



Department
for Environment
Food & Rural Affairs

List of business critical models

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Introduction

In line with recommendations in the Macpherson review¹ of quality assurance of government analytical models and our commitment in the 2015/16 Defra Annual Report and Accounts we have prepared a list of Business Critical models for 2016.

We have reviewed the departmental models and those that scored high on at least three of the five following risks: reputational, financial/economic, legal, operational/user impact and future effect have been defined as business critical².

Each business critical model has a Senior Responsible Owner who have approved the quality assurance which has been undertaken for their model.

Additionally Defra also uses some models owned by other government departments which are business critical, these are not included in the below list.

1

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/206946/review_of_qa_of_govt_analytical_models_final_report_040313.pdf

² The Tree/plant disease spread Model scored High against two risks however was deemed to be business critical in providing a generic framework for the department in the event of a tree/plant disease outbreak.

Defra's business critical models 2016

Common Agricultural Policy (CAP) Disallowance Projection Model (DAP)

DAP can be used to produce annual projections for CAP disallowance cost in England under a range of user-defined input scenarios. It provides a tool for assessing the impact of policy decisions on disallowance.

AGLINK-COSIMO

A partial equilibrium model of global agricultural markets developed by the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN) Food & Agricultural Organisation. It is widely used by agricultural analysts.

Environment Agency Modelling Decision Support Framework 2 (MDSF2)

The MDSF2 model is used to calculate the flood risk (likelihood and consequences) in areas at risk of flooding from rivers and the sea across England. It is currently being used to update the National Flood Risk Assessment (NaFRA) and is available as Open Data through the Risk of Flooding from Rivers and Sea (RoFRS) products on GOV.UK. NaFRA is primarily used to describe the scale and impact of flood risk when flood defences are modelled to include breach and overtopping. NaFRA products are used to report to Defra the progress we make in reducing flood risk.

Environment Agency Water Resources Geographic Information System (WRGIS)

The WRGIS is a collection of water resources information viewable via the cloud-based mapping platform ArcGIS. Driving the tool are the 101 Resource Assessment and Management ledgers which the WRGIS links together to provide a national picture of long term water availability for England and cross border catchments with Natural Resources Wales. The main role of the WRGIS is to calculate the national water resources input to Water Framework Directive (WFD) reporting for both surface water and groundwater. The WRGIS also gives a national indicator of water availability for future abstraction. Associated tools are used to manage the data upload process.

Future Funding Model - Agri Environment

The model converts business assumptions and policy targets into financial commitments. Rural Development Programme for England agreements are largely 5 or 10 years. The model provides outputs of financial commitments going forwards over the longer term. Annual budgets are set and future years' funding pressures feed into policy development.

Budget Management Model

The model assesses the impacts of spend, forecast spend and exchange rates on the EU budget for Rural Development Programme for England 2014 – 2020.

Impact Pathway Model

The model estimates the monetary value of changes in emissions and concentrations of air pollutants to assist with appraisal of air quality policies.

Pollution Climate Mapping (PCM) Model

The PCM model is a collection of geographic information system (GIS) based models used to estimate ambient concentrations of key pollutants at background and roadside locations throughout the UK. Additional outputs include assessment of compliance across zones, and source apportionment.

Tree/plant disease spread Model

A suite of models that can be used to:

- (i) assess the risk associated with outbreaks of novel pests and diseases;
- (ii) optimise strategies for detecting and mapping invading pathogens; and
- (iii) optimise strategies to manage invading pathogens.

National Atmospheric Emissions Inventory (NAEI)

The NAEI is a suite of over 600 models which are brought together under its umbrella to provide national estimates of key air pollutants by sector on an annual basis to meet EU and United Nations Economic Commission for Europe reporting requirements. A consistent time series is calculated back to at least 1990 and current year data are disaggregated to 1x1km grid squares.

Outputs include a database of emissions, visual map images and GIS data layers.

Appraisal Modelling Framework for Flood and Coastal Erosion Risk Management Investments

The generic model takes input data on flood extents, levels and probabilities, topography and properties, and uses depth-damage relationships from research to generate probabilistic monetary estimates of flood damage for different flood management options, for specific proposed investment projects. Modelling can also involve the estimation of the economic value of other impacts, such as on agricultural output and land, risks to health and life, and of disruption. Ultimately, models provide analysis to generate cost-benefit ratios for management options. Models are generally constructed and operated by private sector consultants to economic appraisal principles established by Environment Agency and Defra. Models are used to recommend substantial (up to £m) investments with long lives (up to 100 years in some cases).

Exodis-FMD

To forecast the potential range of outcomes and resources used in an outbreak of Foot and Mouth disease (FMD), as well as monitoring disease control. Used between outbreaks for developing contingency plans and investigating control options including vaccination.

Economic Consequences Model (ECM)

To analyse the economic impact of FMD outbreak scenarios. The model allows us to compare the economic impact across a number of different control strategies, taking account of the uncertainty of how diseases spread. The ECM uses the predicted size of an FMD outbreak estimated by the Exodis-FMD model as an input. The ECM is also used between outbreaks for developing contingency plans and investigating control options including vaccination.