

Modelling and Decision Support Framework 2 (MDSF2)

Project Summary SC050051/S

This project involved development of the Modelling and Decision Support Framework 2 (MDSF2). It comprises Phase 2B of the MDSF2 Programme. Phase 2A involved scoping the development of the MDSF2 and establishing the Environment Agency CIS software requirements for MDSF2.

The MDSF2 is a decision support toolset for quantifying economic and social impacts of flooding and coastal erosion for present day conditions, future scenarios and different flood management options. It integrates information on fluvial and coastal hazards, the physical flood risk system and people and property in the floodplain - to provide a rich picture of the overall flood and coastal erosion risk.

The MDSF2 builds on the original MDSF1, which was designed for catchment scale modelling and has been widely used for flood and erosion risk assessments as part of Catchment Flood Risk Management Plans and Shoreline Management Plans.

The MDSF1 uses a simplified representation of the role of assets and does not properly take account of asset performance which is a crucial input in understanding and managing "true" risk. The MDSF2 incorporates an approach based on the Risk Assessment for Strategic Planning (RASP) methodologies that includes probabilistic analysis of assets.

This project involved the following key stages:

- Development of a detailed design for the software system (**Report S050051/SR3**);
- Development of the software system;
- Testing of the software system (Development Testing, Alpha Testing);
- Documentation of the technical methods (**Report S050051/SR4**); and
- Preparation of a Software User Manual (**Report S050051/SR5**).

The project was delivery focused, providing a comprehensive software system and supporting documentation. However, there were some method innovations, for example:

- Development of an approach for incorporating point assets (e.g. gates, culverts) in the RASP risk analysis;
- Development of a simple approach for handling main channel floodplain interaction;
- Development of an approach for handling encounter probability i.e. the chance that an asset has failed in an earlier year and not been repaired;
- Development of a case management system; and
- Development of a Data Quality Scoring system.

The final MDSF2 software and documentation is aimed at Environment Agency staff involved in Flood Risk Management activities (e.g. long-term strategic planning, catchment studies, national / strategic / local flood risk assessments, etc.) and consultants on their behalf. A potential secondary audience may be Local Authorities and Drainage Boards.

MDSF2 Software usage will require particular skill sets. These are documented fully in **Report S050051/SR5**.

This summary relates to information from project **SC050051, MDSF2 Phase 2B**, reported in detail in the following output(s):

[Note: Reports SR1 and SR2 were produced in MDSF2 Phase 2A]

Report: S050051/SR3
Title: MDSF2 Detailed Design Report **June, 2009**
Report Product Code: [leave blank]
Internal Status: Released to all regions/Restricted
External Status: Publicly available/Restricted
Project manager: Suresh Surendran, Evidence Directorate
Theme manager: Suresh Surendran, MAR Theme
Research Collaborator: n/a
Research Contractor: HR Wallingford Ltd.

Report: S050051/SR4
Title: MDSF2 Technical Report **March, 2011**
Report Product Code: [leave blank]
Internal Status: Released to all regions/Restricted
External Status: Publicly available/Restricted

Project manager: [Adam Baylis](#), Evidence Directorate
Theme manager: [Jim Walker](#), MAR Theme
Research Collaborator: n/a
Research Contractor: [HR Wallingford Ltd.](#)

Report: S050051/SR5
Title: MDSF2 Software User Manual **March, 2011**
Report Product Code: [leave blank]
Internal Status: Released to all regions/Restricted
External Status: Publicly available/Restricted
Project manager: [Adam Baylis](#), Evidence Directorate
Theme manager: [Jim Walker](#), MAR Theme
Research Collaborator: n/a
Research Contractor: [HR Wallingford Ltd.](#)

This project was commissioned by the Environment Agency's Evidence Directorate, as part of the joint Environment Agency/Defra Flood and Coastal Erosion Risk Management Research and Development Programme.

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