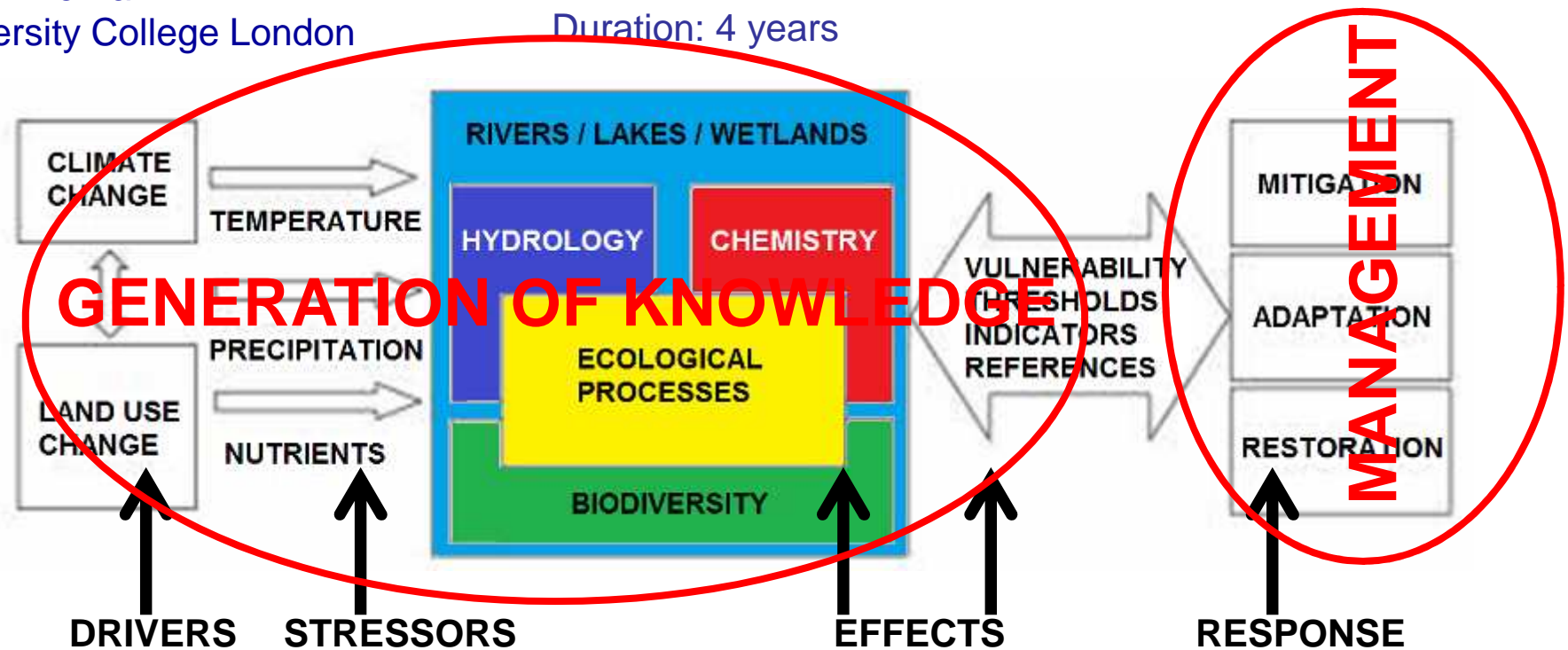


# Adaptive strategies to Mitigate the Impacts of Climate Change on European Freshwater Ecosystems

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Collaborative large-scale integrating project  
Started: Feb 1<sup>st</sup> 2010  
Duration: 4 years



# REFRESH Model

- “Ultimate objective... develop parsimonious integrated models... robust simulations of future water quantity, quality and ecology at the catchment scale”
- Objectives – better:
  - Inclusion of ecology
  - Connectivity
  - Scenario assessment (with uncertainty) to help design adaptation measures and cost effective restoration at local and catchment scales

**INNOVATION**

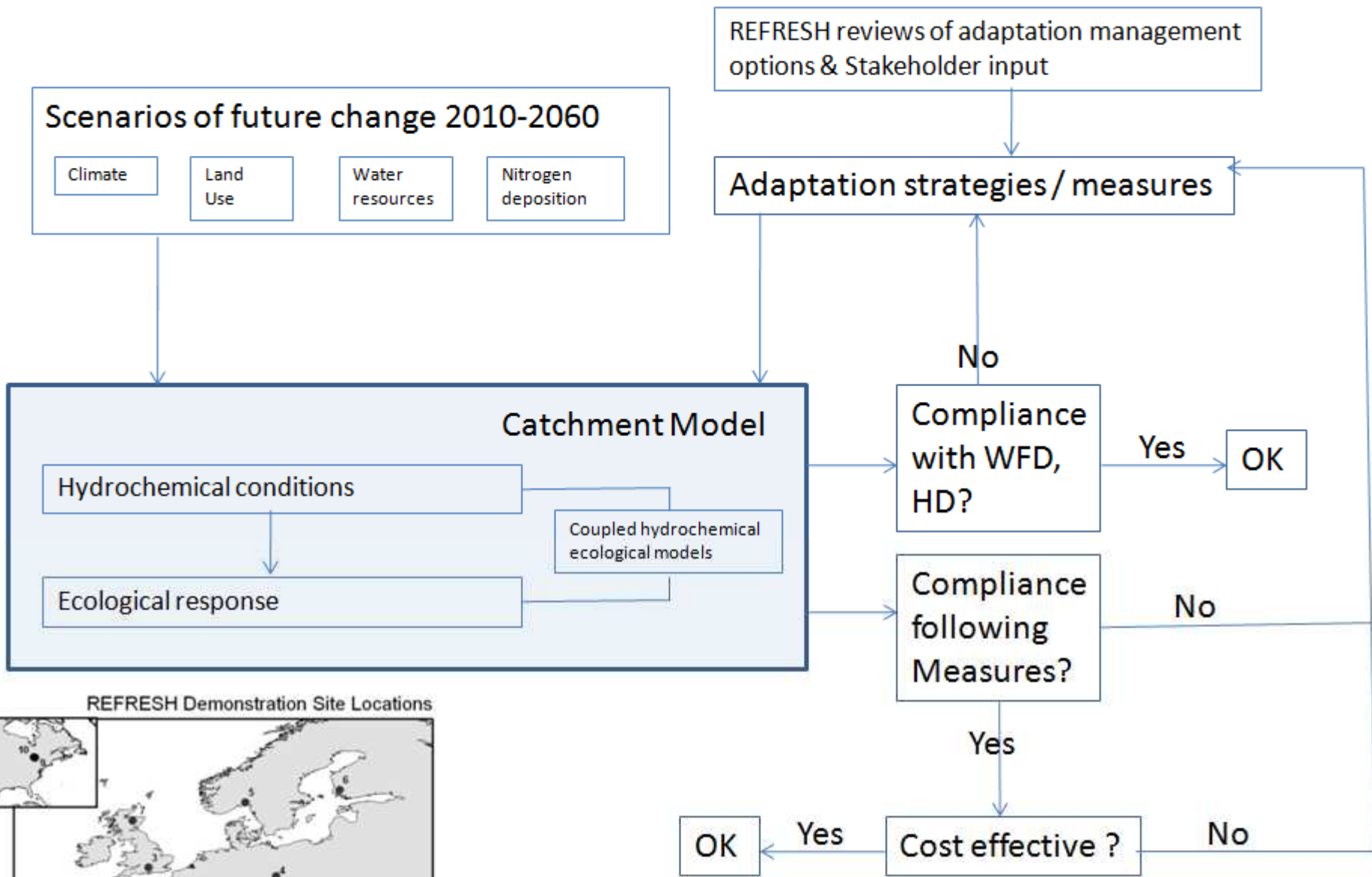


## REFRESH CASE STUDIES

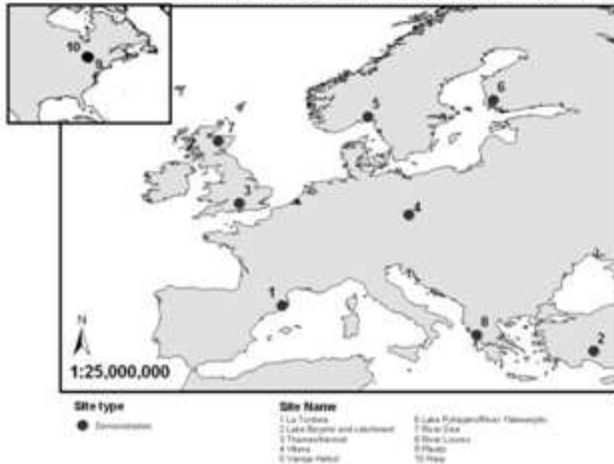
Most of this work on the lakes, rivers and wetlands is designed to support the modelling effort at a series of demonstration case studies where we are seeking to

- i) Examine scenarios of change over the next 50-60 years
- ii) Assess how these projected changes impact on the hydrological and chemical conditions (lakes, streams and wetlands)
- iii) Quantify the ecological response driven by these changes
- iv) Identify where this is likely to cause problems with reaching prescribed ecological targets e.g. failing to achieve compliance with the Water Framework directive or Habitats Directive
- v) Modelling the system response to some management response, adapted to accommodate future global change represented by the scenarios
- vi) Examine the cost effectiveness of the management response





REFRESH Demonstration Site Locations



## INTEGRATED MODELLING AT 8 DEMONSTRATION CATCHMENTS

# **Is the output transferable and how ready is it to be used on the market?**

**Modelling still at a developmental stage, in particular the innovative aspects (linking hydrology & chemistry to ecology and incorporating cost effectiveness analysis)**

**Applications beyond case study catchments require further work and discussions given the nature of the effort required. Can we produce a generic version that can be applied elsewhere or is this best used as a guideline for best practice?**

**Need to show users (catchment / water managers) what the model can do and consider how it can have real application rather than a scientific modeling exercise – two way dialogue required. What fora? REFRESH stakeholder workshops...**

