edmonds, W. Kim, D. Mohrig, G. Parker, E. Viparelli, and V. R. Voller (2011), Natural processes in delta restoration: Application to the Mississippi Delta, *Annual Review of Marine Science*, *3*(1), 67--91, doi:10.1146/annurev-marine-120709-142856.

Papanicolaou, A. N., A. Bdour, and E. Wicklein (2004), One-dimensional hydrodynamic/sediment transport model applicable to steep mountain streams, *Journal of Hydraulic Research*, *42*(4), 357--375, doi:10.1080/00221686.2004.9728402.

Parés, C. (2006), Numerical methods for nonconservative hyperbolic systems: a theoretical framework., *SIAM J. Numer. Anal.*, *44*(1), 300--321, doi:10.1137/050628052.

Park, I., and S. C. Jain (1987), Numerical simulation of degradation of alluvial channel beds, *J. Hydraul. Eng.*, *113*(7), 845--859, doi:10.1061/(ASCE)0733-9429(1987)113:7(845).

Park, M., E. Leahey, and R. J. Funk (2023), Papers and patents are becoming less disruptive over time, *Nature*, *613*(7942), 138--144, doi:10.1038/s41586-022-05543-x.

Parker, G. (), Notes on "magic sand": A gary parker obsession, wilcock and crowe 2003, fraction of sand.

Parker, G. (1976), On the cause and characteristic scales of meandering and braiding in rivers, *J. Fluid Mech.*, *76*(3), 457--480, doi:10.1017/S0022112076000748.

Parker, G. (1978a), Self-formed straight rivers with equilibrium banks and mobile bed. Part 1. The sand-silt river, *J. Fluid Mech.*, *89*(1), 109--125, doi:10.1017/S0022112078002499.

Parker, G. (1978b), Self-formed straight rivers with equilibrium banks and mobile bed. Part 2. The gravel river, *J. Fluid Mech.*, *89*(1), 127--146, doi:10.1017/S0022112078002505.

Parker, G. (1990a), Surface-based bedload transport relation for gravel rivers, *J. Hydraul. Res.*, *28*(4), 417--436, doi:10.1080/00221689009499058.

Parker, G. (1990b), The ''Acronym'' series of Pascal programs for computing bed load transport in gravel rivers., *External Memorandum M-220*, St. Anthony Falls Hydraulic Laboratory, University of Minnesota, Minneapolis, MN, United States, 24 pp.

Parker, G. (1991a), Selective sorting and abrasion of river gravel. I: Theory, *J. Hydraul. Eng.*, *117*(2), 131--147, doi:10.1061/(ASCE)0733-9429(1991)117:2(131).

Parker, G. (1991b), Selective sorting and abrasion of river gravel. II: Applications, *J. Hydraul. Eng.*, *117*(2), 150--171, doi:10.1061/(ASCE)0733-9429(1991)117:2(150).

Parker, G. (1992), Some random notes on grain sorting, *Proc. Grain Sorting Seminar, Ascona, Switzerland*.

Parker, G. (2004a), 1D Sediment transport morphodynamics with applications to rivers and turbidity currents., E-Book.

Parker, G. (2004b), Response of the gravel bed of a mountain river to a hydrograph, in *Proc. Int. Conf. on Slopeland Disaster Mitigation, Taipei, Taiwan, October 5-6*.

Parker, G. (2008), Transport of gravel and sediment mixtures, in *Sedimentation Engineering*, edited by M. Garcia, chap. 3, pp. 165--251, America Society of Civil Engineers, Reston, VA, United States, doi: 10.1061/9780784408148.ch03.

Parker, G., and E. D. Andrews (1985), Sorting of bed load sediment by flow in meander bends, *Water Resour. Res.*, *21*(9), 1361--1373, doi:10.1029/WR021i009p01361.

Parker, G., and Y. Cui (1998), The arrested gravel front: stable gravel-sand transitions in rivers. Part 1: Simplified analytical solution, *J. Hydraul. Res.*, *36*(1), 75--100, doi:10.1080/00221689809498379.

Parker, G., and P. C. Klingeman (1982), On why gravel bed streams are paved, *Water Resour. Res.*, *18*(5), 1409--1423, doi:10.1029/WR018i005p01409.

Parker, G., and L. A. Perg (2005), Probabilistic formulation of conservation of cosmogenic nuclides: effect of surface elevation fluctuations on approach to steady state, *Earth Surf. Process. Landf.*, *30*(9), 1127--1144, doi:10.1002/esp.1266.

Parker, G., and A. J. Sutherland (1990), Fluvial armor, *J. Hydraul. Res.*, *28*(5), 529--544, doi:10.1080/00221689009499044.

Parker, G., and C. M. Toro-Escobar (2002), Equal mobility of gravel in streams: The remains of the day, *Water Resour. Res.*, *38*(11), 1--8, doi:10.1029/2001WR000669, 1264.

Parker, G., and P. Wilcock (1993), Sediment feed and recirculating flumes: Fundamental difference, *J. Hydraul. Eng.*, *119*(11), 1192--1204, doi:10.1061/(ASCE)0733-9429(1993)119:11(1192).

Parker, G., S. Dhamotharan, and H. Stefan (1982a), Model experiments on mobile, paved gravel bed streams, *Water Resour. Res.*, *18*(5), 1395--1408.

Parker, G., P. C. Klingeman, and D. G. McLean (1982b), Bedload and size distribution in paved gravel-bed streams, *J. Hydraulics Div.*, *108*(4), 544--571.

Parker, G., K. Sawai, and S. Ikeda (1982c), Bend theory of river meanders. part 2. nonlinear deformation of finite-amplitude bends, *J. Fluid Mech.*, *115*, 303--314, doi:10.1017/S0022112082000767.

Parker, G., C. Paola, and S. Leclair (2000), Probabilistic Exner sediment continuity equation for mixtures with no active layer, *J. Hydraul. Eng.*, *126*(11), 818--826, doi:10.1061/(ASCE)0733-9429(2000)126:11(818).

Parker, G., G. Seminara, and L. Solari (2003), Bed load at low Shields stress on arbitrarily sloping beds: Alternative entrainment formulation, *Water Resour. Res.*, *39*(7), 1183, doi:10.1029/2001WR001253.

Parker, G., P. R. Wilcock, C. Paola, W. E. Dietrich, and J. Pitlick (2007), Physical basis for quasi-universal relations describing bankfull hydraulic geometry of single-thread gravel bed rivers, *J. Geophys. Res., Earth Surface*, *112*(F4), F04,005, doi:10.1029/2006JF000549.

Parker, G., M. Hassan, and P. Wilcock (2008a), *Adjustment of the bed surface size distribution of gravel-bed rivers in response to cycled hydrograph*, pp. 241--285, doi:10.1016/S0928-2025(07)11127-5.

Parker, G., T. Muto, Y. Akamatsu, W. E. Dietrich, and J. W. Lauer (2008b), Unravelling the conundrum of river response to rising sea-level from laboratory to field. Part I: Laboratory experiments, *Sedimentology*, *55*(6), 1643--1655, doi:10.1111/j.1365-3091.2008.00961.x.

Parker, G., T. Muto, Y. Akamatsu, W. E. Dietrich, and J. W. Lauer (2008c), Unravelling the conundrum of river response to rising sea-level from laboratory to field. Part II. the Fly--Strickland River system, Papua New Guinea, *Sedimentology*, *55*(6), 1657--1686, doi:10.1111/j.1365-3091.2008.00962.x.

Parker, G., V. Voller, C. Paola, K. Hill, L. S. Sklar, and W. E. Dietrich (2008d), Comminution as a mechanism for downstream fining in rivers: formulation, in *Procedings of the 4th International Conference on Fluvial Hydraulics (River Flow), 3-5 September, Cesme, Izmir, Turkey*.

Parker, G., Y. Shimizu, G. V. Wilkerson, E. C. Eke, J. D. Abad, J. W. Lauer, C. Paola, W. E. Dietrich, and V. R. Voller (2011), A new framework for modeling the migration of meandering rivers, *Earth Surface Processes and Landforms*, *36*(1), 70--86, doi:https://doi.org/10.1002/esp.2113.

Parrot, E. (2015), Analyse spatio-temporelle de la morphologie du chenal du rhône du léman à la méditerranée, Ph.D. thesis, Université Jean Moulin (Lyon 3).

Parsons, D. R., J. L. Best, O. Orfeo, R. J. Hardy, R. Kostaschuk, and S. N. Lane (2005), Morphology and flow fields of three-dimensional dunes, rio paraná, argentina: Results from simultaneous multibeam echo sounding and acoustic doppler current profiling, *J. Geophys. Res., Earth Surface*, *110*(F4), F04S03, doi:10.1029/2004JF000231.

Partheniades, E. (1965), Erosion and deposition of cohesive soils, *J. Hydraulics Div.*, *91 (HY1)*, 105--139.

Payne, L., and D. Sather (1967), On some improperly posed problems for the Chaplygin equation, *Journal of Mathematical Analysis and Applications*, *19*(1), 67--77, doi:https://doi.org/10.1016/0022-247X(67)90021-2.

Péchon, P., F. Rivero, H. Johnson, T. Chesher, B. O'Connor, J.-M. Tanguy, T. Karambas, M. Mory, and L. Hamm (1997), Intercomparison of wave-driven current models, *Coastal Engineering*, *31*(1), 199 -- 215, doi:https://doi.org/10.1016/S0378-3839(97)00006-9.

PEERY, K., and S. IMLAY (1988), *Blunt-body flow simulations*, doi:10.2514/6.1988-2904.

Pelanti, M., F. Bouchut, and A. Mangeney (2008), A Roe-type scheme for two-phase shallow granular flows over variable topography, *ESAIM: Mathematical Modelling and Numerical Analysis*, *42*(5), 851--885, doi:10.1051/m2an:2008029.

Pelosi, A., and G. Parker (2014), Morphodynamics of river bed variation with variable bedload step length, *Earth Surf. Dyn.*, *2*(1), 243--253, doi:10.5194/esurf-2-243-2014.

Pelosi, A., G. Parker, R. Schumer, and H.-B. Ma (2014), Exner-based master equation for transport and dispersion of river pebble tracers: Derivation, asymptotic forms, and quantification of nonlocal vertical dispersion, *J. Geophys. Res., Earth Surface*, *119*(9), 1818--1832, doi:10.1002/2014JF003130.

Pelosi, A., R. Schumer, G. Parker, and R. I. Ferguson (2016), The cause of advective slowdown of tracer pebbles in rivers: Implementation of Exner-based Master Equation for coevolving streamwise and vertical dispersion, *J. Geophys. Res., Earth Surface*, *121*(3), 623--637, doi:10.1002/2015JF003497.

Pennekamp, J. G. S., and R. Booij (1983), Simulation of flow in rivers and tidal channels with an implicit finite difference method of the adi-type, *Tech. rep.*, Laboratory of Fluid Mechanics, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands.

Pennekamp, J. G. S., and R. Booij (1984), Improved simulation of main flow and secondary flow in a curved open channel, *Tech. rep.*, Laboratory of Fluid Mechanics, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands.

Perko, L. (1993), *Differential Equations and Dynamical Systems*, Springer Verlag.

Peters, B. (2022), Role of albert canal system in july 2021 flood: what can we learn from this?, Master's thesis, Wageningen University.

Peters, B., A. Dittrich, T. Stoesser, T. Smits, and G. Geerling (2001), The Restrhine: New opportunities for nature rehabilitation and flood prevention, *Tech. rep.*, University of Nijmegen, the Netherlands and University of Karlsruhe, Germany.

Petts, G. E., M. C. Thoms, K. Brittan, and B. Atkin (1989), A freeze-coring technique applied to pollution by fine sediments in gravel-bed rivers, *Sci. Total Environ.*, *84*, 259--272, doi:10.1016/0048-9697(89)90388-4.

Pfeiffer, A. M., N. J. Finnegan, and J. K. Willenbring (2017), Sediment supply controls equilibrium channel geometry in gravel rivers, *Proceedings of the National Academy of Sciences*, *114*(13), 3346--3351, doi:10.1073/pnas.1612907114.

Phillips, B. C., and A. J. Sutherland (1989), Spatial lag effects in bed load sediment transport, *J. Hydraul. Res.*, *27*(1), 115--133, doi:10.1080/00221688909499247.

Phillips, B. C., and A. J. Sutherland (1990), Temporal lag effect in bed load sediment transport, *J. Hydraul. Res.*, *28*(1), 5--23, doi:10.1080/00221689009499144.

Phillips, C. B., and D. J. Jerolmack (2016), Self-organization of river channels as a critical filter on climate signals, *Science*, *352*(6286), 694--697, doi:10.1126/science.aad3348.

Phillips, C. B., R. L. Martin, and D. J. Jerolmack (2013), Impulse framework for unsteady flows reveals superdiffusive bed load transport, *Geophys. Res. Lett.*, *40*(7), 1328--1333, doi:10.1002/grl.50323.

Phillips, C. B., M. Singer, K. M. Hill, and C. Paola (2016), Exploring the effects of hydrograph shape on unimodal and bimodal sediment mixtures, in *abstract presented at the AGU fall meeting*.

Phillips, J. D. (1992), The end of equilibrium?, *Geomorphology*, *5*(3), 195 -- 201, doi:http://dx.doi.org/10.1016/0169-555X(92)90002-6.

Phillips, N. A. (1957), A COORDINATE SYSTEM HAVING SOME SPECIAL ADVANTAGES FOR NUMERICAL FORECASTING, *Journal of Meteorology*, *14*(2), 184--185, doi:10.1175/1520-0469(1957)014⟨0184:ACSHSS⟩2.0.CO;2.

Piccolroaz, S., M. Toffolon, C. T. Robinson, and A. Siviglia (2018), Exploring and quantifying river thermal response to heatwaves, *Water*, *8*, 1098, doi:10.3390/w10081098.

Pickup, G., and W. A. Rieger (1979), A conceptual model of the relationship between channel characteristics and discharge, *Earth Surface Processes*, *4*(1), 37--42, doi:10.1002/esp.3290040104.

Pickup, G., and R. F. Warner (1976), Effects of hydrologic regime on magnitude and frequency of dominant discharge, *J. Hydrol.*, *29*(1), 51--75, doi:10.1016/0022-1694(76)90005-6.

Pierce, J. K. (2021), The stochastic movements of individual streambed grains, Ph.D. thesis, University of British Columbia, doi:http://dx.doi.org/10.14288/1.0402359.

van der Pijl, S. P. (2019), Checkerboard oscillations in d-flow fm, *Tech. rep.*, Deltares, Delft, the Netherlands.

Pilarczyk, K. W. (1995), Simplified unification of stability formulae for revetments under current and wave attach, in *River, coastal, and shorteline protection: erosion control using riprap and armourstone*, edited by C. R. Thoren, S. R. Abt, F. B. Barends, S. T. Maynord, and K. W. Pilarczyk, John Wiley & Sons, Chichester, United Kingdom.

Pin-nam Lin, H.-w. S. (1984), Twod flow with sediment by characteristics method, *J. Hydraul. Eng.*, *110*(5), doi:10.1061/(ASCE)0733-9429(1984)110:5(615).

Pinos, J., and L. Timbe (2019), Performance assessment of two-dimensional hydraulic models for generation of flood inundation maps in mountain river basins, *Water Science and Engineering*, *12*(1), 11--18, doi:https://doi.org/10.1016/j.wse.2019.03.001.

Plato (), *Phaedo*.

Platzek, F. (2017), Accuracy and efficiency in numerical river modelling: Investigating the large effects of seemingly small numerical choices, Ph.D. thesis, Delft University of Technology, doi: 10.4233/uuid:284c6349-3abf-4400-abfc-748cbc060ae0.

Plows, W. H. (1968), Some numerical results for two-dimensional steady laminar Bénard convection, *Phys. Fluids*, *11*(8), 1593--1599, doi:10.1063/1.1692166.

Ponce, V. M. (1991), Kinematic wave controversy, *Journal of Hydraulic Engineering*, *117*(4), 511--525, doi:10.1061/(ASCE)0733-9429(1991)117:4(511).

Poole, S. (2016), *Rethink: The Surprising History of New Ideas*, 352 pp., Scribner, New York, NY, United States.

PORNPROMMIN, A., A. TERAMOTO, N. IZUMI, T. KITAMURA, and T. TSUJIMOTO (2002), Numerical simulation of bar formation in straight channels by the nhsed2d model, *J Appl Mech*, *5*, 629--638, doi:10.2208/journalam.5.629.

PORNPROMMIN, A., N. IZUMI, and T. TSUJIMOTO (2004), Weakly nonlinear analysis of multimodal fluvial bars, *PROCEEDINGS OF HYDRAULIC ENGINEERING*, *48*, 1009--1014, doi:10.2208/prohe.48.1009.

Posamentier, H., and P. Vail (1988), Eustatic controls on clastic deposition II - sequence and systems tract models, *Sea-Level Changes: An Integrated Approach: SEPM, Special Publication*, *42*, 125--154.

Posamentier, H., M. Jervey, and P. Vail (1988), Eustatic controls on clastic deposition I - conceptual framework, *Sea-Level Changes: An Integrated Approach: SEPM, Special Publication*, *42*, 109--124.

Posamentier, H. W., and G. P. Allen (1993), Variability of the sequence stratigraphic model: effects of local basin factors, *Sediment. Geol.*, *86*(1), 91--109.

Posamentier, H. W., G. P. Allen, D. P. James, and M. Tesson (1992), Forced regressions in a sequence stratigraphic framework: Concepts, examples, and exploration significance, *Am. Assoc. Pet. Geol. Bull.*, *76*(11), 1687--1709.

Postel, S., and B. Richter (2003), *Rivers for life: managing water for people and nature*, Island Press.

Postma, G. (1990), An analysis of the variation in delta architecture, *Terra Nova*, *2*, 124--130, doi:10.1111/j.1365-3121.1990.tb00052.x.

Postma, G. (1995), Sea-level-related architectural trends in coarse-grained delta complexes, *Sediment. Geol.*, *98*, 3--12, doi:10.1016/0037-0738(95)00024-3.

Postman, N. (1985), *Amusing ourselves to death*.

Powell, D. M. (1998), Patterns and processes of sediment sorting in gravel-bed rivers, *Prog. Phys. Geogr.*, *22*(1), 1--32, doi:10.1177/030913339802200101.

Preissmann, A., and J. A. Cunge (1961), Calcul du mascaretsur machine électronique, *La Houille Blanche*, (5), 588--596.

Preissmann, A., and G. Werner (1961), Application du calcul des intumescences sur machine électronique à divers cas pratiques, *La Houille Blanche*, (5), 613--621.

Prins, A. (1969a), Dominant discharge, *Tech. Rep. S 78-III*, Waterloopkundig Laboratorium Delft, 135 pp.

Prins, A. (1969b), Beddingvormen rapport literatuurstudie, *Tech. rep.*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Prins, A., and M. de Vries (1971), On dominant discharge concepts for rivers, in *Proc. of the 14th IAHR World Congress, 29 August--3 September, Paris, France*.

Proffitt, G. T., and A. J. Sutherland (1983), Transport of non-uniform sediment, *J. Hydraul. Res.*, *21*(1), 33--43, doi:10.1080/00221688309499448.

van Prooijen, B. C. (2012), considerations on a generic water-bed eschange module, *Tech. rep.*

van Prooijen, B. C., and W. S. J. Uijttewaal (2002), A linear approach for the evolution of coherent structures in shallow mixing layers, *Phys. Fluids*, *14*(12), 4105--4114, doi:10.1063/1.1514660.

van Prooijen, B. C., and J. C. Winterwerp (2010), A stochastic formulation for erosion of cohesive sediments, *J. Geophys. Res., C: Oceans*, *115*(C1), doi:10.1029/2008JC005189.

Provansal, M., S. Dufour, F. Sabatier, E. J. Anthony, G. Raccasi, and S. Robresco (2014), The geomorphic evolution and sediment balance of the lower rhône river (southern france) over the last 130 years: Hydropower dams versus other control factors, *Geomorphology*, *219*(0), 27--41, doi:http://dx.doi.org/10.1016/j.geomorph.2014.04.033.

Pusey, P. N. (2011), Brownian motion goes ballistic, *Science*, *332*(6031), 802--803, doi:10.1126/science.1192222.

van Putten, D. (2021), Analyse en advies over ondieptes in de vaargeul Waal, *Memo*, Rijkswaterstaat, Arnhem, the Netherlands.

Pyrce, R. S., and P. E. Ashmore (2003), The relation between particle path length distributions and channel morphology in gravel-bed streams: A synthesis, *Geomorphology*, *56*(1), 167--187, doi:10.1016/S0169-555X(03)00077-1.

Qian, H., Z. Cao, G. Pender, H. Liu, and P. Hu (2015), Well-balanced numerical modelling of non-uniform sediment transport in alluvial rivers, *Int. J. Sediment Res.*, *30*(2), 117 -- 130, doi:http://dx.doi.org/10.1016/j.ijsrc.2015.03.002.

Qian, H., Z. Cao, H. Liu, and G. Pender (2016), Numerical modelling of alternate bar formation, development and sediment sorting in straight channels, *Earth Surf. Process. Landf.*, *42*(7), 555--574, doi:10.1002/esp.3988.

Qin, C., X. Shao, and G. Zhou (2016), Comparison of two different secondary flow correction models for depth-averaged flow simulation of meandering channels, *Procedia Eng.*, *154*, 412 -- 419, doi:http://dx.doi.org/10.1016/j.proeng.2016.07.507, 12th International Conference on Hydroinformatics (HIC 2016) - Smart Water for the Future.

Quick, I., F. König, Y. Baulig, S. Schriever, and S. Vollmer (2020), Evaluation of depth erosion as a major issue along regulated rivers using the classification tool valmorph for the case study of the lower rhine, *International Journal of River Basin Management*, *18*(2), 191--206, doi:10.1080/15715124.2019.1672699.

Raaijmakers, T., F. Liefhebber, B. Hofland, and P. Meys (2012), Mapping of 3d-bathymetries and structures using stereophotography through an air-water-interface, *Tech. rep.*, Deltares and ST Vision.

Radecki-Pawlik, A. (2015), *Rivers - physical, fluvial and environmental processes*, chap. Why do we need bankfull and dominant discharges, pp. 497--518, Springer.

Radice, A., F. Ballio, and V. Nikora (2009), On statistical properties of bed load sediment concentration, *Water Resour. Res.*, *45*(6), doi:10.1029/2008WR007192.

Rahuel, J., F. Holly, J. Chollet, P. Belleudy, and G. Yang (1989), Modeling of riverbed evolution for bedload sediment mixtures, *J. Hydraul. Eng.*, *115*(11), 1521--1542, doi:10.1061/(ASCE)0733-9429(1989)115:11(1521).

Rahuel, J. L. (1993), Discussion of ‘‘fully coupled unsteady mobile boundary flow model’’; by l. r. p. correia, b. g. krishnappan, and w. h. graf (march, 1992, vol. 118, no. 3), *J. Hydraul. Eng.*, *119*(4), doi:10.1061/(ASCE)0733-9429(1993)119:4(528).

Rakha, K. A., and J. W. Kamphuis (1997), A morphology model for an eroding beach backed by a seawall, *Coastal Eng.*, *30*(1-2), 53--75, doi:10.1016/S0378-3839(96)00036-1.

Ramamurthy, A. S., J. Qu, and D. Vo (2007), Numerical and experimental study of dividing open-channel flows, *J. Hydraul. Eng.*, *133*(10), 1135--1144, doi:10.1061/(ASCE)0733-9429(2007)133:10(1135).

Ramshaw, J. D., and J. A. Trapp (1978), Characteristics, stability, and short-wavelength phenomena in two-phase flow equation systems, *Nucl. Sci. Eng.*, *66*(1), 93--102, doi:10.13182/NSE78-A15191.

Ranasinghe, R., C. Swinkels, A. Luijendijk, D. Roelvink, J. Bosboom, M. Stive, and D. Walstra (2011), Morphodynamic upscaling with the MORFAC approach: Dependencies and sensitivities, *Coastal Eng.*, *58*(8), 806--811, doi:10.1016/j.coastaleng.2011.03.010.

Rathbun, R. E., V. C. Kennedy, and J. K. Culbertson (1971), Transport and dispersion of fluorescent tracer particles for the flat-bed condition, Rio Grande conveyance channel, near Bernardo, New Mexico, *US Geological Survey Professional Paper 562-I*, US Government Printing Office, Washington, DC, United States, 263 pp.

Raudkivi, A. J., and R. Ettema (1983), Clear water scour at cylindrical piers, *Journal of Hydraulic Engineering*, *109*(3), 338--350, doi:10.1061/(ASCE)0733-9429(1983)109:3(338).

Ravenstijn, E. (2009), Behaviour of nourishments in quasi 3-dimensional graded sediment models, Master’s thesis, Delft University of Technology.

Recking, A. (2016), A generalized threshold model for computing bed load grain size distribution, *Water Resour. Res.*, *52*(12), 9274--9289, doi:10.1002/2016WR018735.

Recking, A., P. Frey, A. Paquier, and P. Belleudy (2009), An experimental investigation of mechanisms involved in bed load sheet production and migration, *J. Geophys. Res., Earth Surface*, *114*(F3), F03,010, doi:10.1029/2008JF000990.

Recking, A., F. Liébault, C. Peteuil, and T. Jolimet (2012), Testing bedload transport equations with consideration of time scales, *Earth Surf. Process. Landf.*, *37*(7), 774--789, doi:10.1002/esp.3213.

Recking, A., G. Piton, D. Vazquez-Tarrio, and G. Parker (2016), Quantifying the morphological print of bedload transport, *Earth Surf. Process. Landf.*, *41*(6), 809--822, doi:10.1002/esp.3869.

Recktenwald, G. (2017a), Crank nicolson solution to the heat equation, *Tech. Rep. ME 448/548*, Department of Mechanical Engineering, Portland State University.

Recktenwald, G. (2017b), Alternative boundary condition implementations for crank nicolson solution to the heat equation, *Tech. Rep. ME 448/548*, Department of Mechanical Engineering, Portland State University.

Redolfi, M. (2021), Free alternate bars in rivers: Key physical mechanisms and simple formation criterion, *Water Resources Research*, *57*(12), e2021WR030,617, doi:https://doi.org/10.1029/2021WR030617, e2021WR030617 2021WR030617.

Redolfi, M., G. Zolezzi, and M. Tubino (2016), Free instability of channel bifurcations and morphodynamic influence, *J. Fluid Mech.*, *799*, 476--504, doi:10.1017/jfm.2016.389.

Reeze, B., A. van Winden, and D. Oomen (2016), Inventarisatie van zandoverslag op de oeverwal van de Waaltrajecten met langsdammen in het jaar 2016, *Tech. rep.*, Bureau Stroming, (in Dutch).

Reeze, B., A. van Winden, J. Postma, R. Pot, J. Hop, and W. Liefveld (2017), Watersysteemrapportage rijntakken 1990-2015. ontwikkelingen waterkwaliteit en ecologie., *Tech. rep.*, Bart Reeze Water & Ecologie, Harderwijk, the Netherlands, 136 pp., (in Dutch).

Rehbock, T. (1931), Wasserbauliche Modellversuche zur Klärung der Abflusserscheinungen beim Abschluss der Zuiderzee ausgeführt im Flussbaulaboratorium der Technischen Hochschule zu Karlsruhe, *Tech. rep.*, Rijkswaterstaat.

Reid, I., L. E. Frostick, and J. T. Layman (1985), The incidence and nature of bedload transport during flood flows in coarse-grained alluvial channels, *Earth Surface Processes and Landforms*, *10*(1), 33--44, doi:https://doi.org/10.1002/esp.3290100107.

Reid, I. R., and L. E. Frostick (1984), Particle interaction and its effect on the thresholds of initial and final bedload motion in coarse alluvial channels.

Reula, O. A. (2004), Strongly hyperbolic systems in general relativity, eprint 0403007.

Reynolds, A. J. (1965), Waves on the erodible bed of an open channel, *J. Fluid Mech.*, *22*(1), 113--133, doi:10.1017/S0022112065000630.

Reyns, J., A. Dastgheib, R. Ranasinghe, A. Luijendijk, D.-J. Walstra, and D. Roelvink (2014), Morphodynamic upscaling with the morfac approach in tidal conditions: the critical morfac, *Coastal Engineering Proceedings*, *1*(34), sediment.27, doi:10.9753/icce.v34.sediment.27.

RHDHV (2018), Jaarlijkse actualisatie rijntakken model 2018, *Tech. rep.*, RHDHV, bF9483WATRP1807021634.

Rhebergen, S. (2010), Discontinuous galerkin finite element methods for (non)conservative partial differential equations, Ph.D. thesis, University of Twente, Netherlands, doi:10.3990/1.9789036529648, 10.3990/1.9789036529648.

Rhoads, B., and M. Welford (1991), Initiation of river meandering, *Progress in Physical Geography*, *15*, 127--156, doi:10.1177/030913339101500201.

Ribberink, J. (1978), Bed-load formular for non-uniform sediment, *Tech. Rep. 4-78*, Delft University of Technology.

Ribberink, J. S. (1984), Discussion to ‘‘routing graded sediment in streams: Formulations’’, *J. Hydraulics Div.*, *110*(2), 203--205.

Ribberink, J. S. (1987), Mathematical modelling of one-dimensional morphological changes in rivers with non-uniform sediment, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Ribberink, J. S. (1998), Bed-load transport for steady flows and unsteady oscillatory flows, *Coastal Eng.*, *34*(1!!e!!2), 59 -- 82, doi:http://dx.doi.org/10.1016/S0378-3839(98)00013-1.

Ribberink, J. S., and J. T. M. van der Sande (1985), Aggradation in rivers due to overloading - analytical approaches, *J. Hydraul. Res.*, *23*(3), 273--283, doi:10.1080/00221688509499355.

Ribberink, J. S., and J. T. M. Van der Sande (1984), Aggradation in rivers due to overloading, *Communications on hydraulics 1984-01*, Delft University of Technology.

Rijkswaterstaat (1968), Afvoerkarakteristieken van kaden, *Tech. Rep. 68.9*, Rijkswaterstaat, Directie Bovenrivieren, Afdeling Studiedienst.

Rijkswaterstaat (1973), de ontwikkeling van de stroombaanberekening met een rekenvoorbeeld van de huidige methode, *Nota 73.6*, Rijkswaterstaat, Directie Bovenrivieren, Afdeling studiedienst, Arnhem, the Netherlands.

Rijkswaterstaat (2018), Betrekkingslijnen rijn.

Rijkswaterstaat (2021), Geoweb - profiel rws zn.

Rijkswaterstaat, and Deltares (2022), Factsheet zesde generatie Modelschematisaties D-FLOW FM 2D Maas, *Tech. rep.*, Rijkswaterstaat.

Rijkswaterstaat Zuid Nederland (2019), Betrekkingslijnen maas 2019-2020.

van Rijn, L. C. (1984a), Sediment transport, part I: Bed load transport, *J. Hydraul. Eng.*, *110*(10), 1431--1456, doi:10.1061/(ASCE)0733-9429(1984)110:10(1431).

van Rijn, L. C. (1984b), Sediment transport, part III: Bed forms and alluvial roughness, *J. Hydraul. Eng.*, *110*(12), 1733--1754, doi:10.1061/(ASCE)0733-9429(1984)110:12(1733).

van Rijn, L. C. (1987), Mathematical modelling of morphological processes in the case of suspended sediment transport, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

van Rijn, L. C., M. W. C. Nieuwjaar, T. van der Kaay, E. Nap, and A. van Kampen (1993), Transport of fine sands by currents and waves, *Journal of Waterway, Port, Coastal, and Ocean Engineering*, *119*(2), 123--143, doi:10.1061/(ASCE)0733-950X(1993)119:2(123).

RIZA (2005), Flow technical reference sobek-re, *Tech. Rep. 2.52.005*, RIZA Institute for Inland Water Management and Waste Water Treatment.

Rodi, W. (1982), *Turbulence model and their application in hydraulics*, IAHR Monographs, 124 pp., CRC press.

Rodríguez-Amaya, C., A. Durán-Ariza, and S. Duarte-Méndez (2020), Submerged vane technology in colombia: Five representative projects, *Water*, *12*(4), doi:10.3390/w12040984.

Rodrigues, L., and K. Zumbrun (2016), Periodic-coefficient damping estimates, and stability of large-amplitude roll waves in inclined thin film flow, *SIAM J. Math. Anal.*, *48*(1), 268--280, doi:10.1137/15M1016242.

Rodrigues, S., E. Mosselman, N. Claude, C. L. Wintenberger, and P. Juge (2015), Alternate bars in a sandy gravel bed river: generation, migration and interactions with superimposed dunes, *Earth Surf. Process. Landf.*, *40*(5), 610--628, doi:10.1002/esp.3657.

Roelvink, D. (), Strategies for morphodynamic updating, *Tech. rep.*

Roelvink, J. A. (2006), Coastal morphodynamic evolution techniques, *Coastal Eng.*, *53*(2--3), 277--287, doi:10.1016/j.coastaleng.2005.10.015.

Roelvink, J. A., and A. J. H. M. Reniers (2012), *A guide to modelling coastal morphology*, *Advances in Coastal and Ocean Engineering*, vol. 12, World Scientific, Singapore.

Ronco, P., G. Fasolato, M. Nones, and G. Di Silvio (2010), Morphological effects of damming on lower Zambezi River, *Geomorphology*, *115*(1), 43--55, doi:10.1016/j.geomorph.2009.09.029.

Roos, P. (2004), Seabed pattern dynamics and offshore sand extraction, Ph.D. thesis, University of Twente, Netherlands.

Roos, P. C., R. Wemmenhove, S. J. M. H. Hulscher, H. W. M. Hoeijmakers, and N. P. Kruyt (2007a), Modeling the effect of nonuniform sediment on the dynamics of offshore tidal sandbanks, *J. Geophys. Res., Earth Surface*, *112*(F2), doi:10.1029/2005JF000376.

Roos, P. C., S. J. M. H. Hulscher, F. M. van der Meer, T. A. G. P. van Dijk, I. G. M. Wientjes, and J. van den Berg (2007b), Proceedings of the 5th Symposium on River Coastal and Estuarine Morphodynamics, 17-21 September, Enschede, the Netherlands., chap. Grain size sorting over offshore sandwaves: observations and modelling, pp. 649--656, CRC Press.

Rorink, T. (), The potential of side channels to mitigatelarge-scale bed degradation in the dutchrhine distributaries: A 1d-modelling study, Master’s thesis.

Roseberry, J. C., M. W. Schmeeckle, and D. J. Furbish (2012), A probabilistic description of the bed load sediment flux: 2. Particle activity and motions, *J. Geophys. Res., Earth Surface*, *117*(F3), F03,032, doi:10.1029/2012JF002353.

Rosgen, D. L. (1994), A classification of natural rivers, *CATENA*, *22*(3), 169--199, doi:10.1016/0341-8162(94)90001-9.

Rovira, A., and C. Ibañez (2007), Sediment management options for the lower ebro river and its delta, *J. Soils Sediments*, *7*(5), 285--295, doi:10.1065/jss2007.08.244.

Rowiński, P., and A. Radecki-Pawlik (Eds.) (2015), *Rivers - Physical, Fluvial and Environmental Processes*, Springer International Publishing.

Roy, C. J. (2005), Review of code and solution verification procedures for computational simulation, *J. Comput. Phys.*, *205*(1), 131--156, doi:10.1016/j.jcp.2004.10.036.

Royal Haskoning DHV (2019), Grip op nevengeulen: Pilot voor programmeringsmethodiek beheer en onderhoud van nevengeulen, *Tech. Rep. BF9237-101_Grip op nevengeulen_04032019_d6.0*, Royal Haskoning DHV, https://iplo.nl/thema/water/oppervlaktewater/ecologie-maatregelen-effecten/nevengeulen-verbeteren-ecologische-waterkwaliteit/.

Rozovskii, I. L. (1957), *Flow of water in bends in open channels*, 233 pp., Academy of Sciences of the Ukrainian SSR, (in English translated by Y. Prushansky in 1961).

Rüther, N., and N. R. B. Olsen (2007), Modelling free-forming meander evolution in a laboratory channel using three-dimensional computational fluid dynamics, *Geomorphology*, *89*(3), 308--319, doi:https://doi.org/10.1016/j.geomorph.2006.12.009.

Rădoane, M., N. Rădoane, D. Dumitriu, and C. Miclăuş (2008), Downstream variation in bed sediment size along the east carpathian rivers: evidence of the role of sediment sources, *Earth Surf. Process. Landf.*, *33*(5), 674--694, doi:10.1002/esp.1568.

Rubbioli, A. (2016), A degradational experiment under conditions of ellipticity of the hirano model, Master's thesis, Universitá degli Studi Firenze, TU Delft.

Rubey, W. W. (1933), Equilibrium-conditions in debris-laden streams, *EOS, Trans. Am. Geophys. Union*, *14*(1), 497--505, doi:10.1029/TR014i001p00497.

Rubey, W. W. (1952), Geology and mineral resources of the Hardin and Brussels quadrangles (in Illinois), *Tech. Rep. 218*, US Department of the Interior.

Ruelle, D., and F. Takens (1971), On the nature of turbulence, *Communications in Mathematical Physics*, *20*(3), 167--192, doi:10.1007/BF01646553.

de Ruijsscher, T. V., A. J. F. Hoitink, S. Naqshband, and A. J. Paarlberg (2019), Bed morphodynamics at the intake of a side channel controlled by sill geometry, *Advances in Water Resources*, *134*, 103,452, doi:10.1016/j.advwatres.2019.103452.

de Ruijsscher, T. V., S. Naqshband, and A. J. F. Hoitink (2020a), Effect of non-migrating bars on dune dynamics in a lowland river, *Earth Surface Processes and Landforms*, *45*(6), doi:10.1002/esp.4807.

de Ruijsscher, T. V., B. Vermeulen, and A. J. F. Hoitink (2020b), Diversion of flow and sediment toward a side channel separated from a river by a longitudinal training dam, *Water Resources Research*, *56*(6), e2019WR026,750, doi:10.1029/2019WR026750.

de Ruijsscher, T. V., S. Naqshband, B. Vermeulen, and A. J. F. Hoitink (2020c), Morfodynamische effecten van langsdammen in de waal, *H2O : tijdschrift voor watervoorziening en afvalwaterbehandeling*, pp. 20--23, (in Dutch).

de Ruijsscher, T. V. d., A. J. F. Hoitink, S. Dinnissen, B. Vermeulen, and P. Hazenberg (2018), Application of a line laser scanner for bed form tracking in a laboratory flume, *Water Resour. Res.*, *54*(3), 2078--2094, doi:10.1002/2017WR021646.

Runge, C. (1895), Ueber die numerische Auflösung von Differentialgleichungen, *Mathematische Annalen*, *46*(2), 167--178, doi:10.1007/BF01446807, (in German).

RWS, Directie Bovenrivieren (1968), Stroomsnelheidsmetingen op met gras begroeide kaden, nota 68.8 RWS.

RWS, Directie Limburg (1968), Materiaaltransport door de maas, nota 68.8 RWS.

RWS, Directie Limburg (1979), Waterloopkundige aspecten in het winterbed van de maas, samenhangend met de bochtafsnijding boxmeer en rijksweg 77.

RWS, Directie Limburg (1998), Morfologische ontwikkeling van de maas tussen gennep en grave : ten gevolge van baggerwerkzaamheden.

Saad, Y. (1994), Sparskit: a basic tool kit for sparse matrix computations - version 2, *Tech. rep.*, CSDR, University of Illinois and RIACS.

Salant, N. L., C. E. Renshaw, and F. J. Magilligan (2006), Short and long-term changes to bed mobility and bed composition under altered sediment regimes, *Geomorphology*, *76*, 43--53, doi:10.1016/j.geomorph.2005.09.003.

Saletti, M., P. Molnar, A. Zimmermann, M. A. Hassan, and M. Church (2015), Temporal variability and memory in sediment transport in an experimental step-pool channel, *Water Resour. Res.*, *51*(11), 9325--9337, doi:10.1002/2015WR016929.

Salt, J. D. (2008), The seven habits of highly defectivesimulation projects, *Journal of Simulation*, *2*(3), 155--161.

Sambrook Smith, G. H., and R. I. Ferguson (1995), The gravel-sand transition along river channels, *J. Sediment. Res.*, *65(2)*(2), 423--430.

Sambrook Smith, G. H., and R. I. Ferguson (1996), The gravel-sand transition: flume study of channel response to reduced slope, *Geomorphology*, *16*(2), 147--159, doi:http://dx.doi.org/10.1016/0169-555X(95)00140-Z.

Sambrook Smith, G. H., and A. P. Nicholas (2005), Effect on flow structure of sand deposition on a gravel bed: Results from a two-dimensional flume experiment, *Water Resour. Res.*, *41*(10), 1--12, doi:10.1029/2004WR003817.

Samuels, P. G. (1989), Backwater lengths in rivers, *Proc. Inst. Civ. Eng.*, *87*(4), 571--582, doi:10.1680/iicep.1989.3779.

Sanders, B. F. (2008), Integration of a shallow water model with a local time step, *Journal of Hydraulic Research*, *46*(4), 466--475, doi:10.3826/jhr.2008.3243.

Sarker, M. H., C. R. Thorne, M. N. Aktar, and M. R. Ferdous (2014), Morpho-dynamics of the brahmaputra-jamuna river, bangladesh, *Geomorphology*, *215*, 45--59, doi:10.1016/j.geomorph.2013.07.025.

Sarker, S. (2022), Essence of mike 21c (fdm numerical scheme): Application on the river morphology of bangladesh, *Open Journal of Modelling and Simulation*, *10*(2), doi:10.4236/ojmsi.2022.102006.

Sarma, J. N. (2005), Fluvial process and morphology of the Brahmaputra River in Assam, India, *Geomorphology*, *70*(3!!e!!4), 226 -- 256, doi:https://doi.org/10.1016/j.geomorph.2005.02.007, tropical Rivers.

Sarno, L., A. Carravetta, R. Martino, M. N. Papa, and Y.-C. Tai (2017), Some considerations on numerical schemes for treating hyperbolicity issues in two-layer models, *Adv. Water Resour.*, *100*(Supplement C), 183--198, doi:10.1016/j.advwatres.2016.12.014.

Savary, C., and Y. Zech (2007), Boundary conditions in a two-layer geomorphological model. Application to a hydraulic jump over a mobile bed, *J. Hydraul. Res.*, *45*(3), 316--332, doi:10.1080/00221686.2007.9521766.

Savitzky, A., and M. J. E. Golay (1964), Smoothing and differentiation of data by simplified least squares procedures., *Analytical Chemistry*, *36*(8), 1627--1639, doi:10.1021/ac60214a047.

Sayre, W. W., and D. W. Hubbell (1965), Transport and dispersion of labeled bed material North Loup River, Nebraska, *US Geological Survey Professional Paper 433-C*, US Government Printing Office, Washington, DC, United States, 48 pp.

Schaefer, P. W. (1967), Pointwise bounds in the cauchy problem for an elliptic system, *SIAM J. Appl. Math.*, *15*(3), 665--677.

Schaeffer, D. G. (1987), Instability in the evolution equations describing incompressible granular flow, *Journal of Differential Equations*, *66*(1), 19 -- 50, doi:http://dx.doi.org/10.1016/0022-0396(87)90038-6.

Schalko, I., V. Ruiz-Villanueva, F. Maager, and V. Weitbrecht (2021), Wood retention at inclined bar screens: Effect of wood characteristics on backwater rise and bedload transport, *Water*, *13*(16), doi:10.3390/w13162231.

Scheffer, M., S. R. Carpenter, T. M. Lenton, J. Bascompte, W. Brock, V. Dakos, J. van de Koppel, I. A. van de Leemput, S. A. Levin, E. H. van Nes, M. Pascual, and J. Vandermeer (2012), Anticipating critical transitions, *Science*, *338*(6105), 344--348, doi:10.1126/science.1225244.

Scheingross, J. S., E. W. Winchell, M. P. Lamb, and W. E. Dietrich (2013), Influence of bed patchiness, slope, grain hiding, and form drag on gravel mobilization in very steep streams, *J. Geophys. Res., Earth Surface*, *118*(2), 982--1001, doi:10.1002/jgrf.20067.

Scheingross, J. S., F. Brun, D. Y. Lo, K. Omerdin, and M. P. Lamb (2014), Experimental evidence for fluvial bedrock incision by suspended and bedload sediment, *Geology*, *42*(6), 523--526, doi:10.1130/G35432.1.

Schielen, R. (1995a), Notes on komarova.

Schielen, R. (1995b), Nonlinear stability analysis and pattern formation in morphological models, Ph.D. thesis, Utrecht University.

Schielen, R., A. Doelman, and H. E. de Swart (1993), On the nonlinear dynamics of free bars in straight channels, *J. Fluid Mech.*, *252*, 325--356, doi:10.1017/S0022112093003787.

Schielen, R. M. J., and A. Blom (2018), A reduced complexity model of a gravel-sand river bifurcation: Equilibrium states and their stability, *Adv. Water Resour.*, *121*, 9--21, doi:10.1016/j.advwatres.2018.07.010.

Schielen, R. M. J., T. van Leeuwen, and P. A. Zegeling (2005), *Proc. of the 4th IAHR symposium on River, Coastal, and Estuarine Morphodynamics, 4--7 October 2005, Urbana, IL, United States*, vol. 1, chap. Numerical Simulation of Alternating Bars in Straigh Channels, pp. 463--469, Taylor and Francis.

van Schijndel, S. A. H., and H. R. A. Jagers (2002), Anticiperend onderzoek kribben : rekenen rondom kribben met hles, *Tech. Rep. Q2973*, Delft Hydraulics Laboratory, Delft, the Netherlands, 98 pp.

Schirmer, M., J. Luster, N. Linde, P. Perona, E. A. D. Mitchell, D. A. Barry, J. Hollender, O. A. Cirpka, P. Schneider, T. Vogt, D. Radny, and E. Durisch-Kaiser (2014), Morphological, hydrological, biogeochemical and ecological changes and challenges in river restoration – the thur river case study, *Hydrol. Earth Syst. Sci.*, *18*(6), 2449--2462, doi:10.5194/hess-18-2449-2014.

Schmidt, J. C. (1990), Recirculating flow and sedimentation in the colorado river in grand canyon, arizona, *The Journal of Geology*, *98*(5), 709--724.

Schmidt, J. C., and P. R. Wilcock (2008), Metrics for assessing the downstream effects of dams, *Water Resour. Res.*, *44*(4), n/a--n/a, doi:10.1029/2006WR005092, w04404.

Schmidt, K.-H., and P. Ergenzinger (1992), Bedload entrainment, travel lengths, step lengths, rest periods-studied with passive (iron, magnetic) and active (radio) tracer techniques, *Earth Surf. Process. Landf.*, *17*(2), 147--165, doi:10.1002/esp.3290170204.

Schoklitsch, A. (1933), Über die Verkleinerung der Geschiebe in Flussläufen, in *Proceedings of the Vienna Academy of Science,*, vol. Section IIa, pp. 343--366.

Schoklitsch, A. (1937), *Hydraulic Structures*, vol. 1, 504 pp., American Society of Mechanical Engineers, New York, (translated by S. Shulits).

Schoonman, H. (1991), Bodemtransportmetingen op de Grensmaas, *rapport deltares*, WL Delft Hydraulics, Delft, 99 p. pp.

Schrier, D. M. v. d. (2004), Wanneer de ijssel een rijntak werd en hoe het meer flevo afwaterde, *Westerheem*, *53*, 182--189.

Schropp, M. H. I., P. Jesse, and J. A. F. van Essen (2000), Morfologie en zandtransport Maas zomerbedverdieping Gennep - Grave: Monitoringsresultaten 1996 -1999, *rapport 2000.001*, RIZA, Arnhem, 114 p. pp.

Schumer, R., and D. J. Jerolmack (2009), Real and apparent changes in sediment deposition rates through time, *J. Geophys. Res., Earth Surface*, *114*(F3), F00A06, doi:10.1029/2009JF001266.

Schumer, R., M. M. Meerschaert, and B. Baeumer (2009), Fractional advection-dispersion equations for modeling transport at the earth surface, *J. Geophys. Res., Earth Surface*, *114*(F4), F00A07, doi:10.1029/2008JF001246.

Schuurman, F., and M. G. Kleinhans (2015), Bar dynamics and bifurcation evolution in a modelled braided sand-bed river, *Earth Surface Processes and Landforms*, *40*(10), 1318--1333, doi:10.1002/esp.3722, esp.3722.

Schuurman, F., W. A. Marra, and M. G. Kleinhans (2013), Physics-based modeling of large braided sand-bed rivers: Bar pattern formation, dynamics, and sensitivity, *Journal of Geophysical Research: Earth Surface*, *118*(4), 2509--2527, doi:10.1002/2013JF002896.

Schwartz, M. A. (2008), The importance of stupidity in scientific research, *J. Cell Sci.*, *121*(11), 1771--1771, doi:10.1242/jcs.033340.

Schwartz, M. L. (Ed.) (2005), *Encyclopedia of Coastal Science*, Springer, Dordrecht, the Netherlands.

Seal, R., C. Paola, G. Parker, J. Southard, and P. Wilcock (1997), Experiments on downstream fining of gravel: I. narrow-channel runs, *J. Hydraul. Eng.*, *123*(10), 874--884, doi:10.1061/(ASCE)0733-9429(1997)123:10(874).

Sebus, J. H. (1923), De oudste geschreven berichten over ons land, *KNAG*, *40*, 27--49.

Seizilles, G., O. Devauchelle, E. Lajeunesse, and F. Métivier (2013), Width of laminar laboratory rivers, *Phys. Rev. E*, *87*, 052,204, doi:10.1103/PhysRevE.87.052204.

Seizilles, G., E. Lajeunesse, O. Devauchelle, and M. Bak (2014), Cross-stream diffusion in bedload transport, *Phys. Fluids*, *26*(1), 013,302, doi:10.1063/1.4861001.

Sekine, M., and H. Kikkawa (1992), Mechanics of saltating grains. II, *J. Hydraul. Eng.*, *118*(4), 536--558, doi:10.1061/(ASCE)0733-9429(1992)118:4(536).

Sekine, M., and G. Parker (1992), Bed-load transport on transverse slope. I, *J. Hydraul. Eng.*, *118*(4), 513--535, doi:10.1061/(ASCE)0733-9429(1992)118:4(513).

Seminara, G. (2006), Meanders, *J. Fluid Mech.*, *554*, 271--297, doi:10.1017/S0022112006008925.

Seminara, G., and M. Tubino (1989), Alternate bars and meandering, in *River Meandering*, edited by S. Ikeda and G. Parker, chap. 10, pp. 267--320, AGU, Washington, DC, United States, doi:10.1029/WM012p0267.

Seminara, G., and M. Tubino (1992), Weakly nonlinear theory of regular meanders, *J. Fluid Mech.*, *244*, 257--288, doi:10.1017/S0022112092003069.

Seminara, G., M. Colombini, and G. Parker (1996), Nearly pure sorting waves and formation of bedload sheets, *J. Fluid Mech.*, *312*, 253--278, doi:10.1017/S0022112096001991.

Seminara, G., L. Solari, and G. Parker (2002), Bed load at low Shields stress on arbitrarily sloping beds: Failure of the Bagnold hypothesis, *Water Resour. Res.*, *38*(11), 1249, doi:10.1029/2001WR000681.

Serra, S. G., and C. A. Vionnet (2005), Migration of large dunes during extreme floods of the Paraná River, Argentina, in *River, Coastal and Estuarine Morphodynamics*, Taylor and Francis, doi:10.1201/9781439833896.ch96.

Sharef, B. I. (2006), Numerical modelling with graded sediments for 2d morphological changes for pilot project meers (common meuse), Master's thesis, UNESCO-IHE.

Shaw, J., and R. Kellerhals (1982), The composition of recent alluvial gravels in Alberta river beds, *Alberta Research Council Bulletin*.

Shaw, J. B., D. Mohrig, and R. W. Wagner (2016), Flow patterns and morphology of a prograding river delta, *J. Geophys. Res., Earth Surface*, *121*(2), 372--391, doi:10.1002/2015JF003570, 2015JF003570.

Shen, H. W., and J.-Y. Lu (1983), Development and prediction of bed armoring, *Journal of Hydraulic Engineering*, *109*(4), 611--629, doi:10.1061/(ASCE)0733-9429(1983)109:4(611).

Shevchuk, I. V. (2016), *Modelling of Convective Heat and Mass Transfer in Rotating Flows*, Springer International Publishing.

Shields, A. (1936), Anwendung der Ähnlichkeitsmechanik und Turbulenzforschung auf die Geschiebebewegung, Ph.D. thesis, Versuchsanstalt für Wasserbau und Schiffbau, 26, Berlin, Germany, (in German).

Shimizu, Y., M. Hirano, and Y. Watanabe (1996), Numerical calculation of bank erosion and free meandering, *Proceedings of Hydraulic Engineering*, *40*, 921--926, doi:10.2208/prohe.40.921, (in Japanese).

Shimizu, Y., S. Giri, S. Yamaguchi, and J. Nelson (2009), Numerical simulation of dune-flat bed transition and stage-discharge relationship with hysteresis effect, *Water Resour. Res.*, *45*(4), W04,429, doi:10.1029/2008WR006830.

Shores, T. S. (2018), *Applied Linear Algebra and Matrix Analysis*, Undergraduate Texts in Mathematics, Springer.

Shulits, S. (1941), Rational equation of river-bed profile, *EOS, Trans. Am. Geophys. Union*, *22*(3), 622--631, doi:10.1029/TR022i003p00622.

Shurman, J. (2016), *Calculus and Analysis in Euclidean Space*, Undergraduate Texts in Mathematics, Springer.

Sieben, A. (1993), Hydraulics and morphology of mountain rivers, *Tech. Rep. 93--4*, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands.

Sieben, A. (1994), Notes on the mathematical modelling of alluvial mountain rivers with graded sediment, *Tech. Rep. 94--3*, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands, 134 pp.

Sieben, A. (1995), A study on one-dimensional and discontinuous river flows with mobile beds, *Tech. rep.*, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands.

Sieben, A. (2008a), Semi-vaste lagen in de rivieren, *Tech. rep.*, RIZA.

Sieben, A. (2010a), methodiek inschatting morfologische effecten in het zomerbed door lokale rivieringrepen, *Tech. Rep.*, Rijkswaterstaat, 33 pp.

Sieben, A. (2010b), Wd advies overlaten in waqua, *Tech. rep.*, Rijkswaterstaat.

Sieben, A. (2010c), overzicht en synthese beschikbare data overlaatproeven, *Tech. rep.*, Rijkswaterstaat.

Sieben, A. (2011a), Overzicht en synthese beschikbare data overlaatproeven, update 2011, *Tech. rep.*, Rijkswaterstaat, 74 pp., (in Dutch).

Sieben, A. (2012), Vergelijking gemeten en berekende stroombeelden, hoogwater voorjaar 2011, *Tech. rep.*, Rijkswaterstaat.

Sieben, A. (2019), Functioneel ontwerp morfologisch model maas, *Note 22-3-2019*, Rijkswaterstaat, 10 pp.

Sieben, A. (2020), Overzicht afvoermetingen 2016-2019 project monitoring langsdammen, *Tech. rep.*, Rijkswaterstaat, (in Dutch).

Sieben, A. (2021), Aanpak modelontwikkeling maas, *Note 1-2-2021*, Rijkswaterstaat, 2 pp.

Sieben, A. (2022a), Perspectief maas 2022, *Note 28-1-2022*, Rijkswaterstaat, 3 pp.

Sieben, A. (2022b), Notitie update kentallen lokale 1D bodemdynamiek Maas, *Tech. rep.*, Rijkswaterstaat.

Sieben, A. (2023), Uitgangspunt voorlopige model versie stuwpand grave, *Note 27-1-2023*, Rijkswaterstaat, 7 pp.

Sieben, J. (1997), Modelling of hydraulics and morphology in mountain rivers, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Sieben, J. (1999a), A theoretical analysis of discontinuous flow with mobile bed, *J. Hydraul. Res.*, *37*(2), 199--212, doi:10.1080/00221689909498306.

Sieben, J. (1999b), A theoretical analysis on armouring of river beds, *Journal of Hydraulic Research*, *37*(3), 313--326, doi:10.1080/00221686.1999.9628250.

Sieben, J. (2004), Ruimtelijke variaties in duinhoogte, *Tech. Rep. 2004.166x*, Ministerie van Verkeer en Waterstaat, Directoraal-Generaal Rijkswaterstaat, RIZA.

Sieben, J. (2008b), Taal van de rivierbodem: parameters voor morfodynamiek in rivieren, *rapport WD 2008-049*, Rijkswaterstaat, Lelystad, 118 p. pp.

Sieben, J. (2008c), Kennis en instrumenten Maas morfologie: Inventarisatie behoefte monitoring en voorspelgereedschap, *rapport WD 2008-049*, Rijkswaterstaat, Lelystad, 62 p. pp.

Sieben, J. (2009), Sediment management in the Dutch Rhine branches, *International Journal of River Basin Management*, *7*(1), 43--53, doi:10.1080/15715124.2009.9635369.

Sieben, J. (2011b), Methodiek inschatting morfologische effecten in het zomerbed door lokale rivieringrepen UPDATE December 2011, *memo*, Rijkswaterstaat, Lelystad, 33 p. pp.

Sieben, J., R. van der Veen, D. F. Kroekenstoel, and M. H. I. Schropp (2005a), Morfologische effecten Ruimte voor de Rivier in het bovenrivierengebied, *Tech. Rep. 2005.044X*, RIZA, Directoraat-Generaal Rijkswaterstaa, Arnhem, the Netherlands., 111 pp., (in Dutch).

Sieben, J., R. van der Veen, and D. F. Kroekenstoel (2005b), Morfologische effecten van heinrichting, PKB Ruimte voor de Rivier, *Tech. Rep. 2005.044X*, RIZA, Directoraat-Generaal Rijkswaterstaa, Arnhem, the Netherlands., 111 pp.

Siele, M., A. Blom, and E. Viparelli (2019), Two counterintuitive findings on channel bed incision in engineered alluvial rivers, in *11th Symposium on River, Coastal and Estuarine Morphodynamics, Auckland, New Zealand 16--21 November*, edited by H. Friedrich and K. Bryan, p. 143.

Silva, W., and C. Jol (1999), Obstakels verwijderen uit het rivierbed, *Land + Water*, *39(9)*, 29--31.

Silva, W., F. Klijn, and J. Dijkman (2001), Room for the rhine branches in the netherlands: What the research has taught us, *Tech. rep.*, Rijkswaterstaat.

di Silvio, G. (1992a), Sediment exchange between stream and bottom: a four layer model, in *Proceedings of the International Grain Sorting Seminar, IAHR. Monte Verità, Ascona, Switzerland*, pp. 161--191.

di Silvio, G. (1992b), *Dynamics of Gravel-bed Rivers*, chap. Modelling sediment transport under different hydrological and morphological circumstances, pp. 363--371, J. Wiley and Sons.

di Silvio, G., and A. Marion (1997), Transfer function for the deposition of poorly sorted gravel in response to streambed aggradation, *J. Hydraul. Res.*, *35:4*, 563--566, doi:10.1080/00221689709498411.

di Silvio, G., and M. Nones (2014), Morphodynamic reaction of a schematic river to sediment input changes: Analytical approaches, *Geomorphology*, *215*, 74--82, doi:10.1016/j.geomorph.2013.05.021, morphological characterisation and fluvial processes of large rivers at different time scales.

di Silvio, G., and A. Peviani (1989), Modelling short and long term evolution of mountain rivers: an application to the torrent Mallero (Itally), in *Workshop on Fluvial Hydraulics of Mountain Regions*, pp. B145--B168.

di Silvio, G. M. N. (2016), How fast evolve the river-bottom profile and grain-size composition at basin scale.

Simon, A., M. Doyle, M. Kondolf, J. F. D. Shields, B. Rhoads, G. Grant, F. Fitzpatrick, K. Juracek, M. McPhillips, and J. MacBroom (2005), How well do the rosgen classification and associated ''natural channel design'' methods integrate and quantify fluvial processes and channel response?, doi:10.1061/40792(173)584.

Simon, A., M. Doyle, M. Kondolf, F. D. Shields, B. Rhoads, and M. McPhillips (2007), Critical evaluation of how the rosgen classification and associated natural channel design methods fail to integrate and quantify fluvial processes and channel response1, *J. Am. Water Resour. Assoc.*, *43*(5), 1117--1131, doi:10.1111/j.1752-1688.2007.00091.x.

Simon, A., M. Doyle, M. Kondolf, F. D. Shields, B. Rhoads, and M. McPhillips (2008), Reply to discussion by dave rosgen, *J. Am. Water Resour. Assoc.*, *44*(3), 793--802, doi:10.1111/j.1752-1688.2008.00213.x.

Simons, D. B., and M. L. Albertson (1963), Uniform water conveyance channels in alluvial materials, *Transaction ASCE*, *128*, 65--105.

Simons, D. B., E. V. Richardson, and C. F. Nordin (1965), Bedload equation for ripples and dunes, *US Geological Survey Professional Paper 462-H*, US Government Printing Office, Washington, DC, United States, 9 pp.

Simoons, E. (2012), Edge scour around an offshore wind turbine, Master's thesis, Delft University of Technology.

Singer, M. B. (2008), Downstream patterns of bed material grain size in a large, lowland alluvial river subject to low sediment supply, *Water Resour. Res.*, *44*, W12,202, doi:10.1029/2008WR007183.

Singer, M. B. (2010), Transient response in longitudinal grain size to reduced gravel supply in a large river, *Geophys. Res. Lett.*, *37*(18), L18,403, doi:10.1029/2010GL044381.

Singh, A., K. Fienberg, D. J. Jerolmack, J. Marr, and E. Foufoula-Georgiou (2009), Experimental evidence for statistical scaling and intermittency in sediment transport rates, *J. Geophys. Res., Earth Surface*, *114*(F1), F01,025, doi:10.1029/2007JF000963.

Sinha, S. K., and G. Parker (1996), Causes of concavity in longitudinal profiles of rivers, *Water Resour. Res.*, *32*(5), 1417--1428, doi:10.1029/95WR03819.

Siteur, K., E. Siero, M. B. Eppinga, J. D. M. Rademacher, A. Doelman, and M. Rietkerk (2014), Beyond turing: The response of patterned ecosystems to environmental change, *Ecological Complexity*, *20*, 81--96, doi:https://doi.org/10.1016/j.ecocom.2014.09.002.

Siviglia, A., and A. Crosato (2016), Numerical modelling of river morphodynamics: latest developments and remaining challenges, *Adv. Water Resour.*, pp. --, doi:10.1016/j.advwatres.2016.01.005.

Siviglia, A., G. Nobile, and M. Colombini (2008), Quasi-conservative formulation of the one-dimensional saint-venant-exner model, *J. Hydraul. Eng.*, *134*(10), 1521--1526.

Siviglia, A., A. Stocchino, and M. Colombini (2009), Case study: Design of flood control systems on the vara river by numerical and physical modeling, *J. Hydraul. Eng.*, *135*(12), 1063--1072, doi:10.1061/(ASCE)HY.1943-7900.0000135.

Siviglia, A., G. Stecca, D. Vanzo, G. Zolezzi, E. F. Toro, and M. Tubino (2013), Numerical modelling of two-dimensional morphodynamics with applications to river bars and bifurcations, *Adv. Water Resour.*, *52*, 243--260, doi:10.1016/j.advwatres.2012.11.010.

Siviglia, A., G. Stecca, and A. Blom (2017a), Modeling of mixed-sediment morphodynamics in gravel bed rivers using the active layer approach: insights from mathematical and numerical analysis, in *Proc. Gravel Bed Rivers 8, Kyoto, Japan.*

Siviglia, A., G. Stecca, and A. Blom (2017b), Modeling of mixed-sediment morphodynamics in gravel bed rivers using the active layer approach: Insights from mathematical and numerical analysis, in *Gravel-Bed Rivers: Process and Disasters*, edited by D. Tsutsumi and J. Laronne, chap. 26, pp. 703--728, Wiley-Blackwell, Hoboken, NJ, United States, doi:10.1002/9781118971437.ch26.

Siviglia, A., D. Vanzo, and E. Toro (2022), A splitting scheme for the coupled saint-venant-exner model, *Advances in Water Resources*, *159*, 104,062, doi:https://doi.org/10.1016/j.advwatres.2021.104062.

Sklar, L. S., and W. E. Dietrich (2004), A mechanistic model for river incision into bedrock by saltating bed load, *Water Resour. Res.*, *40*(6), W06,301, doi:10.1029/2003WR002496.

Sklar, L. S., and W. E. Dietrich (2006), The role of sediment in controlling steady-state bedrock channel slope: Implications of the saltation-abrasion incision model, *Geomorphology*, *82*(1-2), 58--83, doi:10.1016/j.geomorph.2005.08.019, the Hydrology and Geomorphology of Bedrock Rivers.

Sklar, L. S., and W. E. Dietrich (2008), Implications of the saltation-abrasion bedrock incision model for steady-state river longitudinal profile relief and concavity, *Earth Surf. Process. Landf.*, *33*(7), 1129--1151, doi:10.1002/esp.1689.

Sklar, L. S., W. E. Dietrich, E. Foufoula-Georgiou, B. Lashermes, and D. Bellugi (2006), Do gravel bed river size distributions record channel network structure?, *Water Resour. Res.*, *42*, W06D18, doi:10.1029/2006WR005035.

Slingerland, R., and N. D. Smith (1998), Necessary conditions for a meandering-river avulsion, *Geology*, *26*(5), 435--438, doi:10.1130/0091-7613(1998)026⟨0435:NCFAMR⟩2.3.CO;2.

Slingerland, R., and N. D. Smith (2004), River avulsions and their deposits, *Annu. Rev. Earth Planet. Sci.*, *32*(1), 257--285, doi:10.1146/annurev.earth.32.101802.120201.

Sloff, C. (2006a), Vaarwegverbetering Vianen : rivierkundige berekeningen, *rapport deltares*, WL Delft Hydraulics, Delft.

Sloff, C., R. van der Sligte, and A. Visser (2013a), Riviermorfologisch Deltamodel : testen RMD, *rapport deltares*, Deltares, Delft.

Sloff, C. J. (1992), The method of characteristics applied to analyse 2DH models, *Tech. Rep. 92--4*, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands.

Sloff, C. J. (2006b), Uitbreiding SOBEK-RT model naar niet-uniform sediment, *Tech. Rep. Q4130.10*, Delft Hydraulics Laboratory, Delft, the Netherlands, 56 pp.

Sloff, C. J. (2009), Tenryuu River system project. Part 1 - stability of upstream bed in Sakuma reservoir, *Tech. Rep. 11203051-005-ZWS-0002*, Deltares, Delft, the Netherlands.

Sloff, C. J., and C. Stolker (2000), Calibratie SOBEK-Gegradeerd zandmaas: voorbereiding voor morfologische berekeningen OTB, *Tech. Rep. Q2589*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Sloff, C. J., H. J. Barneveld, and J. R. Moll (1996), Morfologisch model Zandmaas : MAASMOR 1995, *rapport deltares*, WL Delft Hydraulics, Delft, 83 p. pp.

Sloff, C. J., E. Mosselman, and J. Sieben (2006), Effective use of non-erodible layers for improving navigability, in *Proceedings of the 3rd International Conference on Fluvial Hydraulics (River Flow), Lisbon, Portugal, 6-8 September*, edited by R. M. L. Ferreira, E. C. T. L. Alves, J. G. A. B. Leal, and A. H. Cardoso, pp. 1211--1220, Taylor and Francis, London, United Kingdom.

Sloff, C. J., R. A. M. van der Sligte, and W. Ottevanger (2014), Morfologische pakketsom Waal : morfologische effecten ruimte-voor-de-riviermaatregelen, *rapport*, Deltares, Delft, 188 p. pp.

Sloff, K. (1993), Analysis of basic equations for sediment-laden flows, *techreport 93-8*, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands, 54 pp.

Sloff, K. (2011), *Kleine und Grose Steine*, chap. DVR toolbox for sediment management in the Rhine delta, pp. 1--21, RWTH.

Sloff, K. (2019), Prognose bodemligging Rijntakken 2020-2050. Trends voor scheepvaart en waterbeschikbaarheid, *Tech. Rep. 11203738-005-BGS-0008*, Deltares, Delft, the Netherlands, 29 pp., (in Dutch).

Sloff, K. (2020), KBN HVWN - Stresstest droogte Maas - Bedreiging van de bodemveranderingen voor de scheepvaart, *Tech. Rep. 11205274-004-BGS-0007*, Deltares, Delft, the Netherlands, 20 pp.

Sloff, K., and E. Mosselman (2012), Bifurcation modelling in a meandering gravel-sand bed river, *Earth Surf. Process. Landf.*, *37*(14), 1556--1566, doi:10.1002/esp.3305.

Sloff, K., and W. Ottevanger (2017), Verificatie- en kalibratieprotocol voor riviermorfologische modellering, *Tech. Rep. 11200536-006-ZWS-0008*, Deltares, Delft, the Netherlands, 30 pp.

Sloff, K., M. Bernabè, and T. Baur (2003), On the stability of the Pannerdense Kop river bifurcation, in *Proceedings of the 3rd IAHR symposium on River, Coastal, and Estuarine Morphoynamics, Barcelona*.

Sloff, K., A. van Spijk, E. Stouthamer, and A. Sieben (2011), Understanding and managing the morphology of branches incising into sand-clay deposits in the dutch rhine delta, in *RCEM 2011 : proceedings of the 7th IAHR symposium on River, Coastal and Estuarine Morphodynamics (Beijing, China, September 6-8, 2011)*, pp. 1237--1252.

Sloff, K., A. van Spijk, E. Stouthamer, and A. Sieben (2013b), Understanding and managing the morphology of branches incising into sand-clay deposits in the dutch rhine delta, *International Journal of Sediment Research*, *28*(2), 127--138, doi:https://doi.org/10.1016/S1001-6279(13)60025-6.

Smagorinsky, J. (1963), General circulation experiments with the primitive equations, *Mon. Weather Rev.*, *91*(3), 99--164, doi:10.1175/1520-0493(1963)091⟨0099:GCEWTP⟩2.3.CO;2.

Smale, A. J. (2000), Morphological effects of spatially varying grain size and bed roughness in rivers, Master's thesis, Delft University of Technology, The Netherlands.

Small, C., and R. J. Nicholls (2003), A global analysis of human settlement in coastal zones, *J. Coast. Res.*, *19*(3), 584--599.

Smart, G. (1984), Sediment transport formula for steep channels, *J. Hydraul. Eng.*, *110*(3), 267--276, doi:10.1061/(ASCE)0733-9429(1984)110:3(267).

Smith, D. G., and H. M. Jol (1997), Radar structure of a Gilbert-type delta, Peyto Lake, Banff National Park, Canada, *Sediment. Geol.*, *113*(3-4), 195--209, doi:10.1016/S0037-0738(97)00061-4.

Smith, J. D., and S. R. McLean (1977), Spatially averaged flow over a wavy surface, *J. Geophys. Res.*, *82*(12), 1735--1746, doi:10.1029/JC082i012p01735.

Smith, S. W. (), *Moving Average Filters*, chap. 15.

Snippen, E., A. Fioole, H. Geelen, A. Kamsteeg, A. van Spijk, and T. Visser (2005), Sediment in (be)weging : sedimentatiebalans rijn-maasmonding 1990-2000, rIZA rapport; 2005.023.

Snow, R. S., and R. L. Slingerland (1987), Mathematical modeling of graded river profiles, *J. Geol.*, *95*(1), 15--33.

Snyder, H. A. (1969), Wave-number selection at finite amplitude in rotating couette flow, *J. Fluid Mech.*, *35*(2), 273--298, doi:10.1017/S002211206900111X.

Soares-Frazão, S., and Y. Zech (1999), Effects of a sharp bend on dam-break flow.

Soh, W. Y., and S. A. Berger (1984), Laminar entrance flow in a curved pipe, *J. Fluid Mech.*, *148*, 109--135, doi:10.1017/S0022112084002275.

Solari, L., and G. Parker (2000), The curious case of mobility reversal in sediment mixtures, *J. Hydraul. Eng.*, *126*(3), 185--197, doi:10.1061/(ASCE)0733-9429(2000)126:3(185).

Song, C. G., I. W. Seo, and Y. D. Kim (2012), Analysis of secondary current effect in the modeling of shallow flow in open channels, *Adv. Water Resour.*, *41*, 29--48, doi:https://doi.org/10.1016/j.advwatres.2012.02.003.

Sonke, J. E., D. J. Furbish, and V. J. M. Salters (2003), Dispersion effects of laminar flow and spray chamber volume in capillary electrophoresis-inductively coupled plasma-mass spectrometry: a numerical and experimental approach, *J. Chromatogr. A*, *1015*(1), 205--218, doi:10.1016/S0021-9673(03)01210-X.

Sorber, A. M. (1997), Geeft een overzicht van de gegevens die zijn verzameld met betrekking tot de sedimentatie van zand op de oevers van de rijntakken en de maas tijdens deze hoogwaters 1993/1994 en 1995. tevens worden de mechanismen beschreven die bij hoge afvoeren bepalend zijn voor het sedimentatiepatroon., rIZA rapport 97.015.

Soulsby, R. (1997), *Dynamics of marine sands*, Thomas Telford, London, United Kingdom.

Southard, J. B. (1991), Experimental determination of bed-form stability, *Annu. Rev. Earth Planet. Sci.*, *19*(1), 423--455, doi:10.1146/annurev.ea.19.050191.002231.

Southgate, H. N., and A. Crosato (2013), Non-linear evolution of steady and migrating alternate bars in a straight channel, in *The 8th symposium on River, Coastal and Estuarine Morphodynamics*, edited by G. Coco, B. Blanco, M. Olaberrieta, and R. Tinoco, p. 66 de 204.

Souzy, M., and A. Marin (2022), Role of liquid driving on the clogging of constricted particle suspensions, *Journal of Fluid Mechanics*, *953*, A40, doi:10.1017/jfm.2022.981.

Spanjaard, G. (2004), Recent erosion and sedimentation processes in the geul river, Master's thesis, Vrije Universiteit Amsterdam.

Spinewine, B., and Y. Zech (2008), An ex-post analysis of the german upper rhine: data gathering and numerical modelling of morphological changes in the 19th century, *J. Flood Risk Manage.*, *1*(1), 57--68, doi:10.1111/j.1753-318X.2008.00007.x.

Spinewine, B., V. Guinot, S. Soares Frazão, and Y. Zech (2011), Solution properties and approximate Riemann solvers for two-layer shallow flow models, *Comput. Fluids*, *44*(1), 202--220, doi:10.1016/j.compfluid.2011.01.001.

Sprong, A. (2019), 1d modelling of river bends with d-flow fm, *Msc internship report*, Wageningen University, Wageningen, the Netherlands, 35 pp.

Spruyt, A. (2010-2012), a generic bed composition module sand mud interaction fluff layer concept, *Tech. rep.*, Deltares.

Spruyt, A., and A. Fujisaki (2016), Herkalibratie SOBEK 3-model Rijntakken, *Tech. Rep. 1230071-003*, Deltares, Delft, the Netherlands, 42 pp.

Spruyt, A., and W. Ottevanger (2019), Plan van aanpak morfologisch model Maas, *rapport*, Deltares, Delft, 92 p. pp.

Spruyt, A., and W. Ottevanger (2022), Plan voor ontwikkeling 2D morfologisch modelinstrumentarium van de Rijntakken in D-HYDRO: Functioneel en technisch ontwerp, *rapport deltares*, 92 p. pp., (concept).

Spruyt, A., E. Mosselman, and B. Jagers (2011), A new approach to river bank retreat and advance in 2d numerical models of fluvial morphodynamics, in *RCEM*.

Spruyt, A., R. Schielen, and V. Chavarrías (2020), Riverlab { the numerical experimental facility for river research, in *Proceedings of the NCR days, Nijmegen, the Netherlands, 13--14 February*, edited by S. R. E. E. v. R. J. Boersema, M.P., 44-2020, pp. 108--109, Netherlands Center for River studies.

Staentzel, C., F. Arnaud, I. Combroux, L. Schmitt, M. Trémolières, C. Grac, H. Piégay, A. Barillier, V. Chardon, and J.-N. Beisel (2018), How do instream flow increase and gravel augmentation impact biological communities in large rivers: A case study on the Upper Rhine River, *River Research and Applications*, *34*(2), 153--164, doi:https://doi.org/10.1002/rra.3237.

Stahl, W. M. v. T. M. K. I. H. A.-F.-D. S. J. G. K. M. G., K. (2022), Impact of climate change on the rain,snow and glacier melt components of streamflow of the river rhine and itstributaries., *Tech. Rep. I 28*, International Commission for the Hydrology ofthe Rhine basin (CHR).

Stam, J. (1998), Exact evaluation of catmull-clark subdivision surfaces at arbitrary parameter values, in *Proceedings of the 25th Annual Conference on Computer Graphics and Interactive Techniques*, SIGGRAPH '98, p. 395{404, Association for Computing Machinery, New York, NY, USA, doi:10.1145/280814.280945.

Stanley, J.-D. (2001), Dating modern deltas: Progress, problems, and prognostics, *Annu. Rev. Earth Planet. Sci.*, *29*(1), 257--294, doi:10.1146/annurev.earth.29.1.257.

Stecca, G. (2012), Numerical modelling of gravel-bed river morphodynamics, Ph.D. thesis, Università degli studi di Trento.

Stecca, G., and D. M. Hicks (), Numerical simulations of confined braided river morphodynamics: display of deterministic chaos and characterization through turbulence theory, *Journal of Geophysical Research: Earth Surface*, *n/a*(n/a), e2021JF006,409, doi:https://doi.org/10.1029/2021JF006409, e2021JF006409 2021JF006409.

Stecca, G., A. Siviglia, and E. F. Toro (2010), Upwind-biased {FORCE} schemes with applications to free-surface shallow flows, *J. Comput. Phys.*, *229*(18), 6362--6380, doi:http://dx.doi.org/10.1016/j.jcp.2010.05.001.

Stecca, G., A. Siviglia, and A. Blom (2014), Mathematical analysis of the Saint-Venant-Hirano model for mixed-sediment morphodynamics, *Water Resour. Res.*, *50*(10), 7563--7589, doi:10.1002/2014WR015251.

Stecca, G., A. Siviglia, and A. Blom (2016), An accurate numerical solution to the Saint-Venant-Hirano model for mixed-sediment morphodynamics in rivers, *Adv. Water Resour.*, *93, Part A*, 39--61, doi:10.1016/j.advwatres.2015.05.022.

Stecca, G., R. Measures, and D. M. Hicks (2017), A framework for the analysis of noncohesive bank erosion algorithms in morphodynamic modeling, *Water Resour. Res.*, *53*(8), 6663--6686, doi:10.1002/2017WR020756.

Stelling, G. S. (1983), On the construction of computational methods for shallow water flow problems., Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Stelling, G. S., and N. Booij (1999), Computational modelling flow and transport, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

Stelling, G. S., and S. P. A. Duinmeijer (2003), A staggered conservative scheme for every Froude number in rapidly varied shallow water flows, *Int. J. Numer. Meth. Fluids*, *43*, 1329--1354, doi:10.1002/fld.537.

Stenfert, J. (2017), Scour holes in heterogeneous subsoil: An experimental study to improve knowledge of the development of scour holes in heterogeneous subsoil, Master's thesis, Delft University of Technology.

Sternberg, H. (1875), Untersuchungen über Längen- und Querprofil geschiebeführender Flüsse, *Zeitschrift für Bauwesen*, *25*, 483--506, (in German).

Stevens, M. A. (1988), Discussion of ''Unsteady sediment transport modeling'' by Dennis A. Lyn (January, 1987, Vol. 113, No. 1), *J. Hydraul. Eng.*, *114*(8), 954--956, doi:10.1061/(ASCE)0733-9429(1988)114:8(954).

Stewart, H. B. (1979), Stability of two-phase flow calculation using two-fluid models, *J. Comput. Phys.*, *33*(2), 259--270, doi:10.1016/0021-9991(79)90020-2.

Stewart, H. B., and B. Wendroff (1984), Two-phase flow: Models and methods, *J. Comput. Phys.*, *56*(3), 363--409, doi:10.1016/0021-9991(84)90103-7.

Stoker, J. J. (1992), Water waves: The mathematical theory with applications, doi:10.1002/9781118033159.

Stolker, C., and H. Verheij (2001a), Gevoeligheidsonderzoek sedimentatie en erosie in kribvakken langs de Lek, *rapport deltares*, WL Delft Hydraulics, Delft, 90 p. pp.

Stolker, C., and H. Verheij (2001b), Calibratie van een oeverafslagmodel voor de Zandmaas, *rapport deltares*, WL Delft Hydraulics, Delft.

Storti, M. A., C. E. Baumann, and S. R. Idelsohn (1992), A preconditioning mass matrix to accelerate the convergence to the steady euler solutions using explicit schemes, *Int. J. Numer. Methods Eng.*, *34*(2), 519--541, doi:10.1002/nme.1620340210.

Stouthamer, E., and H. J. A. Berendsen (2001), Avulsion frequency, avulsion duration, and interavulsion period of Holocene channel belts in the Rhine-Meuse delta, The Netherlands, *J. Sediment. Res.*, *71*(4), 589--598, doi:10.1306/112100710589.

Stouthamer, E., H. Middelkoop, M. Kleinhans, M. van der Perk, and M. Straatsma (Eds.) (2019), *Land of rivers: NCR DAYS 2019 Proceedings.*, publication 43-2019, Netherlands Centre for River studies.

STOWA (2015), Handboek geomorfologisch beekherstel, *Tech. rep.*, STOWA.

Straub, L. G. (1940), Approaches to the study of the mechanics of bed movement, in *Proc. of the Hydraulics Conference*, edited by J. H. Howe, pp. 178--192, University of Iowa, Iowa City, IA, United States.

STRAUSS, W. A. (2008), *PARTIAL DIFFERENTIAL EQUATIONS AN INTRODUCTION*, John Wiley & Sons.

Strickler, A. (1923), Beiträge zur frage der geschwindigkeitsformel und der rauhigkeitszahlen für ströme, kanäle und geschlossene leitungen., *Mitteilungen des Eidgenossischen Amtes für Wasserwirtschaft*, *16*, (Translated as ''Contributions to the Question of a Velocity Formula and Roughness Data for Streams, Channels and Closed Pipelines.'' W. M. Keck Laboratory of Hydraulics and Water Resources Translation, T-10. California Institute of Technology , Pasadena, CA. 1981).

Strikwerda, J. (2004), *Finite Difference Schemes and Partial Differential Equations*, 2 ed., 427 pp., Society for Industrial and Applied Mathematics, Philadelphia, PA, United States, doi:10.1137/1.9780898717938.

Strikwerda, J. C. (2007), *Finite Difference Schemes and Partial Differential Equations*, 434 pp., Society for Industrial and Applied Mathematics.

Strogatz, S. H. (), *Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry, and Engineering*, 2 ed., CRC Press, doi:https://doi.org/10.1201/9780429492563.

Struiksma, N. (1980), Recent development in design of a river scale modles with mobile bed, *Tech. Rep.*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Struiksma, N. (1983a), Point bar initiation in bends of alluvial rivers with dominant bed load transport : Report on theoretical investigation, *Tech. Rep. R657-XVII/W308 part III*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Struiksma, N. (1983b), Results of movable bed experiments in the DHL curved flume: Report on experimental investigation, *Tech. Rep. R657-XXIII/M1771*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Struiksma, N. (1985a), Prediction of 2d bed topography in rivers, *J. Hydraul. Eng.*, *111*(8), 1169--1182, doi:10.1061/(ASCE)0733-9429(1985)111:8(1169).

Struiksma, N. (1985b), Celerity and deformation of bed perturbations travelling over a non-erodible layer, *Tech. Rep R657-48, W308*, Delft Hydraulics Laboratory, Delft, the Netherlands, 22 pp.

Struiksma, N. (1988), RIVCOM a summary of results of some test computations, *Tech. Rep. Q0794*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Struiksma, N. (1999), Mathematical modelling of bedload transport over non-erodible layers, in *Proceedings of the 1st IAHR symposium on River, Coastal, and Estuarine Morphodynamics, Genova, Italy*, pp. 89--98.

Struiksma, N., and A. Crosato (1989), Analysis of a 2-d bed topography model for rivers, in *River Meandering*, edited by S. Ikeda and G. Parker, chap. 6, pp. 153--180, AGU, Washington, DC, United States, doi:10.1029/WM012p0153.

Struiksma, N., K. W. Olesen, C. Flokstra, and D. H. J. D. Vriend (1985), Bed deformation in curved alluvial channels, *J. Hydraul. Res.*, *23*(1), 57--79, doi:10.1080/00221688509499377.

Struiksma, N., M. M. Laguzzi, and J. G. H. Bremer (1994), River waal and sint andries: Improvement of the navigability conditions by means of a fixed layer., *Tech. Rep. Q1788*, Delft Hydraulics Laboratory, Delft, the Netherlands., 123 pp.

Stuart, J. T. (1960), On the non-linear mechanics of wave disturbances in stable and unstable parallel flows part 1. the basic behaviour in plane poiseuille flow, *J. Fluid Mech.*, *9*(3), 353--370, doi:10.1017/S002211206000116X.

Stuart, J. T., and R. C. DiPrima (1978), The Eckhaus and Benjamin-Feir resonance mechanisms, *Proceedings of the Royal Society of London. Series A, Mathematical and Physical Sciences*, *362*(1708), 27--41.

Stuhmiller, J. H. (1977), The influence of interfacial pressure forces on the character of two-phase flow model equations, *Int. J. Multiphase Flow*, *3*(6), 551--560, doi:10.1016/0301-9322(77)90029-5.

Stuparu, D., and W. Ottevanger (2017), Richtlijnen rivieren: Analyse van duinafmetingen uit covadem data, *Tech. Rep. 11201113-000-ZWS-0008*, Deltares, Delft, the Netherlands, 27 pp.

Styer, D. F. (2007), How do two moving clocks fall out of sync? a tale of trucks, threads, and twins, *Am. J. Phys*, *75*(9), 805--814, doi:http://dx.doi.org/10.1119/1.2733691.

Sumer, B. M., and M. Bakioglu (1984), On the formation of ripples on an erodible bed, *J. Fluid Mech.*, *144*, 177--190, doi:10.1017/S0022112084001567.

Sumer, B. M., and J. Fredsøe (1998), Wave scour around group of vertical piles, *Journal of Waterway, Port, Coastal, and Ocean Engineering*, *124*(5), 248--256, doi:10.1061/(ASCE)0733-950X(1998)124:5(248).

Sumer, B. M., and J. Fredsøe (2001), Scour around pile in combined waves and current, *Journal of Hydraulic Engineering*, *127*(5), 403--411, doi:10.1061/(ASCE)0733-9429(2001)127:5(403).

Sun, J., B.-l. Lin, and H.-w. Kuang (2015), Numerical modelling of channel migration with application to laboratory rivers, *Int. J. Sediment Res.*, *30*(1), 13--27, doi:10.1016/S1001-6279(15)60002-6.

Surian, N., L. Mao, M. Giacomin, and L. Ziliani (2009), Morphological effects of different channel-forming discharges in a gravel-bed river, *Earth Surf. Process. Landf.*, *34*(8), 1093--1107, doi:10.1002/esp.1798.

Sutherland, J., A. Peet, and R. Soulsby (2004), Evaluating the performance of morphological models, *Coastal Engineering*, *51*(8-9), 917--939.

Suzuki, K. (1976), On the propagation of a disturbance in the bed composition of an open channel, *Tech. Rep. R 1976/09/L*, Laboratory of Fluid Mechanics, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Delft, the Netherlands, 41 pp.

Suzuki, K., , and M. Michiue (1979), On the dune height and the influence of sand mixture on its characteristics, *paper presented at the 23rd National Hydraulics Symposium, Jpn. Soc. of Civ. Eng., Tokyo, Feb. 1979.*

Swamee, P. K. (1988), Generalized rectangular weir equations, *Journal of Hydraulic Engineering*, *114*(8), 945--949, doi:10.1061/(ASCE)0733-9429(1988)114:8(945).

Swanson, E. (1999), *Mathematics into Type*, 102 pp., American Mathematical Society.

Swanson, R. C., and E. Turkel (1986), Pseudo-time algorithms for the navier-stokes equations, *Appl. Numer. Math.*, *2*(3), 321--333, doi:10.1016/0168-9274(86)90037-1.

Swenson, J. B., and T. Muto (2007), Response of coastal plain rivers to falling relative sea-level: allogenic controls on the aggradational phase, *Sedimentology*, *54*(1), 207--221, doi:10.1111/j.1365-3091.2006.00830.x.

Swenson, J. B., V. R. Voller, C. Paola, G. Parker, and J. Marr (2000), Fluvio-deltaic sedimentation: A generalized Stefan problem, *Eur. J. Appl. Math.*, *11*(05), 433--452, doi:10.1017/S0956792500004198.

Swenson, J. B., C. Paola, L. Pratson, V. R. Voller, and A. B. Murray (2005), Fluvial and marine controls on combined subaerial and subaqueous delta progradation: Morphodynamic modeling of compound-clinoform development, *J. Geophys. Res., Earth Surface*, *110*(F2), F02,013, doi:10.1029/2004JF000265.

Symonds, A., T. Vijverberg, S. Post, B.-J. Spek, and J. Henrotte (2017), Comparison between mike 21 fm, delft3d and delft3d fm flow models of western port bay, australia.

Syvitski, J. P., and G. R. Brakenridge (2013), Causation and avoidance of catastrophic flooding along the indus river, pakistan, *GSA Today*, *23*(1), 4--10, doi:10.1130/GSATG165A.1.

Syvitski, J. P., M. D. Morehead, D. B. Bahr, and T. Mulder (2000), Estimating fluvial sediment transport: The rating parameters, *Water Resour. Res.*, *36*(9), 2747--2760, doi:10.1029/2000WR900133.

Syvitski, J. P. M., C. J. Vörösmarty, A. J. Kettner, and P. Green (2005), Impact of humans on the flux of terrestrial sediment to the global coastal ocean, *Science*, *308*(5720), 376--380, doi:10.1126/science.1109454.

Syvitski, J. P. M., A. J. Kettner, I. Overeem, E. W. H. Hutton, M. T. Hannon, G. R. Brakenridge, J. Day, C. Vorosmarty, Y. Saito, L. Giosan, and R. J. Nicholls (2009), Sinking deltas due to human activities, *Nat. Geosci.*, *2*(10), 681--686, doi:10.1038/ngeo629.

Tal, M., and C. Paola (2010), Effects of vegetation on channel morphodynamics: results and insights from laboratory experiments, *Earth Surf. Process. Landf.*, *35*(9), 1014--1028, doi:10.1002/esp.1908.

Talmon, A. M., N. Struiksma, and M. C. L. M. V. Mierlo (1995), Laboratory measurements of the direction of sediment transport on transverse alluvial-bed slopes, *J. Hydraul. Res.*, *33*(4), 495--517, doi:10.1080/00221689509498657.

Talstra, H. (2011), Large-scale turbulence structures in shallow separating flows, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Tan, W. Y. (1992), *Shallow Water Hydrodynamics: Mathematical Theory and Numerical Solution for a Two-dimensional System of Shallow-water Equations*, *Elsevier Oceanography Series*, vol. 55, 1 ed., 433 pp., Elsevier, Amsterdam, the Netherlands.

Tanner, W. F. (1971), The river profile, *J. Geol.*, *79*, 482--492.

Tarekul Islam, G. M., M. R. Kabir, and A. Nishat (2006), Nodal point relation for the distribution of sediments at channel bifurcation, *J. Hydraul. Eng.*, *132*(10), 1105--1109, doi:10.1061/(ASCE)0733-9429(2006)132:10(1105).

Tassi, P. A., S. Rhebergen, C. A. Vionnet, and O. Bokhove (2008), A discontinuous galerkin finite element model for river bed evolution under shallow flows, *Computer Methods in Applied Mechanics and Engineering*, *197*(33!!e!!40), 2930--2947, doi:http://dx.doi.org/10.1016/j.cma.2008.01.023.

Tealdi, S., C. Camporeale, and L. Ridolfi (2011), Long-term morphological river response to hydrological changes, *Adv. Water Resour.*, *34*(12), 1643--1655, doi:10.1016/j.advwatres.2011.08.011.

ten Brinke, W. B. M. (1997), De bodemsamenstelling van Waal en IJssel in de jaren 1966,1976,1984 en 1995, *techreport 97.009*, RIZA.

Ten Brinke, W. B. M., and E. Gölz (2001), Bed level changes and sediment budget of the rhine near the german - dutch border, *Tech. Rep. 2001.044*, RIZA.

Ten Brinke, W. B. M., L. J. Bolwidt, E. Snippen, and L. W. van Hal (2001), Sedimentbalans Rijntakken 2000, een actualisatie van de sedimentbalans voor slib, zand en grind van de Rijntakken in het beheersgebied van de Directie Oost-Nederland, *Tech. Rep. 2001.043*, RIZA, (in Dutch).

Termes, A. P. P. (1986), Vertical composition of sediment in a dune, R 657-xxx, R 1626, *Tech. rep.*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Termes, A. P. P. (1989), Analyse bodembemonstering pannerdensch kanaal 1989, *Tech. Rep. Q1102*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Thatcher, M. L., and D. R. F. Harleman (1972), A mathematical model for the prediction of unsteady salinity intrusion in estuaries, *Tech. Rep. NOAA-2-35150*, Sea Grant Project Office, Massachusetts Inst. of Tech., Cambridge, MA, United States., 234 pp.

Thomas, R. E., D. R. Parsons, S. D. Sandbach, G. M. Keevil, W. A. Marra, R. J. Hardy, J. L. Best, S. N. Lane, and J. A. Ross (2011), An experimental study of discharge partitioning and flow structure at symmetrical bifurcations, *Earth Surf. Process. Landf.*, *36*(15), 2069--2082, doi:10.1002/esp.2231.

Thompson, S. M., and P. L. Campbell (1979), Hydraulics of a large channel paved with boulders, *J. Hydraul. Res.*, *17*(4), 341--354, doi:10.1080/00221687909499577.

Thomson, J. (1876), On the origin of windings of rivers in alluvial plains, with remarks on the flow of water round bends in pipes, *Proc. Roy. Soc. London*, *25*(171-178), 5--8, doi:10.1098/rspl.1876.0004.

Thomson, J. (1912), *Collected papers in Physics and Engineering*, Cambridge University Press, Cambridge, United Kingdom.

Thorn, C. E., and M. R. Welford (1994), The equilibrium concept in geomorphology, *Ann. Assoc. Am. Geogr.*, *84*(4), 666--696, doi:10.1111/j.1467-8306.1994.tb01882.x.

Tiessen, M., E. de Goede, J. Groenenboom, F. Zijl, G. Winter, and W. Kranenburg (2018), Onderzoek naar nauwkeurigheid voor zoutindringing met D-HYDRO, *Tech. Rep. 11202219-006-DSC-0008*, Deltares, Delft, the Netherlands, 67 pp.

Tijssen, A., A. Becker, D. Stuparu, and M. Yossef (2014), Quantification of model uncertaintyfor waqua for the upper riverarea, *Tech. Rep. 1207807-002*, Deltares, Delft, the Netherlands.

Tiselj, I., and S. Petelin (1997), Modelling of two-phase flow with second-order accurate scheme, *J. Comput. Phys.*, *136*(2), 503--521, doi:10.1006/jcph.1997.5778.

Tockner, K., C. Zarfl, and C. Robinson (), *Rivers of Europe*.

Toe, C. Y. (2018), Issues in numerical modelling and assessing the flow over weirs and groynes, Master's thesis, Delft University of Technology.

Tolkmitt, G. (1892), *Handbuch der Ingenieurwissenschaften. III Band: Der Wasserbau. Erste Abteilung*, chap. 3, Stauwerke, pp. 213--272, Leipzig: Wilhelm Engelmann.

Tolman, F. (1987), Bochtafsnijding in de maas bij boxmeer, Master's thesis, Delft University of Technology.

Tominaga, A., and I. Nezu (1991), Turbulent structure in compound open-channel flows, *J. Hydraul. Eng.*, *117*(1), 21--41, doi:10.1061/(ASCE)0733-9429(1991)117:1(21).

Tominaga, A., I. Nezu, K. Ezaki, and H. Nakagawa (1989), Three-dimensional turbulent structure in straight open channel flows, *J. Hydraul. Res.*, *27*(1), 149--173, doi:10.1080/00221688909499249.

Tonnon, P. K., and E. de Goede (2021), Voorstel voor oplossen van showstoppers in d-morphology en in d-waves voor 2d-modeltoepassingen in 2021(vervolg op 2020-project), *Memo 10 februari 2021*, Deltares, Delft, the Netherlands.

Toro, E. F. (2001), *Shock-capturing methods for free-surface shallow flows*, 326 pp., John Wiley & Sons, Hoboken, NJ, United States.

Toro, E. F. (2009), *Riemann Solvers and Numerical Methods for Fluid Dynamics*, 3 ed., 724 pp., Springer-Verlag Berlin-Heidelberg, Heidelgberg, Germany, doi:10.1007/b79761.

Toro, E. F., B. Thornber, Q. Zhang, A. Scoz, and C. Contarino (2018), A computational model for the dynamics of cerebrospinal fluid in the spinal subarachnoid space, *J. Biomech. Eng.*, doi:10.1115/1.4041551.

Toro, E. F., L. O. Müller, and A. Siviglia (2020), Bounds for wave speeds in the riemann problem: Direct theoretical estimates, *Computers & Fluids*, *209*, 104,640, doi:10.1016/j.compfluid.2020.104640.

Toro-Escobar, C. M., C. Paola, and G. Parker (1996), Transfer function for the deposition of poorly sorted gravel in response to streambed aggradation, *J. Hydraul. Res.*, *34*(1), 35--53, doi:10.1080/00221689609498763.

Trampush, S. M., S. Huzurbazar, and B. McElroy (2014), Empirical assessment of theory for bankfull characteristics of alluvial channels, *Water Resour. Res.*, *50*(12), 9211--9220, doi:10.1002/2014WR015597.

Travis, J. R., F. H. Harlow, and A. A. Amsden (1976), Numerical calculation of two-phase flows, *Nucl. Sci. Eng.*, *61*(1), 1--10, doi:10.13182/NSE76-A28455.

Trendelenburg (Ed.) (1868), *MONATSBERICHT DER KÖNIGLICH PREUSSISCHEN AKADEMIE DER WISSENSCHAFTEN ZU BERLIN*, BUCHDRUCKEREI DER KÖN1GL. AKADEMIE DER WISSENSCHAFTEN (G. VOGT) UNIVERSITÄTSSTU. 8.

Tritthart, M. (2005), Three dimensional numerical modelling of turbulent river flow using polyhedral finite volumes, Ph.D. thesis.

Tritthart, M., and D. Gutknecht (2007), Three-dimensional simulation of free-surface flows using polyhedral finite volumes, *Engineering Applications of Computational Fluid Mechanics*, *1*(1), 1--14, doi:10.1080/19942060.2007.11015177.

Tron, S., P. Perona, L. Gorla, M. Schwarz, F. Laio, and L. Ridolfi (2015), The signature of randomness in riparian plant root distributions, *Geophys. Res. Lett.*, *42*(17), 7098--7106, doi:10.1002/2015GL064857, 2015GL064857.

Tsubaki, R., S. Baranya, M. Muste, and Y. Toda (2018), Spatio-temporal patterns of sediment particle movement on 2d and 3d bedforms, *Exp. Fluids*, *59*(6), 93, doi:10.1007/s00348-018-2551-y.

Tsuchiya, Y. (1963), On the critical tractive force of graded sand gravels, *Proc. Jpn. Soc. Civ. Eng.*, *1963*(98), 1--9, doi:10.2208/jscej1949.1963.98_1.

Tsujimoto, T. (1982), Sand wave formation due to irregular bed load motion, in *Euromech 156: mechanics of sediment transport Istanbul, 12-14 July, Istambul, Turkey*.

Tsujimoto, T. (1989a), Longitudinal stripes of sorting due to cellular secondary currents, *J. Hydrosci. Hydraul. Eng.*, *7*(1), 23--34.

Tsujimoto, T. (1989b), Formation of alternate longitudinal sorting as an instability of fluvial bed-surface composition, *Doboku Gakkai Ronbunshu*, *411*, 143--150, doi:10.2208/jscej.1989.411_143, (in Japanese).

Tsujimoto, T. (1989c), Formation of longitudinal stripes due to lateral sorting by cellular secondary currents, in *Proc. 33rd Japanese Conference on Hydraulics*, vol. 33, pp. 403--408, doi:10.2208/prohe1975.33.403, (in Japanese).

Tsujimoto, T. (1990a), Static armoring and dynamic pavement, *J. Hydrosci. Hydraul. Eng.*, *8*(1), 55--67.

Tsujimoto, T. (1990b), Instability of longitudinal distribution of fluvial bed-surface composition, *J. Hydrosci. Hydraul. Eng.*, *7*(2), 69--80.

Tsujimoto, T., and K. Motohashi (1989), Formation mechanism and predominant wave length of alternate longitudinal sorting on a stream bed composed of sand and gravel, in *Proc. 33rd Japanese Conference on Hydraulics*, vol. 33, pp. 409--414, doi:10.2208/prohe1975.33.409, (in Japanese).

Tsujimoto, T., and A. Saito (), non-equilibrium profile of suspended sediment concentration.

Tsujimoto, T., A. Mori, T. Okabe, and T. Ohmoto (1990a), Non-equilibrium sediment transport: A generalized model, *J. Hydrosci. Hydraul. Eng.*, *7*(2), 1--25.

Tsujimoto, T., A. Cardoso, and A. Saito (1990b), Open channel flow with spatially varied bed shear stress, *J. Hydrosci. Hydraul. Eng.*, *8*(2), 1--20.

Tubino, M. (1991), Growth of alternate bars in unsteady flow, *Water Resour. Res.*, *27*(1), 37--52, doi:10.1029/90WR01699.

Tubino, M., and W. Bertoldi (2008), *Gravel-Bed Rivers VI: From Process Understanding to River Restoration*, vol. 11, chap. 6: Bifurcations in gravel-bed streams, pp. 133--159, Elsevier B.V., doi:http://dx.doi.org/10.1016/S0928-2025(07)11123-8, gravel-Bed Rivers VI: From Process Understanding to River Restoration.

Tubino, M., R. Repetto, and G. Zolezzi (1999), Free bars in rivers, *J Hydraul Res*, *37*(6), 759--775, doi:10.1080/00221689909498510.

Tucker, G. E., and R. L. Bras (1998), Hillslope processes, drainage density, and landscape morphology, *Water Resour. Res.*, *34*(10), 2751--2764.

Tuijnder, A. (2010), Sand in short supply: Modelling of bedforms, roughness and sediment tansport in rivers under supply-limited conditions, Ph.D. thesis, University of Twente, Enschede, the Netherlands, Netherlands.

Tuijnder, A., and J. Ribberink (2010a), A morphological concept for semi-fixed layers, *Tech. Rep. 2011R-003/WEM-003*, Twente University, Enschede, the Netherlands., 31 pp.

Tuijnder, A., and J. S. Ribberink (2010b), Development of supply-limited transport due to vertical sorting of a sand-gravel mixture, in *Proceedings of the 5th International Conference on Fluvial Hydraulics (River Flow), Braunschweig, Germany, 8-10 September*, edited by R. Murillo Muñoz, pp. 487--492, CRC press, Taylor and Francis Group.

Tuijnder, A., and J. S. Ribberink (2012a), Immobile layer formation due to vertical sorting of immobile grain size fractions, in *Proceedings of the 6th International Conference on Fluvial Hydraulics (River Flow), San José, Costa Rica, 5-7 September*, edited by K. Koll, A. Dittrich, J. Aberle, and P. Geisenhainer, pp. 847--854, Bundesanstalt für Wasserbau, Karlsruhe, Germany.

Tuijnder, A., J. Ribberink, and A. Spruyt (2011), Modelling semi-fixed layers with Delft3D, *Tech. Rep. 2011R-004/WEM-004*, Twente University, Enschede, the Netherlands.

Tuijnder, A., A. Spruyt, and J. Ribberink (2012), Application of the Delft3D semi-fixed layer model to Boven-Rijn and Pannerdensch Kanaal, *Tech. Rep. 2012R-0xx/WEM-0xx*, Twente University, Enschede, the Netherlands., 20 pp.

Tuijnder, A. P., and J. S. Ribberink (2012b), Experimental observation and modelling of roughness variation due to supply-limited sediment transport in uni-directional flow, *J. Hydraul. Res.*, *50*(5), 506--520, doi:10.1080/00221686.2012.719201.

Tuijnder, A. P., J. S. Ribberink, and S. J. M. H. Hulscher (2009), An experimental study into the geometry of supply-limited dunes, *Sedimentology*, *56*(6), 1713--1727, doi:10.1111/j.1365-3091.2009.01054.x.

Turkel, E. (1987), Preconditioned methods for solving the incompressible and low speed compressible equations, *J. Comput. Phys.*, *72*(2), 277--298, doi:10.1016/0021-9991(87)90084-2.

Turkel, E. (1993), Review of preconditioning methods for fluid dynamics, *Appl. Numer. Math.*, *12*(1), 257--284, doi:10.1016/0168-9274(93)90122-8.

Turkel, E. (1999), Preconditioning techniques in computational fluid dynamics, *Annu. Rev. Fluid Mech.*, *31*(1), 385--416, doi:10.1146/annurev.fluid.31.1.385.

Turowski, J. M., D. RICKENMANN, and S. J. DADSON (2010), The partitioning of the total sediment load of a river into suspended load and bedload: a review of empirical data, *Sedimentology*, *57*(4), 1126--1146, doi:10.1111/j.1365-3091.2009.01140.x.

Uchida, T., Y. Kawahara, Y. Hayashi, and A. Tateishi (2020), Eulerian deposition model for sediment mixture in gravel-bed rivers with broad particle size distributions, *Journal of Hydraulic Engineering*, *146*(10), 04020,071, doi:10.1061/(ASCE)HY.1943-7900.0001783.

Udden, J. A. (1914), Mechanical composition of clastic sediments, *GSA Bulletin*, *25*(1), 655, doi:10.1130/GSAB-25-655.

Uijttewaal, W., M. J. Franca, D. Valero, V. Chavarrias, C. Y. Arbós, R. Schielen, and A. Crosato (2020), *Proceedings of the 10th International Conference on Fluvial Hydraulics (River Flow), Delft, the Netherlands, 7--10 July*.

Uijttewaal, W. S. J., and R. Booij (2000), Effects of shallowness on the development of free-surface mixing layers, *Phys. Fluids*, *12*(2), 392--402, doi:10.1063/1.870317.

Uijttewaal, W. S. J., D. Lehmann, and A. van Mazijk (2001), Exchange processes between a river and its groyne fields: Model experiments, *J. Hydraul. Eng.*, *127*(11), 928--936, doi:10.1061/(ASCE)0733-9429(2001)127:11(928).

Uittenbogaard, R. E. (1993), Testing some damping functions for mixing-length turbulence models, *Z721*, Delft Hydraulics Laboratory, Delft, the Netherlands, 42 pp.

Uittenbogaard, R. E., J. A. T. M. van Kester, and G. S. Stelling (1992), Implementation of three turbulence models in 3D-TRISULA for rectangular horizontal grids, *Tech. Rep. Z162*, Delft Hydraulics Laboratory, Delft, the Netherlands, 218 pp.

UNESCO (1969a), Mekong river delta model study, *Tech. rep.*, UNESCO.

UNESCO (1969b), Mathematical model of mekong river delta, *Tech. rep.*, UNESCO.

Urban, O. (2018), Predicting the shallowest river locations, *Tech. Rep.*, HAL24K, 23 pp.

USACE (2021a), HEC-RAS river analysis system, *Tech. rep.*, U.S. Army Corps of Engineers, Institue for Water Resources, Hydrologic Engineering Center, 609 Second Street, Davis, CA, United States., 546 pp.

USACE (2021b), HEC-RAS two-dimensional sediment transport technical reference manual, *Tech. rep.*, U.S. Army Corps of Engineers, Institue for Water Resources, Hydrologic Engineering Center, 609 Second Street, Davis, CA, United States., 116 pp.

USDA (2007), National engineering handbook, part 630, hydrology, *Tech. Rep. 210-VI-NEH*, United States Department of Agriculture, 50 pp.

Utsugawa, T., and M. Shirai (2016), Sand grain producing-transport processes estimated from gravel-sand grain roundness on dams-constructed Tenryu River, central Japan., *Geographical Reports of Tokyo Metropolitan University*, *51*, 101--108.

Valiani, A., and V. Caleffi (2008), Depth{energy and depth{force relationships in open channel flows: Analytical findings, *Advances in Water Resources*, *31*(3), 447--454, doi:https://doi.org/10.1016/j.advwatres.2007.09.007.

Valiani, A., and V. Caleffi (2009), Depth{energy and depth{force relationships in open channel flows. ii: Analytical findings for power-law cross-sections, *Advances in Water Resources*, *32*(2), 213--224, doi:https://doi.org/10.1016/j.advwatres.2008.10.015.

van Balen, W. (a), A parameter study on curved open-channel flows by means of experiments and large-eddy simulations.

van Balen, W. (b), Large-eddy simulations and experiments of single-bend open-channel flow at different water depths.

van Balen, W. (2010), Curved open-channel flows. a numerical study., Ph.D. thesis, Delft University of Technology.

van Balen, W., K. Blanckaert, and W. S. J. Uijttewaal (2010a), Analysis of the role of turbulence in curved open-channel flow at different water depths by means of experiments, les and rans, *J. Turbul.*, *11*, N12, doi:10.1080/14685241003789404.

van Balen, W., W., W. S. J. Uijttewaal, and K. Blanckaert (2010b), Large-eddy simulation of a curved open-channel flow over topography, *Physics of Fluids*, *22*(7), 075,108, doi:10.1063/1.3459152.

van der Kaaij, T., and V. Chavarrias (2019), Preliminary simulations with the 6th generation 3d rmm model, *Tech. Rep. 11203714-015-ZWS-0002*, Deltares, Delft, the Netherlands, 58 pp.

van der Mark, C. F. (2004), Sedimentverdeling bij riviersplitsingen, Master's thesis, Delft University of Technology.

Van der Meulen, B. (2021), River flood reconstruction in the lower rhine valley and delta water levels and discharges in past landscape contexts, Ph.D. thesis, University of Utrecht, The Netherlands.

van der Pijl, S. (), Temporal discretization of the shallow-water equations in d-flow fm, *Tech. rep.*, Deltares, Delft, the Netherlands.

Van der Scheer, P., J. S. Ribberink, and A. Blom (2002), Transport formulas for graded sediment: behaviour of transport formulas and verification with data, *Tech. Rep. 2002R-002*, Civil Engineering, University of Twente, The Netherlands, 124p.

van der Stelt, S. (2012), Rise and fall of periodic patterns in a generalized klausmeier-gray-scott model, Ph.D. thesis, Universiteit van Amsterdam.

van der Ven, G. P. (1979), De waterverdeling tussen de rijntakken in de i7e en i8e eeuw, *De Ingenieur*, *91*(11), 193--199, (in Dutch).

van Duin, O. J. M., J. S. Ribberink, C. M. Dohmen-Janssen, and S. J. M. H. Hulscher (2013), Modelling sediment pick-up and deposition in a dune model, in *Marine and River Dune Dynamics (MARID IV) 15-16 April, Bruges, Belgium.*

van Duin, O. J. M., S. J. M. H. Hulscher, J. S. Ribberink, and C. M. Dohmen-Janssen (2017), Modeling of spatial lag in bed-load transport processes and its effect on dune morphology, *J. Hydraul. Eng.*, *143*(2), 04016,084, doi:10.1061/(ASCE)HY.1943-7900.0001254.

van Genuchten, M. T., and W. J. Alves (1982), Analytical solutions of the one-dimensional convective-dispersive solute transport equation, *Tech. Bulletin 1661*, United States Department of Agriculture.

van Rijn, L., J. A. Roelvink, and W. ter Horst (), Approximation formulae for sand transport by currents and waves and implementation in delft-mor, *Tech. rep.*

van Rooijen, E., E. Mosselman, K. Sloff, and W. Uijttewaal (2020), The effect of small density differences at river confluences, *Water*, *12*(11), doi:10.3390/w12113084.

van der Deijl, E. (2021a), Recente oeverlijnen, huidige oeverlijnen, grenzen aan toelaatbare oevererosie, en prognoses van toekomstige oeverlijnen langs de Maas: Deel 1: afbeelding op luchtfoto's, *Tech. Rep. 11205234-012*, Deltares, Delft, the Netherlands., 55 pp.

van der Deijl, E. (2021b), Recente oeverlijnen, huidige oeverlijnen, grenzen aan toelaatbare oevererosie, en prognoses van toekomstige oeverlijnen langs de Maas: Deel 2: afbeelding op topografische kaart, *Tech. Rep. 11205234-012*, Deltares, Delft, the Netherlands., 55 pp.

van der Deijl, E. (2022), Validatie hoogwater maas juli 2021, *Tech. Rep. 11208053-002-ZWS-0006*, Deltares, Delft, the Netherlands.

van Dijk, W. M. (2013), Meandering rivers - feedbacks between channeldynamics, floodplain and vegetation, Ph.D. thesis.

de Vriend, H. J. (1981), Velocity redistribution in curved rectangular channels, *J. Fluid Mech.*, *107*, 423--439, doi:10.1017/S0022112081001833.

van Kaaij, T., and V. Chavarrias (2020), D-hydro rijnmaasmonding 3d; zoutindringing in de nieuwe waterweg; werkzaamheden 2020, *Tech. rep.*, Deltares, Delft, the Netherlands.

El Kadi Abderrezzak, K., A. D. Moran, E. Mosselman, J.-P. Bouchard, H. Habersack, and D. Aelbrecht (2014), A physical, movable-bed model for non-uniform sediment transport, fluvial erosion and bank failure in rivers, *J. Hydro-environ. Res.*, *8*(2), 95--114, doi:10.1016/j.jher.2013.09.004, moveable Bed Models.

van de Lageweg, W. (2013), Morphodynamics and sedimentary architectureof meandering rivers, Ph.D. thesis.

van Looy, K., and J. Coeck (2005), *Ontwerpcriteria Grinddrempels Grensmaas*, no. INBO.A.1110 in Adviezen van het Instituut voor Natuurbehoud, Instituut voor Natuurbehoud.

van Looy, K., T. de Boeck, and G. van Thuyne (2009), *Grensmaas: evaluatie ecologische monitoring drempels*, no. INBO.A.1902 in Adviezen van het Instituut voor Natuur- en Bosonderzoek, Instituut voor Natuur- en Bosonderzoek, België.

von Neumann, J., and R. D. Richtmyer (1950), A method for the numerical calculation of hydrodynamic shocks, *J. Appl. Phys.*, *21*(3), 232--237, doi:10.1063/1.1699639.

Vanoni, V. A., and N. H. Brooks (1957), Laboratory studies of the roughness and suspended load of alluvial streams, *Tech. Rep. E-68*, Sedimentation Laboratory, California Institute of Technology, Pasadena, CA, United States, 121 pp.

van Rijn, L. C. (2007), Unified view of sediment transport by currents and waves. i: Initiation of motion, bed roughness, and bed-load transport, *Journal of Hydraulic Engineering*, *133*(6), 649--667, doi:10.1061/(ASCE)0733-9429(2007)133:6(649).

van Tets, P. (2020), Testing 1D functionalities in Flexible Mesh: A case study on river bends and bifurcations, *MSc internship report*, Delft University of Technology, 32 pp.

van Leeuwen, Tristan (2005), Numerical simulation of alternating bars in straight channels, *Tech. rep.*, Utrecht University.

van der Veen, R., and R. C. Agtersloot (2021), Topafvoeren hoogwater Maas juli 2021, *Tech. Rep. versie 2.0 d.d. 16-12-2021*, Rura-Arnhem and AHA BV.

van de Ven, G. P. (2003), *Leefbaar laagland. Geschiedenis van de waterbeheersing en landaanwinning in Nederland*, 455 pp., Uitgeverij Matrijs.

de Wit, S. I. (2009), *Dutch Lowlands: Morphogenesis of a Cultural Landscape*, SUN.

VANZO, D., A. SIVIGLIA, G. ZOLEZZI, G. STECCA, and M. TUBINO (2011), Interaction between steady and migrating bars in straight channels, in *RCEM*.

Vanzo, D., A. Siviglia, G. Stecca, and G. Zolezzi (2014), Long term gravel-bed river morphodynamics simulations using morphological factor: are final configurations always reliable?, in *Abstract 3549 presented at the 2014 European Geophysical Union General Assembly 27 April - 2 May*.

Vanzo, D., L. Adami, A. Siviglia, G. Zolezzi, and D. F. Vetsch (2017), The role of numerical diffusion in river alternate bar simulations, in *RCEM*.

Vanzo, D., S. Peter, L. Vonwiller, M. Bürgler, M. Weberndorfer, A. Siviglia, D. Conde, and D. F. Vetsch (2021), basement v3: A modular freeware for river process modelling over multiple computational backends, *Environmental Modelling & Software*, *143*, 105,102, doi:https://doi.org/10.1016/j.envsoft.2021.105102.

Vargas-Luna, A. (2016), Role of vegetation in river bank accretion, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Vargas-Luna, A., A. Crosato, and W. S. J. Uijttewaal (2014), Effects of vegetation on flow and sediment transport: Comparative analyses and validation of predicting models, *Earth Surf. Process. Landf.*, *40*(2), 157--176, doi:10.1002/esp.3633.

Vargas-Luna, A., A. Crosato, P. Byishimo, and W. S. J. Uijttewaal (2018), Impact of flow variability and sediment characteristics on channel width evolution in laboratory streams, *J. Hydraul. Res.*, pp. 1--11, doi:10.1080/00221686.2018.1434836.

Västilä, K., and J. Järvelä (2014), Modeling the flow resistance of woody vegetation using physically based properties of the foliage and stem, *Water Resour. Res.*, *50*(1), 229--245, doi:10.1002/2013WR013819.

van der Vat, M. (2021), Eindevaluatie pilot Langsdammen in de Waal; functie zoetwatervoorziening, *Rapport 11204644*, Deltares, Delft, the Netherlands, september.

Veldkamp, A., J. E. M. Baartman, T. J. Coulthard, D. Maddy, J. M. Schoorl, J. E. A. Storms, A. J. A. M. Temme, R. van Balen, M. J. van De Wiel, W. van Gorp, W. Viveen, R. Westaway, and A. C. Whittaker (2017), Two decades of numerical modelling to understand long term fluvial archives: Advances and future perspectives, *Quat. Sci. Rev.*, *166*, 177--187, doi:10.1016/j.quascirev.2016.10.002.

Venditti, J., R. Humphries, M. Allison, J. Nittrouer, and M. Church (2010a), Morphology and dynamics of a gravel-sand transition, in *9th Federal Interagency Sedimentation Conference, Las Vegas, NV*, p. 11.

Venditti, J., R. Humphries, M. Allison, J. Nittrouer, and M. Church (2010b), Morphology and dynamics of a gravel-sand transition, in *Proceedings of the 9th Federal Interagency Sedimentation Conference, Las Vegas NV.*, vol. 11.

Venditti, J., M. Church, M. Lamb, N. Domarad, and C. Rennie (2014), Controls on the abruptness of gravel-sand transitions, in *Abstract EP52A-06, AGU Fall Meeting, San Francisco*.

Venditti, J. G., and M. Church (2014), Morphology and controls on the position of a gravel-sand transition: Fraser River, British Columbia, *J. Geophys. Res., Earth Surface*, *119*(9), 1959--1976, doi:10.1002/2014JF003147.

Venditti, J. G., N. Domarad, M. Church, and C. D. Rennie (2015), The gravel-sand transition: Sediment dynamics in a diffuse extension, *J. Geophys. Res., Earth Surface*, *120*(6), 943--963, doi:10.1002/2014JF003328.

Veprek, R. G., S. Steiger, and B. Witzigmann (2007), Ellipticity and the spurious solution problem of k-p envelope equations, *Phys. Rev. B*, *76*, 165,320, doi:10.1103/PhysRevB.76.165320.

Verbrugge, L. N. H., and R. J. G. van den Born (2021), Eindevaluatie pilot Langsdammen in de Waal; beleving en participatie, *Rapport*, Radboud Universiteit en Universiteit Twente in samenwerking met Deltares, februari.

Verhaar, P. M. (2003), Morpfologish gedrag Pannerdensche Kop, Q3178, Delft University of Technology, (in Dutch).

Verhagen, H. (2000-10), Water injection dredging, *2nd International Conference Port Development and Coastal Environment: PDCE 2000, 5-7 June 2000, Varna, Bulgaria*.

Verheul, M., J. Joziasse, G. Klaver, and E. van der Meulen (2009), De invloed van de Geul op de concentraties metalen in water en zwevend stof in de Maas, *rapport deltares*, Deltares, Delft.

Verhulst, F. (1990), *Nonlinear Differential Equations and Dynamical Systems*, Springer-Verlag.

Verhulst, F. (2005), *Methods and Applications of Singular Perturbations*, Springer-Verlag New York, doi:10.1007/0-387-28313-7.

Vermaas, H. (1987), Energieverliezen door overlaten: een gewijzigde berekeningsprocedure voor waqua-rivieren versie, *Tech. Rep. Q92*, Delft Hydraulics Laboratory, Delft, the Netherlands., tabellenboek.

Vermeer, K. (1990), MAASMOR : morfologisch model van de Maas in Nederland, *rapport deltares*, WL Delft Hydraulics, Delft, 76 p. pp.

Vermeer, K. (1996), morphological modelling, a personal view, *Tech. rep.*, HKV consultants.

Verwer, J. G., and J. M. Sanz-Serna (1984), Convergence of method of lines approximations to partial differential equations, *Computing*, *33*(3), 297--313, doi:10.1007/BF02242274.

Verwolf, G. (1977), Bochtafsnijding bij boxmeer : noodzaak en afmetingen bestorting : scheepvaartproblemen, nota 77.2 RWS.

Vesipa, R., C. Camporeale, and L. Ridolfi (2017), Effect of river flow fluctuations on riparian vegetation dynamics: Processes and models, *Adv. Water Resour.*, *110*(Supplement C), 29--50, doi:10.1016/j.advwatres.2017.09.028.

Vetsch, D., D. Ehrbar, S. Peter, P. Russelot, C. Volz, L. Vonwiller, R. Faeh, D. Farshi, R. Mueller, and R. Veprek (2006), *BASEMENT, Basic Simulation Environment for Computation of Environmental Flow and Natural Hazard Simulation, software manual.*, Laboratory of Hydraulics, Hydrology and Glaciology (VAW), Eidgenössische Technische Hochschule Zürich, Zürich, Switzerland.

Villaret, C., J.-M. Hervouet, R. Kopmann, U. Merkel, and A. G. Davies (2013), Morphodynamic modeling using the Telemac finite-element system, *Computers & Geosciences*, *53*, 105--113, doi:10.1016/j.cageo.2011.10.004.

Villemonte, J. R. (1947), Submerged-weir discharge studies, *Engineering News-Record*, pp. 866--869.

da Vinci, L. (ca. 1478--1518), *The notebook of Leonardo da Vinci*, (translated by Jean Paul Richter in 1888).

Viparelli, E., R. Haydel, M. Salvaro, P. R. Wilcock, and G. Parker (2010a), River morphodynamics with creation/consumption of grain size stratigraphy 1: Laboratory experiments, *J. Hydraul. Res.*, *48*(6), 715--726, doi:10.1080/00221686.2010.515383.

Viparelli, E., O. E. Sequeiros, A. Cantelli, P. R. Wilcock, and G. Parker (2010b), River morphodynamics with creation/consumption of grain size stratigraphy 2: Numerical model, *J. Hydraul. Res.*, *48*(6), 727--741, doi:10.1080/00221686.2010.526759.

Viparelli, E., D. Gaeuman, P. Wilcock, and G. Parker (2011), A model to predict the evolution of a gravel bed river under an imposed cyclic hydrograph and its application to the Trinity River, *Water Resour. Res.*, *47*(2), W02,533, doi:10.1029/2010WR009164.

Viparelli, E., A. Blom, and G. Parker (2012), Modeling stratigraphy formed by prograding Gilbert-type deltas, in *Proceedings of the 6th International Conference on Fluvial Hydraulics (River Flow), San José, Costa Rica, 5-7 September*, edited by R. Murillo, pp. 5--7, Taylor and Francis Group, London.

Viparelli, E., J. W. Lauer, P. Belmont, and G. Parker (2013), A numerical model to develop long-term sediment budgets using isotopic sediment fingerprints, *Computers & Geosciences*, *53*(0), 114--122, doi:http://dx.doi.org/10.1016/j.cageo.2011.10.003.

Viparelli, E., A. Blom, C. Ferrer-Boix, and R. Kuprenas (2014), Comparison between experimental and numerical stratigraphy emplaced by a prograding delta, *Earth Surf. Dyn.*, *2*(1), 323--338, doi:10.5194/esurf-2-323-2014.

Viparelli, E., J. W. Lauer, and P. Belmont (2014), MAST-1D, a model to route sediment and tracers in channel-floodplain complexes, in *Abstract EP44A-01, AGU Fall Meeting, San Francisco*.

Viparelli, E., J. A. Nittrouer, and G. Parker (2015), Modeling flow and sediment transport dynamics in the lowermost mississippi river, louisiana, usa, with an upstream alluvial-bedrock transition and a downstream bedrock-alluvial transition: implications for land-building using engineered diversions., *J. Geophys. Res., Earth Surface*, *120*(3), 534--563, doi:10.1002/2014JF003257.

Viparelli, E., R. R. H. Moreira, and A. Blom (2017), Modelling stratigraphy-based GBR morphodynamics., in *Gravel-Bed Rivers: Process and Disasters*, edited by D. Tsutsumi and J. Laronne, chap. 23, pp. 609--637, Wiley-Blackwell, Hoboken, NJ, United States, doi:10.1002/9781118971437.ch23.

Visconti, F., L. Stefanon, C. Camporeale, F. Susin, L. Ridolfi, and S. Lanzoni (2012), Bed evolution measurement with flowing water in morphodynamics experiments, *Earth Surf. Process. Landf.*, *37*(8), 818--827, doi:10.1002/esp.3200.

Visser, P. J. (2000), Bodemontwikkeling Rijnsysteem: Een verkenning van omvang, oorzaken, toekomstige ontwikkelingen en mogelijke maatregelen (bed development of the Rhine system: An exploration of magnitude, causes, future developments and possible measures), *Report to Rijkswaterstaat Oost-Nederland*, Delft University of Technology, Delft, the Netherlands, (in Dutch).

Visser, P. J., H. Havinga, and W. B. M. ten Brinke (1999), Hoe houden we de rivier bevaarbaar? daling zomerbed rijntakken vraagt aandacht, *Land + Water*, *39(9)*, 24--27.

Voepel, H., R. Schumer, and M. A. Hassan (2013), Sediment residence time distributions: Theory and application from bed elevation measurements, *J. Geophys. Res., Earth Surface*, *118*(4), 2557--2567, doi:10.1002/jgrf.20151.

Vogel, K. R., A. van Niekerk, R. L. Slingerland, and J. S. Bridge (1992), Routing of heterogeneous sediments over movable bed: Model verification, *J. Hydraul. Eng.*, *118*(2), 263--279, doi:10.1061/(ASCE)0733-9429(1992)118:2(263).

Vogel, R. M., J. R. Stedinger, and R. P. Hooper (2003), Discharge indices for water quality loads, *Water Resour. Res.*, *39*(10), 1--9, doi:10.1029/2002WR001872, 1273.

Vollmer, S., and E. Gölz (2006), *Sediment dynamics and the hydromorphology of fluvial systems.*, chap. Sediment monitoring and sediment management in the Rhine River., p. 626, IAHR.

Volp, N. (), Subgrid is dancing with sediment; a full subgrid approach for morphodynamic modelling, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands., doi:10.4233/uuid:271c4360-e242-42aa-8974-72fe012365ee.

Volp, N. D., B. C. van Prooijen, J. D. Pietrzak, and G. S. Stelling (2015), A subgrid based approach for morphodynamic modelling, *Adv. Water Resour.*, pp. --, doi:10.1016/j.advwatres.2015.07.013.

Volp, N. D., B. C. van Prooijen, J. D. Pietrzak, and G. S. Stelling (2016), A subgrid based approach for morphodynamic modelling, *Advances in Water Resources*, *93*, 105--117, doi:10.1016/j.advwatres.2015.07.013, numerical modelling of river morphodynamics.

Vonwiller, L., D. F. Vetsch, and R. M. Boes (2018), Modeling streambank and artificial gravel deposit erosion for sediment replenishment, *Water*, *10*(4), 508, doi:10.3390/w10040508.

Voogt, J., and C. B. Vreugdenhil (1974), Experiences with mathematical models used for water quality and quantity problems, *Communications 18*, Rijkswaterstaat.

Vreugdenhil, C. B. (1979), Waterloopkundige berekeningen, *Handleiding college b84*, Technische Hogeschool Delft.

Vreugdenhil, C. B. (1989), *Computational Hydraulics*.

Vreugdenhil, C. B. (1994), *Numerical Methods for Shallow-Water Flow*, 262 pp., Springer, Dordrecht, the Netherlands, doi:10.1007/978-94-015-8354-1.

Vreugdenhil, C. B., and M. de Vries (1973), analytical approaches to non -steady bed load transport, *Tech. Rep. S 78 part IV*, Delft Hydraulics Laboratory, Delft, the Netherlands, 32 pp.

Vreugdenhil, K., G. Alberts, and P. van Gelder (2001), Een eeuw wiskunde en werkelijkheid waterloopkunde, *Nieuw Archiefvoor Wiskunde*, *3*, 266--276, (in Dutch).

de Vriend, H. J. (1976), A mathematical model of steady flow in curved shallow channels, *Tech. Rep. 76-1*, Delft Hydraulics Laboratory, Delft, the Netherlands, 137 pp.

de Vriend, H. J. (1977), A mathematical model of steady flow in curved shallow channels, *J. Hydraul. Res.*, *15*(1), 37--54, doi:10.1080/00221687709499748.

de Vriend, H. J. (1981), Steady flow in shallow channel bends, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

de Vriend, H. J. (1985), Flow formulation in mathematical models of 2dh morphological changes, *Tech. Rep. R 1747-5*, Delft Hydraulics Laboratory, Delft, the Netherlands, 137 pp.

de Vriend, H. J. (1987), Analysis of horizontally two-dimensional morphological evolutions in shallow water, *J. Geophys. Res., C: Oceans*, *92*(C4), 3877--3893, doi:10.1029/JC092iC04p03877.

de Vriend, H. J. (2010), Morfologische effecten kribverlaging. notitie deskundigenoordeel project kribverlaging, *Tech. rep.*, TU Delft, Delft.

de Vriend, H. J. (2015), The long-term response of rivers to engineering works and climate change, *Proc. Inst. Civ. Eng.*, *168(CE3)*, 139--145, doi:10.1680/cien.14.00068.

de Vriend, H. J., and N. Struiksma (1983), Flow and bed deformationin river bends, *Tech. Rep. 317*, Delft Hydraulics Laboratory, Delft, the Netherlands.

de Vries, M. (1966), Bepaling bedvormende afvoer, *Tech. Rep. V 163*, Delft Hydraulics Laboratory, Delft, the Netherlands.

de Vries, M. (1959), Rivierstudie Maas, *rapport*, Waterloopkundig Laboratorium, Delft.

de Vries, M. (1969), Solving river problems by hydraulic and mathematical modelling, in *Conference on selected problems for the theory and simulation of hydrodynamic phenomena*.

de Vries, P., C. Huang, and B. Aldrich (2014), Sediment transport modeling along the gravel-sand transition zone of the snohomish river, in *Proceedings of the American Geopshysical Union Fall Meeting, San Francisco, United States*, poster WA EP53C-3675.

de Vries, M. (1959), Elementaire hydraulica, *Tech. rep.*, Waterloopkundig laboratorium delft.

de Vries, M. (1965), Considerations about non-steady bed load transport in open channels, *Tech. Rep. 36*, Delft Hydraulics Laboratory, Delft, the Netherlands, 10 pp.

de Vries, M. (1966), Application of luminophores in sandtransport-studies, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

de Vries, M. (1971a), Aspecten van zandtransport in open waterlopen, *Tech. rep.*, Afd. der Weg- en Waterbouwkunde, Technische Hogeschool Delft, Delft, The Netherlands, (in Dutch).

de Vries, M. (1971b), Solving river problems by hydraulics and mathematical models, *Tech. Rep. 76b*, Delft Hydraulics Laboratory, Delft, the Netherlands.

de Vries, M. (1973), River-bed variations - aggradation and degradation, *Tech. Rep. 107*, Delft Hydraulics Laboratory, Delft, the Netherlands, 21 pp.

de Vries, M. (1974), Sedimenttransport, *Lecture Notes f10*, Delft University of Technology, Delft, the Netherlands, 65 pp., (in Dutch).

de Vries, M. (1975), A morphological time-scale for rivers, in *Proc. of the 16th IAHR World Congress, 27 July--1 August, São Paulo, Brazil*.

de Vries, M. (1976), Morphological computations, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

de Vries, M. (1982), A sensitivity analysis applied to morphological computations, in *3rd congress of the Asian and Pacific Division of the IAHR, Badung, Indonesia*.

de Vries, M. (1990), Rivieren, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

de Vries, M. (1993a), *Use of models for river problems*, 85 pp., UNESCO.

de Vries, M. (1993b), River engineering, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

de Vries, M., and J. J. van der Zwaard (1975), Movable bed river problems, *Tech. Rep. 156*, Delft Hydraulics Laboratory, Delft, the Netherlands, 17 pp.

van Vuren, B. G., A. Hauschild, W. Ottevanger, J. I. Crebas, and M. F. M. Yossef (2008), Voorspelinstrument duurzame vaarweg : reducing computation time, *rapport*, WL Delft Hydraulics, Delft, 111 p. pp.

van Vuren, S., and W. Ottevanger (2006), Inbouw duinhoogte- en ruwheidsvoorspellers in Delft3D- 3DMOR, *Tech. rep.*, WL | Delft Hydraulics, Delft.

van Vuren, S., and C. J. Sloff (2006), Verbetering 1-d rijntakkenmodel vanaf andernach, *Tech. Rep. Q4130*, Delft Hydraulics.

van Vuren, S., E. Mosselman, C. J. Sloff, and B. Vermeulen (2006), Voorspelinstrument duurzame vaarweg : initiele modelbouw en demonstratieberekeningen, *rapport*, WL Delft Hydraulics, Delft, 60 p. pp.

van Vuren, S., A. Paarlberg, and H. Havinga (2015), The aftermath of room for the river and restoration works: Coping with excessive maintenance dredging, *J. Hydro-environ. Res.*, *9*(2), 172--186, doi:10.1016/j.jher.2015.02.001, special Issue on Environmental Hydraulics.

Vázquez-Tarrío, D., A. Recking, F. Liébault, M. Tal, and R. Menéndez-Duarte (2019), Particle transport in gravel-bed rivers: Revisiting passive tracer data, *Earth Surface Processes and Landforms*, *44*(1), 112--128, doi:10.1002/esp.4484.

Vázquez-Tarrío, D., M. Tal, E. Parrot, and H. Piégay (2022), Can we incorrectly link armouring to damming? a need to promote hypothesis-driven rather than expert-based approaches in fluvial geomorphology, *Geomorphology*, *413*, 108,364, doi:https://doi.org/10.1016/j.geomorph.2022.108364.

Wainwright, J., A. J. Parsons, J. R. Cooper, P. Gao, J. A. Gillies, L. Mao, J. D. Orford, and P. G. Knight (2015), The concept of transport capacity in geomorphology, *Rev. Geophys.*, *53*(4), 1155--1202, doi:10.1002/2014RG000474.

Walling, D. E. (1983), The sediment delivery problem, *J. Hydrol.*, *65*(1), 209--237, doi:10.1016/0022-1694(83)90217-2.

Walshe, M. (1995), *The Long Discourses of the Buddha: A Translation of the Digha Nikaya*, 648 pp., Wisdom Publications, Somerville, MA, United States.

Walstra, D. J., and L. C. van Rijn (2003), Modeling of sand transport in Delft3D, *Tech. Rep. Z3624*, Delft Hydraulics Laboratory, Delft, the Netherlands.

van der Wal, M. (2013), Waterstandsverlaging door de pilot kribverlaging in de Waal : monitoring waterstanden 2009 - 2011, *rapport*, Deltares, Delft, 140 p. pp.

Wang, B., and Y. J. Xu (2018a), Dynamics of 30 large channel bars in the lower mississippi river in response to river engineering from 1985 to 2015, *Geomorphology*, *300*(Supplement C), 31--44, doi:10.1016/j.geomorph.2017.09.041.

Wang, B., and Y. J. Xu (2018b), Decadal-scale riverbed deformation and sand budget of the last 500 km of the mississippi river: Insights into natural and river engineering effects on a large alluvial river, *J. Geophys. Res., Earth Surface*, *123*(5), 874--890, doi:10.1029/2017JF004542.

Wang, G., J. Xia, and B. Wu (2008a), Numerical simulation of longitudinal and lateral channel deformations in the braided reach of the Lower Yellow River, *J. Hydraul. Eng.*, *134*(8), 1064--1078, doi:10.1061/(ASCE)0733-9429(2008)134:8(1064).

Wang, Z. B., and T. van der Kaaij (1994), Morphodynamic development of secondary channel systems along Rhine branches in the Netherlands, *rapport*, WL Delft Hydraulics, Delft, 96 p. pp.

Wang, Z. B., M. D. Vries, R. J. Fokkink, and A. Langerak (1995), Stability of river bifurcations in id morphodynamic models, *J. Hydraul. Res.*, *33*(6), 739--750, doi:10.1080/00221689509498549.

Wang, Z. B., Z. Wang, and H. J. de Vriend (2008b), Impact of water diversion on the morphological development of the Lower Yellow River, *Int. J. Sediment Res.*, *23*(1), 13--27, doi:10.1016/S1001-6279(08)60002-5.

Warrier, S. (2014), *Kamandalu: The Seven Sacred Rivers of Hinduism*, 280 pp., Mayur University, London, United Kingdom.

Watanabe, Y., and K. Kuwamura (2006), Mode-decrease process of double-row bars, in *RCEM*, edited by G. Parker and M. García, Taylor and Francis, London, United Kingdom.

Wathen, S. J., R. I. Ferguson, T. B. Hoey, and A. Werritty (1995), Unequal mobility of gravel and sand in weakly bimodal river sediments, *Water Resour. Res.*, *31*(8), 2087--2096, doi:10.1029/95WR01229.

Watson, J. (1960), On the non-linear mechanics of wave disturbances in stable and unstable parallel flows part 2. the development of a solution for plane poiseuille flow and for plane couette flow, *J. Fluid Mech.*, *9*(3), 371--389, doi:10.1017/S0022112060001171.

Watson, J. (1962), On spatially-growing finite disturbances in plane poiseuille flow, *J. Fluid Mech.*, *14*(2), 211--221, doi:10.1017/S0022112062001172.

van Weerdenburg, R. (2018), Measured change in bed elevation and surface texture near longitudinal training dams in the Waal River, *Tech. rep.*, Delft University of Technology, Delft, the Netherlands.

van der Wegen, M., and B. E. Jaffe (2014), Processes governing decadal-scale depositional narrowing of the major tidal channel in san pablo bay, california, usa, *Journal of Geophysical Research: Earth Surface*, *119*(5), 1136--1154, doi:https://doi.org/10.1002/2013JF002824.

van der Wegen, M., R. Schrijvershof, A. Colina Alonso, Y. Broekema, W. Kranenburg, and B. Huisman (2021), Hydrodynamics in the pits of borssele and hansweert: Data-analysis and delft3d-fm modeling, *Tech. rep.*, Flanders Marine Institute, 54 pp.

Werner, M. G. F., M. Ververs, C. van, Haselen, U. Pakes., K. Daamen, and M. Muerlebach (2000), A comparison of methods for generating cross sections for flood modelling using detailed floorplain elevation models, in *Proceedings of the European conference on advances in flood research, 1-11 November*, vol. 1, edited by A. Bronstert and C. Bismuth, pp. 73--83, Potsdam institute for climate impact research.

Werritty, A. (2006), Sustainable flood management: oxymoron or new paradigm?, *Area*, *38*(1), 16--23.

Wesselius, C., and J. de Jong (2017), Become acquainted with d-flow flexible mesh: Hand-out for the use of d-flow fm in interactor, deltares (unpublished).

Wetser, A. (2017), Riverbank protection removal to enhancebar formation for habitat diversity, *Msc thesis*, Delft University of Technology, Delft, the Netherlands.

White, D. C., and P. A. Nelson (2023), Flume investigation into mechanisms responsible for particle sorting in gravel-bed meandering channels, *Journal of Geophysical Research: Earth Surface*, *128*(1), e2022JF006,821, doi:https://doi.org/10.1029/2022JF006821, e2022JF006821 2022JF006821.

White, F. M. (1999), *Fluid mechanics*, 4 ed., 1023 pp., McGrawHill, New York.

Whiting, P. J., W. E. Dietrich, L. B. Leopold, T. G. Drake, and R. L. Shreve (1988), Bedload sheets in heterogeneous sediment, *Geology*, *16*(2), 105--108, doi:10.1130/0091-7613(1988)016⟨0105:BSIHS⟩2.3.CO;2.

Wienk, T. (2021), Evaluation of the resilience of inland waterway transport to increasing periods of low flow, following a dynamic adaptive policy pathway approach, Master's thesis, Delft University of Technology.

Wiersma, A. (2015), De ondergrond van de Boven Merwede, Dordtsche Kil, Nieuwe Maas en Nieuwe Waterweg : in relatie tot stabiliteit van oevers, onderwatertaluds en waterbodems, *rapport deltares*, Deltares, Delft, 83 p. pp.

Wiesemann, J.-U., P. Mewis, and U. C. E. Zanke (2006), Downslope transport (transverse sediment transport), in *Third Chinese-German Joint Symposium on Coastal and Ocean Engineering, National Cheng Kung University, Tainan, China, November 8--16.*

Wiggins, S. (2003), *Introduction to Applied Nonlinear Dynamical Systems and Chaos*, *Texts in Applied Mathematics*, vol. 2, 2 ed., 844 pp., Springer-Verlag New York, NY, United States, doi:10.1007/b97481.

Wijbenga, J. H. A. (1990), Weergave van extra energieverlies in rivcur, *Tech. Rep. Q910*, Delft Hydraulics Laboratory, Delft, the Netherlands, 126 pp.

van der Wijk, R., and R. van der Mark (2020), Evaluatie pilot langsdammen - functie vaarweg: Wp7, *Concept report (in preparation) 11204644-009-ZWS-0003*, Deltares, Delft, the Netherlands.

van der Wijk, R., T. van der Kaaij, and W. Kranenburg (2019), Data-analyse verzilting Hollandsche IJssel en Lek droogteperiode 2018, *Tech. Rep. 11203735-004-ZWS-0004*, Deltares, Delft, the Netherlands.

Wilbers, A. (1996), The border meuse over the years. a study into the morphological changes of the bed of the meuse river in the period 1978 through 1998, *Tech. rep.*, Faculteit Ruimtelijke Wetenschappen, Vakgroep Fysische Geografie, Universiteit Utrecht. Nederland.

Wilbers, A. W. E., and W. B. M. Ten Brinke (2003), The response of subaqueous dunes to floods in sand and gravel bed reaches of the dutch rhine, *Sedimentology*, *50*(6), 1013--1034, doi:10.1046/j.1365-3091.2003.00585.x.

Wilbraham, H. (1848), On a certain periodic function, *The Cambridge and Dublin Mathematical Journal*, *3*, 198--201.

Wilcock, P. R. (1998), Two-fraction model of initial sediment motion in gravel-bed rivers, *Science*, *280*, 410--412, doi:10.1126/science.280.5362.410.

Wilcock, P. R., and J. C. Crowe (2003), Surface-based transport model for mixed-size sediment, *J. Hydraul. Eng.*, *129*(2), 120--128, doi:10.1061/(ASCE)0733-9429(2003)129:2(120).

Wilcock, P. R., and B. T. DeTemple (2005), Persistence of armor layers in gravel-bed streams, *Geophys. Res. Lett.*, *32*(8), L08,402, doi:10.1029/2004GL021772.

Wilcock, P. R., and B. W. McArdell (1993), Surface-based fractional transport rates: Mobilization thresholds and partial transport of a sand-gravel sediment, *Water Resour. Res.*, *29*(4), 1297--1312, doi:10.1029/92WR02748.

Wilcock, P. R., and B. W. McArdell (1997), Partial transport of a sand/gravel sediment, *Water Resour. Res.*, *33*(1), 235--245, doi:10.1029/96WR02672.

Wilcock, P. R., S. T. Kenworthy, and J. C. Crowe (2001), Experimental study of the transport of mixed sand and gravel, *Water Resour. Res.*, *37*(12), 3349--3358, doi:10.1029/2001WR000683.

Wildt, D., C. Hauer, H. Habersack, and M. Tritthart (2022), Les two-phase modelling of suspended sediment transport using a two-way coupled euler{lagrange approach, *Advances in Water Resources*, *160*, 104,095, doi:https://doi.org/10.1016/j.advwatres.2021.104095.

de Wildt, P. (1981), Sedimenttransport in de maas, nota 81.24 RWS.

de Wildt, P. (1983), Erosie bochtafsnijding Boxmeer, *RWS, WW, -rapporten ; nota 83.6 ; projectnr 65.017.00 171229*, Ministerie van Verkeer en Waterstaat, Rijkswaterstaat, Directie Waterhuishouding en Waterbeweging (RWS, WW), 16 pp.

Williams, G. P. (1978), Bankfull discharge of rivers, *Water Resour. Res.*, *14*(6), 1141--1154, doi:10.1029/WR014i006p01141.

Williams, H. F. L., and M. C. Roberts (1989), Holocene sea-level change and delta growth: Fraser River delta, British Columbia, *Can. J. Earth Sci.*, *26*(9), 1657--1666, doi:10.1139/e89-142.

Williams, R. D., R. Measures, D. M. Hicks, and J. Brasington (2016), Assessment of a numerical model to reproduce event-scale erosion and deposition distributions in a braided river, *Water Resour. Res.*, *52*(8), 6621--6642, doi:10.1002/2015WR018491.

Wilson, C. A. M. E., P. D. Bates, and J. M. Hervouet (2002), Comparison of turbulence models for stage-discharge rating curve prediction in reach-scale compound channel flows using two-dimensional finite element methods, *J. Hydrol.*, *257*(1), 42--58, doi:10.1016/S0022-1694(01)00553-4.

Wilson, G., D. A. Aruliah, C. T. Brown, N. P. Chue Hong, M. Davis, R. T. Guy, S. H. D. Haddock, K. D. Huff, I. M. Mitchell, M. D. Plumbley, B. Waugh, E. P. White, and P. Wilson (2014), Best practices for scientific computing, *PLOS Biology*, *12*(1), 1--7, doi:10.1371/journal.pbio.1001745.

Wilson, G. W., and A. E. Hay (2016), Acoustic observations of near-bed sediment concentration and flux statistics above migrating sand dunes, *Geophys. Res. Lett.*, *43*(12), 6304--6312, doi:10.1002/2016GL069579.

van Winden, A., B. Reeze, and P. Veldt (2018), Inventarisatie van zandoverslag op de oeverwal van de Waaltrajecten met langsdammen in het voorjaar 2018, *Tech. rep.*, Bureau Stroming, (in Dutch).

Winterwerp, J. C., T. van Kessel, D. S. van Maren, and B. C. van Prooijen (2022), *Fine Sediment in Open WaterFrom Fundamentals to Modeling*.

Wohl, E. (2013), Floodplains and wood, *Earth Sci. Rev.*, *123*, 194 -- 212, doi:http://dx.doi.org/10.1016/j.earscirev.2013.04.009.

Wohl, E., P. L. Angermeier, B. Bledsoe, G. M. Kondolf, L. MacDonnell, D. M. Merritt, M. A. Palmer, N. L. Poff, and D. Tarboton (2005), River restoration, *Water Resour. Res.*, *41*(10), W10,301, doi:10.1029/2005WR003985.

Wolcott, J. (1988), Nonfluvial control of bimodal grain-size distributions in river-bed gravels, *J. Sediment. Res.*, *58*(6), 979--984, doi:10.1306/212F8ED6-2B24-11D7-8648000102C1865D.

Wolman, M. G., and L. B. Leopold (1957), River flood plains: Some observations on their formation, *Tech. Rep.*, US Department of the Interior, Geological Survey.

Wolman, M. G., and J. P. Miller (1960), Magnitude and frequency of forces in geomorphic processes, *J. Geol.*, *68*(1), 54--74.

Wong, M., and G. Parker (2006a), One-dimensional modeling of bed evolution in a gravel bed river subject to a cycled flood hydrograph, *J. Geophys. Res., Earth Surface*, *111*(F3), F03,018, doi:10.1029/2006JF000478.

Wong, M., and G. Parker (2006b), Reanalysis and correction of bed-load relation of Meyer-Peter and Müller using their own database, *J. Hydraul. Eng.*, *132*(11), 1159--1168, doi:10.1061/(ASCE)0733-9429(2006)132:11(1159).

Wong, M., G. Parker, P. De Vries, T. M. Brown, and S. J. Burges (2007), Experiments on dispersion of tracer stones under lower-regime plane-bed equilibrium bed load transport, *Water Resour. Res.*, *43*(3), W03,440, doi:10.1029/2006WR005172.

Woodhouse, M. J., A. R. Thornton, C. G. Johnson, B. P. Kokelaar, and J. M. N. T. Gray (2012), Segregation-induced fingering instabilities in granular free-surface flows, *J. Fluid Mech.*, *709*, 543--580, doi:10.1017/jfm.2012.348.

Wright, N., and A. Crosato (2011), The hydrodynamics and morphodynamics of rivers, in *Treatise on water science*, vol. 2, edited by P. Wilderer, pp. 135--156, Academic Press, Oxford.

Wright, S., and G. Parker (2004), Flow resistance and suspended load in sand-bed rivers: Simplified stratification model, *J. Hydraul. Eng.*, *130*(8), 796--805, doi:10.1061/(ASCE)0733-9429(2004)130:8(796).

Wright, S., and G. Parker (2005a), Modeling downstream fining in sand-bed rivers. I: Formulation, *J. Hydraul. Res.*, *43*(6), 613--620, doi:10.1080/00221680509500381.

Wright, S., and G. Parker (2005b), Modeling downstream fining in sand-bed rivers. II: Application, *J. Hydraul. Res.*, *43*(6), 621--631, doi:10.1080/00221680509500382.

WSV (2023), Langfristige Sicherung der Geschiebezugabe in Iffezheim, https://www.wsa-oberrhein.wsv.de/Webs/WSA/Oberrhein/DE/1_Wasserstrasse/Projekte/Langfristige-Sicherung-der-Geschiebezugabe/std_node.html, accessed: 2023-01-31.

Wu, F., and K. Yang (2004), Entrainment probabilities of mixed-size sediment incorporating near-bed coherent flow structures, *J. Hydraul. Eng.*, *130*(12), 1187--1197, doi:10.1061/(ASCE)0733-9429(2004)130:12(1187).

Wu, F. C., Y. C. Shao, and Y. C. Chen (2011), Quantifying the forcing effect of channel width variations on free bars: Morphodynamic modeling based on characteristic dissipative galerkin scheme, *J. Geophys. Res., Earth Surface*, *116*(F3), F03,023, doi:10.1029/2010JF001941.

Wu, W. (2004), Depth-averaged two-dimensional numerical modeling of unsteady flow and nonuniform sediment transport in open channels, *J. Hydraul. Eng.*, *130*(10), 1013--1024, doi:10.1061/(ASCE)0733-9429(2004)130:10(1013).

Wu, W. (2007), *Computational River Dynamics*, 494 pp., Taylor & Francis, London, United Kingdom.

Wu, W., S. S. Y. Wang, and Y. Jia (2000), Nonuniform sediment transport in alluvial rivers, *J. Hydraul. Res.*, *38*(6), 427--434, doi:10.1080/00221680009498296.

Wu, Z., E. Foufoula-Georgiou, G. Parker, A. Singh, X. Fu, and G. Wang (2019), Analytical solution for anomalous diffusion of bedload tracers gradually undergoing burial, *J. Geophys. Res., Earth Surface*, *124*(1), 21--37, doi:10.1029/2018JF004654.

Wurms, S., and P. M. Schröeder (2012), Evaluation of strategies for the acceleration of morphodynamic simulations against the background of waterways maintenance, in *Proceedings of the 6th International Conference on Fluvial Hydraulics (River Flow), San José, Costa Rica, 5-7 September*, vol. 2, edited by R. M. M. noz, pp. 1235--1241, CRC press, Taylor and Francis Group.

Xia, J., G. Wang, and B. Wu (2004), Two-dimensional numerical modeling of the longitudinal and lateral channel deformations in alluvial rivers, *Science in China Series E: Technological Sciences*, *47*(1), 199--211, doi:10.1360/04ez0017.

Yager, E. M., M. Kenworthy, and A. Monsalve (2015), Taking the river inside: Fundamental advances from laboratory experiments in measuring and understanding bedload transport processes, *Geomorphology*, *244*, 21 -- 32, doi:http://dx.doi.org/10.1016/j.geomorph.2015.04.002, laboratory Experiments in Geomorphology 46th Annual Binghamton Geomorphology Symposium 18-20 September 2015.

Yalin, M. S. (1964a), Geometrical properties of sand wave, *J. Hydraulics Div.*, *90*(5), 105--119.

Yalin, M. S. (1964b), Geometrical properties of sand wave, *J. Hydraulics Div.*, *90*(5), 105--119.

Yalin, M. S. (1985), On the determination of ripple geometry, *J. Hydraul. Eng.*, *111*(8), 1178--1155, doi:10.1061/(ASCE)0733-9429(1985)111:8(1148).

Yalin, M. S., and H. Scheuerlein (), Friction factors in alluvial rivers.

Yamaguchi, S., S. Giri, Y. Shimizu, and J. M. Nelson (), Morphological computation of dune evolution with equilibrium and non-equilibrium sediment-transport models, *Water Resources Research*, *n/a*(n/a), doi:10.1029/2018WR024166.

Yang, S.-L., P.-X. Ding, and S.-L. Chen (2001), Temporal change in bed level of a river mouth channel, Yangtze River mouth: With emphasis on the response to river discharge and storm, *J. Coast. Res.*, *17*(2), 297--308.

Yang, S.-Q. (2005), Prediction of total bed material discharge, *J. Hydraul. Res.*, *43*(1), 12--22, doi:10.1080/00221680509500107.

Yang, X., W. An, W. Li, and S. Zhang (2020), Implementation of a local time stepping algorithm and its acceleration effect on two-dimensional hydrodynamic models, *Water*, *12*(4), doi:10.3390/w12041148.

Yatsu, E. (1955), On the longitudinal profile of the graded river, *EOS, Trans. Am. Geophys. Union*, *36(4)*, 655--663.

Ye, J., and J. A. McCorquodale (1997), Depth-averaged hydrodynamic model in curvilinear collocated grid, *J. Hydraul. Eng.*, *123*(5), 380--388, doi:10.1061/(ASCE)0733-9429(1997)123:5(380).

Yee, H., R. Warming, and A. Harten (1985), Implicit total variation diminishing (TVD) schemes for steady-state calculations, *J. Comput. Phys.*, *57*(3), 327--360, doi:10.1016/0021-9991(85)90183-4.

Yen, B. C. (2002), Open channel flow resistance, *J. Hydraul. Eng.*, *128*, 20--39, doi:10.1061/(ASCE)0733-9429(2002)128:1(20).

Ylla Arbós, C., A. Blom, S. van Vuren, and R. M. J. Schielen (2019), Bed level change in the upper Rhine Delta since 1926 and rough extrapolation to 2050, *Tech. Rep.*, Delft University of Technology, Delft, the Netherlands.

Ylla Arbós, C., A. Blom, E. Viparelli, M. Reneerkens, R. M. Frings, and R. M. J. Schielen (2021), River response to anthropogenic modification: Channel steepening and gravel front fading in an incising river, *Geophysical Research Letters*, *48*(4), e2020GL091,338, doi:https://doi.org/10.1029/2020GL091338, e2020GL091338 2020GL091338.

Yossef, M., E. Mosselman, H. Jagers, C. Sloff, S. van Vuren, and B. Vermeulen (2006), Voorspelinstrument duurzame vaarweg : innovatieve aspecten, *rapport deltares*, WL Delft Hydraulics, Delft, 69 p. pp.

Yossef, M., M. Zagonjolli, and K. Sloff (2008a), Voorspelinstrument duurzame vaarweg; case study: fixed layer and sediment nourishment in the Bovenrijn, *Tech. Rep. Q4357.30*, Delft Hydraulics Laboratory, Delft, the Netherlands.

Yossef, M., B. Jagers, G. Donchyts, and J. de. Jong (2018), From earth observations to river models (eo-riv), *Web page*, Deltares, Delft, the Netherlands, http://intranet.deltares.nl/umbraco/nl/ideeënplatform/challenge

Yossef, M. F. M. (2005), Morphodynamics of rivers with groynes, Ph.D. thesis, Delft University of Technology, Delft, the Netherlands.

Yossef, M. F. M., and K. Sloff (2012), Detailed modelling of river morphological response to climate change scenarios, in *Proceedings River Flow*.

Yossef, M. F. M., and T. Visser (2018), Effect of groyne schematisation on WAQUA model results, *Tech. Rep. 11202188-008-ZWS-0001*, Deltares, Delft, the Netherlands., 41 pp.

Yossef, M. F. M., H. R. A. Jagers, S. van Vuren, and A. Sieben (2008b), Innovative techniques in modelling large-scale river morphology, in *Procedings of the 4th International Conference on Fluvial Hydraulics (River Flow), 3-5 September, Cesme, Izmir, Turkey*, edited by M. Altinakar, M. A. Kokpinar, Ismail Aydin, Şevket Cokgor, and S. Kirgoz, Kubaba Congress Department and Travel Services, Ankara, Turkey.

Yossef, M. F. M., M. Zagonjolli, and C. J. Sloff (2008c), Voorspelinstrument duurzame vaarweg : case study fixed layer and sediment nourishment in the Bovenrijn, *rapport*, WL Delft Hydraulics, Delft, 88 p. pp.

Yubero-Ferrero, F. (1998), El universo poético de Claudio Rodríguez, Ph.D. thesis, Faculty of Filology, Complutense University of Madrid, Madrid, Spain, (in Spanish).

Zagonjolli, M., F. Platzek, and J. van Kester (2017), Modelling the flow over a groyne and weir in WAQUA: Comparison of effective discharge coefficients ofstandard and streamlined structures according to WAQUA and a 3D non-hydrostatic model., *techreport 11200536-008-ZWS-0005*, Deltares, Delft, the Netherlands., 60 pp.

Zanotti, A. L., C. G. Méndez, N. M. Nigro, and M. Storti (2007), A preconditioning mass matrix to avoid the ill-posed two-fluid model, *J. Appl. Mech.*, *74(4)*, 732--740, doi:doi:10.1115/1.2711224.

Zanré, D. D. L., and D. J. Needham (1994), On the hyperbolic nature of the equations of alluvial river hydraulics and the equivalence of stable and energy dissipating shocks, *Geophys. Astrophys. Fluid Dyn.*, *76*, 193--222, doi:10.1080/03091929408203665.

Zarrati, A. R., H. Gholami, and M. B. Mashahir (2004), Application of collar to control scouring around rectangular bridge piers, *Journal of Hydraulic Research*, *42*(1), 97--103, doi:10.1080/00221686.2004.9641188.

Zervakis, D. (2015), Combining a physics-based model and spatial interpolation of scarce bed topography data in meandering alluvial rivers, M.Sc thesis, TU Delft, The Netherlands., available from http://resolver.tudelft.nl/uuid:f41ba0a0-acd5-462e-b5aa-7c1c5878e1ac.

Zhang, H., and R. Kahawita (1987), Nonlinear model for aggradation in alluvial channels, *J. Hydraul. Eng.*, *113*(3), 353--369, doi:10.1061/(ASCE)0733-9429(1987)113:3(353).

Zhang, H., and R. Kahawita (1990), Linear hyperbolic model for alluvial channels, *J. Hydraul. Eng.*, *116*(4), 478--493, doi:10.1061/(ASCE)0733-9429(1990)116:4(478).

Zhang, H.-T., W.-H. Dai, A. M. F. da Silva, and H.-W. Tang (2021), Numerical model for convective flow in meandering channels with various sinuosities, *Journal of Hydraulic Engineering*, *147*(11), 04021,042, doi:10.1061/(ASCE)HY.1943-7900.0001917.

Zhang, L., H. Zhang, H. Tang, and C. Zhao (2017), Particle size distribution of bed materials in the sandy river bed of alluvial rivers, *Int. J. Sediment Res.*, pp. --, doi:10.1016/j.ijsrc.2017.07.005.

Zhang, S., J. G. Duan, and T. S. Strelkoff (2013), Grain-scale nonequilibrium sediment-transport model for unsteady flow, *J. Hydraul. Eng.*, *139*(1), 22--36, doi:10.1061/(ASCE)HY.1943-7900.0000645.

Zhang, X., D. Schmidt, and B. Perot (2002), Accuracy and conservation properties of a three-dimensional unstructured staggered mesh scheme for fluid dynamics, *Journal of Computational Physics*, *175*(2), 764--791, doi:https://doi.org/10.1006/jcph.2001.6973.

Zhou, Z., G. Coco, I. Townend, M. Olabarrieta, M. van der Wegen, Z. Gong, A. D'Alpaos, S. Gao, B. E. Jaffe, G. Gelfenbaum, Q. He, Y. Wang, S. Lanzoni, Z. Wang, H. Winterwerp, and C. Zhang (2017), Is ''morphodynamic equilibrium'' an oxymoron?, *Earth Sci. Rev.*, *165*, 257--267, doi:10.1016/j.earscirev.2016.12.002.

Zhu, Z., J. Z. LeRoy, B. L. Rhoads, and M. H. García (2018), Hydrosedfoam: A new parallelized two-dimensional hydrodynamic, sediment transport, and bed morphology model, *Comput. Geosci.*, *120*, 32--39, doi: https://doi.org/10.1016/j.cageo.2018.07.008.

Zijlema, M. (2015), Computational modelling flow and transport, *Tech. rep.*, Delft University of Technology.

Zijlema, M. (2020), Computation of free surface waves in coastal waters with swash on unstructured grids, *Computers & Fluids*, *213*, 104,751, doi:https://doi.org/10.1016/j.compfluid.2020.104751.

Zima, W., M. Nowak-Oc␣loń, and P. Oc␣loń (2015), Simulation of fluid heating in combustion chamber waterwalls of boilers for supercritical steam parameters, *Energy*, *92*, 117--127, doi:10.1016/j.energy.2015.02.111.

Zimmerman, C., and J. F. Kennedy (1978), Transverse bed slopes in curved alluvial streams, *J. Hydraulics Div.*, *104*(1), 33--48.

Zolezzi, G., and G. Seminara (2001), Downstream and upstream influence in river meandering. part 2. planimetric development, *J. Fluid Mech.*, *438*, 183â€\211, doi:10.1017/S002211200100427X.

Zolezzi, G., M. Guala, D. Termini, and G. Seminara (2005), Experimental observations of upstream overdeepening, *J. Fluid Mech.*, *531*, 191--219, doi:10.1017/S0022112005003927.

Zolezzi, G., W. Bertoldi, and M. Tubino (2006), Morphological analysis and prediction of river bifurcations., in *Braided Rivers: Process, Deposits, Ecology and Management*, edited by G. H. S. Smith, J. L. Best, C. S. Bristow, and G. E. Petts, pp. 233--256, Wiley-Blackwell.

Zuijderwijk, W. M., and J. de Jong (2021), Eindevaluatie pilot Langsdammen in de Waal; optimalisatie, *Rapport 117743/20-006.749 (Wi+Bo), 11204644 (Deltares)*, Witteveen+Bos and Deltares, september.

van der Zwaard, J. J. (1974), Roughness aspects of sand transport over a fixed bed, *Tech. Rep. 118*, Delft Hydraulics Laboratory, Delft, the Netherlands, 10 pp.

van der Zwaard, J. J. (1981), Bifurcation Pannerden, sediment distribution at the bifurcation, *Tech. Rep. M 932*, Delft Hydraulics Laboratory, Delft, the Netherlands.