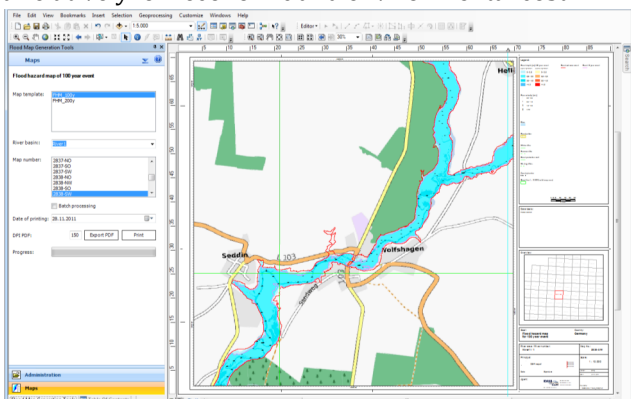# Flood Toolbox
Custom solutions for flood risk management planning, to support the implementation of the EU Flood Directive (EU 2007/60)

DHI

Severe flooding without preventive flood management can cause major economic losses

The number of flood disasters worldwide has increased significantly in recent years. While this may partly be due to a changing climate, the increasing utilisation of flood plains and a reduction in the natural retention capacity of catchments play a significant role.

Losses cannot be avoided when major floods occur, but flood preparedness can help to reduce flood damage and the number of lives lost considerably. Flood management planning, in particular, provides an opportunity to minimise the impacts of flood events at a relatively low economic and environmental cost.

The Flood Toolbox allows to prepare flood maps, which are an essential part of the EU Flood Directive, with a broad set of different tasks in the Flood Map Generation Tool. (Map data © OpenStreetMap, CC-BY-SA 2.0)

Solutions for the implementation of the EU Flood Directive

The EU Flood Directive (FD 2007/60/EC) aims to reduce and manage the risks that floods pose to human health, the environment, infrastructure, cultural heritage and economic activity. The Directive requires Member States to first carry out a preliminary assessment until the end of 2011, and an update every six years from 2018 where required, to identify the river basins and associated coastal areas at risk of flooding. For such zones, they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015.

SUMMARY

Clients
Public/Water authorities, policy makers, consultants

Challenge
- Handling tasks of the EU Flood Directive
- Flood risk assessment
- Calculation of depth, velocity and direction
- Automated creation of flood maps
- Damage assessment

Solution
The Flood Toolbox offers a one-stop-shopping solution for the EU Flood Directive. The package comprises 5 modules including flood estimation, risk and damage assessment as well as map generation.

Benefits
- Useful workflow with task control interface
- Wide range of convenient tools
- Based on ESRI ArcGIS
- Import of modeling data
- Batch mode to create maps

Five modules for a comprehensive flood management planning

DHI has developed a modular toolbox for flood related tasks including the following tools:

- Preliminary Flood Risk Asessement Tool
- MIKE2011 Tool (Data import tool)
- Flood Estimation Tools
- Flood Damage Assessment Tool
- Flood Map Generation Tool

Optimise your solution for tasks of the Flood Directive and flood risk management
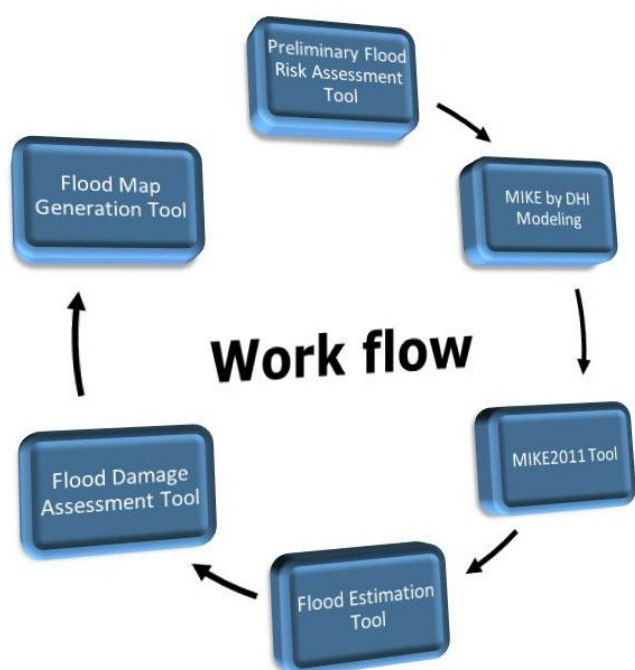
The Flood Toolbox consists of five major components, including a Flood Damage Assessment Tool to calculate the economic damage in selected areas and analyse the prioritisation of measures, as well as a tool for the generation of standardised flood maps.

Flood Toolbox
Custom solutions for flood risk management planning, to support the implementation of the EU Flood Directive (EU 2007/60)

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DHI is well prepared to help regional water authorities to fulfill the requirements of the EU Flood Directive and other flood related tasks with its Flood Toolbox and the modeling software MIKE by DHI, comprising the most advanced modeling and GIS mapping.

The modules within the Flood Toolbox:

Preliminary Risk Assessment
The Preliminary Flood Risk Assessment Tool is used for a preparatory estimation of the potential flood risk on river sections. It is not based on modeling results but on land use, slope inclination and—if available—historical flood extents. The output of the Preliminary Risk Assessment is user-adjustable risk categories for river sections.

The flood plain task of the Flood Estimation Tool module. It enables the creation of flood maps as rasters and polygons as well as border lines.

classes in specific regions, damage maps and total damages as well as the average annual damage (AAD) is evaluated. A comparison of different scenarios can be carried out to provide decision support for risk mitigation.

Flood Map Generation
In the last step, the Flood Toolbox will take care of creating maps, including a batch mode for serial map production. It enables the convenient management of map templates for creating map files in RTL or PDF format as well as easy printing.

Reaching beyond the EU Flood Directive
The Flood Toolbox and MIKE by DHI supply you with a complete solution, bundled with DHI's experience in handling flood projects. Even though centred on the EU Flood Directive, its outreach is much wider: Water authorities outside the EU will profit from the tools when they have to handle similar flood related tasks.

Suggested work flow of the Flood Toolbox modules.

MIKE2011
This module is a basic tool to import modeling data from e.g. MIKE by DHI. It enables the import of data from MIKE11 and MIKE21 result files.
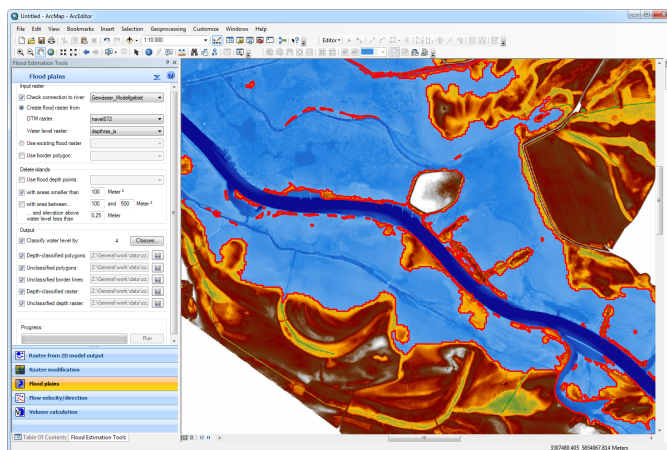
Flood Estimation
The Flood Estimation Tool consists of five main tasks to create flood maps including water depth and volume, flow velocity and direction.

Two-dimensional modeling and raster results or digital terrain models can be edited for analysis and map creation. Additonally, the Flood Estimation Tool calculates the volumes of the flooded areas.

Flood Damage Assessment
Combining flood map results and land use files, monetary damages for selected areas are calculated. Additionally, flow velocity and duration can serve as parameters for damage evaluation. Using damage values for land use

Flood disasters are increasingly frequent and severe all over the world, endangering many lives and livelihoods.

Want to know more? Contact: marketing@dhigroup.com