



## SURFACE AND GROUNDWATER

Water – a precious and finite resource

The world's water consumption rate is doubling every 20 years — twice as fast as the population growth rate. By 2025, water demand will exceed supply by 56%. Managing this precious and finite resource is a critical and urgent challenge. While there is theoretically enough fresh water on the planet to sustain the needs of its population, much of it is wasted, polluted and unsustainably managed. In addition, its uneven distribution means that while some parts of the planet have more than enough water, scarcity occurs elsewhere. In many areas, increasingly erratic rainfall is leading to repeating cycles of drought and flood.

The critical need for water to sustain all aspects of human activity has driven us to inhabit floodplains and deltas close to rivers. Today, 82% of the global population lives in these areas and are exposed to a high risk of flooding. This is further magnified by the impact of climate change. The need of the hour: to sustainably manage these risks and balance the various conflicting uses of water; for drinking supply, agriculture and industry, power production, navigation and the environment.

### THE CHALLENGES

- Ensuring reliable water supply for consumption, agriculture and industry
- Minimising environmental impacts of water abstraction and use
- Mitigating flood risk
- Managing water infrastructure
- Improving efficiency of water delivery

### OUR APPROACH

At DHI, we strive to develop a robust understanding of the physical water environment as a precursor to any analyses influencing decision-making. We apply state-of-the-art modelling technologies and analytics to achieve this. We work with our clients and stakeholders to appreciate the water management issues that may affect their project outcomes. We develop solutions that are appropriate, cost-effective and environmentally responsible.

### OUR SOLUTIONS

- Watershed management
- Rivers, dams and reservoirs
- Flood management and forecasting
- Groundwater management
- Irrigation
- Water quality and environmental impacts

### THE ULTIMATE GOAL

SUSTAINABLE MANAGEMENT OF THE WORLD'S FRESHWATER RESOURCES

## OUR EXPERTISE

With cost-effective and sustainable solutions, we help you achieve sound water management in the entire spectrum of global freshwater resources:

### WATERSHEDS

- Catchment yield
- River basin planning
- Integrated Water Resource Management (IWRM)
- River management rules and allocations
- Drought management and forecasting
- Conjunctive use
- Water resources information and management systems
- Capacity building and institutional development

### DAMS AND RESERVOIRS

- Dam operations
- Reservoir inflow forecasting
- Hydropower production and optimisation
- Dam safety
- Reservoir water quality
- Reservoir sediment management
- Spillway performance and design
- Compliance auditing

### GROUNDWATER

- Groundwater yield assessments
- Groundwater recharge
- Protection zones
- Geothermal power
- Surface-groundwater interactions
- Remediation

### RIVERS

- River operations
- Erosion and sedimentation assessments and mitigation
- River training and bank protection
- Hydraulic structures
- Inland navigation
- Real-time data acquisition and management

### FLOODPLAINS

- Flood forecasting and warning systems
- Flood mapping and floodplain management
- Flood mitigation and control

### IRRIGATION

- Irrigation canal system design
- Canal control and automation
- System efficiency improvements
- Irrigation demand forecasting
- Water auditing
- Salinity management

### ENVIRONMENT

Our solutions are always environmentally responsible. Our services guarantee the same in your projects. We help with:

- water quality management and control
- environmental flow analysis and augmentation
- wetland management and restoration
- ecology and habitat response

“ Of all the water on earth, **only 3%** is fresh. Of this, 30% is groundwater and just 0.3% surface water

## CASE STORIES



The riparian countries of the Nile river basin have agreed to co-operatively manage the water resources of the 3 million km<sup>2</sup> basin. Supporting this initiative, we developed a Decision Support System (DSS) enabling transparent and objective prioritisation of investments and contributing to sustainable water resource management. All nine countries can now work together on this shared platform.



Idaho Power Company (IPC) operates 17 hydropower facilities along the Snake River (USA). To help IPC increase operation efficiency at their Bliss Dam facility, we developed a real-time DSS. Providing accurate forecasts of the effects of planned operations, our system supports the optimisation of power production within regulatory and operational constraints.



In response to the devastating floods that occurred in major parts of Thailand in 2011, we were commissioned to establish an operational water management DSS for the Greater Chao Phraya river basin, including the city of Bangkok.

The solution will support early warning and emergency action plans, flood impact mitigation and flood alleviation strategies.

Contact: [info@dhigroup.com](mailto:info@dhigroup.com)

For more information, visit: [www.dhigroup.com](http://www.dhigroup.com)