Cooperation

To discuss research results on an international level a regular scientific exchange within the research projects takes place. Therefore the department maintains numerous cooperations with national and international universities, public authorities, and companies.

Laboratory Equipment

The department has got two experimental halls (Hall I: 21 x 9 m and Hall II: 12 x 8 m), which are equipped with state of the art measuring systems. The independent water supply in form of an 18 m high water tower with an elevated tank volume of 32 m^3 and an underground tank volume of 200 m^3 provides up to 700 l/s water with a constant pressure of 1.5 bar (21.7 psi). The control of all regulating devices including the three pumps for the water supply is computer-based and fully automated.

While Hall I is mainly used for physical hydraulic models Hall II also contains a closed loop flow channel with a length of 40 m and a cross-section of 0.6 x 1.0 m. A hydroelectric turbine is used to generate flow velocities of up to 2.5 m/s. Furthermore the department is equipped with a 6 m long hydraulic channel with a usable cross section of 0.5 x 0.6 m, which can be used as both a conventional flow channel as well as an electronically controlled wave generator for the study of wave loads. Additionally various experimental channels with variable inclinations can be used for teaching purposes.

An additional test site for the development of mobile flood protection systems is located in the outdoor area of the laboratory.

Staff

Chair and Institute Professor

Univ.-Prof. Dr.-Ing. Jürgen Jensen	+49 271 740-2172 juergen.jensen@uni-siegen.de

Scientific Team

Dr.-Ing. Arne Arns	+49 271 740-2627 arne.arns@uni-siegen.de
Dr.-Ing. Jens Bender	+49 271 740-3401 jens.bender@uni-siegen.de
Dr.-Ing. Sönke Dangendorf	+49 271 740-2518 soenke.dangendorf@uni-siegen.de
Kristina Fehler, M.Sc.	+49 271 740-2278 kristina.fehler@uni-siegen.de
Sebastian Gürke, M.Sc.	+49 271 740-3177 sebastian.guerke@uni-siegen.de
Leon Jänicke, M.Sc.	+49 271 740-3035 leon.jaenicke@uni-siegen.de
Dipl.-Ing. Jessica Kelln	+49 271 740-3462 jessica.kelln@uni-siegen.de
Jan-Philipp Küppers, M.Eng.	+49 271 740-2730 jan-philipp.kueppers@uni-siegen.de
Leigh MacPherson, M.Phil.	+49 431 880-1701 leigh.macpherson@uni-siegen.de
Stefan Mehlhase, M.Sc.	+49 271 740-5214 stefan.mehlhase@uni-siegen.de
Jens Metzger, M.Eng.	+49 271 740-2643 jens.metzger@uni-siegen.de
Sebastian Niehüser, M.Sc.	+49 271 740-5215 sebastian.niehueser@uni-siegen.de
Marius Ulm, M.Sc.	+49 271 740-3036 marius.ulm@uni-siegen.de
Daniela Vollmer, M.Sc.	+49 271 740-5213 daniela.vollmer@uni-siegen.de
Dipl.-Ing. Jörg Wieland	+49 271 740-3471 joerg.wieland@uni-siegen.de

Technical Staff

Sandra Sziburies	+49 271 740-3187 sandra.sziburies@uni-siegen.de
Volker Spieß	+49 271 740-2529 volker.spiess@uni-siegen.de
Andre Stettner-Davis	+49 271 740-3187 andre.stettner-davis@uni-siegen.de

Contact

Universität Siegen
Forschungsinstitut Wasser und Umwelt
Paul-Bonatz-Str. 9-11
57076 Siegen, Germany

Phone: +49 271 740-3187
Email: wasserbau@uni-siegen.de
Internet: www.fwu.uni-siegen.de/wb

A01/2018

Research Institute for Water and Environment

Dept. of Hydraulic and Coastal Engineering

Univ.-Prof. Dr.-Ing. Jürgen Jensen

UNIVERSITÄT SIEGEN

Naturwissenschaftlich Technische Fakultät

Tradition

The Research Institute for Water and Environment (fwu) was established in 1994 by Univ.-Prof. Dr.-Ing. Jürgen Jensen as a joint founder. Today fwu consists of three chairs: Dept. of Water Resources Management and Climate Impact Research, Dept. of Sewage and Waste Technologies, and the Dept. of Hydraulic and Coastal Engineering. The tradition of water management and hydraulic engineering in Siegen dates back to 1853, the year in which Siegen's Wiesenbauschule (Agricultural School) was founded. The Wiesenbauschule trained land improvement technicians and meadow builders who gained a high national as well as international reputation. Due to their excellent professional training the Prussian government decreed in 1891 that graduates of Siegen's Wiesenbauschule should preferably be hired at the land improvement departments.

Siegen's Wiesenbauschule evolved steadily, beginning with the Cultural Building School, then the Building School of Water Resources and Environmental Engineering, followed by the School of Civil Engineering, until finally the Universität-Gesamthochschule Siegen now called University of Siegen was founded in 1972. The hydraulic laboratories were built in 1966 and managed by Prof. Dipl.-Ing. Jochen Kadereit until 1992 before Univ.-Prof. Dr.-Ing. Jürgen Jensen, present director of the chair and the hydraulic engineering laboratories, became his successor in that same year.

After the restructuring of the University of Siegen in 2011 today's Dept. of Hydraulic and Coastal Engineering consists of 18 scientific and non-scientific employees under the direction of Prof. Jürgen Jensen. It is embedded in the Department Civil Engineering within the Faculty of Science and Technology of the University of Siegen.

Research

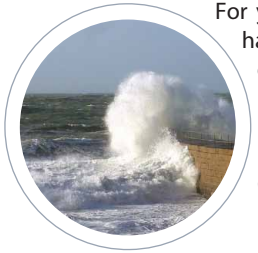
The Dept. of Hydraulic and Coastal Engineering deals intensively with national and international research issues. In particular statistical studies on extreme events, changes in sea level and multi-dimensional computational fluid modeling are the core of the research. The aim of the department is to combine the expertise of the various disciplines Inland Water Engineering, Coastal Engineering, and Sea Level Research and to use existing resources for interdisciplinary issues in the field of water and environment effectively in both research and practical application.

Working Groups

Inland Water Engineering

The main focus of the working group is the identification of univariate and multivariate design values for hydraulic and water management structures. Furthermore, the department has decades of experience in the implementation of complex physical models in it's own hydraulic laboratory. Another important research aspect is the development and optimization of small hydropower plants.

Coastal Engineering



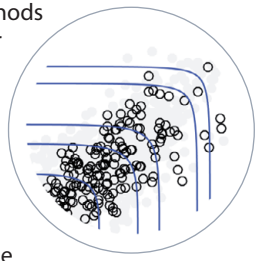
For years, the department's core competence has been coastal engineering. The focus is on the analysis of hydraulic systems of marine and coastal environments. This includes the estimation of storm surge design heights and return periods for the German North Sea and Baltic Sea coast.

Sea Level Research

The department has extensive experience in the field of sea level research and in particular in coastal water level analysis. The aim is to achieve a better understanding of the causes of past water level changes and the generation of robust projections for the future. For this purpose models are developed and potential factors are examined.

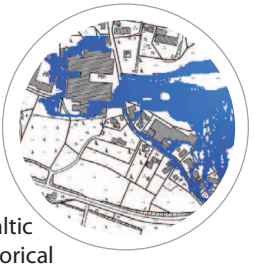
Research Area

Statistical Analysis



- Development of robust statistical methods for analyzing mean and extreme water levels.
- Statistical modeling of event-based and long-term hydrographs for an established determination of design discharge and for estimating uncertainty of statistical investigation.
- Analysis of water levels based on gauge level records.
- Development of methods for the regionalization of water levels with which statements about heights, frequencies, and changes in mean and extreme water levels can be derived for ungauged locations.
- In close collaboration with the Department of Mathematics, statistical methods are developed for the separation of natural and anthropogenic sea level changes.

Numerical Simulations



- The department uses various software products for one-, two-, and three-dimensional hydrodynamic-numerical simulations.
- Numerical simulations of dam break scenarios.
- Numerical modeling of water level and sea disturbance along the North and Baltic Sea, which allows the simulation of historical and scenario-based storm surges.

Physical Modelling

- Performance tests with physical model tests such as the project for the environmental design of the river Sieg in the city center of Siegen on a laboratory area of 90 m^2 and the expansion of the flood spillway for the Malter Dam in a scale of 1:25.

- The focus of the hydropower research are flow machines for the use of small and micro potentials just as the funded project StECon-Infra.
- Studies on mobile flood protection systems in our specifically constructed test building.