



DHI MARKET AREA: ENVIRONMENT AND ECOSYSTEMS

# RECREATIONAL AND BATHING WATER MANAGEMENT

## Promoting safe recreational waters – now and for the future

Flocks of tourists visit rivers, lakes and coastal areas each year to enjoy these recreational areas. However, recreational waters can become unsafe due to sewage water outfalls and algal blooms, for example. Safe recreational waters are essential for users, authorities responsible for water statuses, the private sector and the tourism industry. Most countries around the world have regulatory standards for water quality at recreational sites. Public information is a growing concern for both water utilities and authorities. Thus, there is a need for easily accessible, updated information and timely warning of poor water quality. At DHI, our primary clients are in the water treatment industry and the public authorities responsible for water quality. The tourism industry also approaches us for specialist advice and services to ensure the highest quality recreational waters for their guests.

- THE CHALLENGES**
- Minimising the impacts of treated wastewater impact on water environments
  - Enabling safe, recreational use of water bodies in rivers, lakes and the sea
  - Providing near real-time alerts about human health threats to recreational water users
  - Planning and designing safe, recreational beach areas
  - Supporting cost-effective water utility investments and regulatory approvals
  - Minimising the impacts of infrastructure projects on recreational waters

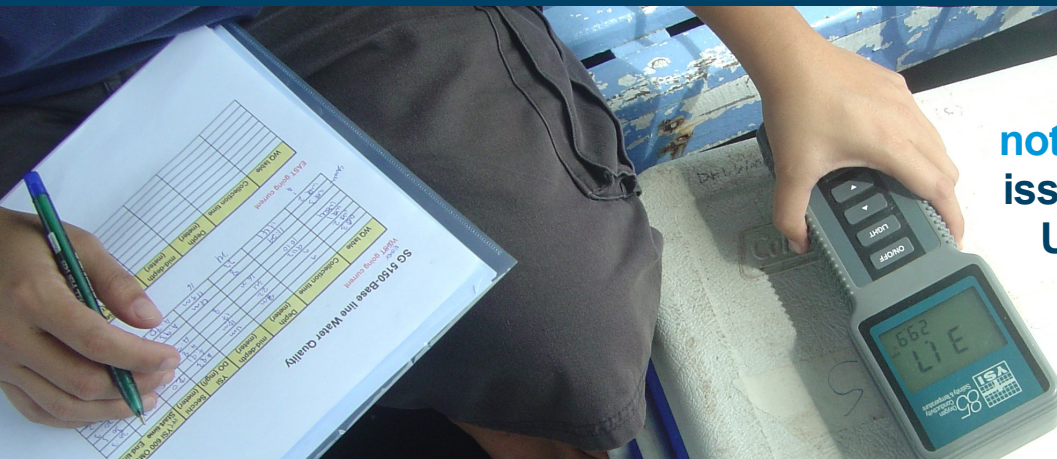
**OUR APPROACH** At DHI, we aim to secure cost-effective solutions and management by asking and answering the right questions. When planning: Are the environmental conditions sustainable? What’s the optimal design, taking users’ requirements, environmental conditions, visualisation and costs into consideration? During operation: How to monitor the water quality (bacteria and algal blooms)? Should pollution be reduced to achieve satisfying health safety? In order to answer these questions, we offer an array of services which support public authorities, the tourism industry and water treatment plants in their planning, design and operation of recreational waters.

**OUR SOLUTIONS** We offer comprehensive solutions to ensure the safety of recreational waters. These solutions range from assessing water quality impacts to recreational (bathing) water quality forecasting and providing information on human health threats. We conduct Health Risk and Safety Planning and aid in climate change adaptation, physical coastal planning and modelling-based EIAs. Lastly, we also help with the design of recreational areas and waterfront developments.

**THE ULTIMATE GOAL** SAFE RECREATIONAL WATER WORLDWIDE

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**In 2012, over 5,725 notification actions\* were issued for beaches in the USA because the water was contaminated**

*\*warnings or closures of at least one day  
USEPA, 2012 Beach Report*

## OUR TOOLS AND SERVICES

In operational mode, our models are at the core of our Bathing Water Forecasting Services. These services provide on-line information to the public, water managers and treatment plant operators on the current and future (up to three days) water quality. Models just form a part of our wide range of tools and services, including:

- numerical modelling with our MIKE Powered by DHI software:
  - MIKE BASIN – multipurpose, GIS-based river basin simulation package
  - MIKE URBAN – urban water modelling software catering to important parameters for model selection such as usability, work flow, openness, flexibility and GIS integration
  - MIKE 11 – modelling software with a wide range of application areas such as flooding and hydraulics, forecasting, hydrology, sediments and water quality
  - MIKE 21 – 2D modelling of hydrodynamics, waves, sediments and ecosystems
  - MIKE 3 – 3D modelling of hydrodynamics, sediments and ecosystems
- DIMS.CORE – a toolbox to build solutions that transform data into information for utility operation and management
- MERMAID – our GIS-based database system for the control of bathing water quality and administration of bathing water data
- bathing water forecast and quality information
- dynamic modelling and water quality monitoring
- sustainable environmental conditions
- pollution assessment and remediation
- health risks and safety planning
- coastal water dilution tool (DK waters)
- tools for managers and the public
- capacity building and training by THE ACADEMY by DHI

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