

INFORM - Integrated Floodplain Response Model

INFORM is designed to support planning procedures of the German Waterways- and Shipping Administration (WSV). Modelling tools enable to predict impacts on vegetation and fauna in and along rivers due to natural and anthropogenic changes. INFORM is developed and operated by the German Federal Institute of Hydrology (BfG).

Detailed knowledge of ecological interrelations in floodplains is required for model development. The water budget is supposed to be most important for controlling riverine plant and animal habitats. Therefore, hydrological factors such as river and ground water levels are key parameters for modelling biological floodplain components (figure 1).

The architecture of INFORM is modular allowing extraction and extension of modules at any time. Modules are linked by a graphical user interface. INFORM is implemented in a Geographical Information System (GIS) providing spatial model predictions.

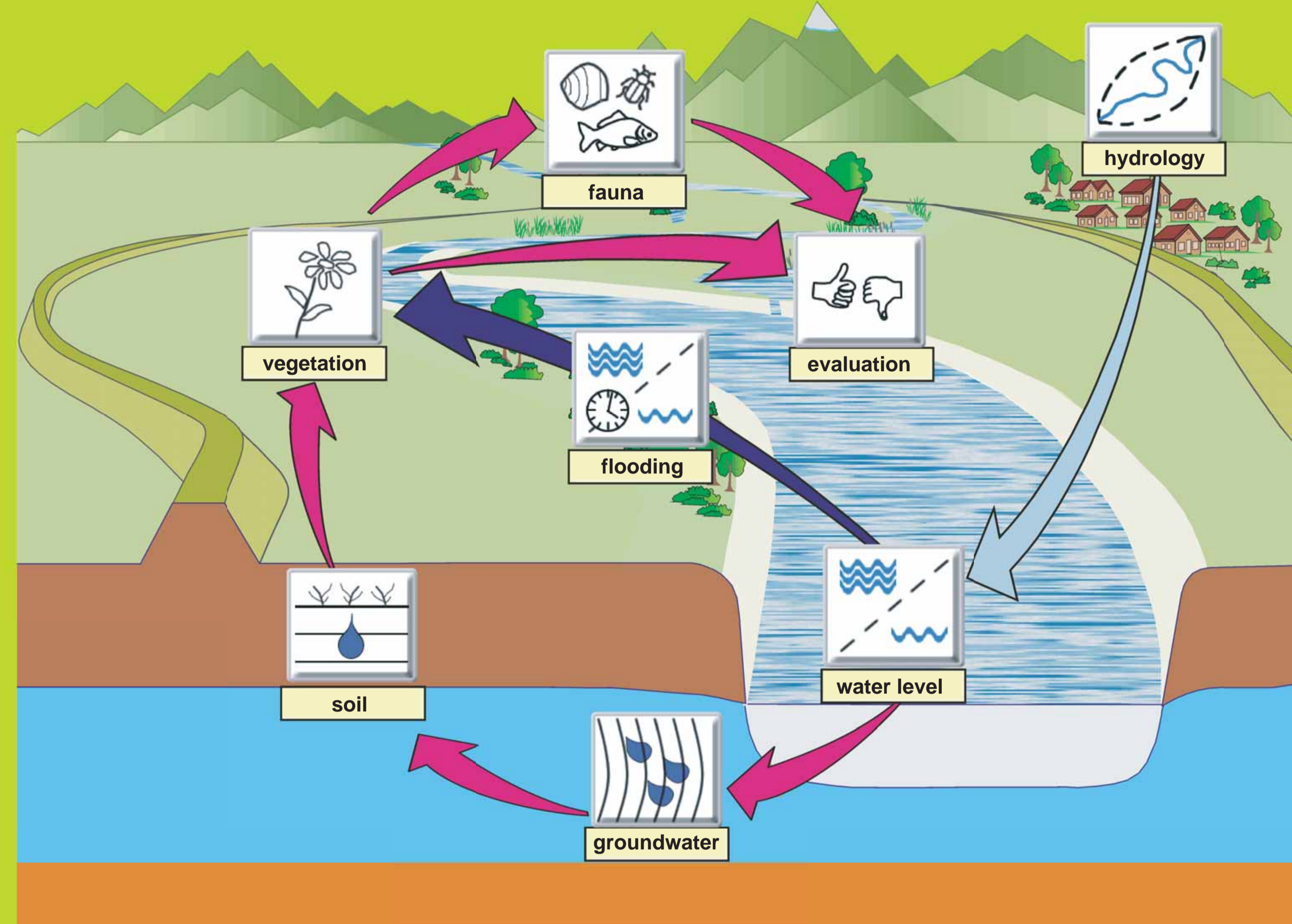


figure 1: ecological interactions in flood plains considered in INFORM

Environmental key parameters driving the models for riverine organisms are:

- flood duration
- plant available soil water
- texture of top soil
- mean groundwater level
- land-use
- structural quality of river banks
- flow velocity

Types of models used are ruled-based models based on empirical knowledge. Rules can and often have to be adapted by experts to local situations. In some cases statistical models are used that are based on statistical analyses of field data sets.

System components of INFORM including models for predicting habitat suitability of riverine organisms are:

- MOVER - floodplain vegetation
- MOCAR - Carabide beetles
- MOMOR - molluscs

Being developed are:

- MOFIR - fish
- MOBER - macro-invertebrates

The evaluation tools of INFORM are designed to be used in environmental impact and risk assessment being part of the legal planning procedure in Germany. Model results and their evaluation are being communicated via maps showing for example areas in which changes are predicted to occur that are evaluated as positive or negative (figure 2).



photo: Dr. Andreas Anlauf (BfG)

INFORM enables to assist planning procedures by pre-selecting ecological meaningful planning alternatives. Choosing measures having predicted minimal impacts on plant and animal habitats can reduce compensation costs. Additionally monitoring programs can be designed efficiently.



photo: Dr. Michael Schleuter (BfG)

Model results comparing different planning alternatives are communicated to the user via topic related maps, tables and graphs. This facilitates the selection of specific planning alternatives e.g. having only little ecological impact.

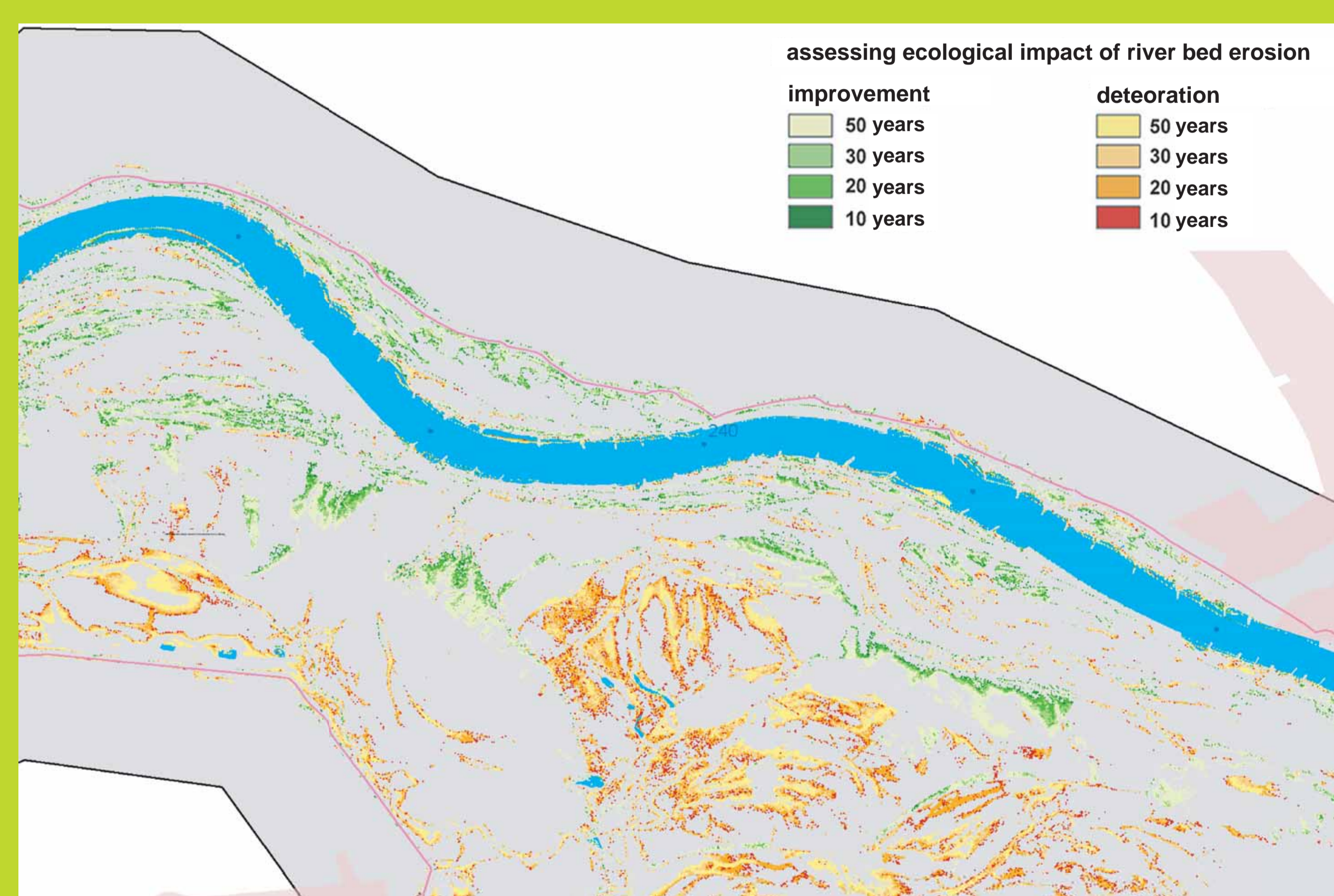


figure 2: example map illustrating modelled areas with changes in vegetation pattern

For practical use in branch offices of the Waterways- and Shipping Administration an easy-to-use software has been developed. INFORM.DSS allows to design constructional riverine measures and to predict their hydraulic impact. A subsequent model calculation of the measures' impact on habitats of plants and animals is performed by BfG. Results are re-transferred to the respective WSV office.

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