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| **Model** | **Requirement** | **Usage scope** | **Applied area** |
| C-GEM 1D,  daily - seasonal | Simpliﬁed hydro-geometrical characteristics, tidal period; biogeochemical reactions | Biogeochemical dynamics in estuaries. Reduces data requirements by using an idealized representation of the estuarine geometry. | Scheldt estuary  (Volta et al., 2014, 2016) |
| CONTRASTE  1D,  daily - seasonal | Bathymetrical maps, Hydrodynamic description in detail in upstream, tidal forcings. Biogeochemical reactions | The time series of nutrient transformations and ﬂuxes along the estuary–coastal zone | Scheldt estuary  (Regnier et al., 1997, 1999) |
| MOSES 1D,  yearly | Biogeochemical, pelagic, reactive- transport model | Fate and turnover of nutrients entering the estuary; and fluxes in the estuary | Scheldt estuary (Hofmann et al., 2008) |
| HEM-3D  daily - seasonal | Detail bathymetry. Hourly tide, daily discharge. Meteorological data. Water quality | Nutrient dynamics (21 state variables), algal groups, fecal coliform bacteria | Kwang-Yang Bay  (Park et al., 1995, 2005) |
| ELCOM-CAEDYM 3D,  daily - seasonal | Detail bathymetry, meteorological data, tidal elevation, Water quality | Nutrient dynamics, phytoplankton bloom, phytoplankton species | Mozambique coast  (Miguel et al., 2018) |
| MOHID 3D,  daily - yearly | Detail bathymetry, Hourly tide, daily discharge upstream, Atmosphere, Water quality, Algal species | Mainly Phytoplankton and macroalgae, zooplankton dynamics | Vouga Estuary  (Trancoso et al., 2005) |
| MIKE 1-3D  + water quality module | Detail bathymetry, hourly tide, daily discharge upstream and tributaries. Water quality | Depend on water quality module, for instance, nutrients dynamics and diatom development. | Scheldt estuary  (Arndt et al., 2009, 2011) |
| Delft3D + GEM/water quality module | Detail bathymetry, hourly tide, daily discharge upstream and tributaries. Water quality | Describes the behavior of nutrients, organic matter and primary producers in estuaries | Dutch coastal waters  Blauw et al., 2008 |