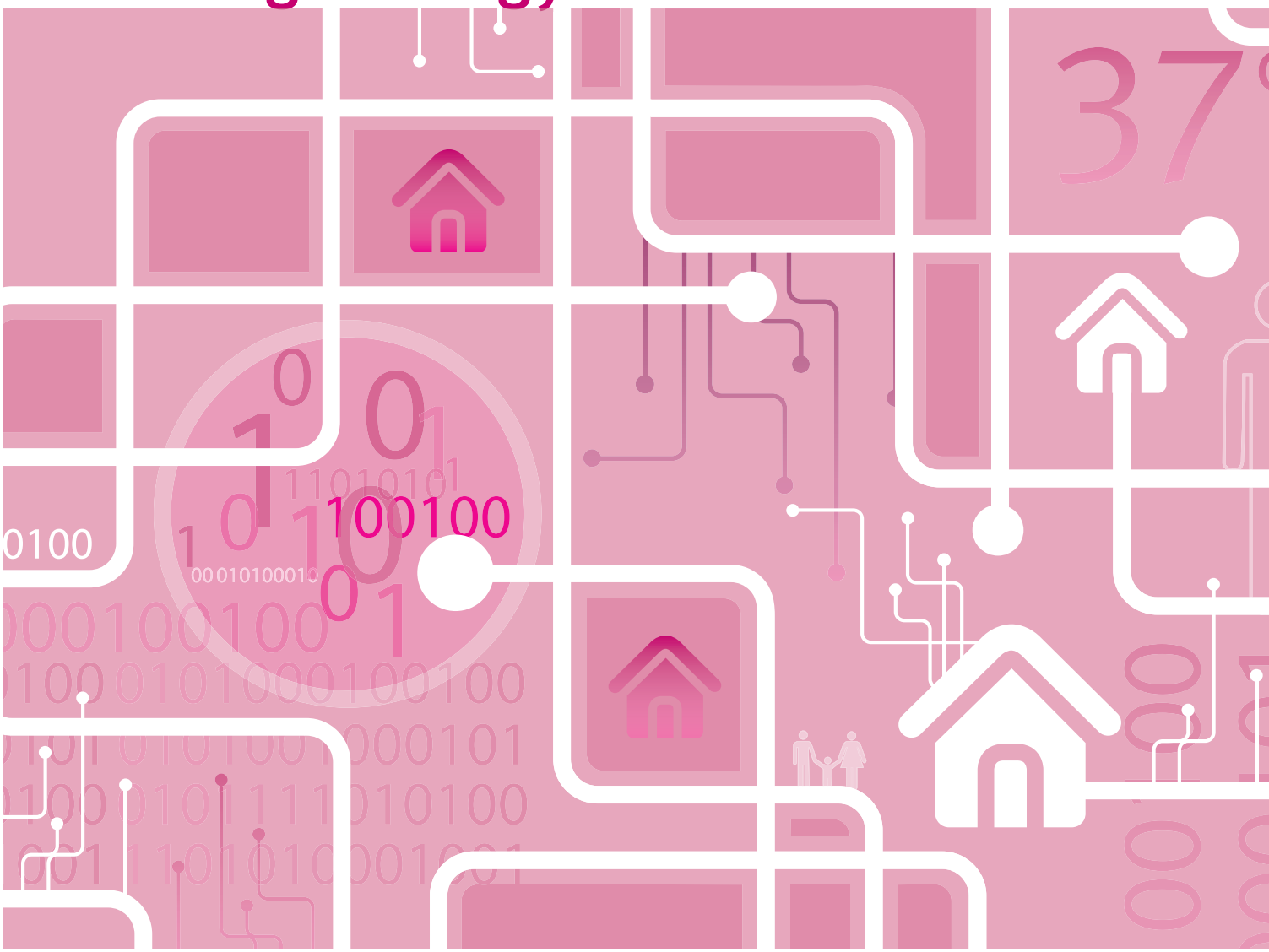
Environment Agency

Flood and Coastal Risk Management Modelling Strategy 2010–2015



We are the Environment Agency. It's our job to look after your environment and make it a better place – for you, and for future generations.

Your environment is the air you breathe, the water you drink and the ground you walk on. Working with business, Government and society as a whole, we are making your environment cleaner and healthier.

The Environment Agency. Out there, making your environment a better place.

Published by:

Environment Agency
Rio House
Waterside Drive, Aztec West
Almondsbury, Bristol BS32 4UD
Tel: 08708 506 506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

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Foreword

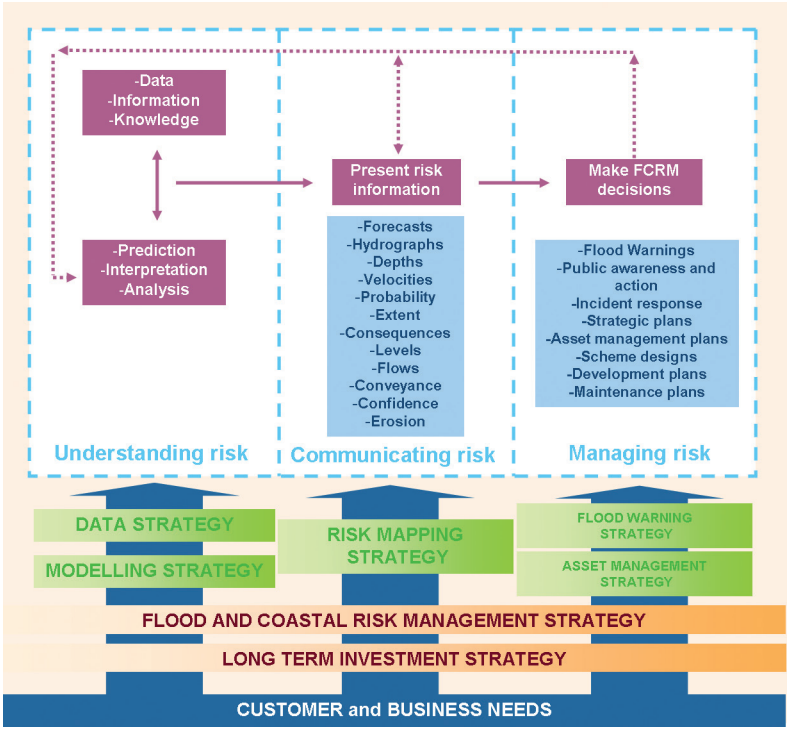
One in six properties in England and Wales is at risk of flooding. It is one of the most serious problems the country faces, and one that requires a strategic and evidence-based approach to tackling it.

Our data, modelling and mapping are the foundations on which effective management of flood and coastal risk depends. We are the national leader in flood and coastal risk information, and this information is the evidence base for our decision-making. And we use our data, models and maps to share information with our partners and communicate risk to the public.

Our Corporate Strategy, *Creating a Better Place*, and the Flood and Coastal Risk Management supporting strategy recognise that it is essential that we manage our risk information so that we have robust data, models and maps. To ensure a clear direction in this area, both for ourselves and for those we work with, we have produced three strategies that set out our approach to data, modelling and mapping over the next five years. They set out the actions required to deliver the outcomes contained in Creating a Better Place: *to recognise data, information and knowledge are assets and manage them accordingly; use environmental data to create compelling evidence that supports and informs our decisions and those of others and; we, our professional partners and the public will have a greater understanding of flood and coastal erosion risk.*

The three strategies are closely linked; you may benefit from reading them all. Our data is not only used in its own right, but also forms much of the basis for our modelling work. And we often communicate data and modelling outputs with maps.

Our strategic overview role in England, and our enhanced oversight role in Wales, is to guide, oversee and advise those partners taking on local flood risk management roles. The three strategies provide greater clarity for our partners about how we will use data, modelling and maps to provide information on risk from all sources of flooding.



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1. Introduction

1.1 Background

We invest approximately £17 million per year in modelling and mapping and an additional £15 million in gathering and processing data to support flood and coastal risk management. This data, modelling and mapping underpins all the decisions we make in Flood and Coastal Risk Management, including significant investment decisions.

Our Corporate Strategy states, under the theme '*work with people and communities to create better places*', that we will:

'Better understand the risks of flooding and of coastal erosion and use this to embed a risk-based approach to our flood and coastal risk management' and 'provide better flood forecasting and warnings'

Our Flood and Coastal Risk Management (FCRM) supporting strategy states that:

'We, our professional partners and the public will have a greater understanding of flood and coastal erosion risk'* and *'we will work effectively with our professional partners and the public to manage risk and reduce the probability of flooding and coastal erosion'

Modelling helps us to understand flood and coastal risk, which enables us to communicate that risk to others and plan ways of managing it. Modelling is essential to enable us to achieve the aims of our corporate strategy.

Modelling enables us to provide credible estimates of how many properties in England and Wales are at risk from flooding, and where they are. It is the basis of our flood forecasting service.

Our modelling of flood and coastal risk is world-class and underpins decision-making in our own and other organisations, at all levels of government in England and Wales, and by the insurance industry.

This *Flood and Coastal Risk Management Modelling Strategy 2010–2015* explains how we will invest in modelling to fully understand the risk of flooding from all sources and to support our partners in delivering effective flood and coastal risk management.

We are also developing a modelling framework for the Environment Agency and have developed this strategy with the framework in mind. We will ensure the principles in this strategy are aligned with and complement the framework.

This strategy will:

- define how we meet our business and customer needs using modelling;
- help embed our policy of justified, sensible investment to meet those needs;
- set out how we will resolve the current challenges facing us in terms of technology, skills and culture change;
- promote a consistent approach to modelling.

Implementing this strategy will avoid:

- unsupported modelling software being implemented and installed ad-hoc, which means no central support is provided to fix problems, provide security or back-up data;
- decisions that are made without considering the uncertainty in our understanding of flood and coastal risk;
- piecemeal development of modelling without consulting all relevant parties, which can lead to duplication of effort and inefficiency.

Our vision:

i) Modelling underpins our Flood and Coastal Risk Management decisions.

ii) Our investment in modelling is targeted so that it achieves the greatest benefits.

iii) Technology enables our modelling development and does not constrain it.

iv) Our staff have the right skills and resources to be an intelligent client.

1.2 What is modelling?

Modelling is the process of simulating a real-life situation and exploring the different ways that situation could develop, given different influencing factors.

Modelling helps us to understand current and future flood risks through physical or computer models. It helps us to predict what may happen in the future, thus supporting our work to reduce the risk of flooding to people, property and the environment.

Our Flood and Coastal Risk Management teams use modelling to predict how flooding and coastal erosion may develop. For example, we may combine a model of how river flows will respond to rainfall with a model of the ground, in order to predict the possible extent of a flood; or we may use a model of how the sea responds to tides and the weather to assess how coastal erosion may develop.

We use modelling to:

- assess which vulnerable groups and communities are at risk;
- provide real-time flood predictions to inform our warning service;
- plan and develop exercises to test our response to emergencies;
- produce maps of flood and coastal risk;
- assess third party flood risk and consequence assessments for planning and development (for example, for new buildings or changes in land use);
- supply insurers with information on the likelihood of flooding;
- design schemes to manage flood and coastal erosion risk;
- help us to plan maintenance programmes, such as vegetation cutting or channel dredging;
- support investment decisions;
- consider the long-term effects of climate change.

It is important to understand that modelling can only approximate what happens in reality, and the accuracy of the results varies depending on the technique used or the input data available. Understanding the uncertainty involved in modelling is critical to using models effectively in decision-making. Probabilistic modelling is one technique that takes uncertainty into account and provides a range of probabilities for different outcomes.

1.3 Who benefits from modelling?

Our customers:

- Modelling helps the general public to understand their risk, and to prepare for and respond to flooding and coastal erosion.

Our partners:

- Modelling helps Category 1 and 2 responders (local authorities, utilities and others responsible for dealing with emergencies under the Civil Contingencies Act) to plan for and respond to flooding and coastal erosion;
- By improving their understanding of risk, modelling allows insurers to continue to offer insurance against flooding, reflect the risk of flooding and coastal erosion in their premiums, and give better advice to their customers;
- Modelling enables planners and developers to assess the impact of potential developments (such as new buildings or changes in land use) on flood and coastal risk, and to manage those risks;
- Modelling helps managers of road and rail networks, water companies and other utilities, and reservoirs to understand and mitigate the risks presented by flooding.

The Environment Agency and the consultants and academics who support us:

- Modelling helps us to meet our obligations in managing flood and coastal risk, including flood forecasting, mapping, asset management and scheme design.

1.4 What is the scope of this strategy?

This strategy covers:

- hydrological modelling (how water flows respond to weather conditions);
- hydraulic modelling (how water levels vary with flow);
- coastal erosion modelling;
- scaled physical modelling of a catchment or coastline;
- modelling for incident response (including flood forecasting for warning purposes);
- modelling for planning purposes (for example for flood risk management options or mapping);
- modelling for rivers, the sea and other sources of flooding;
- modelling input data (such as hydrology, ground surface modelling, hydrometric data, weather data, etc);
- modelling data, software and systems;
- skills, resources, and management of modelling.

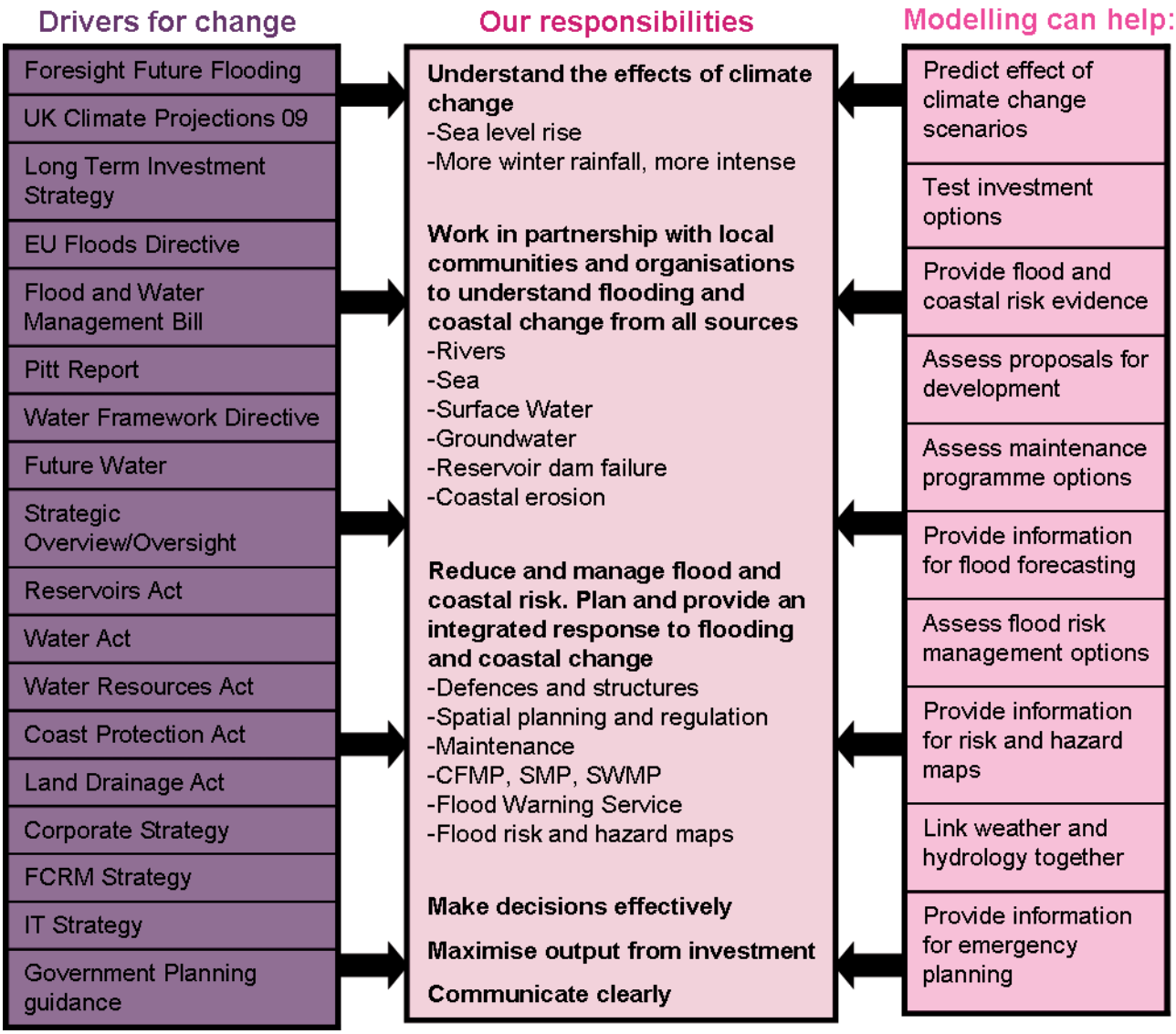
This strategy is relevant to people involved in the flood and coastal risk management industry who:

- work at the Environment Agency, both in and supporting the Flood and Coastal Risk Management directorate;
- work for consultants and in academia;
- work for local authorities, utilities and other service providers;
- work in the insurance industry;
- undertake modelling to plan for construction and other developments;
- manage reservoir safety;
- develop modelling software.

This strategy does not provide technical instructions on how modelling should be carried out or guidance on which modelling software should be used for a particular situation. The modeller should decide the most appropriate method based on outcomes required and risk.

2. Reasons for change

Our Corporate Strategy *Creating a Better Place 2010-2015* clearly identifies the value of our data and information. Specifically it states the need to value our data as an asset and the need to provide evidence based advice. We also need to better communicate risk to the Public and our partners. Together these call for a high level of confidence in our data and information based products. Much of the data used in managing flood and coastal erosion risk is derived from models and the need to deliver these outcomes in our modelling is the primary driver for change. Additionally the lessons learned from recent flood events together with legislative change must be recognised and guide us in delivering the outcomes.



This diagram shows the factors that are shaping flood and coastal risk management, what responsibilities we have as a result and how modelling can help us to achieve them.

Over the last few years, there have been far-reaching changes in the field of flood and coastal risk management, as a result of lessons learnt from severe floods (such as the Pitt Review of the summer 2007 floods) and new predictions about the UK's future climate.

Further changes are being brought about by government policies, such as *Future Water* in England and *New Approaches* in Wales, and legislation such as the Flood and Water Management Bill and the EU Floods Directive. To meet these new challenges, we need to improve our approach to flood and coastal modelling. We will need a broader understanding of the consequence of flood and coastal risk, including the effects on heritage and the environment as well as social and economic consequences.

We will need to work more closely with our partners to share knowledge and data and to improve modelling skills. As a result of the Pitt Review, we established the new Flood Forecasting Centre with the Met Office to develop and bring together modelling of weather and flood hydrology.

Local authorities have a new role to lead management of local flood risk (from surface water, ground water and non-main rivers). They will have our support as part of our strategic overview role in England and enhanced oversight role in Wales. We and our partners will need to develop common modelling standards and techniques and work together to improve the information we provide. The science behind modelling is also changing at a fast pace and we need to work effectively to incorporate improvements.

3. Where we will be in five years

We have developed eight principles that encapsulate where we would like to be in five years' time. We have then detailed a number of high-level activities that will need to be undertaken to put these principles into practice. We will seek to ensure that those we work with also understand and adopt these principles, where appropriate, in their flood and coastal risk modelling.

Principle 1: We will have a better understanding of flood and coastal risk from all sources through our modelling

We will work in partnership to use modelling to understand flood and coastal risk from all sources, including the likely effects of climate change, to support the decisions we, our partners and our customers make.

Current position:

We currently use modelling to understand risk related to rivers, coasts and estuaries. Since the summer 2007 floods, which made surface water flooding an urgent issue, we are developing our understanding of the mechanisms of this and other sources of flooding. We are developing a national understanding of the risks of groundwater flooding, coastal erosion and reservoir dam failures. We need to understand the impact of development proposals, such as new buildings or changes in land use, on surface water run-off. These different sources of flood and coastal risk sometimes interact and we need to develop a clearer picture of these interactions.

We take into account risk caused by climate change in some but not all of our modelling, and we also have less understanding of the impact of flood and coastal risk than we do of its likelihood – particularly social and environmental impacts.

We will:

A1.1 work with partners to use modelling to gain a local and national understanding of flood risk from rivers, reservoirs, surface water and groundwater, and of coastal risk;

A1.2 develop modelling, including considering consequence, uncertainty and climate change requirements, at an appropriate level of detail to meet our needs as well as those of our partners and customers;

A1.3 understand the interactions between different sources of flooding, coastal risk and other environmental influences as appropriate (such as sediment, debris, land use change or blockages);

A1.4 take a risk-based approach to improving our understanding of the forms and mechanisms of flooding from other sources, and our modelling of it;

A1.5 develop a framework and supporting systems to allow modelling developed at a local scale to be integrated into an improved national assessment of flood and coastal risk, including modelling produced by our partners;

A1.6 recognise the difference in needs between modelling for incident response and for planning (such as for flood risk management options or mapping);

A1.7 understand and communicate the purpose and limitations of modelling and its outputs.

Principle 2: Modelling will be developed and shared with partners

We will plan and develop modelling with our partners.

Current position:

We, and the people we work with, sometimes use different software, data and systems for modelling. There are large variations in skills and resources between us and our partners throughout the country.

Working in partnership means assessing what we need to achieve together and what skills and resources are available to us; planning what we can achieve with what is available; and then working jointly towards our agreed aims. In this way we can make the most effective use of our combined skills and resources.

We will:

A2.1 develop local partnerships, using existing links where appropriate, to coordinate modelling;

A2.2 share knowledge about modelling already available and their potential uses with our partners;

A2.3 provide appropriate and timely access to our modelling datasets, to our partners and for third parties to re-use, subject to licence and charging conditions;

A2.4 seek to obtain high level agreements with partners to facilitate sharing of information.

Principle 3: Uncertainty in our modelling will be understood

We will understand and communicate uncertainty in modelling outputs to assist decision-making by ourselves, our partners and our customers. We will reduce any uncertainty that prevents us from making sound decisions.

Current position:

Flood and coastal change data, modelling and mapping are inherently uncertain. Uncertainty is a measure of the likelihood that factors we rely on in our calculations are accurate. Uncertainties are unavoidably introduced at every stage of the modelling process – in the input data (such as water levels, rainfall estimation or ground surface information), in the mathematical equations used, and in the results.

In the past we have made decisions in spite of uncertainty, rather than using it to improve our decisions and help communicate our confidence in modelling outputs. We need to accept that there will always be uncertainty in modelling and that understanding and working with uncertainty is part of our job. We can use uncertainty in a positive way to gain a fuller understanding of the risks we are modelling.

We need to communicate more clearly that there is uncertainty involved in modelling, and find ways to present this uncertainty to help people make more informed decisions. We can use probabilistic methods (which provide a range of risk, rather than a simple 'yes, you're at risk') to help us understand and communicate uncertainty.

We have been developing better ways of communicating risk information. These methods, including the probabilistic approach, give us a way of presenting a fuller picture of risk, including uncertainties.

We will:

A3.1 put in place mechanisms so that we understand the sources and scale of uncertainty in our modelling;

A3.2 reduce uncertainty in modelling inputs, techniques and outputs, where it stops us from making sound decisions;

A3.3 develop methods that allow us to state our confidence in our modelling and help us, our partners and customers understand it;

A3.4 improve understanding of uncertainty through training and communication, recognising that a cultural change is necessary;

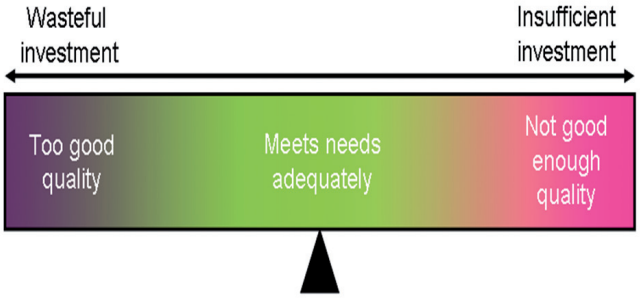
A3.5 develop a structured plan to move towards modelling that provides probabilistic outputs as our standard approach, but recognise there may still be cases where a 'yes or no' answer is required;

A3.6 ensure we have a clear and consistent understanding of probabilistic modelling;

A3.7 ensure that where we have taken a probabilistic approach, we communicate it clearly with the public and our partners, so that they can still make informed decisions.

Principle 4: Modelling will be managed effectively, in partnership

To get the greatest possible value from our investment, we will develop and re-use modelling in a co-ordinated and outcome focused way. To achieve this, we will work with all teams involved in flood and coastal risk management within our own organisation, and with our external partners such as local authorities and water companies. Whilst recognising our differing areas of responsibility we will seek to target resources where need and benefits are greatest. We will take a risk-based approach to produce models with the level of accuracy and detail necessary to meet our needs and those of our partners and customers.



Current position:

Some parts of the Environment Agency have excellent methods for developing modelling in a co-ordinated, justified and outcome focused manner, but we are not consistent in our approach throughout the organisation.

We will:

A4.1 with our partners, develop strategic modelling programmes considering all sources of flood and coastal risk, to get the greatest possible value from our investments in modelling. Sources of risk include river, reservoir, surface water, groundwater, the sea, coastal erosion, and where appropriate the effect of other environmental influences, such as sediment, debris, land use change or blockages;

A4.2 consider what sources of risk affect a location, and what level of detail and accuracy is required when planning a modelling study;

A4.3 ensure that we and our partners clearly specify our requirements and agree upon and use the most appropriate modelling approach (which will generally be the simplest);

A4.4 ensure that the modelling approach chosen achieves the required level of detail and outputs, to give the best value for money;

A4.5 ensure the approach chosen is fit for purpose, but think about possible future uses too, so that the modelling can be re-used (including possibly for other work areas, such as water resources);

A4.6 document the reasons for choosing a modelling approach, and its limitations, to help prove modelling results meet requirements;

A4.7 co-ordinate re-using modelling inputs and outputs for multiple purposes, where possible, both within the Environment Agency and by third parties;

A4.8 ensure our modelling results, and those of third parties submitted to us, are checked to an appropriate level;

A4.9 review the performance of our modelling over time, to make improvements for the future;

A4.10 understand and manage the differences between models developed for the same location, but at different scales or for different needs.

Principle 5: Our modelling will continue to be an asset
We will manage and maintain our modelling inputs, software and outputs as assets to ensure that we, and the people we work with, are not restricted in developing and using these in the future.

Current position:

We receive a significant income from licensing our modelling inputs and outputs, which we reinvest for the benefit of the public and the environment. We could improve the way we manage and protect these valuable intellectual property assets to ensure we are not restricted in developing and using these products in the future.

We will:

A5.1 improve our understanding of intellectual property policy, share that understanding with our staff (including through training), and make our intellectual property asset owners aware of their responsibilities;

A5.2 be clear on what intellectual property assets we are creating or using (including contractual limitations, legal permissions or licences) and record the metadata (in our Information Asset Register);

A5.3 ensure that when we purchase, license or commission others to do modelling for us, we obtain sufficient ownership and control to have the freedom to make whatever use we might need to of the intellectual property assets created;

A5.4 ensure all contractors fully disclose intellectual property they introduce into any project developed for us and understand how this affects our use of the things they create for us;

A5.5 ensure a list of project outputs is provided when any modelling study is completed, along with a clear indication of any restrictions on the use of those outputs. We will ensure contractors are clear on our intellectual property policy before they start working on a project for us, so that we avoid restrictions that affect future use.

Principle 6: We will be an intelligent client with adequate resources to carry out that role

We will ensure we have the skills and resources in Head Office, Regions, and Areas to deliver modelling effectively. We will advise our partners about the skills and resources they need.

Current position:

We have some very experienced and expert modellers in the Environment Agency, but there are shortfalls and inconsistencies in modelling capabilities across our own organisation and also amongst our partners. To ensure our own competency in modelling and to be able to help our partners, we need to support the FCRM Skills Strategy, the Hydrology Strategy and any other Environment Agency-wide initiatives to improve our modelling skills and capabilities.

We will:

A6.1 understand and develop the in-house skills and competencies (including in hydrology, geomorphology and hydraulics) we need to undertake, manage or review modelling (for both real-time and planning purposes) appropriately and behave as an intelligent client;

A6.2 where required, advise our partners about the skills and resources they will need to fulfil their local flood risk responsibilities, based on our own experience;

A6.3 review the resources we have available to carry out modelling and determine whether we have enough resources to achieve our responsibilities.

Principle 7: Data will support our modelling

We will have data available and of suitable quality to use for modelling, and will store this data and our modelling output data securely.

Current position:

Our modelling requires and produces large quantities of data. Input data is not always available or may not be of the right quality, and we don't have enough secure storage capacity for our output data – which represents a big business risk.

The *Flood and Coastal Risk Management Data Strategy 2010-2015* will lead to the creation of data quality, data coverage and quality reporting standards and proactive data acquisition plans. Under the data strategy, we will develop a consistent and centralised means for storing, maintaining and distributing data within our organisation and amongst our partners and customers. Consequently, this modelling strategy addresses only a few data activities specific to modelling.

The Environment Agency's hydrology strategy will also influence our future modelling capabilities for flood and coastal risk management. This strategy seeks to build our hydrological skills and technology capability. It addresses the challenges involved in using hydrology to support our work in understanding and reducing flood risk, managing floods and responding to land use and climate change. The success of the hydrology strategy will influence the success of this modelling strategy, and the teams involved will work closely together to put the strategies into practice.

We will:

A7.1 understand our modelling datasets, their limitations and what they should be used for;

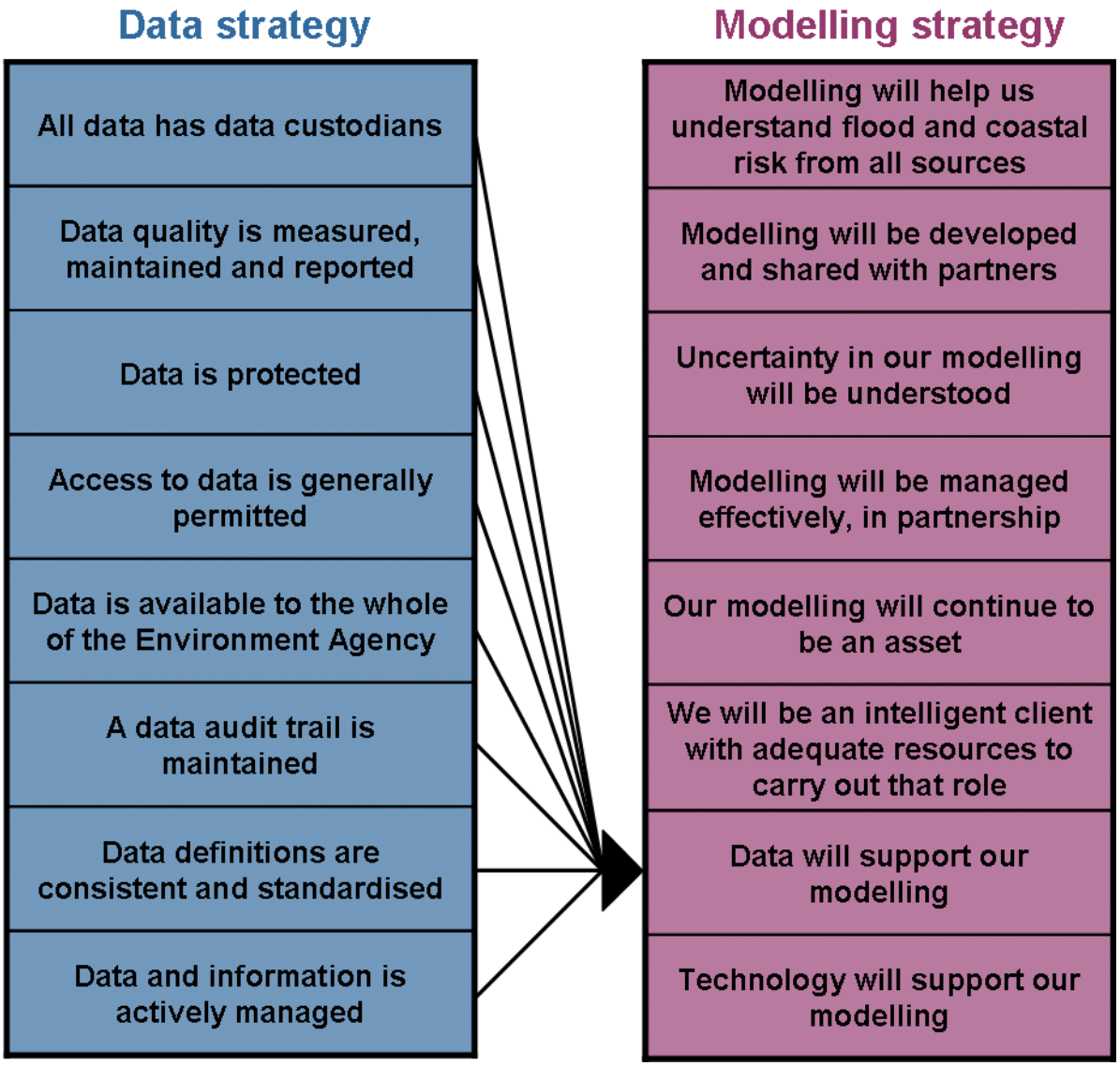
A7.2 define where the quality of input data (such as hydrology, flood defence condition and ground surface information) affects modelling outputs, and influence data providers to improve their data quality where it has the most impact on our results;

A7.3 support the delivery of the data strategy, by providing information on requirements for modelling data quality, storage, maintenance and distribution;

A7.4 consider which modelling output data would be useful to different users when planning a modelling project;

A7.5 maintain an audit trail of the changes in modelling datasets over time;

A7.6 consider new types of data required to support modelling.


Data strategy
All data has data custodians
Data quality is measured, maintained and reported
Data is protected
Access to data is generally permitted
Data is available to the whole of the Environment Agency
A data audit trail is maintained
Data definitions are consistent and standardised
Data and information is actively managed
Modelling strategy
Modelling will help us understand flood and coastal risk from all sources
Modelling will be developed and shared with partners
Uncertainty in our modelling will be understood
Modelling will be managed effectively, in partnership
Our modelling will continue to be an asset
We will be an intelligent client with adequate resources to carry out that role
Data will support our modelling
Technology will support our modelling

Principle 8: Technology will support our modelling

We will have suitable and centrally supported software with formal procedures in place to introduce, upgrade and maintain it. We will have the right hardware and systems to support our modelling needs, and will consider the needs of our partners when developing these.

Current position:

There are many types of software package available for modelling flood and coastal risk. Some of these are already integrated into our systems and working practices. We don't have a method to prove that all the software we use, or would like to use, is suitable for our needs. We use some software packages which are not fully supported by Corporate Information Services (CIS, our IT department) and are run on stand-alone IT equipment, which poses a business risk if unsupported hardware or software malfunctions. We don't have a formal process in place for introducing and maintaining all modelling software we need or use, which means money is being invested inefficiently across the organisation. And some of our software is several versions behind what our partners and third parties are using, making effective assessment of each other's work difficult.

The science of modelling is developing at a fast pace and we need to be flexible enough to adapt to changes in a timely manner. We recognise the importance of academic and other research in providing the tools and techniques we need to meet our obligations, and critiquing existing methods to improve the way we work.

We will:

A8.1 identify and meet our modelling technology needs in a considered, planned and timely manner;

A8.2 ensure our needs are understood and supported by CIS;

A8.3 monitor and influence academic developments and the commercial market to see if new modelling technology will improve our current working practices;

A8.4 ensure that modelling technology developed for us considers the needs of our partners;

A8.5 ensure that we have appropriate hardware and systems for modelling, including sufficient computer processing power;

A8.6 use a range of software that has been demonstrated to be fit for our modelling purposes, so we can fulfil our intelligent client role;

A8.7 seek to procure commercial 'off the shelf' software wherever possible rather than developing our own bespoke software, without restricting flexibility and innovation;

A8.8 require that it is clear who owns intellectual property for modelling technology developed for us, that this ownership is recorded in the appropriate register, and that the technology is developed in such a way that future use or development is not constrained;

A8.9 record information about the modelling software we use in the appropriate software register;

A8.10 support international standards in data (including transferral) and software;

A8.11 not promote or imply that any specific software products should or should not be used by third parties.

4. Next steps

4.1 Implementation plan

We will produce a high-level plan packaging together the actions in this strategy into a manageable number of coherent and prioritised work streams, with outline costs. We will identify any risks to achieving the actions and what can be done to guard against these risks. We will also identify any dependencies and related work led by other departments.

Our head office Mapping and Modelling team will own the high-level plan. Major projects will be carried out in partnership with our FRCM, Evidence and Operations Directorates; with Corporate Information Services (our IT department); and with external partners, such as local authorities.

The high-level plan will be used to inform internal service levels, which will detail specific actions required of Regional and Area staff. The high-level plan will also describe Area Flood Risk Mapping and Data Management teams' leadership role in supporting and advising other regional and area teams.

The plan will identify the skills and resources needed to achieve the *Flood and Coastal Modelling Strategy 2010–2015*. The plan will be a live document that will be reviewed and updated regularly throughout its five-year lifespan. The strategy itself should not be affected by small changes in the way we do things. However, legislative or other high-level influences may affect the overall direction of the strategy. We will monitor any such changes and update the strategy if necessary.

We will communicate the strategy, and the plan to achieve it, to our colleagues in other Environment Agency teams and departments, and to our external partners.

4.2 How will we measure our success?

We will assess the success of this strategy by monitoring progress against a number of relevant measures. We have developed indicative draft measures (see Appendix 1) which will be finalised in the high-level plan.

The measures will be reported as a standing agenda item at the Mapping, Modelling and Data (MMD) Programme Board, which is chaired by the Senior Responsible Officer for Mapping, Modelling and Data. The measures and corrective actions put in place will be made readily available.

We will, over the duration of the strategy, develop further, outward-looking measures to help us understand how well we are working with our partners; and internal measures of service levels in our regions and areas.

Appendix 1

Indicative performance measures

Mo1: Looking out not in – partnership working and modelling management

Description: Better planning of modelling, working in partnership to do so.

Measure: Number of locations where a strategic modelling plan is in place, which considers the needs of Flood and Coastal Risk Management the national capital programme management service, the Environment Agency's hydrology department, local authorities and any other relevant external partners.

Target: All significant risk areas by end of financial year 2011/12.

Mo2: Better – understanding of risk

Description: Better understanding of our confidence in our modelling.

Measure: Proportion of modelling outputs where level of uncertainty is understood and defined (and communicated in a method appropriate to business and customer needs).

Target: Baseline during 2010/11 and set realistic targets when baseline available. Ultimate goal for 100% of our modelling outputs to have uncertainty understood and defined.

Mo3: More for the environment – maximise output for investment

Description: Achieve more modelling work for our investment by working in partnership (for example, sharing funding, reducing duplication of work such as data gathering).

Measure: Amount of money saved through managing modelling in partnership (such as coordination of data gathering such as survey, money saved through re-using existing modelling, etc).

Target: Baseline during 2010/11 and set realistic targets based on the baseline and level of funding available each year.

Mo4: Faster – being an intelligent client and having a critical mass of resources

Description: Be confident we have the knowledge, skills and resources necessary to be an intelligent client.

Measure: Questionnaire to establish perceptions about whether we are achieving this. Costs for maintaining modelling goes down over time, as we spend less on consultants doing maintenance work for us.

Target: Gather information on current perceptions during 2010/11. Re-survey during 2012/13 and 2014/15 to see how we are progressing.

Baseline costs incurred for modelling maintenance in 2010/11. Set realistic targets based on this.

Mo5: Better – software and systems in place to support our modelling

Description: Increased flexibility of software management.

Measure: Number of modelling projects that have to be outsourced to verify their quality or re-run the model to make small changes.

Target: Baseline how much outsourcing we do to check modelling projects quality or make small adjustments during 2010/11. Set realistic targets based on this.

Notes

Would you like to find out more about us, or about your environment?

Then call us on

08708 506 506* (Mon–Fri 8–6)

email

enquiries@environment-agency.gov.uk

or visit our website

www.environment-agency.gov.uk

incident hotline 0800 80 70 60 (24hrs)
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