International Conference

Nature-oriented Flood Damage Prevention

Planning, Evaluation and Communication

TECHNISCHE UNIVERSITÄT DARMSTADT

nofdp

nofdp IDSS - an interactive planning and communication software

nofdp IDSS

Part 1: Introduction

Christoph Hübner

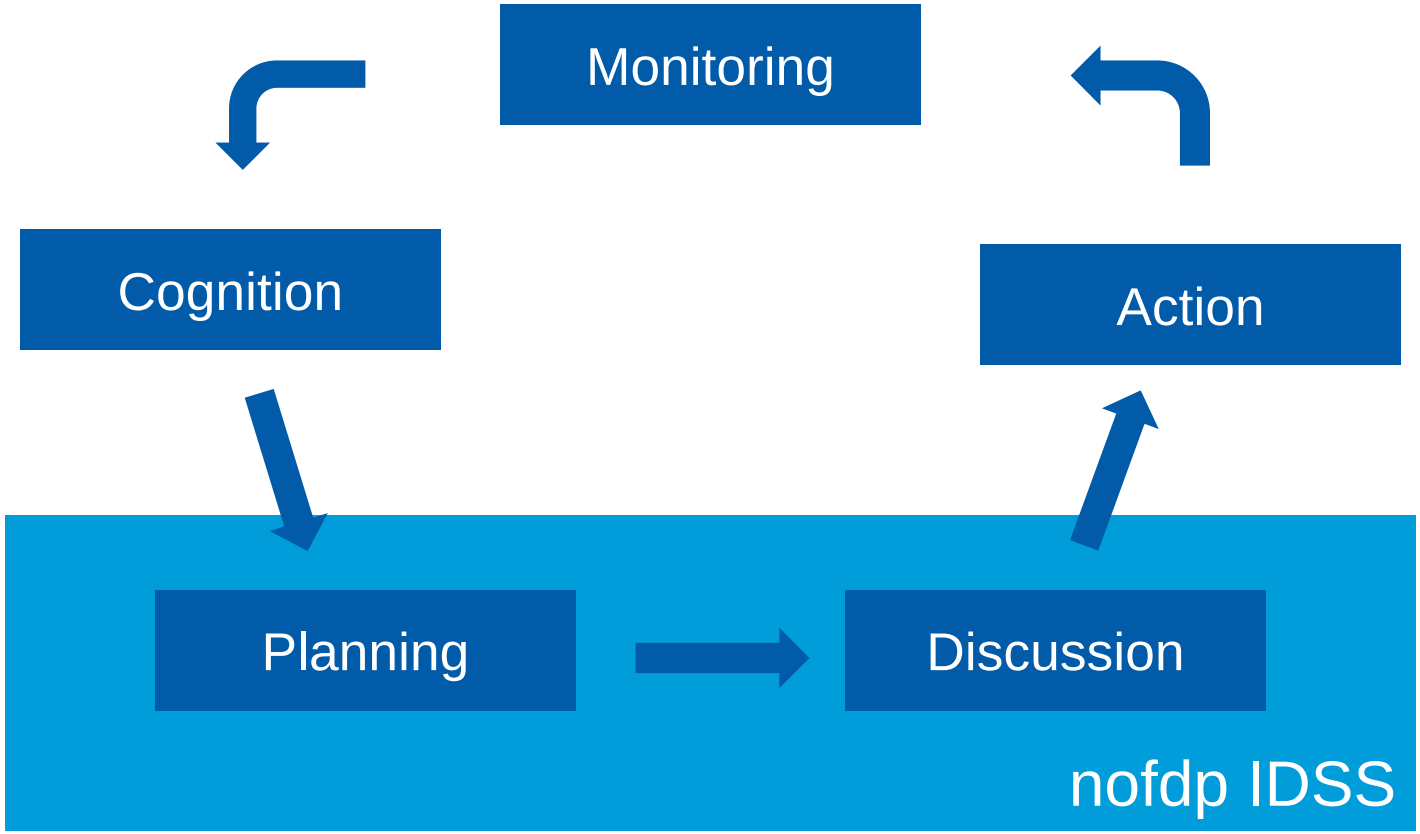
Decision Support

Characteristics of Decision Support Systems

- Support for decision makers in semi-structured and unstructured problems
- Support individuals and groups
- Support for interdependent or sequential decisions
- Support variety of decision processes and styles
- DSS should be adaptable and flexible
- DSS should be interactive and provide ease of use
- Ease of development by (modification to suit needs and changing environment) end users
- Model-, communication-, data-, document-, knowledge-driven

Decision Support

Decision Process



Simon (1960)

Decision Support

IDSS requirements

- Reliable Results
- Simple and clear demonstration of results
- Not make decisions, but deliver information
- Multicriteria Evaluation
- Support discussions
- Maximum on transparency
- Model-, communication- and data-driven
- Standalone
- Free of charge

IDSS Concept Development

Implemented by:

BCE
BJÖRNSEN BERATENDE INGENIEURE

Deltares
Enabling Delta Life

Objective

The overall objective of the project is to:

develop a computer based decision support system

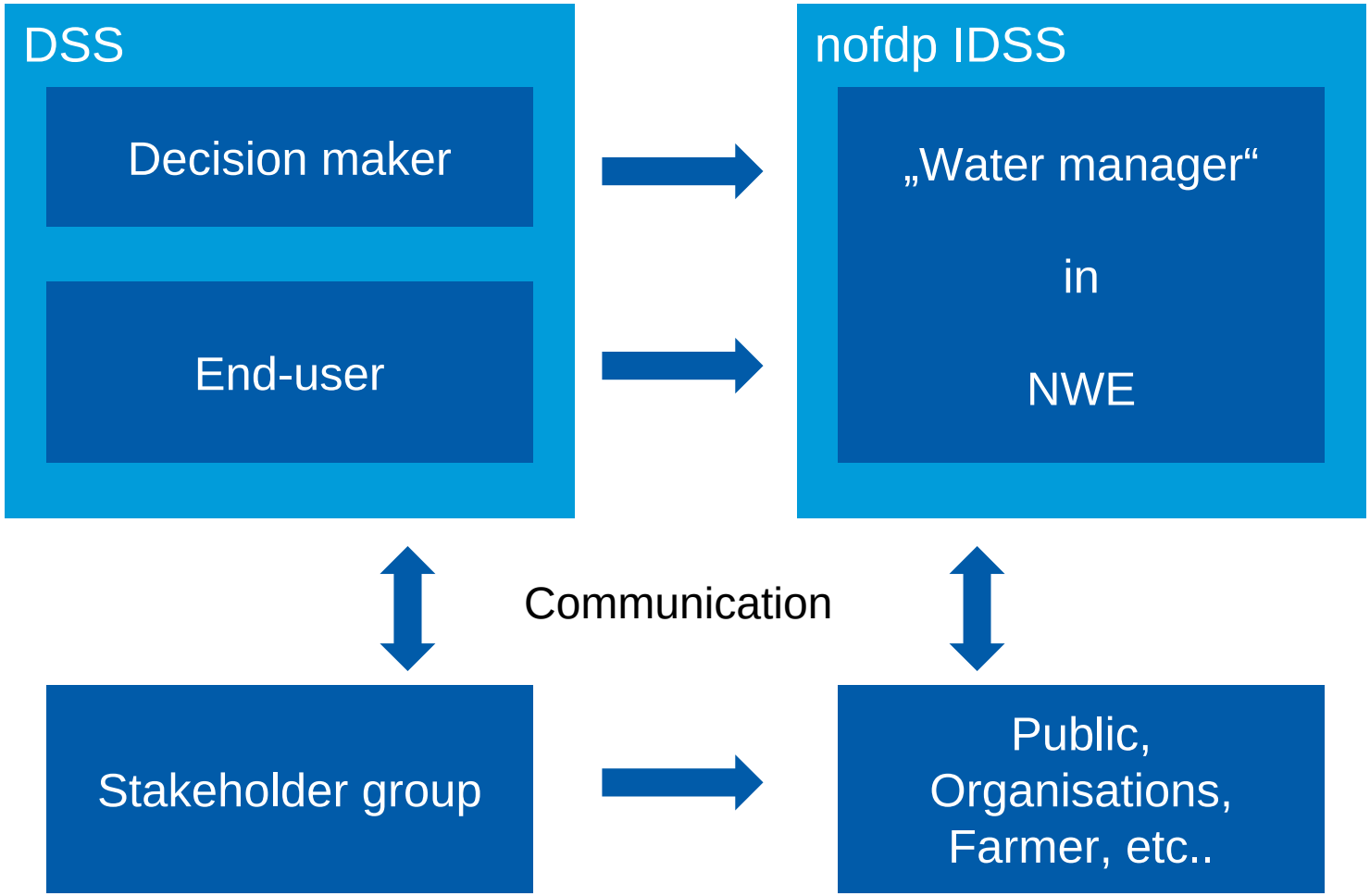
that provides the information required,

as well as suitable models and methods

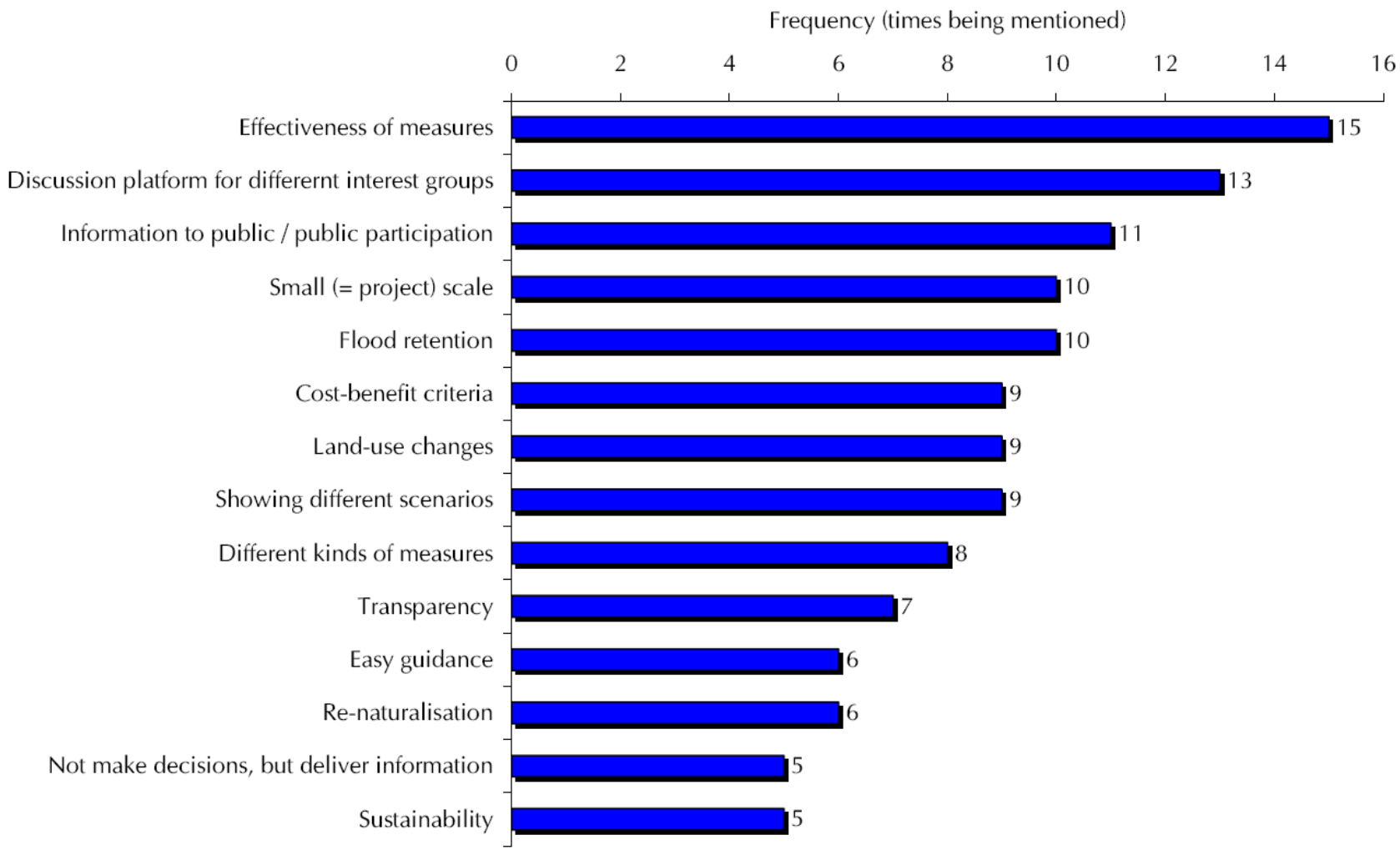
to demonstrate the expected function of flood prevention measures / projects

on different scales, in an integrated temporal

Stakeholder and user



End-user demands



Measures

Category	Sub-category	Measure
Constructive Measures	Flood retention	Polder
		Retarding basin (controlled and uncontrolled)
		Excavation works within floodplains
		Lowering floodplains
	Hydraulic conveyance capacity	Bank recession and –fill up
		Change of bottom slope or level
		Obstacles and line-structures on floodplains
		Diversion flood discharge
		Weirs
	Activation of retention area	Relocation of dykes
		Earth walls in the valley
	Flood protection	Construction of dykes, increasing dyke height
		Mobile walls for local flood protection
Measures of nature conservancy and spatial planning	Flood retention	Ecological flooding of floodplains and polders
	Hydraulic conveyance capacity	Establishment of buffer strips with free vegetation succession on river banks
		Meandering of river course (controlled and uncontrolled)
	Activation of retention area	Adapted forest management
		Forest development on floodplains (controlled and uncontrolled)
		Adapted cultivation on floodplains
		Zoning plan modifications
	Flood protection	Urban land use planning -precautionary measures against flood damage

Management levels

Time horizon of decisions

Management levels

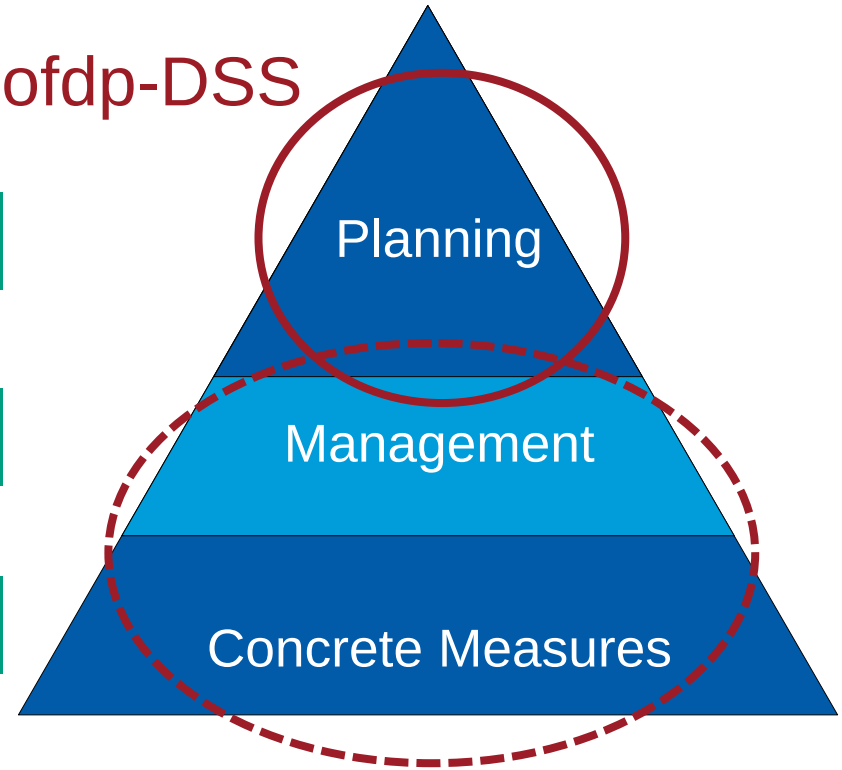
Characteristics of present information

nofdp-DSS

long-term

medium-term

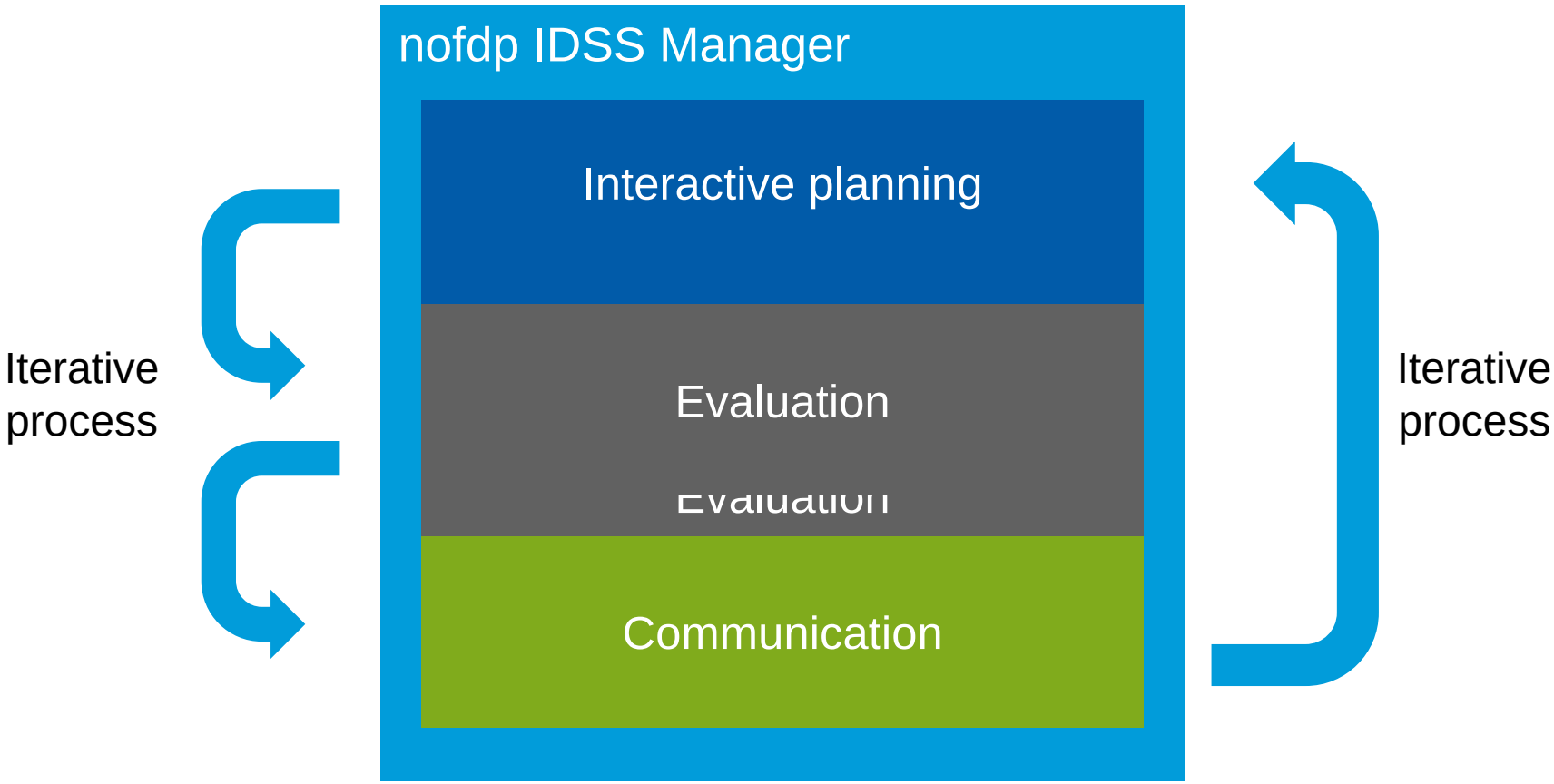
short-term



external, aggregated, prognostic, unstructured, uncertain

internal, detailed, Field Data, structured, rel. certain

Interactive planning



Conclusions

- Decision Support for planning of flood control measures and variants
- The nofdp IDSS is transferable to other catchments, up to 50 km length
- Existing and therefore validated data can be used by the system
- Information and data can be prepared transparent
- Interactive planning and decision process is supported
- Planning variants can be evaluated and discussed
- Modular structured, for interdependent or sequential decisions
- Version 0.9 ready, Version 1.0 in a view weeks

Fin

Thank you very much

for your attention!

www.nofdp.net

www.riverscape.eu

www.ihwb.tu-darmstadt.de

nofdp IDSS - an interactive planning and communication software

Part 2: Implementation

Dr. Kaj Lippert

German and Dutch Co-operation

BJÖRNSEN BERATENDE INGENIEURE

http://www.bjoernsen.de/

Design and Development of Graphical User Interface and Modules / Tools

Deltares
Enabling Delta Life

http://www.deltares.nl/

Implementation of **SOBEK** and OpenMI

Content

- Dilemma of the Developer
- Software Architecture (Open Source)
- User-Friendly Design (Plug and Play?)
- Data Management (High Degree of Freedom)
- How to Get Started
- IDSS Highlights
- Release 1.0

Dilemma of the Developer

The nofdp IDSS should be:

- a multitasking talent
- a system with high degree of freedom
- a plug and play system
- open source
- free of charge (… for the End User)

Software Architecture

external programs

IDSS modules

IDSS tools

Kalypso Enterprise plugins and views

Project Setup	Analysis	Interactive Planning	Evaluation	Communi-cation
Geodata import	ISAR Web	Conflict detection	Ranking	Screenshot
Cross section	ISAR Appl.	Measure construction	Rating	Report
Time series	Vegetation	Hydraulic comp.	Cost-Effectiveness	Export
Flow network	Water Storage	Variant manager	Cost Benefit	Google Earth

navigator
GIS desktop (map view, style editor)
table view | chart view | tree view
time series manager (connected to GIS)
cross section manager (connected to GIS)

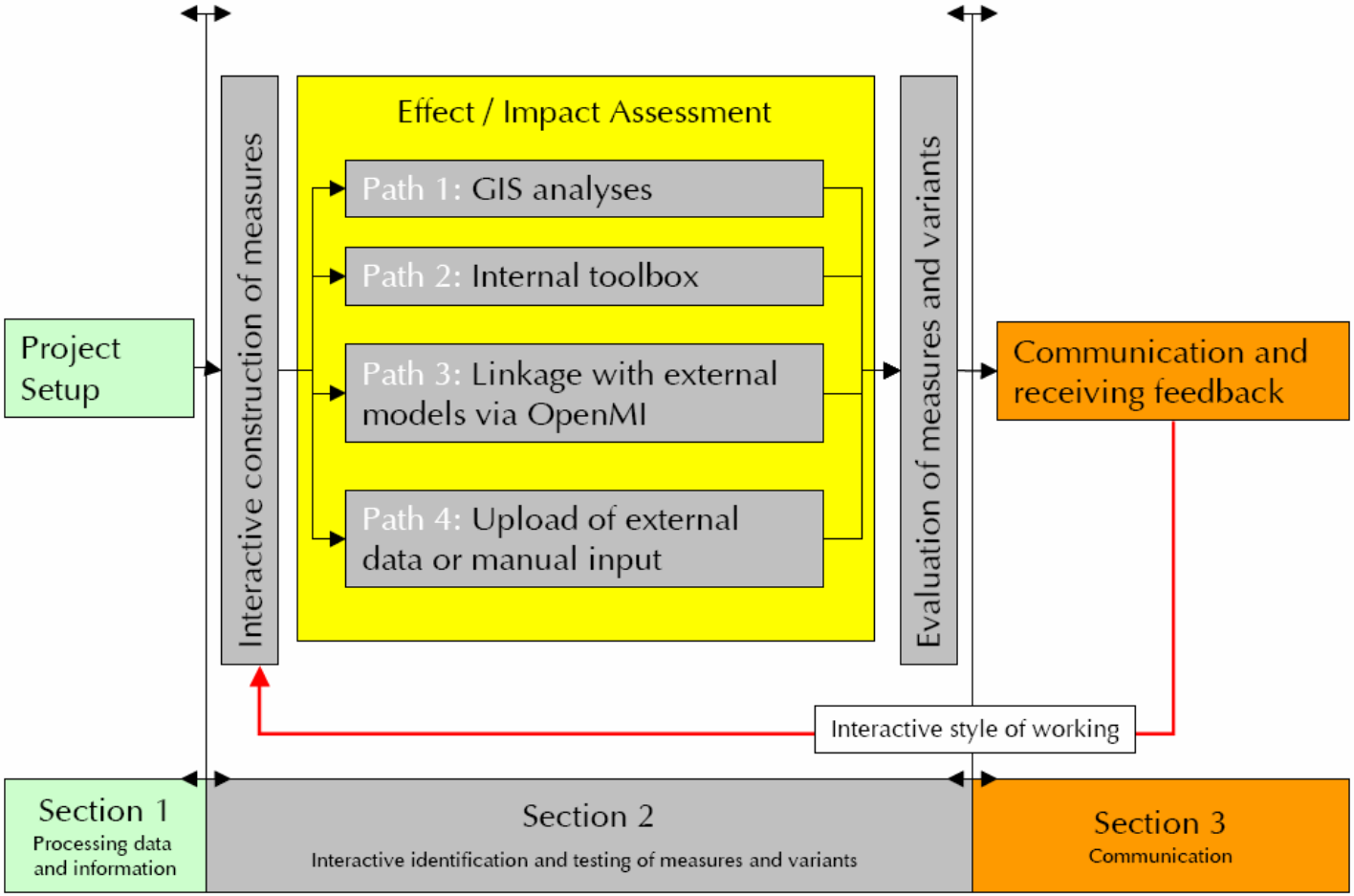
Development Framework

reporting	OpenOffice.org *
hydraulic computation	SOBEK *
SLD, filter encoding map rendering, coordinate transformation WMS, …	deegree *
geometric operations	JTS Topology Suite *
basic application	eclipse, Apache *

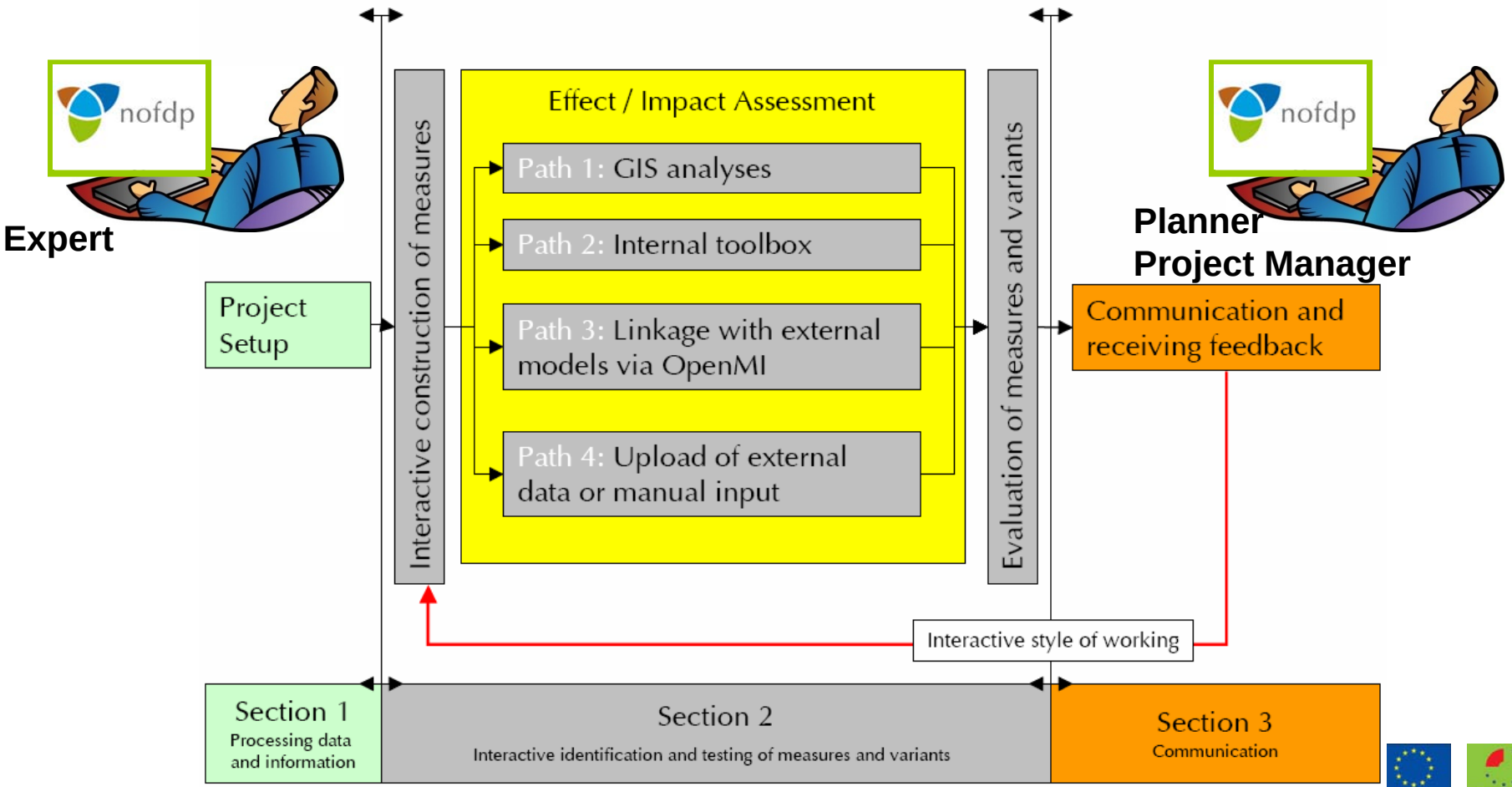
Registered Trademark*

nofdp IDSS:
The Five Headed Monster?

Procedure of Using the nofdp IDSS



Outcome of 2nd user workshop, Cologne 2006



User Profiles and Tasks

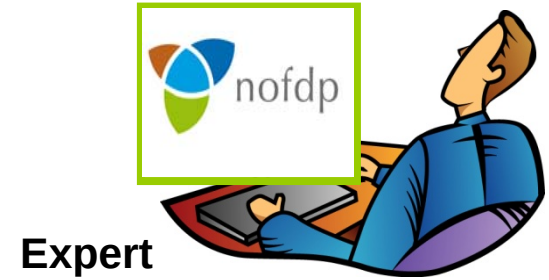
Interactive Planning, Evaluation and Communication

User with basic knowledge concerning GIS and modeling. Familiar with Office, Internet,…

Planner
Project Manager

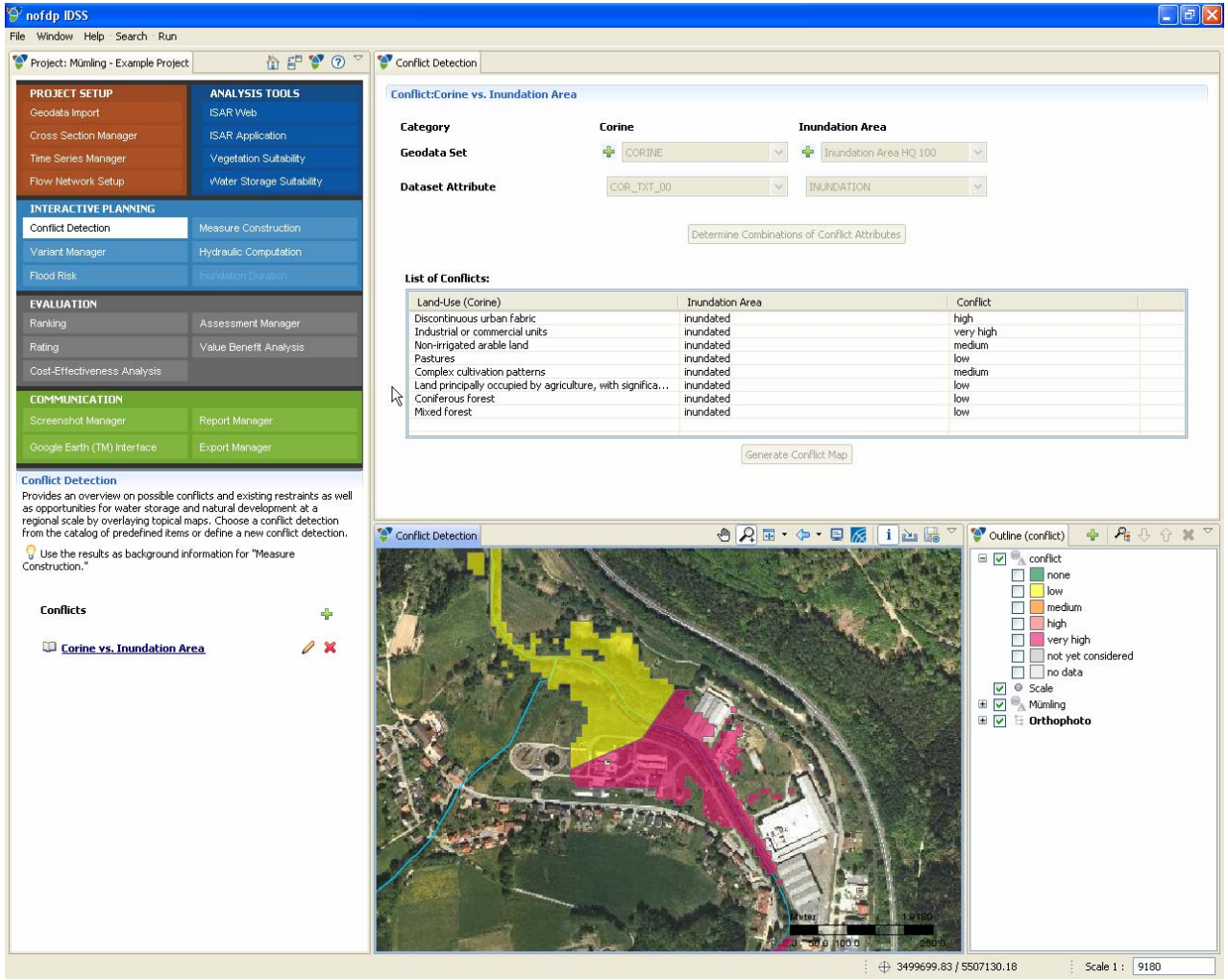
Project Setup and Analysis

Experienced user in processing of geodata and modeling (hydraulic and environmental)



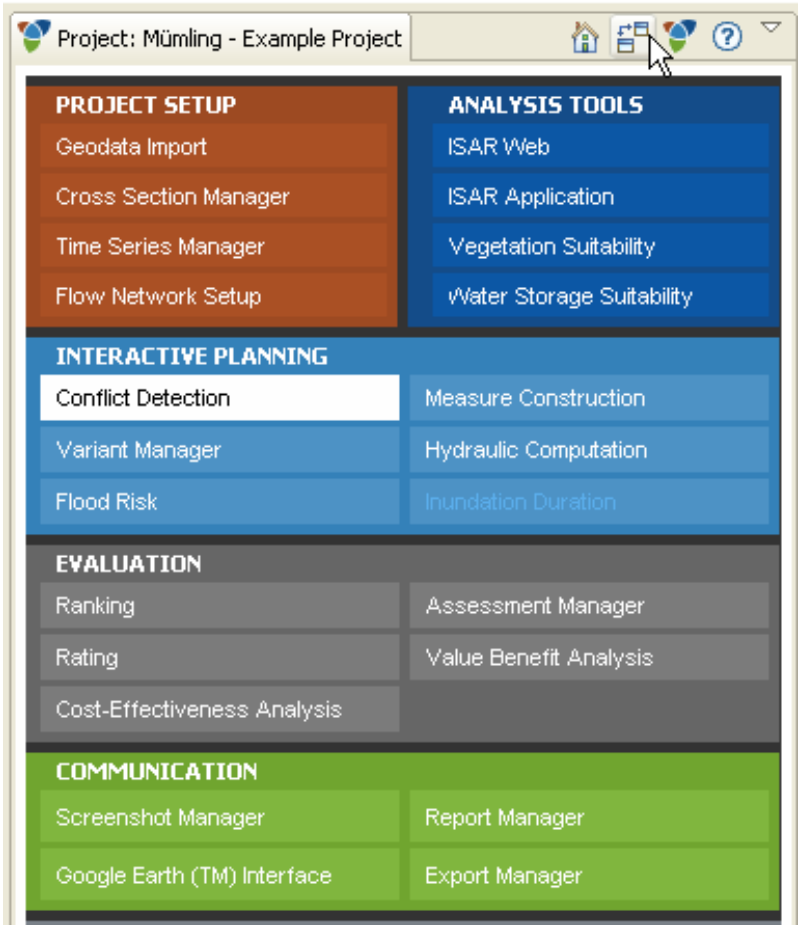
Expert

IDSS User Interface: Navigation

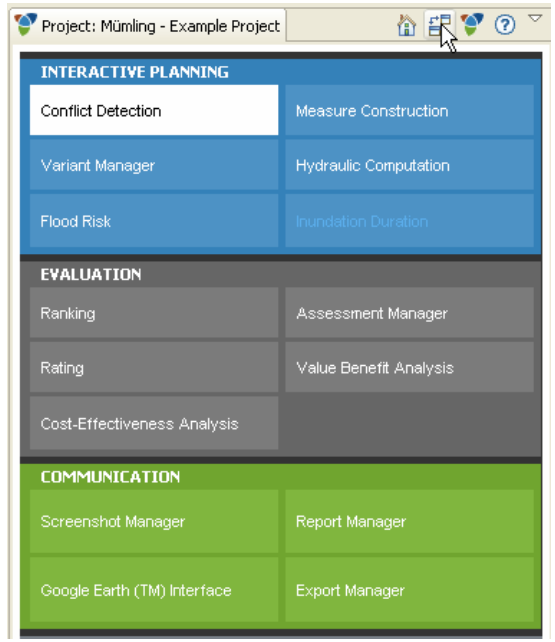


IDSS User Interface: Expert vs. Planner

„fat“ Expert



„thin“ Planner

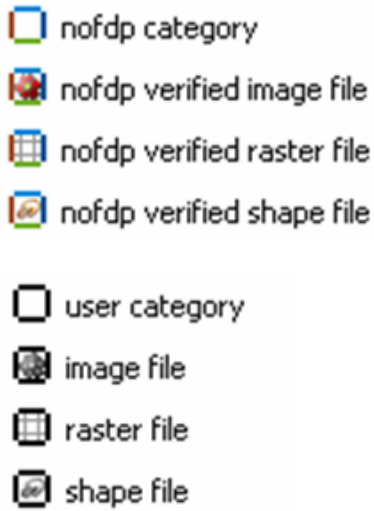


Data Management

supported data types

- Geodata
  - SHAPE data (SHP format)
  - Raster data (ASC format)
  - Image data, geo-referenced (e.g. orthophotos, topographical base maps)
    - GeoTIFF
    - TIFF with World file (TFW)
    - JPEG with World file (JGW, JPW)
- Cross Section data as special geodata
  - ASCII format (XYZ format)
- Time series data
  - ASCII format (selectable delimiter and date format)
  - ZML format (internal time series format, XML)

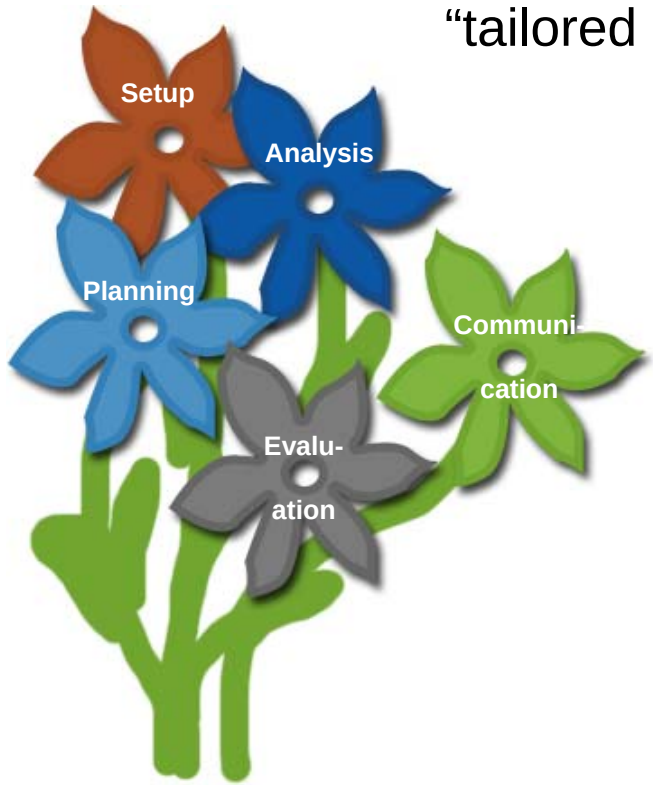
data categories



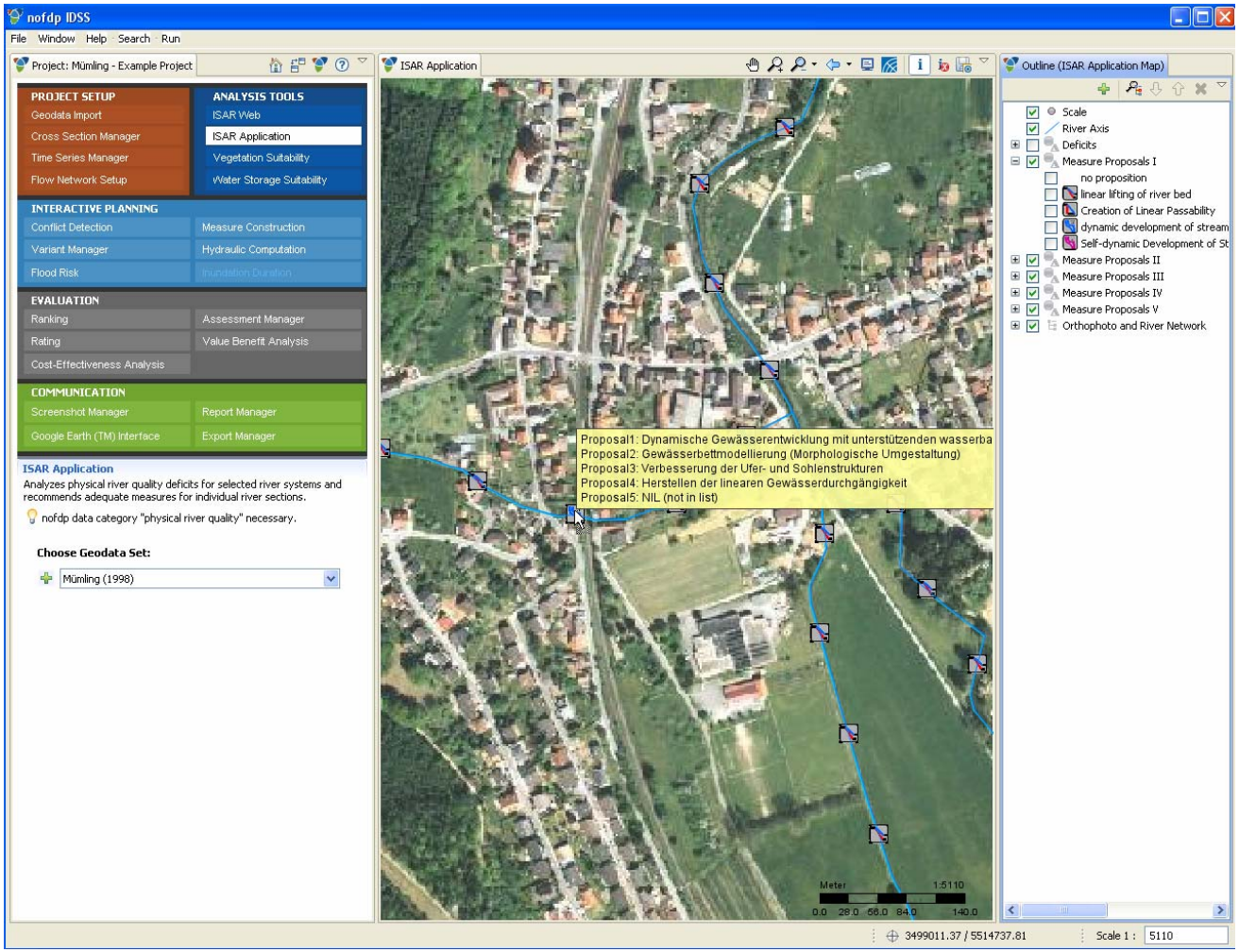
How to Get Started

step by step
“workflow approach“

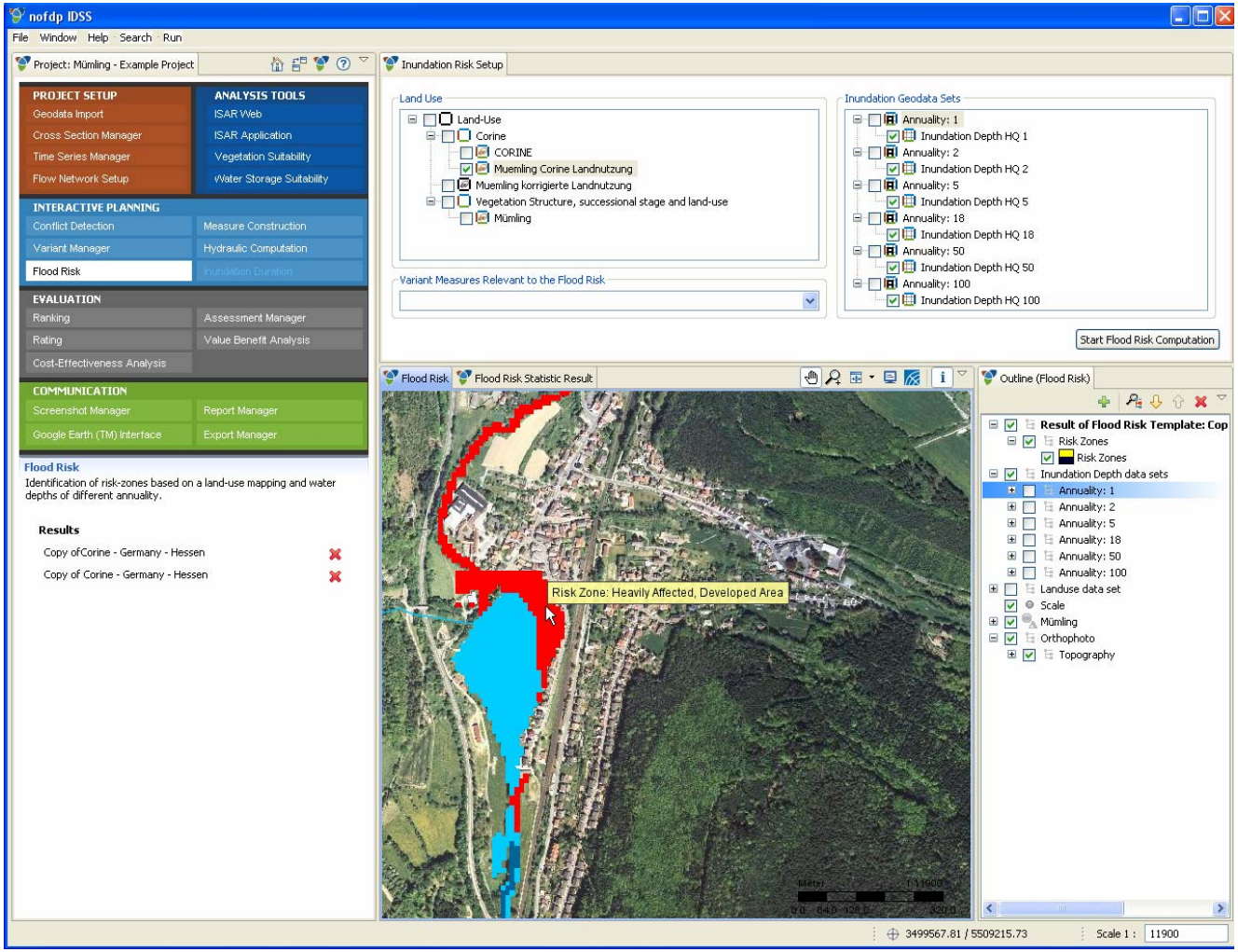
“tailored approach”



Use Case No. 1: Analysis of Hydromorphological Conditions



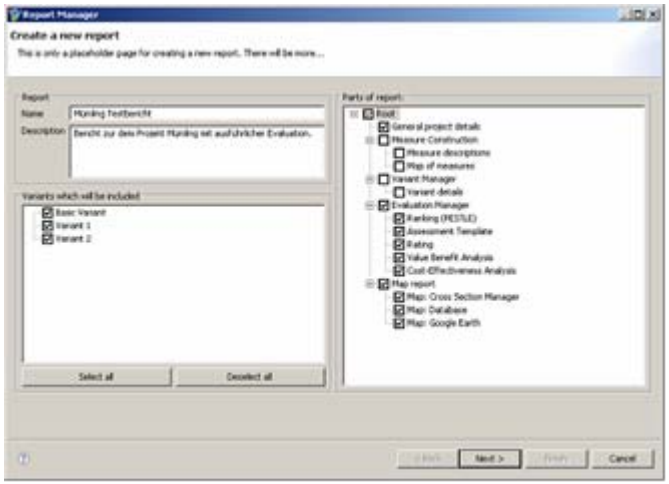
Use Case No. 2: Calculation of Flood Damage and Risk Mapping

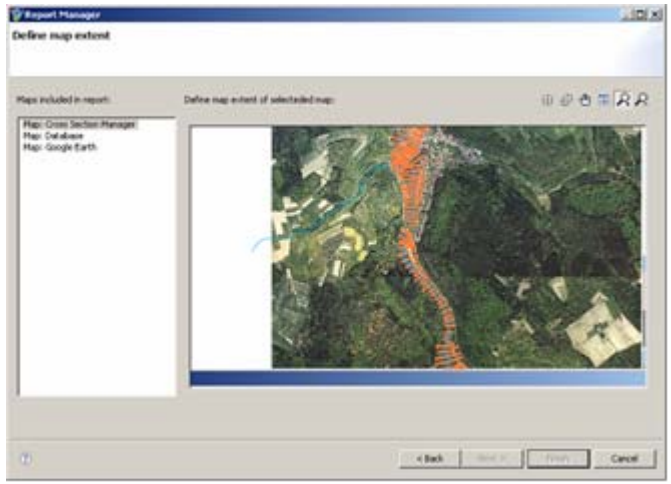


IDSS Highlights

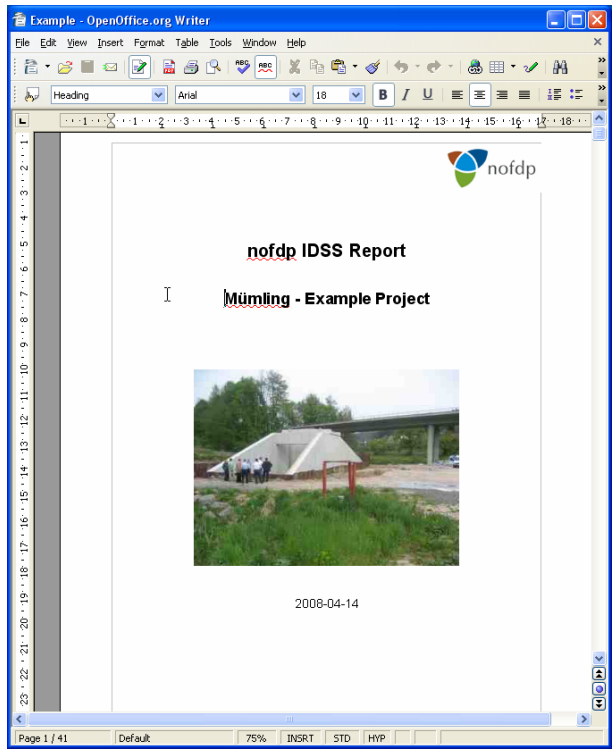
Report Manager

User-specific, automatic creation of project reports

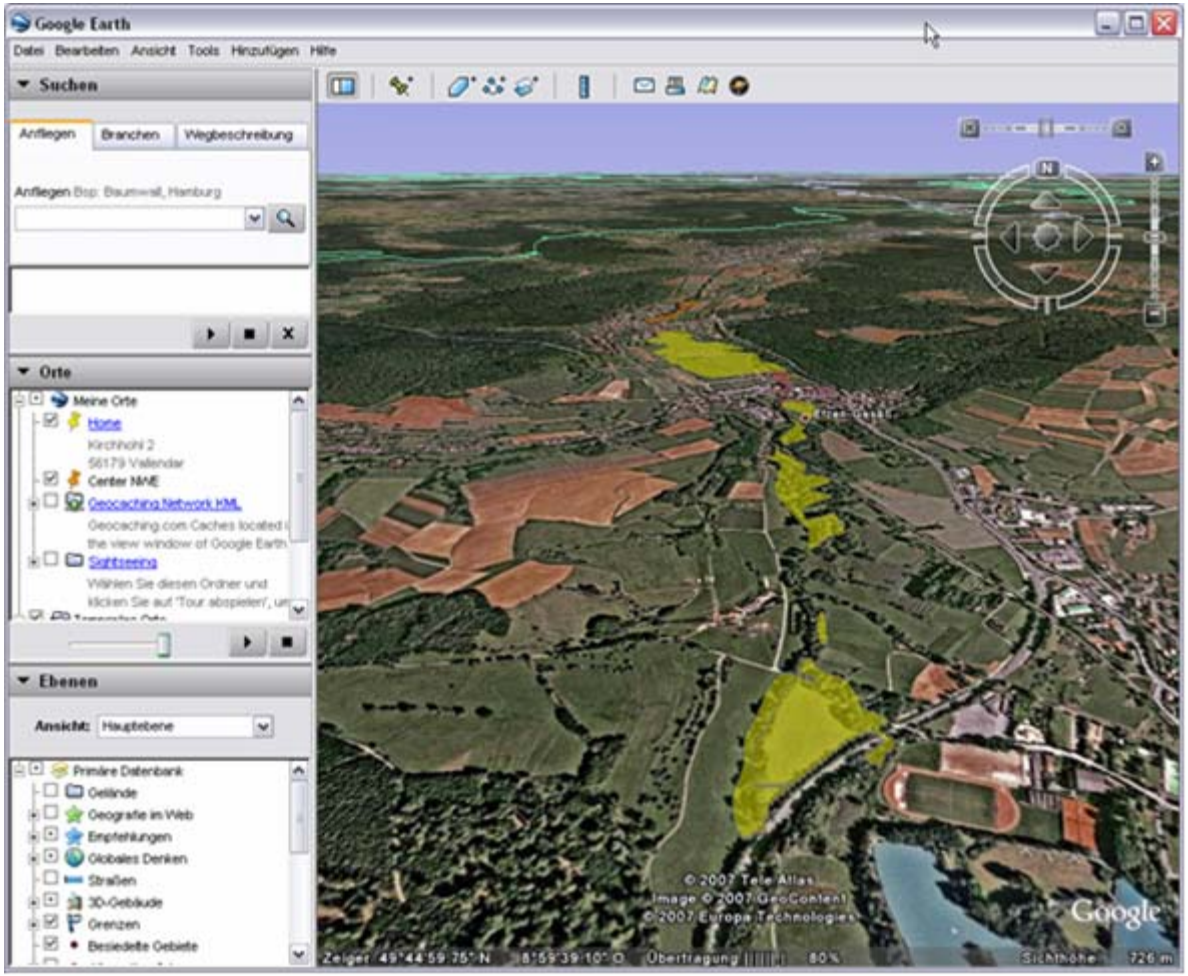




Output: OpenOffice and PDF-document



Google Earth Export



3D-Visualization of objects created by the nofdp IDSS

Release 1.0

- implementation of SOBEK
- new tool: “Flood Duration and Frequency”
- English and German version

Available from June 2008

Fin

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for your attention!

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IDSS Presentations