

# Estuary Management System

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# Today

- drivers are (inter alia) FCERM Making Space for Water, Habitats Directive, WFD, Floods Directive, [Marine Bill]
- estuary guide
  - Estuary Impact Assessment System (EIAS)
  - collection of tools and supporting information

## Future

- Estuary Management System
  - framework, data, methods, tools
  - DPSIR approach
- a modular system – common interface with separate modules



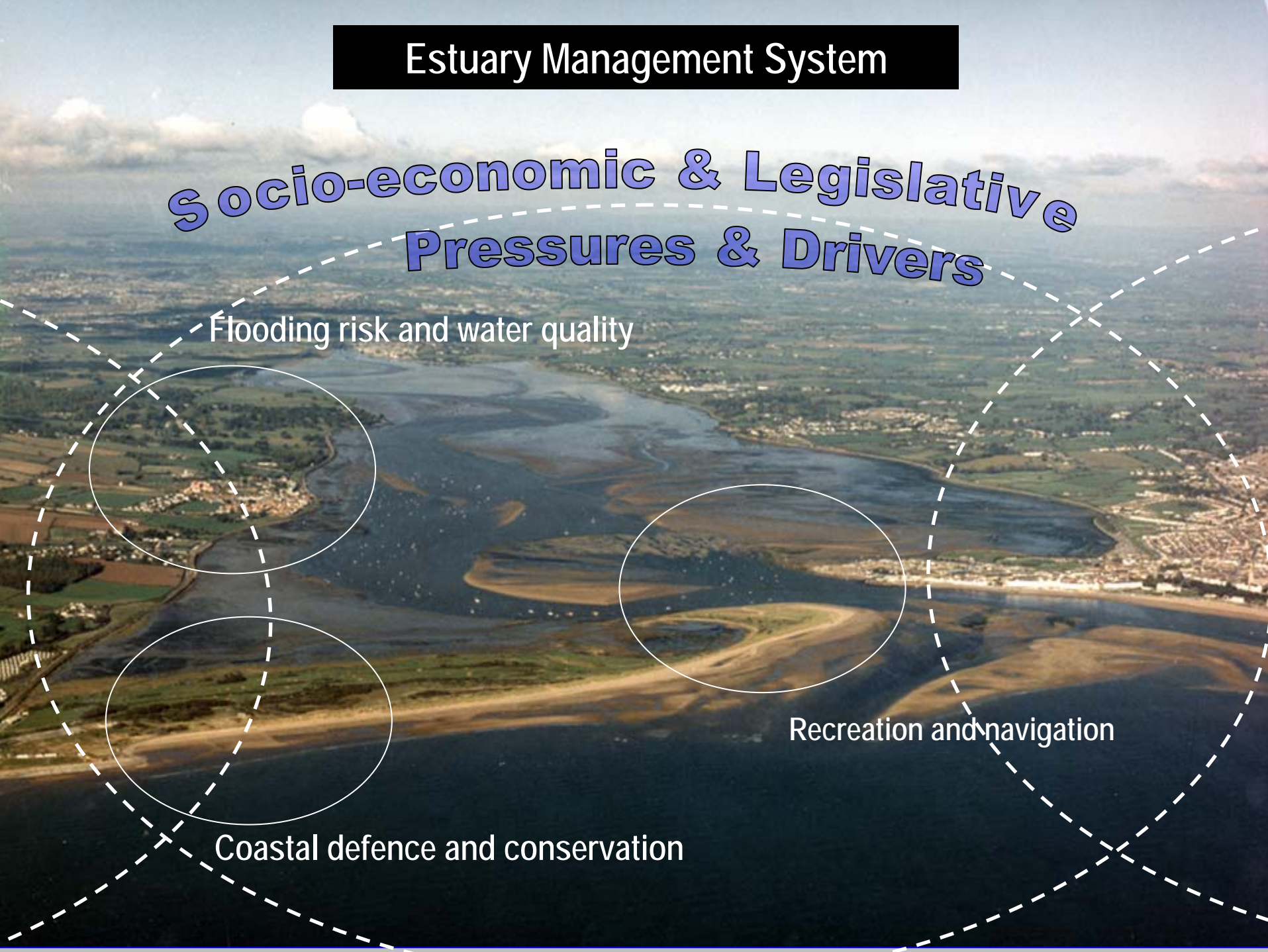
# Estuary Management System

## Socio-economic & Legislative Pressures & Drivers

Flooding risk and water quality

Recreation and navigation

Coastal defence and conservation



# EMS

- an Estuary Management System is a framework for decision making and exploring the consequences of anthropogenic activities in estuaries
  - hierachical to allow regional strategic through to local operational decision support
  - modular - requires data and methods
  - synthesis of the evidence base



# Methods and tools

- a framework for methods and how to use them is available from [www.estuary-guide.net](http://www.estuary-guide.net)
  - modular approach - links to tools and (some) data
  - consistent resource for use in existing frameworks requiring morphological prediction as a key component or boundary condition in flood risk assessment (e.g. \*MDSF and \*RASP)
  - cause consequence model is an accepted approach to provide direction on model selection
- science and datasets required to keep EMS up to date with relevant tools and data

\*see later



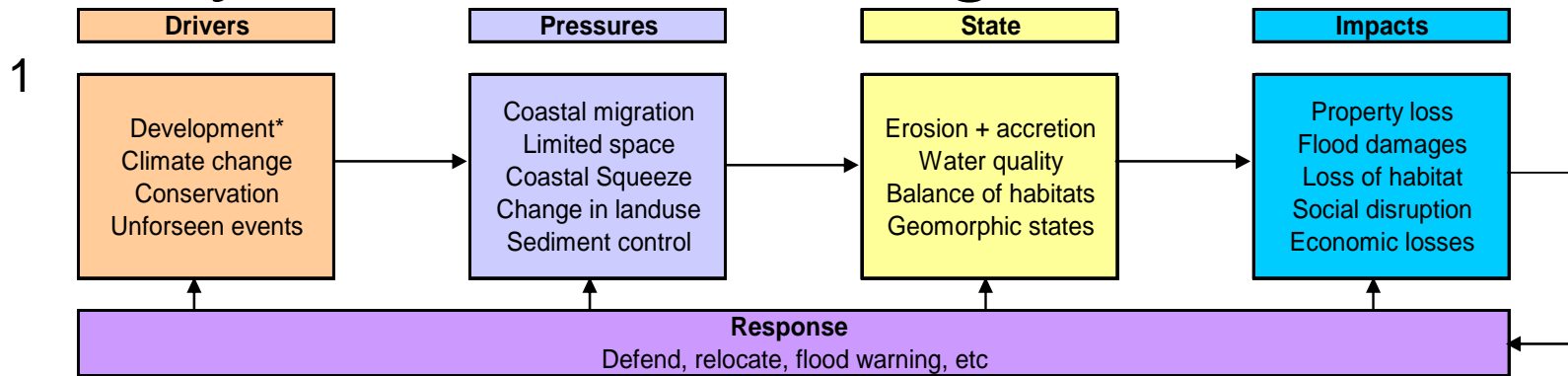
# To be useful it needs to facilitate:

- **identification of the environmental changes**
  - from proposed activities and the features of interest/receptors that could be affected
- **understanding the nature of the environmental changes**
  - in terms of their exposure characteristics, the natural background system, and establish the sensitivity characteristics of specific features
- **evaluation of the vulnerability of the features**
  - as a basis for assessing the nature of the impact and its significance
- **management of any impacts**
  - which are found to be significant and require implementation of impact reduction measures

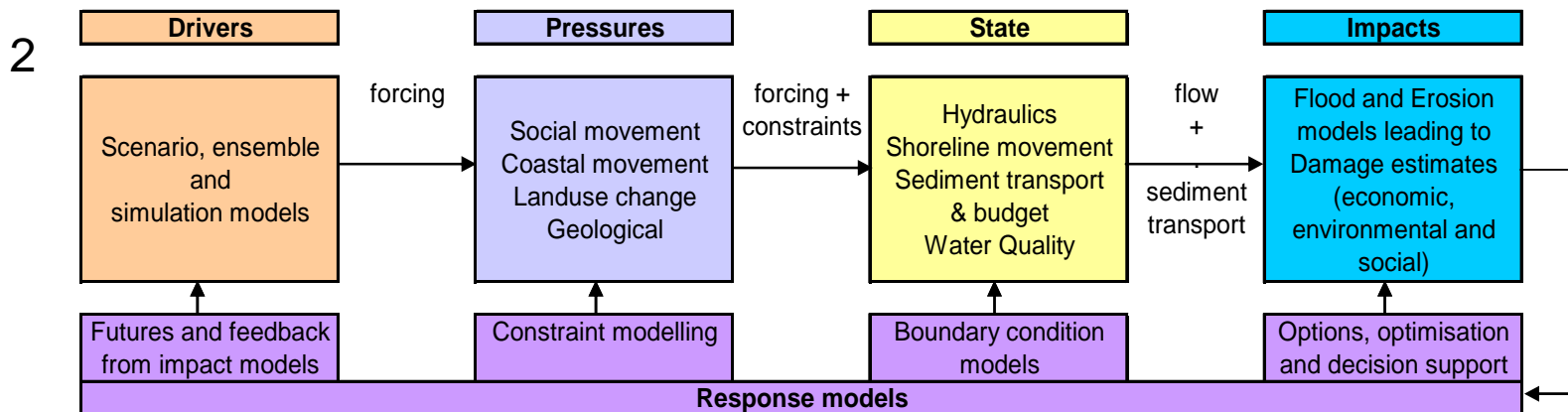


# DPSIR approach (links policy and science)

## 1. system 2. modelling



\* includes Urban growth, tourism, industry, ports, aquaculture, etc



Source: as copied from FD2119 inception report



# Estuary Impact Assessment System (EIAS) (1997 definition)

existing breadth of focus

	Estuarine Morphology	Water/sediment Quality	Ecology	Anthropogenic Influences
Bottom-up (Process-based, Short-term) Methods	Physics-based numerical models	Flow-plus-chemistry water quality models	Plant and animal biological understanding	Local socio-economic analysis/methods
Top-Down (Estuary-system, Long-term) Methods	Qualitative, empirical and regime methods	Sediment-pollutant models	Population dynamics models	Institutional framework / macro-economic models
Hybrid (Bottom-up Plus Top-down, Short to Long term) Methods	Long-term, physics - calibrated, morphological models	Long-term water/sediment quality predictors	Long-term ecological development predictors	Long-term socio-economic predictors
Estuary impact Assessment System	Collection of the above tools			
Estuary Management System	Interlinked combination of all the above tools			

Source: Scoping Study Report, SR478 (HR Wallingford)



# Links to other projects

- MDSF
  - Modelling and Decision Support Framework for Catchment Flood Management Plans
- RASP
  - Risk Assessment of Flood & Coastal Defence for Strategic Planning
- PAMS
  - Performance Based Asset Management System for Flood Defences
- TraC MImAS
  - Water Framework Directive assessment tool for hydromorphology
- HARBASINS
  - enhancing capability of management strategies for North Sea coastal and transitional waters



# Four areas for future research

## 1. Development of tools

- to be used in flood risk frameworks that calculate flooding damage and hence socio-economic impact
- ERP feeding into MDSF

## 2. Development of level of understanding and tools

- to be used in water quality and ecological modelling over large areas
- to support marine assessments

## 3. Development of tools

- to be able to model the natural or anthropogenic constraints on an estuary system

## 4. Development of science and datasets

- to provide robust evidence based decision making



# Future – short timescale

- implement systems approach through DPSIR
  - how far towards a Decision Support System?
  - expert system using rules base?
- update/reissue the EIAS guide
- review and collate the metadata and datasets needed
  - include links to PAMS\* etc
- document and benchmark capabilities of predictive models
  - update toolbox



# Future – longer timescale

- continue to upgrade EMS with links to data and tools
- carry out pilot testing of EMS
- revise EMS based on pilot testing
  - develop minimum toolbox
- complete and roll out EMS
- annual review, dissemination, steering group



# Headline R&D and commissioning

1. EMS is a modular system
2. understanding - science, tools
3. coherent and co-ordinated programme of work required
  1. broaden scope as required
  2. risk of disparate projects, key areas being missed, loss of momentum and effectiveness
  3. co-ordinate operational and academic streams

