Name	Jacob Harm (Jaap) Nienhuis	Email	j.h.nienhuis@uu.nl
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Phone +31 (0) 6 2843 1791 Date of birth May 12, 1988

RESEARCH INTERESTS

Coastal hydrology, geomorphology, waves, sediment transport, coastal hazards, deltas, modelling, remote sensing

EDUCATION

PhD	MIT / WHOI, Marine Geology & Geophysics, 2016 Concentrations: Tidal Inlets, River Deltas, Bedforms Thesis: Plan-view evolution of wave-dominated deltas Advisors: A. Ashton (WHOI), L. Giosan (WHOI), T. Perron (MIT)
MSc	University of Twente, Civil Engineering (<i>cum laude</i>), 2011 Concentrations: Hydro/Morphodynamics, Hydraulic engineering, Flow networks Thesis: <i>Modeling deltaic response to changes in fluvial sediment delivery</i> Advisors: A. Ashton (WHOI), P. Roos (U Twente), S. Hulscher (U Twente)
BSc	University of Twente, Civil Engineering, 2009 Minor/pre-master: Mathematics, Stochastic operations research Thesis: <i>The usage of Cooperative/Adaptive Cruise Control</i> Advisors: S. Shladover (UC Berkeley), B. van Arem (U Twente)

EMPLOYMENT

2019 - now	Utrecht University Geoscience	Assistant Professor
2017 - 2018	Florida State University Earth, Ocean, and Atmospheric Science	Assistant Professor
2017 - 2018	Wageningen UR Hydrology and Quantitative Water Management	Lecturer/Researcher
2016 - 2017	Tulane University Earth and Environmental Sciences	Postdoctoral Fellow
2012 - 2015	MIT / WHOI Marine Geology & Geophysics	Grad. Res. Assistant
2012	Woods Hole Oceanographic Institution Geology & Geophysics	Guest Investigator
2011 - 2012	Royal Haskoning Distributed Temperature Sensing (DTS)	Software Developer
2011	Woods Hole Oceanographic Institution Geology & Geophysics	Guest Student
2009	University of California, Berkeley Institute for Transportation Studies	Research Scholar

TEACHING

2019 - 2020	Utrecht University Managing Future Deltas
2018	FSU Coastal Geomorphology
2018	FSU Graduate Seminar on Gulf of Mexico coastlines
2018	FSU Physical Geology
2017 - 2018	Wageningen UR Hydrology and Geology of Deltas (co-instructor)
2016	Tulane University Marine Environmental Geology (6 lectures)
2014 - 2015	MIT MATLAB Bootcamp (co-instructor)
2010	University of Twente Cost Management & Engineering (teaching assistant)
2010	University of Twente Modeling B (teaching assistant)
2008 - 2010	University of Twente Finance & Accounting (teaching assistant)

Last updated: January 2020

GRANTS	
2019-2022	NWO VENI, What does not drown will be eroded away: predicting global river delta change in the 21st century (PI, €271k)
2019-2022	NSF OPP-NS, Arctic Shelf sediment fate - an observational and modeling study of sediment pathways and morphodynamic feedbacks in a changing polar environment (co-PI, \$994k)
2018-2021	American Chemical Society Petroleum Research Fund, Filling of incised valleys: how long does a sea-level highstand need to last? (PI, \$110k)
2018-2020	NSF EAR-GLD, Predicting Coastal Deltaic Change on a Global Scale (PI, \$214k)
2017	FSU FYAP summer award, Can sea-level rise explain ongoing coastal change? (PI, \$20k)
2017	EGU Roland Schlich travel support grant
2014	WHOI Deep Ocean Exploration Graduate Student Fellowship
2014	WHOI Ocean Ventures Fund Grant
2014	GSA Graduate Student Research Grant
2011	KIVI Royal Dutch Society of Engineers Travel Grant

HONORS/AWARDS

2019	NWO VENI Laureate
2018	AGU Editor's Citation for Excellence in Refereeing for JGR-Earth Surface
2017	Wageningen University Postdoc Talent Programme in Computational Hydrology
2015	AGU Fall Meeting Outstanding Student Paper Award
2015	Los Alamos National Laboratory Directors Postdoctoral Fellowship
2014	CSDMS Annual Meeting Best Poster Award
2013	CSDMS Annual Meeting student keynote talk
2011	Graduated cum laude from the University of Twente
2010	Dutch Nomination at the International Meuse Symposium in Liege, BE
2010	Nominated for the University of Twente thesis prize

ADDITIONAL EXPERIENCE

2020	6th International Planetary Dunes Workshop, Colorado, USA, Science Organising Committee
2019	Presenter for Deltares masterclass on sea-level rise impacts
2019	AGU Fall Meeting River Deltas, Session convener
2019 - now	AGU Journal of Geophysical Research - Earth's Surface, Associate Editor
2018 - 2019	AGU Thriving Earth Exchange, Scientific Liaison for flooding in Pensacola
2018	AGU Fall Meeting Session Coastal Hydrology, Session Chair
2018	Jamaica coastal fieldwork: wave-driven circulation in reef-sheltered lagoons
2017	AGU Fall Meeting Session Tides and Rivers, Deltas and Estuaries, Convener
2017	5th International Planetary Dunes Workshop, Colorado, USA, Convener
2017	Deltares Risc-KIT summer school on coastal hazards, Faro, Portugal
2016	AGU Fall Meeting Session Coastal Geomorphology and Morphodynamics, Convener
2016	Mississippi delta fieldwork: sediment coring in oxbow lakes for paleoflood reconstruction
2016	Mississippi delta fieldwork: drilling wells for the installation of fiber-optic compaction meters
2015	National Center for Earth-surface Dynamics summer school, New Orleans
2013 - 2015	Board member/organizer for the MIT EAPS student association
2014	Danube delta fieldwork (PI): collecting electrical resistivity data and OSL samples

2014	WHOI Coastal field methods field school, Woods Hole
2014	BanglaPIRE delta and tectonics field school, Bangladesh
2012	Mississippi delta fieldwork: sediment coring in oxbow lakes for paleoflood reconstruction
2012	National Center for Earth-surface Dynamics summer school, Minneapolis
2006 - 2012	Cub Scout leader at Tecumseh, Haren, NL

ADVISING

Postdoctoral	Derrick Vaughn, 2019-present, carbon sequestration in deltas
Scholars	Juan Felipe Paniagua Arroyave, 2018-present, tropical deltas
	Christopher Daly, 2018-2019, coral reef morphodynamics
Graduate	Ahmed Elghandour, 2019-present, PhD at Algarve University, co-advisor, barrier islands
students	John Malito, 2019-present, PhD at UNC, co-advisor, Artic shelf morphodynamics
	Leoni Heijkers, 2019-present, MS at UU, storm impact on barrier islands
	Wouter Gerats, 2019-present, MS at UU, floodplain sedimentation in deltas
	Mingyang Chen, 2018-present, PhD at FSU, remote sensing of global coastal change
	Daan van Keulen, 2017-2019, MS at WUR, scours in estuaries
	Hamzah Suharyanto, 2017-2019, MS at WUR, long-term estuarine change
Undergraduate students	Kevencia Faton (FSU 2018), Feliks Raap (UU 2019), Stan Gerritsen (UU 2019), Sophie Ali (UU 2019)

MISCELLANEOUS

Reviewer	~40 manuscripts/proposals submitted to: National Science Foundation, Nature Geoscience, Geophysical Research Letters, Journal of Geophysical Research, Marine Geology, GSA Bulletin, American Chemical Society PRF, Water, Elementa, ESPL, Geology, Geomorphology, Catena, Water Resources Research, SEA Grant
Invited Talks	GFZ Potsdam (2020), University of Bergen (2019), AGU Fall Meeting (2018), University of Alabama (2018), UT Austin (2017), Fifth International Planetary Dunes Workshop (2017), Tulane University (2017), Naval Research Laboratory (2017), Florida State University (2017), New Orleans Geological Society (2017), Water Institute of the Gulf (2016), AGU Ocean Sciences Press Conference (2016), University of Minnesota Twin Cities (2016), Los Alamos National Laboratory (2015), WHOI Coastal Ocean Fluid Dynamics Laboratory Seminar (2015)
Languages	Dutch (native speaker), English (fluent), German (basic)
Programming	C, Javascript, Matlab

PEER REVIEWED PUBLICATIONS

- Nienhuis, J. H., Ashton, A. D., Edmonds, D. A., Hoitink, A. J. F., Kettner, A. J., Rowland, J. C., & Tornqvist, T. E. (2020). Global-scale human impact on delta morphology has led to net land area gain. Nature, 1. doi:10.1038/s41586-019-1905-9
- Nienhuis, J. H., and Lorenzo-Trueba, J. (2019). Can Barrier Islands Survive Sea-Level Rise? Quantifying the Relative Role of Tidal Inlets and Overwash Deposition. Geophysical Research Letters, 46, 1–9. doi:10.1029/2019GL085524
- Caldwell, R. L., Edmonds, D. A., Baumgardner, S., Paola, C., Roy, S., and Nienhuis, J. H. (2019) A global delta dataset and the environmental variables that predict delta formation, Earth Surf. Dynam., doi:10.5194/esurf-2019-12
- Nienhuis, J.H., and J. Lorenzo-Trueba. (2019) Simulating barrier island response to sea-level rise with the barrier island and inlet environment (BRIE) model v1.0, Geosci. Model Dev., doi:10.5194/gmd-2019-10
- Nienhuis, J.H., Törnqvist, T.E., Esposito, C.R. (2018) Crevasse splays versus avulsions: A recipe for land building with levee breaches, Geophysical Research Letters, doi:10.1029/2018GL077933

- Nienhuis, J.H., Törnqvist, T.E., Hoitink, A.J.F. (2018) Future changes to tide-dominated deltas, Geophysical Research Letters, doi:10.1029/2018GL077638
- Nienhuis, J.H., A.D. Ashton, A.J. Kettner, L. Giosan (2017) Large-scale coastal and fluvial models constrain the late Holocene evolution of the Ebro delta, Spain, Earth Surf. Dynam., doi:10.5194/esurf-2017-9 (*featured in NASA Earth Observatory*)
- Nienhuis, J.H., T.E. Törnqvist, K.L. Jankowski, A.J. Fernandes, M. Keogh (2017) A new subsidence map of coastal Louisiana, GSA Today, v. 27, doi:10.1130/GSATG337GW.1 (featured in the Washington Post, Boston Globe, TIME, and others)
- Nienhuis, J.H., Ashton, A.D. (2016) Mechanics and rates of tidal inlet migration: modeling and application to natural examples, J Geophys. Res. Earth Surf. 121, doi:10.1002/2016JF004035
- Nienhuis, J.H., A. D. Ashton, L. Giosan (2016) Littoral steering of deltaic channels, Earth Planet. Sci. Lett., 453, 204–214, doi:10.1016/j.epsl.2016.08.018.
- Nienhuis, J.H., Ashton, A.D., Nardin, W., Fagherazzi, S., Giosan, L. (2016) Alongshore sediment bypassing as a control on river mouth morphodynamics, J Geophys. Res. Earth Surf. 121, 664-683, doi:10.1002/2015JF003780
- Ashton, A.D., Nienhuis, J.H., Ells, K. (2016) On a neck, on a spit: controls on the shape of free spits. Earth Surf. Dynam., 4, 193-210, doi:10.5194/esurf-4-193-2016
- Nienhuis, J.H., A. D. Ashton, L. Giosan (2015) What makes a delta wave-dominated?, Geology, 43(6), 511–514, doi:10.1130/G36518.1. (featured in MIT news, phys.org, and others)
- Nienhuis, J.H., Perron, J.T., Kao, J.C.T., Myrow, P.M. (2014) Wavelength selection and symmetry breaking in orbital wave ripples. J. Geophys. Res. Earth Surf. 119, 2239–2257, doi: 10.1002/2014JF003158. (AGU EOS Research Highlight)
- Vosse, M., Schilperoort, R., Haan, C. de, Nienhuis, J.H., Tirion, M., Langeveld, J.G. (2013) Processing of DTS monitoring results: automated detection of illicit connections, Water Practice & Technology, 8(3-4), 375-381, doi:10.2166/wpt.2013.037
- Nienhuis, J.H., A. D. Ashton, P.C. Roos, S.J.M.H. Hulscher, L. Giosan (2013) Wave reworking of abandoned deltas, Geophys. Res. Lett., 40, 5899–5903, doi:10.1002/2013GL058231
- Nienhuis, J.H., C. de Haan, J. Langeveld, M. Klootwijk, F. Clemens (2013) Assessment of detection limits of fiber-optic distributed temperature sensing for detection of illicit connections, Water science and technology, 67(12), 2712-2718.
- Ashton, A.D., E.W.H. Hutton, A.J. Kettner, F. Xing, J. Kallumadikal, <u>J.H. Nienhuis</u>, L. Giosan (2013) Progress in coupling models of coastline and fluvial dynamics, Computers & Geosciences, 53, 21-29

OTHER PUBLICATIONS

- Nienhuis, J.H. (2019) Effect of tidal inlet stabilization on barrier island morphodynamics, Coastal Sediments Proceedings
- Nienhuis, J.H. (2018) Barrier Inlet Environment (BRIE) Model, long-term coastal barrier response to sea-level rise, doi:10.5281/zenodo.1218142
- Makaske, B., <u>J.H. Nienhuis</u>, S. Naqshband, J. Wallinga, A.J.F. Hoitink (2017) Hydrology and Geology or Deltas, course reader, Wageningen University, Wageningen, Netherlands
- Nienhuis, J.H. (2016) Plan-view evolution of wave-dominated deltas (doctoral dissertation), MIT-WHOI Joint Program in Oceanography, Marine Geology & Geophysics, doi: 10.1575/1912/7742
- Nienhuis, J.H., A. D. Ashton, W. Nardin, S. Fagherazzi, L. Giosan (2015), Breaking-Wave-Driven Sediment Bypassing of River Mouths: Mechanisms and Effects on Delta Evolution, in The Proceedings of the Coastal Sediments 2015, edited by P. Wang, J. Rosati, and J. Cheng, World Scientific Pub Co Inc, San Diego, USA, doi: 10.1142/9789814689977_0158
- Vosse, M., Schilperoort, R., Haan, C. de, Nienhuis, J.H., Tirion, M., Langeveld, J.G. (2012) Processing of DTS monitoring results: automated detection of illicit connections. IWC Conference, Amsterdam, NL
- Nienhuis, J.H., Haan, C. de, Langeveld, J.G., Klootwijk, M., Clemens, F.H.L.R. (2012) Assessment of detection limits of fiber-optic distributed temperature sensing for detection of illicit connections, Urban Drainage Modelling, Belgrade, Serbia
- Nienhuis, J.H., A.D. Ashton, P.C. Roos, S.J.M.H. Hulscher, Giosan, L. (2012) Modeling deltaic response to changes in fluvial sediment delivery, NCK days, Netherlands center for coastal research, Enschede, Netherlands.

- Nienhuis, J.H. (2011) Deltaic response to fluvial sediment elimination, Conceptueel 20 (4), 15-18
- Shladover, S.E., X.Y. Lu, D. Cody, C. Nowakowski, T.Z. Qiu, A. Chow, J. O'Connell, <u>J.H. Nienhuis</u>, D. Su (2011) Development and Evaluation of Selected Mobility Applications for VII, in *UCB-ITS-PRR-2010-25*, PATH, UC Berkeley, Berkeley.
- Nienhuis, J.H. (2011) Modeling deltaic response to changes in fluvial sediment delivery (MSc thesis), University of Twente, Twente Water Centre, url: essay.utwente.nl/61060/
- Nienhuis, J.H. (2009) Automating the drivers' behaviour: the use of Cooperative/Adaptive Cruise Control (BSc thesis), University of Twente, Centre for Transport Studies, url: essay.utwente.nl/68776/

ABSTRACTS

- Nienhuis, J.H., J. Lorenzo-Trueba (2019) Can barrier islands survive sea level rise? Tidal inlets versus storm overwash, Nederlands Aardwetenschappelijk Congres, Utrecht, NL
- Nienhuis, J.H., M. Chen (2019) Feedbacks between overwash deposition and flood-tidal deltas. Netherlands Coastal Center meeting, Enkhuizen, NL
- Nienhuis, J.H. (2019) River delta floodplains: diffusive deposition, crevasse splays, or avulsions? Netherlands River Center meeting, Utrecht, NL
- Daly, C., <u>J.H. Nienhuis</u> (2018) Effect of Reef Degradation on Sediment Flushing through Reef Gaps: Whitehouse, Jamaica, OS11E-1449, AGU Fall Meeting, Washington DC, USA
- Lera, S., W. Nardin, <u>J.H. Nienhuis</u> (2018) The impact of offshore waves and vegetation on the sediment budget in the Virginia Coast Reserve (VA), EP41D-2696, AGU Fall Meeting, Washington DC, USA
- Paniagua-Arroyave, J.F., <u>J.H. Nienhuis</u> (2018) Physical controls in the empirical relationship of current ripple wavelength, EP23F-2382, AGU Fall Meeting, Washington DC, USA
- Nienhuis, J.H. (2018) River delta floodplains: diffusive deposition, crevasse splays, or avulsions?, EP51A-08, AGU Fall Meeting, Washington DC, USA
- Nienhuis, J.H., Ashton, A.D., Kettner, A.J., Edmonds, D.A., Rowland, J.C., Törnqvist, T.E., Hoitink, A.J.F. (2018)
 Predicting coastal deltaic change on a global scale, EP23B-01, AGU Fall Meeting, Washington DC, USA
- Nienhuis, J.H., T.E. Törnqvist, K.L. Jankowski, A.M. Fernandes, M. Keogh (2018) A new subsidence map for coastal Louisiana, State of the Coast Meeting, New Orleans, LA
- Nienhuis, J.H., J. Lorenzo-Trueba. (2018) Can barrier islands survive sea level rise? Tidal inlets versus storm overwash, CSDMS Annual Meeting, Boulder, CO
- Goodwin, G., <u>J.H. Nienhuis</u>, S. Mudd (2018) The geometries of salt marsh erosion, EGU2018-14339, EGU general assembly, Vienna, Austria
- Nardin, W., <u>J.H. Nienhuis</u> (2018) The impact of offshore waves and vegetation on the sediment budget in the Virginia Coast Reserve (VA), Ocean Sciences Meeting, Portland, OR
- Törnqvist, T.E., K.L. Jankowski, A.M. Fernandes, M. Keogh, <u>J.H. Nienhuis</u> (2017) Monitoring Rates of Subsidence and Relative Sea-Level Rise in Low-Elevation Coastal Zones: A New Approach, AGU Fall Meeting, New Orleans, LA
- Roy, S., D.A. Edmonds, S.M. Robeson, A.C. Ortiz, <u>J.H. Nienhuis</u> (2017) Spatial and Temporal Patterns of Land Loss in Mississippi River Delta, AGU Fall Meeting, New Orleans, LA
- Caldwell, R.L., D.A. Edmonds, S.E. Baumgardner, C. Paola, S. Roy, <u>J.H. Nienhuis</u> (2017) Controls on delta formation, area, and topset slope: New predictive relationships developed using a global delta dataset, AGU Fall Meeting, New Orleans, LA
- Nienhuis, J.H., J. Lorenzo-Trueba. (2017) Can barrier islands survive sea level rise? Tidal inlets versus storm overwash, AGU Fall Meeting, New Orleans, LA
- Nienhuis, J.H., Törnqvist, T.E., Hoitink, A.J.F. (2017) What makes a delta tide-dominated? River, Estuarine, Coastal Morphodynamics, Padova, Italy
- Nienhuis, J.H., Perron, J.T., Traykovski, P.A. (2017) Mechanics of marine ripples and implications for planetary analogs. Fifth International Planetary Dunes Conference, St. George, Utah
- Edmonds, D.A., Caldwell, R., Baumgardner, S., Paola, C., Roy, S., Nelson, A., Nienhuis, J.H. (2017) A Global Analysis of human habitation on river deltas, EGU2017-10832, EGU general assembly, Vienna, Austria
- Nienhuis, J.H., Ashton, A.D., Kettner, A.J., Edmonds, D.A., Rowland, J.C., Törnqvist, T.E., Hoitink, A.J.F. (2017)

 Predicting coastal deltaic change on a global scale, EGU2017-465, EGU general assembly, Vienna, Austria
- Nienhuis, J.H. (2017) How to find every river delta on Earth? EGU2017-14119, EGU general assembly, Vienna, Austria

- Nienhuis, J.H., Törnqvist, T.E., Esposito, C.R. (2016) How much land for your sand: effects of vegetation and compaction on crevasse splay formation. AGU Fall Meeting, San Francisco, CA
- Nienhuis, J.H., Ashton, A.D., Kettner, A.J., Edmonds, D.A., Rowland, J.C., Törnqvist, T.E. (2016) Predicting coastal deltaic change on a global scale. CSDMS Annual Meeting, Boulder, CO
- Nienhuis, J.H., Ashton, A.D. (2016) Quantifying tidal inlets as a sink of littoral sediment. GSA South Central Meeting, Baton Rouge, LA
- Nienhuis, J.H., Ashton, A.D., Kettner, A.J., Edmonds, D.A., Rowland, J.C. (2016) Predicting coastal deltaic change on a global scale. Ocean Sciences Meeting, New Orleans, LA
- Nienhuis, J.H., Ashton, A.D. (2015) Wave-driven tidal inlet migration: mechanics and effects on barrier morphology. AGU Fall Meeting, San Francisco, CA (*outstanding student paper award*)
- Ashton, A.D., Biolchi, L.G., Nienhuis, J.H. (2015) The First Guess: Testing predictions of coastal change from shoreline orientation and wave climate along Cape Cod and the U.S. Eastern Coast. AGU Fall Meeting, San Francisco, CA
- Nienhuis, J.H., Traykovski, P.A., Samuelson, K., Perron, J.T. (2015) Wavelength selection of tidally reversing mega-ripples, field observations and comparison with numerical flow modeling. CSDMS Annual Meeting, Boulder, CO
- Nienhuis, J.H., Ashton, A.D., Giosan, L., Nardin, W., Fagherazzi, S. (2014) Sediment bypassing of river mouths: mechanisms and effects on delta evolution. AGU Fall Meeting, San Francisco, CA
- Nienhuis, J.H., Ashton, A.D., Giosan, L. (2014) Wave angle control on deltaic channel orientation. CSDMS Annual Meeting, Boulder, CO (best poster award)
- Nienhuis, J.H., Perron, J.T., Kao, J.C., Myrow, P. (2013) Fluid dynamical control of spacing and symmetry breaking in orbital wave ripples. AGU Fall Meeting, San Francisco, CA
- Ashton, A.D., Nienhuis, J.H., Ortiz, A.C., Lorenzo Trueba, J., Giosan, L. (2013) Left behind: effects of marine reworking and sea-level rise on deltas of the 21st century. AGU Fall Meeting, San Francisco, CA
- Nienhuis, J.H., Ashton, A.D., Giosan, L. (2013) Terrestrial climate impacts on river deltas. GCC Conference, Woods Hole, MA.
- Nienhuis, J.H., Ashton, A.D., Giosan, L. (2013) Using numerical models to constrain the evolution of the Ebro Delta. RCEM, Santander, ES
- Nienhuis, J.H., Ashton, A.D., Giosan, L. (2013) Growth and Abandonment: Quantifying First-order Controls on Wave Influenced Deltas. CSDMS Annual Meeting, Boulder, CO (*invited*)
- Ashton, A.D., Nienhuis, J.H. (2012) On the hook of a Spit. AGU Fall Meeting, San Francisco, CA
- Nienhuis, J.H., Ashton, A.D., Giosan, L. (2012) Quantifying the transition from fluvial- to wave-dominance for river deltas with multiple active channels. AGU Fall Meeting, San Francisco, CA
- Ashton, A.D., Giosan, L., Nienhuis, J., Kettner, A., and Ibanez, C. (2011) Modeling the evolution of wave-dominated deltas: influence of wave angle distribution and sediment supply variation on plan-view morphologies, with application to the Ebro Delta, Spain. DeltaNet International Conference, Ebro Delta, FS
- Hogeboom, H. J., T. Doldersum, <u>J.H. Nienhuis</u>, M. Siemerink, F. v. d. Werf, A. Zeekant (2010) 'Ritsen met water' How to manage the Meuse, International Meuse Conference, Liege, BE (*invited*)