

Research and Development

Final Project Report

(Not to be used for LINK projects)

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Project title

Position Review of Data and Information Issues within Flood and Coastal Defence

DEFRA project code

FD2314

Contractor organisation and location

Atkins, Thomson House, Birchwood Science Park, Warrington, WA3 6AT

Total DEFRA project costs

£ 65,500

Project start date

01/02/03

Project end date

01/02/04

Executive summary (maximum 2 sides A4)

Although data underpins the management decisions to support all aspects of Flood and Coastal Management (FCM), issues surrounding 'data' are generally addressed as part of another subject (project appraisal, flood forecasting etc.). This study looks at data as a central item with the purpose to understand the efficiency of current data and information practices and what opportunities exist to improve the flood and coastal defence process through better data management. Focussing specifically on flood issues (fluvial, estuarine and coastal), the output of the project is to determine where limitations can be matched with quick fixes and improved uptake of ongoing research and initiatives. In addition, this project aims to reflect and challenge new thought processes on this topic area, to support and promote policy development, implementation and operations, taking full account of existing data collection programmes and archives.

The key findings of the project focus upon the five key principles of data management.

- Data Understanding
- Roles and Responsibilities
- Processes and Procedures
- Enabling Technologies
- Audit

Data Understanding

To improve the supply of data to support FCM decision making, an 'ontology' of FCM data needs to be determined. An ontology for FCM data would consider issues including: a) what data is required?, b) how certain are we of this requirement?, c) where does it come from?, d) where is it used?, e) what data is needed in the future?, f) what standards are used to maintain the data?, g) what organisations are involved?. This R&D Project has made a good start in establishing an ontology but more work is needed, and it needs to be embedded as a process within flood and coastal management.

Clearer communication is required on the needs of the FCM community and to help this, an ontology could be developed to map responsibilities and initiatives that are being undertaken to improve FCM data management.

Roles and Responsibilities

There needs to be a distinct improvement in encouraging better engagement of wider stakeholders in FCM. The study recommends encouraging partnerships with local stakeholders when managing datasets. Defra/Agency can be more proactive and clear in how best to combine resources (internally and externally) when undertaking consultation and information dissemination. Wherever possible, the Agency/Defra need to review regularly existing mechanisms of involving stakeholders in data collection to assist local communities, rather than setting up duplicatory processes or systems that do not provide a service to local communities in times of need. Staff in all Operating Authorities should be informed that they have a "duty of care" to data, and protocols should be established for the retention of data to ensure the preservation of valuable records.

Process and Procedures

The key conclusion regarding process and procedures centre on data standards. In particular there are gaps on which standards are used, communicating this to the FCM community and supporting compliance to these standards. The wider FCM community is looking towards metadata standards based on ISO19115 and Dublin Core (e.g. e-GIF). As the FCM community is primarily dealing with geo-spatial data, the FCM community should look to develop, maintain and service a FCM profile of ISO19115. The FCM community should also embrace the diversity of data standards existing within FCM and to manage this establish a registry of FCM data standards and the associated mapping between these standards. This includes use of common dictionaries for terminology.

Enabling Technology

The FCM community is generally very quick to look at new technology and the lack of uptake of new technology is a minor issue not currently limiting FCM progress. The UK is generally a leader in all aspects of the application of new technology to FCM. This includes enabling technology for data collection, processing and dissemination. Often, the limiting factor is the integration between 'requirements' and 'technology' to ensure the appropriate uptake and use of technology. Recommendations are therefore based on minimizing this gap through improved communication of technology development plans and to make explicit (e.g. provide guidelines) on the integration of the technology with FCM process workflows.

Audit

There is no mechanism in place to regularly appraise the data needs of FCM. There is also a requirement to ensure a continual feedback from current FCM initiatives (e.g.: PAMS) to others such as the NFDDMS. The benefits of data collections also need to be appraised alongside data needs as this ultimately appraises its value. It is recommended that a simple screening tool should be developed that takes as input 'what is known' about a dataset and from this infer a statement of its value/management needs.

The FCM community does not have an effective learning mechanism in place to understand what information is valuable and what information is not. The existing Agency Knowledge Management Strategy does provide a framework from which to prepare a FCM specific document.

The recommendations for each data management principle are summarised in the table below. The Importance and Resource ratings [High, Medium, Low, None] are based on a deliberations of a final Stakeholder workshop held in January 2004.

| Principle Number 1 - Data Understanding | | | | |
|--|---|-------------------|--------------------|-----------------|
| No | | Importance | Dependency | Resource |
| 1.1 | Develop an ontology for FCM Data Management activities (research and operation) covering such facets as "what, where?, who? and why?" and serve this to the FCM community. | H | None | L |
| 1.2 | Develop, manage and serve to the FCM community an ontology of FCM data that includes facets on what the data is, the data purpose and responsibilities for maintenance and ownership. This could be related/linked to the above ontology. | H | None | L |
| 1.3 | Develop and publish improved mapping between 'data' and 'process', and serve this to the FCM community. This should embrace risk-based approaches to managing the data lifecycle and make explicit the quality of data required to support the quality of information that can be generated from a workflow, e.g. MDSF. | M | 1.2 required first | M |
| Principle Number 2 - Roles and Responsibility | | | | |
| 2.1 | Assign responsibility for improved (internal and external) communication of existing practices within FCM (Defra/Agency). | H | 1.1 | L |
| 2.2 | Clarify (internal and external) contact points for FCM responsibilities within Defra/Agency. | H | 1.1 | L |

| | | | | |
|--|---|---|---|-----|
| 2.3 | Test approaches for using wider stakeholder community to provide FCM data (academia, public and VAR). | M | 1.2 | M |
| Principle Number 3 - Process and Procedures | | | | |
| 3.1 | Establish an ISO-19135 compliant FCM data standards registry. This can be regarded as going hand in hand with the recommendation under 'Information' for an ontology of FCM activities and take account of e-GIF registries. | H | None | L |
| 3.2 | Introduce standard text that can be included into all Terms of Reference for Defra/Agency projects (NCPMS or research contracts) to ensure standardisation of data collected, stored and disseminated. | H | Some progress on 3.1 required | L |
| 3.3 | Establish an ISO-19115 compliant FCM metadata standard. This can be established in conjunction with the NERC data grid team using the experiences gained from the marine community. | M | None | M |
| Principle Number 4 - Enabling Technology | | | | |
| 4.1 | Look to improve communication on technology appraisal to ensure more uptake. | L | 1.1/1.2 | M |
| 4.2 | Improve communication on how new technology integrates into the FCM process, especially new data capture technologies. | L | 1.3 and 3.1 support and facilitate this | M |
| Principle Number 5 – Audit | | | | |
| 5.1 | Look to develop a national database on post event results for use by researchers and operational staff for studies on model performance and flood warning system performance. | H | None | H |
| 5.2 | Adopt simple framework used in this study to 'audit' data and information issues related to FCM projects (see Appendix A to D as a series of examples). | H | None (could be linked to 3.3) | L |
| 5.3 | Research is required to develop and test screening tools to appraise data value. | M | None | L/M |
| 5.4 | The benefits of a Knowledge Management Programme for FCM need to be formally appraised to see 'how it could work'. | M | None (1.1/1.2 would be useful) | M |
| 5.5 | Emergency exercises should include post event data activities to test the initiation of data collection procedures and allocation or deployment of resources, from either government departments or from other stakeholder sources. | L | None | M/H |

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Scientific report (maximum 20 sides A4)

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