

Abstract

a) General objectives:

We aim to develop new and improved tools for risk assessment, integrated modeling of flooding from urban drainage systems coupled with river catchment and recipients (rivers, lakes, wetland and sea) under Hydroclimate extremes, supported by historical data and on-site monitoring instant data. Sustainable Life Cycle Assessment (LCA), providing holistic decision support toolkit to help water utilities to manage the water and wastewater systems for safe distribution, collect and treatment of water and wastewater from inlet to recipient in regard to the water quantity and quality under the extreme stressors such as intense precipitation and huge temperature variations.

b) Scientific and/or technological aims:

- 1 - To establish an extensive database with historical data, predicted meteorological data of future scenarios, and high-resolution data for regional and global climate change and definition of hydroclimatic extreme events. Thus improving resilience and adaptation capacity of water infrastructure (e.g., industrial water facilities, urban networks, wastewater treatment facilities, stormwater management systems and rural systems) to hydroclimatic extreme events.
- 2 - Development of methodology for quantification of ecosystem services of wetlands with respect to hydrological functions, including hydrological modeling and LCA analysis of the coupled urban-rural water regime provided for both normal operation, extreme events (floods and droughts), and different future climate projection scenarios with ecosystem services incorporated.
- 3 - Development of a smart water management and decision support system for future urban-rural water management under the challenges of climate change/variability and intensified extreme hydroclimatic events.

c) Relevance to the call: The project SmartWater4Future will address the call Topic 2. Tools for water management - in the context of hydroclimatic extreme events, targeting on floods, droughts and water pollution risks. Specifically:

- Subtopic 1.3 Improving resilience and adaptation capacity of water infrastructure (e.g., industrial water facilities, urban networks, wastewater treatment facilities, stormwater management systems and rural systems) to hydroclimatic extreme events.
- Subtopic 2.1 Developing tools (e.g., multi-risk approach, decision support tools, monetary/non- monetary costs valuation) to support the design and implementation of strategies for adaptation and mitigation to hydro-climatic extreme events, especially floods (including "flash-floods"), heat waves and droughts in a catchment to sea perspective.
- Subtopic 2.3 "Smartening the water system" and use of innovative digitalization, including improved/new sensors, models, communications and computing technologies.



► **Project coordinator:** **Ronny BERNDTSSON**
LUNDS UNIVERSITET - SWEDEN

► Project partners

- EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH - SWITZERLAND
- KONYA TEKNIK UNIVERSITESI - TURKEY
- STIFTELSE CSDI WATERTECH - NORWAY
- ULUDAG CEVRE TEKNOLOJILERI ARGE MERKEZI SANAYI VE TICARET LIMITED SIRKETI - TURKEY
- UIT THE ARCTIC UNIVERSITY OF NORWAY - NORWAY

► Funding organisations

FORMAS (SWEDEN) / SNSF (SWITZERLAND) / NCBR (TURKEY) / RCN (NORWAY)

► Duration

3 years

► Contact

Ronny BERNDTSSON
ronny.berndtsson@tvrl.lth.se



Integrated management of water,
River hydrology,
Urban water management,
Water-climate interactions

KEYWORDS