
Modelling and Decision Support Framework (MDSF)

MDSF: History & Overview August 2004

1 Introduction

The Modelling and Decision Support Framework (MDSF) was developed during May to December 2001 to facilitate the production of Catchment Flood Management Plans (CFMPs).

The MDSF originally provided the following:

- Facilitation of the assembly and management of catchment data
- Provision of guidance on flood water level prediction throughout a catchment
- Calculation flood extents and depths, economic damages and social impacts
- Provision of a framework for policy evaluation and uncertainty estimation.

Pilot studies for the CFMP programme were in progress while the MDSF was being developed. The intention was to apply the MDSF to four of the five CFMP Pilot Studies during 2002 (the Medway, Yorkshire Derwent, Severn and Irwell). However, whilst the system has been successfully applied to the Medway and Yorkshire Derwent catchments, it was not possible to fully apply it to the Severn and Irwell catchments.

This was because a Digital Terrain Model (DTM) is needed to calculate flood extents and depths. During testing of the system it was found that the chosen DTM was not accurate enough for flood mapping, and a new DTM had to be produced. The Medway and Derwent were able to proceed because both catchments have LIDAR DTM coverage.

Following the delays to the CFMP programme, primarily caused by the DTM problem referred to above, Framework Consultants were appointed to undertake CFMPs in 2004. It was decided to undertake a Peer Review of the MDSF to see whether it is suitable for use by the Framework Consultants.

The main conclusions of the Peer Review were as follows:

- The MDSF Software is suitable for application to a range of studies where appraisal is required, not just CFMPs.
- The MDSF should therefore be treated as an independent tool, not specifically linked to CFMPs.
- The Software was not changed but the documentation was modified to reflect this change. In particular, guidance on catchment modelling for CFMPs was removed from the documentation.
- The hydrology spreadsheets, developed as part of the catchment modelling, have been retained as part of the MDSF because of their usefulness for a range of hydrological assessment.

2 The MDSF in August 2004

The MDSF comprises:

- The **MDSF Software**, being a customised GIS tool (not a new GIS), developed to work with ArcView Version 3.2a.
- A Software **User Guide**, giving specific instructions for use of the customised GIS tool.

- The **MDSF Procedures**, explaining the software functions so users have an understanding of the results produced and their provenance, notably the influence of “built-in” operations on the results. The Procedures also advise on appropriate use of the MDSF.
- The ‘CEH Packman’ Hydrology spreadsheets.

The MDSF Software provides the functionality listed below.

- Facilities for managing and viewing spatial data.
- Assessment of flood extent and depth.
- Calculation of economic damages due to flooding.
- Calculation of social impacts due to flooding including population in flood risk area and their social vulnerability.
- Economic assessment of erosion losses (this function is aimed at use of the MDSF for SMPs).
- Presentation of results for a range of Cases to assist the user in the selection of the preferred policy. Each Case is a combination of climate scenario, land use scenario and flood management option.
- Procedure for estimating uncertainty in the results for each policy.
- Framework for comparing flood damages and social impacts as an aid to policy evaluation.
- Archiving of Cases.

3 Development of the MDSF

Development of the MDSF initially concentrated on providing upgrades to take account of issues that have arisen in the use of the system since the first full version (Version 3) was released in December 2001. Subsequent improvements have extended the functionality of the MDSF in response to the needs of users. For example, the original MDSF used water levels from external models and other sources to generate flood outlines. The facility to import depth grids and flood extents from external sources has been added at the request of users.

Upgrades to the MDSF have been issued as follows:

- v3.0.1 October 2002
- v3.0.2 December 2002
- v3.1 January 2003
- v3.2.3 August 2003
- v3.2.4 February 2004

Details of recent upgrades can be found on the MDSF website, www.mdsf.co.uk.

4 Support Service

A Support Service is provided for the MDSF which includes:

- Maintenance of the MDSF including “bug fixes”
- Maintenance and servicing of the MDSF website.
- Development of additional functionality
- Provision of the MDSF to Users. The MDSF is provided on a CD.
- Preparation and distribution of upgrades to the MDSF Procedures, Software and User Guide.
- External user support and training.

The Support service is provided by HR Wallingford and Halcrow and the current support contract ends on 31 March 2005. More information on support for MDSF users is contained in a note entitled ‘Support for Users of the MDSF’, which can be found on the MDSF website.

5 Training

A variety of training courses is available for the MDSF. More information on training for the MDSF is contained in a note entitled 'MDSF Training', which can be found on the MDSF website.

6 Associated documents

It is expected that the MDSF will be used to assist the development of CFMPs, SMPs, Strategy Plans and other broad-scale appraisals. Some reference documents associated with these initiatives are listed below.

Catchment Flood Management Plans

- Guidelines Volume I – Policy Guidance
- Guidelines Volume II – Processes and Procedures

Shoreline Management Plans

- Procedural Guidance for Production of Shoreline Management Plans

Strategy Plans

- FCDPAG2 Flood and Coastal Defence Project Appraisal Guidance: Strategic Planning and Appraisal

The MDSF documentation is not intended to supplant the other specific guidance, only to aid use of the MDSF software in support of flood risk management appraisal. There will be many aspects within a CFMP, SMP or other appraisal that are outside the scope of the MDSF.

7 More information

More information on the MDSF can be found on the MDSF website, www.mdsf.co.uk. Specific requests for further information should be emailed to support@mdsf.co.uk

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