

## HS10.2/GM11.7/OS2.6

### **Integrative studies of the River-Sea-Continuum**

Convener: Jana Friedrich

Co-Conveners: David Todd , Debora Bellafiore , Andrea D'Alpaos , Panagiotis Michalopoulos

[Orals](#) / Thu, 12 Apr, 15:30–17:00 / Room 2.15

[Posters](#) / Attendance Thu, 12 Apr, 17:30–19:00 / Hall A

This session provides a scientific platform for exchange of findings from research that addresses the entire continuum of river and sea. We invite studies across geographical borders, along the freshwater-marine water continuum, and interdisciplinary studies that integrate physical, chemical, biological, geological observations/experiments, and modelling, and those that span the traditional silos of natural and social sciences. River-Sea-Systems comprise river catchments, estuaries/deltas, lagoons and the coastal seas. They are dynamic products of interacting environmental and socio-economic processes. River-Sea-Systems provide natural capital and related ecosystem services that are fundamental to societal wellbeing. These systems, however, face compounding pressures from natural forces such as climate change and natural hazards, and from anthropogenic forces like urbanisation, shipping, energy generation, industrial development, water abstraction and damming, operating at local, national and global scales. The resulting pressures contribute to societal challenges such as eutrophication, hypoxia, pollution, change in hydrodynamics and morphodynamics (including disturbed sediment balances), loss of biodiversity, habitat depletion, sea level rise, and ultimately loss of ecosystem services. This impacts not only on the ‘planet’ but also on ‘people’ and ‘profit’. These pressures are likely to increase in the future with implications throughout the river-sea continuum with uncertain consequences for the resilience of the socio-ecological system. We need to fully understand how River-Sea-Systems function. How are River-Sea-Systems changing due to human pressures? What is the impact of processes in the catchment on marine systems function, and vice versa? How can we discern between human-induced changes or those driven by natural processes from climate-induced variability? What will the tipping points of socio-ecologic system states be and what will they look like? How can we better characterise river-sea systems from the latest generation Earth observation to citizen science based observatories. How can we predict short and long term changes in River-Sea-Systems to manage them sustainably? What is the limit to which it is possible to predict the natural and human-influenced evolution of River-Sea-Systems? Which policy responses would be desirable from a scientific perspective and how will the gaps between the existing European environmental policies be bridged (e.g. Water Framework Directive 2000, Marine Strategy Framework Directive 2008 and EU biodiversity policies)? How will links be made to the UN 2030 Agenda’s Sustainable Development Goals 6 (Clean Water & Sanitation) and 14 (Life below Water)? The increasing demand to jointly enable intensive human use and environmental protection in river-sea systems requires holistic and integrative research approaches with the ultimate goal of enhanced system understanding. It is becoming widely recognised that there is a need to study River-Sea-Systems as an entire continuum, to provide scientifically underpinned information to enable better-informed and holistically engaged environmental protection of River-Sea systems, to maintain their ecosystem functioning and thus their capacity to provide ecosystem services.

## Orals HS10.2/GM11.7/OS2.6

**Thursday, 12 Apr 2018**

Room 2.15

Chairperson: Jana Friedrich

- 15:30–15:45 [EGU2018-18025](#)  
**Hydrodynamics of the Po River-Delta-Sea system**  
Francesco Maicu, Christian Ferrarin, Francesca De Pascalis, and Georg Umgiesser
- 15:45–16:00 [EGU2018-10700](#)  
**The effect of flow-regime variability on hydrologic connectivity and biogeochemistry within a coastal aquatic landscape: assessment using a 3D coupled ecohydrology-hydrodynamic-biogeochemical model**  
Matthew Hipsey and Justin Brookes
- 16:00–16:15 [EGU2018-19053](#)  
**Impacts of an extreme flood event on the physical and biogeochemical structure of a coastal system: a model-based analysis**  
Onur Kerimoglu, Yoana G. Voynova, Ivan Kuznetsov, and Justus E.E. van Beusekom
- 16:15–16:30 [EGU2018-8233](#)  
**Phytoplankton dynamics drive nutrient and carbon spiraling in a river-estuary system**  
Andreas Schöl, Stephanie Ritz, Tina Sanders, Kirstin Dähnke, and Helmut Fischer
- 16:30–16:45 [EGU2018-17367](#)  
**Riverine discharge and environmental fate of emerging organic contaminants in the coastal seas**  
Zhiyong Xie, Jianhui Tang, and Ralf Ebinghaus
- 16:45–17:00 [EGU2018-8010](#)  
**Effects of inherited resistant layers on channel-bar shape and long-term morphological evolution of the Eems-Dollard Estuary (the Netherlands/Germany)**  
Harm Jan Pierik, Jasper Leuven, Marc Hijma, Freek Busschers, and Maarten Kleinhans

## Posters HS10.2/GM11.7/OS2.6

Attendance Time: Thursday, 12 Apr, 17:30–19:00

Hall A

Chairperson: Debora Bellafiore, Panagiotis Michalopoulos

- A.327 [EGU2018-17802](#)  
**A new ESFRI research infrastructure: “The International Centre for Advanced Studies on River-Sea Systems” – DANUBIUS-RI | **Highlight****  
Adrian Stanica and **Jana Friedrich** and the [DANUBIUS-RI Consortium](#)
- A.328 [EGU2018-14476](#)  
**Observations and modelling for two Spanish river-sea continuums. Towards a common approach for a e-infrastructure service**  
**Vicente Gracia**, Agustín Sánchez-Arcilla, Antonio Torralba, Manuel Moreno, Antonio Bejarano, and Juan Miguel González
- A.329 [EGU2018-19400](#)  
**Towards Sustainable Management of River-Sea Systems: Enhancing Process and System Understanding in the Elbe-North Sea System**  
**Sina Bold**, Jana Friedrich, Volker Dzaak, Holger Brix, and Justus E.E. van Beusekom
- A.330 [EGU2018-15585](#)  
**Long-term changes in nitrogen dynamics the Elbe estuary?**  
**Annika Eisele**, Tina Sanders, Kai Wirtz, and Justus van Beusekom
- A.331 [EGU2018-7069](#)  
**Nitrogen processes in water column and sediment of two tributaries to the North Sea**  
**Tina Sanders** and Kirstin Dähnke
- A.332 [EGU2018-5112](#)  
**Implications of bio-flocculation on fine estuarine particle transport**  
**Christian Schwarz**, Tom Cox, and Karline Soetaert
- A.333 [EGU2018-14319](#) | OSPP: [volunteer to judge](#)  
**Current trends in water and suspended sediment discharge of some European rivers**  
**Adriana - Maria Constantinescu**, Peter D. Hunter, Evangelos Spyrakos, Andrew N. Tyler, and Adrian Stanica
- A.334 [EGU2018-8101](#)  
**Potential changes to metal bioavailability induced by flood events in sediments contaminated by mining legacy**  
**Tullus Bergmann**, Kate Spencer, and Marco Toffolon
- A.335 [EGU2018-9229](#) | OSPP: [volunteer to judge](#)  
**Changes in the wind-wave field within the Venice Lagoon in the last four centuries and related salt-marsh lateral erosion**

**Laura Tommasini**, Luca Carniello, Marcella Roner, Massimiliano Ghinassi, and Andrea D'Alpaos

- A.336 [EGU2018-1840](#)  
**Coastal mixing in multiple river-mouth deltas: a case study in the Po Delta, Italy**  
**Debora Bellafiore**, Christian Ferrarin, Federica Braga, Luca Zaggia, Francesco Maicu, Giuliano Lorenzetti, Giorgia Manfè, and Francesca De Pascalis
- A.337 [EGU2018-36](#)  
**Thermodynamics of Saline and Fresh Water Mixing in Estuaries**  
**Hubert H.G. Savenije**
- A.338 [EGU2018-307](#) | OSPP: [volunteer to judge](#)  
**The length scale of dispersion in well-mixed estuaries**  
**Zhilin Zhang** and Hubert Savenije
- A.339 [EGU2018-13986](#)  
**Multi-decadal trend analysis of tidal constituents in the Spanish estuaries**  
**Manuel Diez-Minguito**, Maria Angeles Serrano, and Manuel Cobos
- A.340 [EGU2018-11983](#) | OSPP: [volunteer to judge](#)  
**Hydrodynamics and hydrogeochemical changes in the mixing zone of a coastal aquifer during a heavy rain event**  
**Tybaud Goyetche**, Marc Diego-Feliu, Linda Luquot, Jordi Garcia-Orellana, Valenti Rodellas, Laura Del Val, Laura Martinez, Andrea Palacios, Juanjo Ledo, Philippe Pezard, Albert Folch, and Jesus Carrera
- A.341 [EGU2018-16121](#)  
**The “Plastic Cycle”: how ecohydromorphological processes drive the spread of microplastic pollution through rivers to the ocean**  
**Simon Dixon**, Alice Horton, and Chris Hackney
- A.342 [EGU2018-12198](#)  
**Application of Ecosystem service approach to the land use planning in the Kokemäenjoki watershed (Southwestern Finland)**  
**Asko Ijäs**, Laura Mononen, Anne Savola, and Petteri Vihervaara
- A.343 [EGU2018-18007](#)  
**The GEO AquaWatch Initiative | **Highlight****  
**Andrew N. Tyler**, Ghada El Serafy, and Steve Greb