



## Adaptation to climate change

### Europe's Focused approach to experimental hydraulic and environmental research

The HYDRALAB+ project brings together European researchers, industry and stakeholders to improve experimental research, related numeric modelling and field studies aimed at adapting to climate change.

### Countries worldwide are facing climate change consequences

Due to climate change many countries worldwide are faced with extreme river discharges and higher sea water levels with more frequent storm events and increasing wave and river flow conditions along their coasts and riparian margins. New approaches and nature-based solutions are needed to avoid high-risk erosion and inundation events. Experimental research from our project will provide knowledge and tools to manage these problems more effectively. Experimental research, particularly at large scales, is an indispensable step to provide sound and sustainable solutions because of the limitations present in numerical models and field data.

### Extending the traditional research

One of the most urgent technical challenges regarding to Europe's rivers and coasts is to extend the traditional research focusing on hydraulics and morphology with additional knowledge of eco-hydraulics to better understand the biological and ecological environment. This multidisciplinary approach is necessary for effective management of the natural environment under changing climatic conditions.

### Three main components of HYDRALAB+

- I. Joint Research Activities
- II. Transnational Access
- III. Networking Activities

### Joint Research Activities

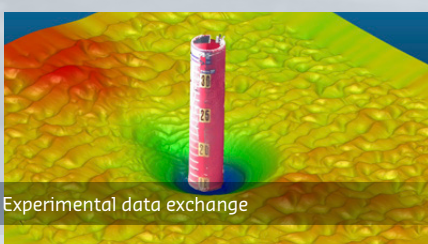
Through three joint research activities the HYDRALAB+ project, is facilitating progress in the discipline as well as strengthening the coherence of the experimental hydraulic and environmental research infrastructure.



JRA1: Representing climate change in physical modelling



JRA2: Morphodynamics, ecology and structures



JRA3: Experimental data exchange



### Transnational Access, opening unique Facilities to European researchers

New generation researchers from all over Europe have been invited to carry out their experimental research in large and unique experimental facilities designed for flow, wave and ice research in 10 top institutes and universities in Europe. The best proposals are selected from an open competition. Many experiments have been selected to deal with the interaction of vegetation and sediment transport/erosion, the increasing wave overtopping of coastal structures and considering new threats like tsunami effects due to falling ice walls. Each 'Transnational Access' project has on average 10 researchers from 5 different countries, and the majority of researchers has never used the facility before.



Aalto, Helsinki



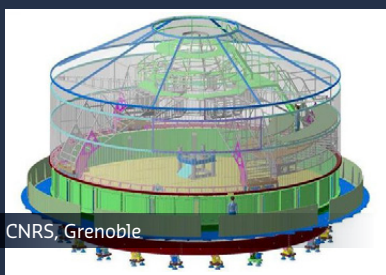
DHI, Horsholm



University of Hull



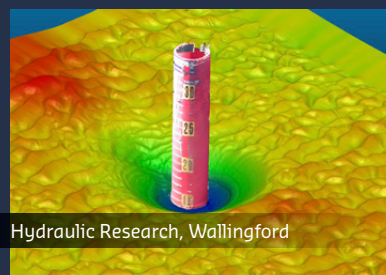
Deltares, Delft



CNRS, Grenoble



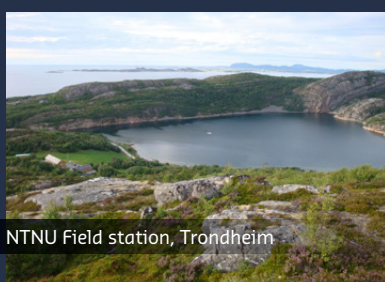
HSVA, Hamburg



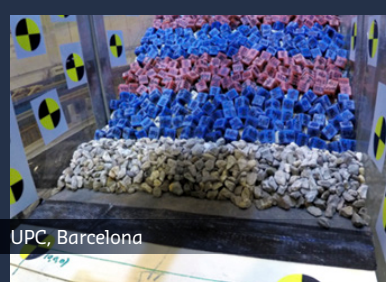
Hydraulic Research, Wallingford



University of Hannover



NTNU Field station, Trondheim



UPC, Barcelona

### Networking, bridging the gap between science and practice

To target wider interactions, a set of thematic workshops for stakeholders are organized during the half yearly 'HYDRALAB+ Workshop Events'. HYDRALAB+ is bridging the gap between scientists, who are working on new developments, manufacturers of hi-tech measurement technics, policy makers and end-users (consultants, contractors) that can make use of the project achievements. Special attention is paid to the hi-tech optical and acoustic measurement techniques that can be used across a range of laboratory facilities. Representatives of industry are invited to attend the experiments and to obtain a fruitful two-way interaction.



### Managing HYDRALAB+

The project, which started in September 2015 and runs until August 2019, has brought together 24 partners and nine associated partners selected on the basis of their specialism and ability to contribute to the various tasks and deliverables. Excellent teamwork is required to manage the project. A multidisciplinary Management Team has been put in place to run the HYDRALAB+ project: Frans Hamer (Deltares The Netherlands and Project Coordinator), Professor Agustín Sánchez-Arcilla, (UPC Spain), Dr James Sutherland (HR Wallingford United Kingdom), Dr Stuart McLelland (UHULL United Kingdom) and Dr Björn Elsässer (DHI Denmark). The coordination and operational aspects of the 'Transnational Access' are managed by Mark Klein Breteler (Deltares). Herman Scholten (Deltares) is taking care of overall finance and administrative issues.



### International Advisory Board

This independent Board monitors the quality of the services and implement improvements where necessary and is advising the Management Team. The Board includes both European and non-European members: Professor Peter A. Davies (UK and chairman), Dr. Ksenia Kosobokova (Russia), Karla González Novion (Chili), Dr. Yoshiaki Kuriyama (Japan), Ad van Os (NL) and Professor Ole Madsen (USA).

## PROJECT INSIGHTS

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### PARTNERS

- Deltares | The Netherlands;
- Aalto University | Finland;
- Cedex – Centro de Estudios y Experimentación de Obras Públicas | Spain;
- CNRS – Centre National de la Recherche Scientifique | France;
- DHI | Denmark;
- GeoEcoMar - The National Institute for Research and Development of Marine Geology and Geo-ecology | Romania;
- HR Wallingford | UK;
- HSVA - Hamburgische Schiffbau Versuchsanstalt | Germany;
- IAHR – International Association for Hydro-Environment Engineering and Research | Spain;
- IBWPAN - Instytut Budownictwa Wodnego Polskiej Akademii Nauk | Poland;
- IFREMER - Institut français de recherche pour l'exploitation de la mer | France;
- Loughborough University | UK;
- LNEC - Laboratório Nacional de Engenharia Civil | Portugal;
- Leibniz University Hannover | Germany;
- NERC NOC - National Oceanography Centre | UK;
- NTNU - Norges teknisknaturvitenskapelige universitet | Norway;
- Samui | UK;
- UABDN – University of Aberdeen | UK;
- University of Catania | Italy;
- UCAN – University of Cantabria | Spain;
- University of Hull | UK;
- UPC - Universitat Politècnica de Catalunya, Barcelona | Spain;
- University of Porto | Portugal;
- University of Twente | The Netherlands;

### ASSOCIATED PARTNERS

- Aker Arctic | Finland;
- Aristotle University of Thessaloniki | Greece;
- Artelia | France;
- EPFL – École polytechnique fédérale de Lausanne | Switzerland;
- Flanders HR – Flanders Hydraulics Research | Belgium;
- Marintek | Norway;
- Plymouth University | UK;
- Polytechnic University of Bari | Italy;
- University of Coimbra | Portugal.

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