Defra / Environment Agency
Flood and Coastal Defence R&D Programme

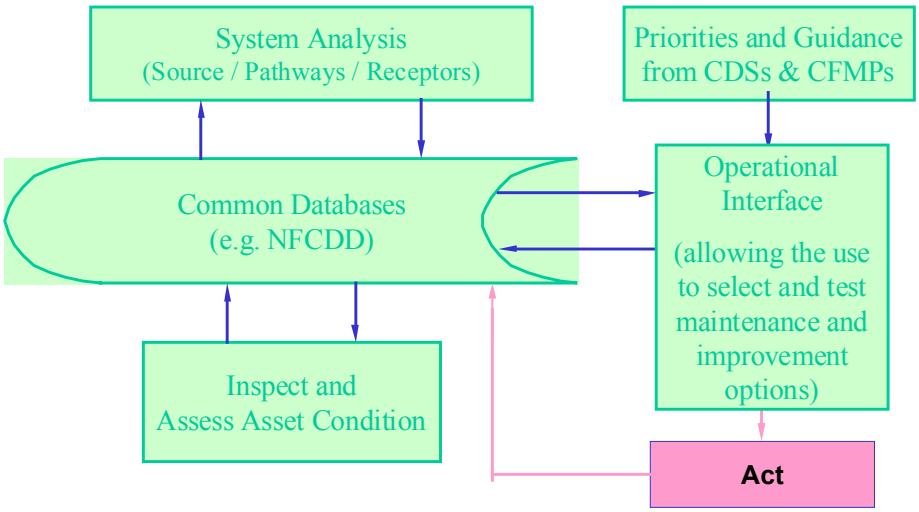
R&D Technical Summary W5-070/2/TS

Performance-based Asset Management System (PAMS) – Phase 1 Scoping Study

Background to R&D project

This project scopes a Performance-based Asset Management System (PAMS) that will provide the Environment Agency and other operating authorities with improved methods for deciding how to manage flood defence assets. The overall aim is to manage flood risk as efficiently and effectively as possible by inspecting, maintaining, repairing and if necessary replacing flood defences in order to achieve the required performance and to reduce risk. As PAMS is developed it will progressively replace existing maintenance and improvement approaches with a more organised approach that utilises risk-based methods. PAMS will apply to all flood defence assets including embankments, walls, and rivers (conveyance), and tidal and sea defences. It will also apply to structures which have a primary flood defence function such as gates, sluices and pumps. It is expected that PAMS could be adapted coast protection structures and, potentially, other non-flood defence assets.

A framework for the development and implementation of PAMS is presented in the figure below. Full operational implementation will take a significant time. In the short term, however, it will be possible to provide a measured step forward in asset management through a small number of key improvements to present practice. These short term improvements will support both the development of PAMS in the longer term as well as improved present day decisions.



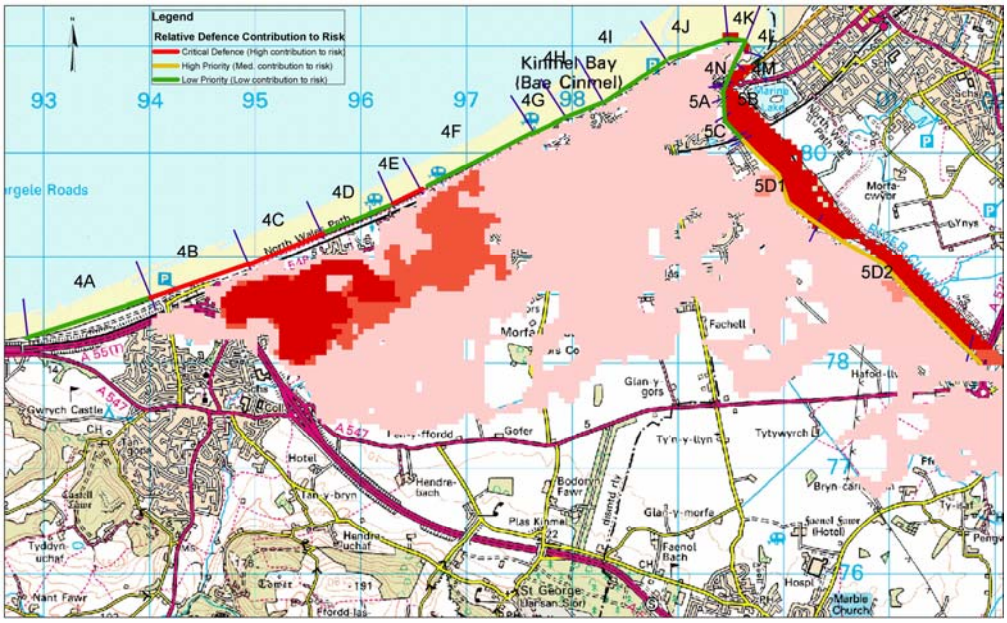
Overview of the proposed PAMS framework

In the short term, two primary improvements have been identified:

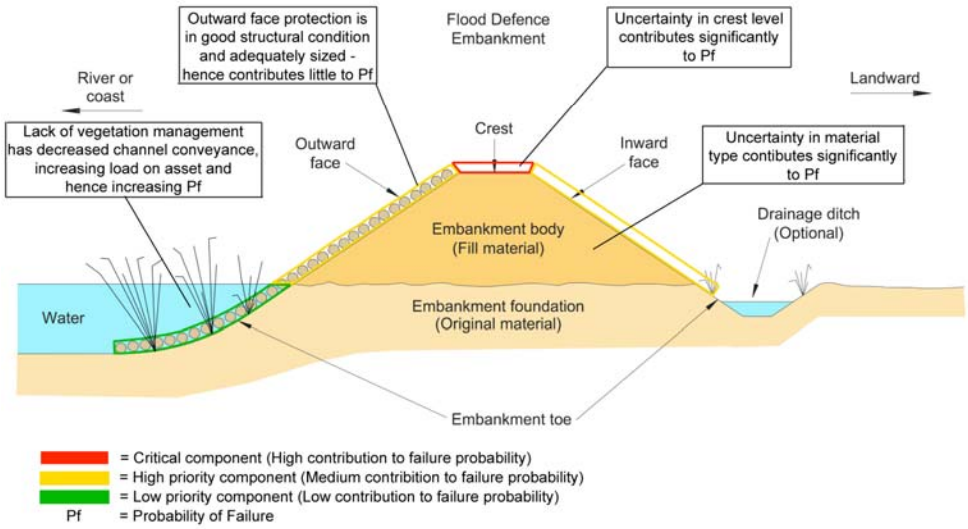
- Improved inspection and condition assessment of defences – that more explicitly recognises the relationship between the condition and the performance of an asset.
- Increased use of *hazard indexing* as a means of rapid, approximate field assessment of the criticality of an existing asset.

Achieving the take up and operation of these improvements will involve a revision of the Flood Defence Management Manual (FDMM) to smooth the transition from the present approach to PAMS. In the longer term a combination of software, databases, activity procedures, work instructions and training will all be needed.

Once fully implemented the information delivered to the user is likely to consist of both map and section information (see figures below). These data will highlight those assets that contribute most to risk and the components of an asset that contribute most to its fragility. This information will then form the basis of decisions to either structurally intervene or gather further data.



An example of mapped output showing critical linear defences



An example of the output showing critical elements of an asset

The implementation of PAMS will demand a number of research and development activities together with field trials and piloting. To be successful these activities will need to be integrated within the broader scope of parallel activities inside and outside of the Agency.

R&D Outputs and their Use

The findings and recommendations of this Scoping Study will be taken forward in a project to carry out Phase 2. In Phase 2, tools and techniques will be developed, applied and evaluated prior to widespread implementation (Phase 3).

This R&D Technical Summary relates to R&D Project W5-070 and the following R&D outputs:

- **R&D Technical Report** - ***Performance-based Asset Management System (PAMS) – Phase 1 Scoping Study W5-070/TR*** Published September 2004
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Publication Internal Status: Unrestricted External Status: Unrestricted

- **R&D Project Record** - ***Performance-based Asset Management System (PAMS) – Phase 1 Scoping Study W5-070/PR***

Publication Internal Status: Available internally on request from the Agency Project Manager

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The above products are available via the Environment Agency's science publications catalogue http://publications.environment-agency.gov.uk/epages/eapublications.storefront on a print-on-demand basis. Alternatively, they may be downloaded from the Defra FCERM Programme website www.defra.gov.uk/environ/fcd/research whose search tool is located on project information and publications page.

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