

KIT Coordinates Water Research Network in Baden-Württemberg

Ministry of Science Funds KIT-coordinated Network for Assessing Risks of Chemicals in Water Bodies – Water Research Network Office Established at KIT



Under the Eff-Net network, scientists study the effects of chemicals on organisms in the water ecosystem. (Photo: KIT)

Water might become the most important resource of the 21st century: Global population, urbanization, and water consumption for energy supply and industrial production are constantly increasing. The growing gap between water supply and demand is a central topic of environmental research. The Baden-Württemberg Water Research Network, an initiative of the State Ministry of Science, Research, and the Arts (MWK), is aimed at pooling the activities of the universities in this sector. The office has now been established at Karlsruhe Institute of Technology (KIT), the spokesperson of the Network for the first three years is Professor Harald Horn. In addition, KIT participates in a research collaboration to assess the risks of chemicals in water bodies.

For both science and society, the office established at KIT is to be a central contact point relating to water research in Baden-Württemberg. "The disciplines and topics of water research covered by KIT represent an excellent basis for representing the network, pooling complementary resources, and developing joint research



*KIT Climate and Environment Center:
For an environment worth living in*

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perspectives in Baden-Württemberg,” Professor Detlef Löhe, KIT Vice President for Research and Information, says.

The challenges faced by water research are manifold: The gap between water supply and water demand is growing. One third of the world’s population, the Global Water Partnership (GWP) says, is already living under “water stress” as regards both water quantity and water quality. Water has become a resource holding a huge conflict potential. Water also is one of the most diverse environmental topics. “Judging from the regional, that is the Baden-Württemberg, perspective, numerous environmental problems reflect the complex relationships between the use of water and water protection,” the spokesperson of the Network, Professor Harald Horn, says. He is responsible for water chemistry and water technology at KIT’s Engler-Bunte Institute. Horn emphasizes that this often results in use conflicts, e.g. between agriculture and drinking water supply when nitrate and pesticides enter the groundwater, between spatial planning and flood protection when constructing polders in floodplains, or between energy supply and water protection when water is used for cooling by thermal power plants during hot spells. “These topics cover a very wide scope and, hence, require a high degree of interdisciplinary cooperation. This is the only way to develop innovative solution strategies and technologies for managing current and future problems in the water research sector and to sustainably transfer them into practice,” Horn points out.

“Eff-Net” Network: Assessment of the Risks of Chemicals in Water Bodies

The State Ministry has now decided to fund three projects at different sites with about EUR 2 million each. Together with the universities of Heidelberg (coordinator) and Tübingen, KIT is involved in the “Eff-Net” network (Effect Network in Water Research). It focuses on effect relations for assessing the risks of chemicals entering water ecosystems as a result of anthropogenic processes (examples being medical substances and food supplements as well as their conversion products). Eff-Net combines fundamental research in natural sciences with social sciences approaches. Comprehensive risk assessment is required for further decision processes. For this purpose, the researchers develop an analytical scheme to identify and quantify food supplements (in particular artificial sweeteners) and medical substances (in particular anti-depressants and anti-diabetic agents) and their conversion products in water bodies. Moreover, the effects of these substances on organisms in the water ecosystem will be studied on the levels of molecules, cells, and organisms. Three working groups of KIT are involved in this project. They study

effects on pathways of metabolism in the cell (receptor and signal pathways) as well as on bacterial communities of the intestinal flora and, hence, vitality of higher water organisms. Eff-Net is not only aimed at identifying biological risks, but also at counteracting them. The research results will be presented to and discussed with groups of society (consumers, political decision-makers). On this basis, concepts will be developed for control of the consumers' behavior and for environmental legislation.

Water Research at KIT

Nearly the complete scope of water research is covered by a number of working groups, with a total of about 250 scientists, under the KIT Climate and Environment Center. Research extends from natural and engineering sciences to technology assessment. Scientists study the complete regional water and substance cycles in natural and anthropogenic systems from the microscale to the river basin scale. Topics range from transport processes in the complete water cycle to the development of numerical and physical models for fundamental research and water management in practice to innovative technologies for water processing. KIT also initiates and participates in internationally visible joint projects, including a group of researchers funded by the German Research Foundation (DFG) together with other universities in Baden-Württemberg. KIT researchers have vast experience in the area of Integrated Water Resources Management (IWRM). The corresponding cooperation projects have been run for several years now under the direction or participation of KIT. Target regions of international water research projects are Southeast Asia, the region of Israel, Jordan, and Palestine territories as well as Africa and South America.

More about KIT Climate and Environment Center:
<http://www.klima-umwelt.kit.edu/english>.

Karlsruhe Institute of Technology (KIT) is a public corporation pursuing the tasks of a Baden-Wuerttemberg state university and of a national research center of the Helmholtz Association. The KIT mission combines the three core tasks of research, higher education, and innovation. With about 9,400 employees and 24,500 students, KIT is one of the big institutions of research and higher education in natural sciences and engineering in Europe.

Since 2010, the KIT has been certified as a family-friendly university.

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