

# Managing flood risk holistically

## Flood risk management infrastructure

Our services in designing and constructing flood-risk management infrastructure help to protect people and assets at risk, now and into the future.

We apply our extensive experience of designing and constructing flood-risk management infrastructure around the world to deliver solutions and outcomes for our clients that are technically excellent, innovative, environmentally sensitive, safe, sustainable and affordable.

### Our approach

At Halcrow, we have all the wide-ranging skills required for the co-ordination, planning, design and supervision of construction of flood protection and management works. Our experience provides clients with the expertise to invest in the right locations and understand the long-term investment required.

Our local staff, supported by global resources, can ensure that our clients will understand the condition of existing assets and the need to additional assets. We can provide solutions that use sustainable infrastructure, require low cost maintenance, are adaptable to future climate change, use sustainable construction methods, are low energy and fit with the environment.

### Our services

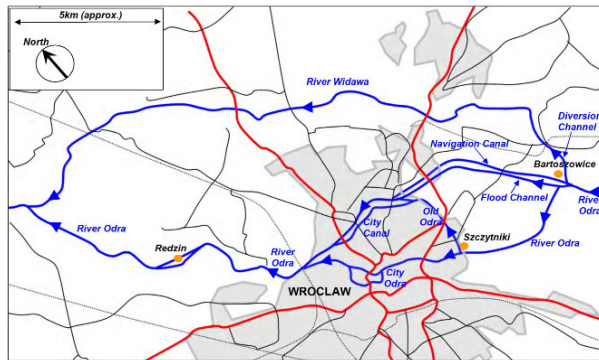
Our services cover the full range of activities needed to undertake detailed design and construction supervision. These include:

- asset condition assessment
- defence asset database
- hydrological and hydraulic modelling
- detailed design
- adaptation to climate change
- geomorphology
- environmental enhancement and impact assessment
- ground investigation
- intrusive testing
- underwater inspections
- topographic surveys
- stakeholder and public consultation
- contract documents, procurement and risk management
- contract administration and site supervision
- long-term investment planning
- programme management
- financial modelling
- securing funding
- cost management and investment appraisal

## Delivering value – case studies

### ■ Modernisation of the Wroclaw Floodway System

The 854km-long River Odra originates in the mountains of the Czech Republic and has a history of significant flooding. The flood of July 1997 inundated an area of 650km<sup>2</sup>, flooding 700,000 households, damaging more than 37,000 buildings, 866 bridges and over 2,000km of roads. The flood caused the loss of 54 lives and evacuation of 110,000 people. The financial cost was valued at PLN8.5 billion.



Map of Wroclaw floodway, Poland

The modernisation of the Wroclaw Floodway System will work in conjunction with the upstream Racibórz polder and the Widawa bypass channel to enable the safe passage of 3,100m<sup>3</sup>/s through Wroclaw. Halcrow, as part of a joint-venture consultant team, is responsible for:

- updating the feasibility study in accordance with EU funding requirements
- hydrological and hydraulic modelling
- design of flood-risk management infrastructure for the city of Wroclaw
- tender documentation under FIDIC
- tender appraisal for construction contracts
- contract administration and site supervision
- strategic advice to the client organisation

### ■ Broadlands Flood Alleviation Scheme

The 20-year Broadlands flood alleviation scheme provides a range of flood-defence improvement, maintenance and emergency response services in the environmentally sensitive Norfolk Broads. Some 7,000ha is protected by law as a designated national park and wildlife habitat. Farming and tourism are also important for the local economy, and the defences shield 1,700 properties from flood risk. This long-term project enables the trial and evaluation of innovative flood-defence solutions at various scales.

Halcrow is responsible for engineering design, environmental monitoring, statutory consents, stakeholder consultation and post-construction evaluation.



Working on flood banks, Broadlands, England

### ■ Reduction of Black Sea coastal erosion

Halcrow was commissioned in 2011 to study and prepare works to limit the effects of coastal erosion along the 240km of Black Sea coast in Romania for the Basin Administration of Water Dobrogea Litoral, which is part of the national Romanian Waters Administration. Halcrow and its associates are providing technical assistance for the preparation of projects and the implementation of structures to prevent natural risks (specifically coastal erosion) in the most exposed areas along the coast. Halcrow's services include:

- coastal master planning
- land surveys and ground investigations
- LiDAR remote sensing
- hydraulic modelling
- cost-benefit analysis
- institutional analysis
- environmental impact assessment
- procurement documentation
- client training

### Contact us

- **Jarek Karpijok** – Poland  
tel +48 22 584 34 40  
email karpijokj@halcrow.com
- **Jeni Ionita** – Romania  
tel +40 311 065 376  
email ionitaj@halcrow.com
- **Richard Crowder** – Rest of Europe  
tel +44 113 220 8220  
email crowderr@halcrow.com

For your nearest Halcrow office, visit [halcrow.com](http://halcrow.com)