

RAFT: a probabilistic tool for attributing flood risk

Given the complexity of flood defence systems and the inherent uncertainty in predicting how they respond to flood events, probabilistic risk assessment is becoming increasingly common as the tool for the management and design of such systems. However, the 'top-down' nature of the probabilistic assessment traditionally applied to entire systems requires both comprehensive flood defence database information and extensive computer simulation.

In response, RAFT (Risk Attribution Field-based Tool) has recently been produced for the Environment Agency by HR Wallingford. This is a 'bottom-up' model that enables risk to be attributed to individual flood defence assets. The RAFT tool utilises the local knowledge of Agency staff and simple information derived from site investigation (or simple desk-study) to estimate the risk associated with asset condition, without recourse to additional modelling.

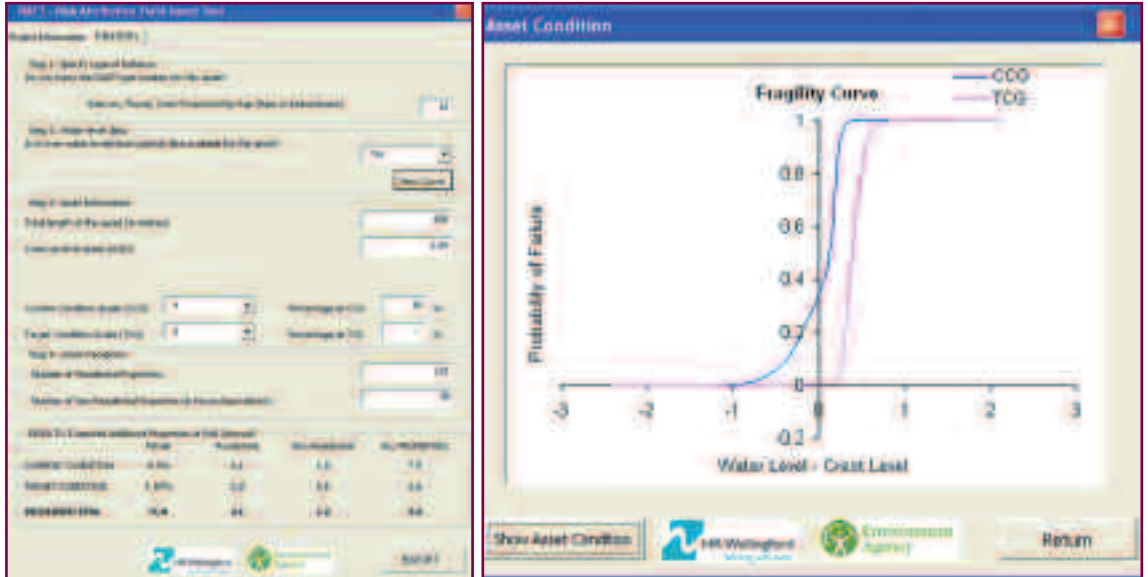
The tool is accessed via a GUI (Graphical User Interface) within a Microsoft Excel spreadsheet, and interrogates users for essential local data via a series of carefully designed questions. The answers are used to estimate the number of additional residential and non-residential properties at risk due to diminished asset condition.

RAFT enables the local knowledge of Environment Agency staff to be captured in a probabilistic analysis for the first time and provides access to powerful RASP techniques (Risk Assessment of Flood and Coastal Defence for

Strategic Planning) without demanding a detailed understanding of probabilistic analysis.

The RAFT tool has been well received by EA staff at all levels, with Jim Barlow (Head of Asset Management Strategy and Data Systems) saying that "seldom has a simple spreadsheet solicited so much genuine praise".

For further information about RAFT, please contact Gordon Glasgow, and on probabilistic flood defence analysis, contact Ben Gouldby, Principal Scientist, Floods Group, HR Wallingford (01491 822273; E-mail: b.gouldby@hrwallingford.co.uk).



(Left) The RAFT Graphical User Interface. (Right) Fragility curves are used to assign how the design performance of a flood defence compares with its estimated actual performance.