Martin Struck, Nils Huber, Gudrun Hillebrand, Pauline Onjira, Axel Winterscheid, Jos Brils, Ralph Schielen, Jan-Willem Mol, Christina Bode, Anna van den Hoek, Fabiola Siering

Living-Lab Rhine

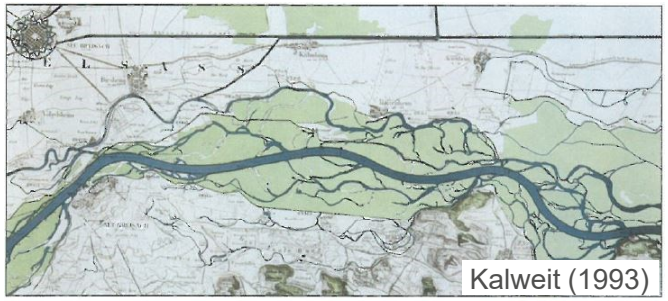
A new approach to transboundary research along the free-flowing Rhine

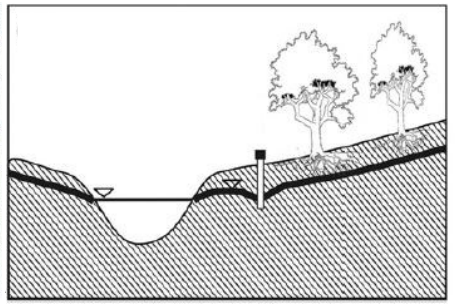
EGU General Assembly 2022 (Session HS10.2)

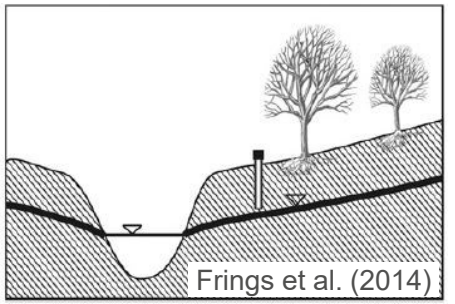
Vienna, 24th May 2022

Current challenges along the Rhine

- **Loss of habitats** due to river straightening and land reclamation
- **Lack of sediment**
- **Erosion tendencies** in several sections of the Rhine
  - ➢ Disconnection of river and floodplain
  - ➢ Decline in groundwater level
- **Navigation and intense use** of the river
- **Flooding**


Kalweit (1993)




Frings et al. (2014)

van der Perk et al. (2019)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→ Discover and use **synergies between improved ecological conditions and human demands.**

Improvements to the river system for a broader benefit

- *"Waters must achieve **good ecological and chemical status**, **to protect human health, water supply, natural ecosystems and biodiversity**."* – European Water Framework Directive
- *"Effective river basin management needs to **include sediment**."* – European Sediment Network
- *"**Integrated river basin management** – across borders – adopts a holistic approach to **protecting the whole body of water**."* – European Water Framework Directive

→ **Effective management** within the Rhine river basin provides the basis for **healthy** aquatic and adjacent **ecosystems**, **sustainable morphodynamics**, **shipping**, **the industry**, **tourism** etc.

Increase efforts across borders

- **Transnational research efforts** along the Rhine are needed to provide the groundwork for an **effective basin-wide management**.
- This can be achieved by:
  - ➢ **combining and harmonizing data** collection
  - ➢ **harmonizing data analyses**
  - ➢ **bringing together historical knowledge**
  - ✓ developing a **common understanding**

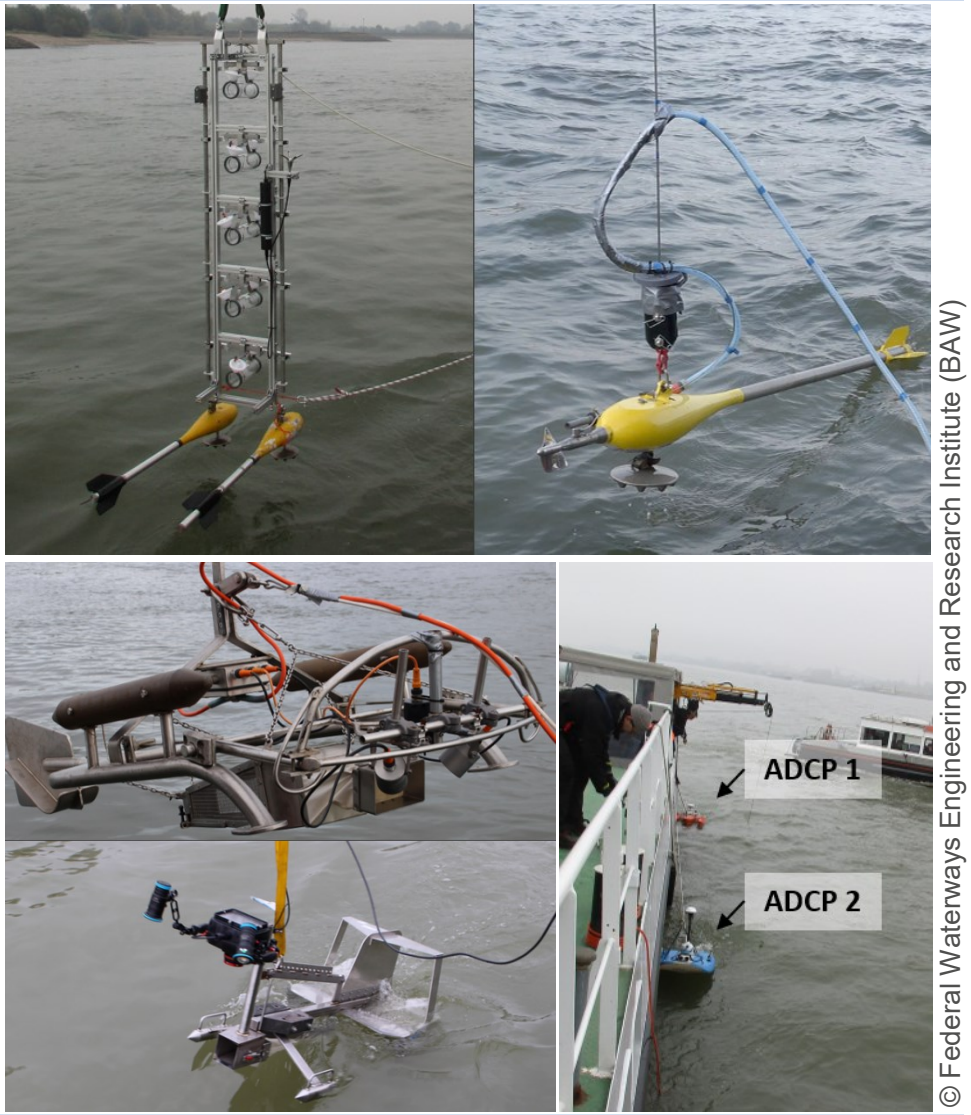
- **DANUBIUS-RI** aims to achieve this on the European scale
  - ➢ **facilitate research on river-sea systems**
  - ➢ easy **access to data and study sites**
  - ➢ **interdisciplinary** approach

H2020 DANUBIUS-PP Consortium (2019) - Science and Innovation Agenda of DANUBIUS-RI

www.danubius-ri.eu

A first pilot project – Living-Lab Rhine (LiLaR)

- Execution of a **joint campaign** in the Dutch-German border region to **compare sediment measurement and analyses methods**
- Direct measurements
  - ➢ suspended load sampling
  - ➢ bed load sampling
- Indirect measurements
  - ➢ ADCP measurements of bed load and suspended load
  - ➢ Dune-Tracking using multi-beam echo-sounding



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www.danubius-ri.de/projects/mr_lilar/index.php.en

www.youtube.com/watch?v=KFTVXz4BU-w

Thank you for your attention!

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