



**British  
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL



# Integrated surface and groundwater modelling in the Thames Basin, UK using the Open Modelling Interface

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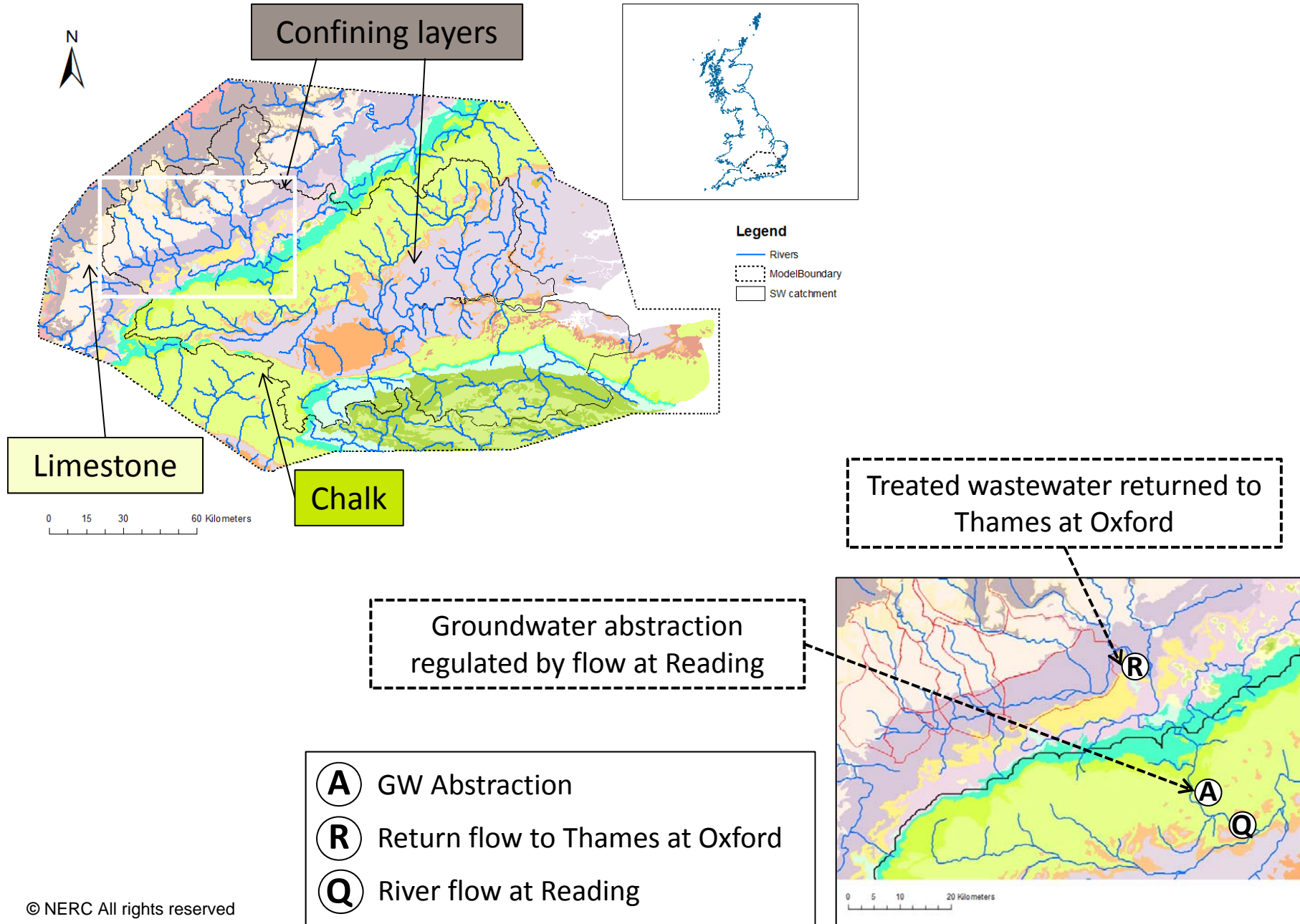
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8<sup>th</sup> April 2013

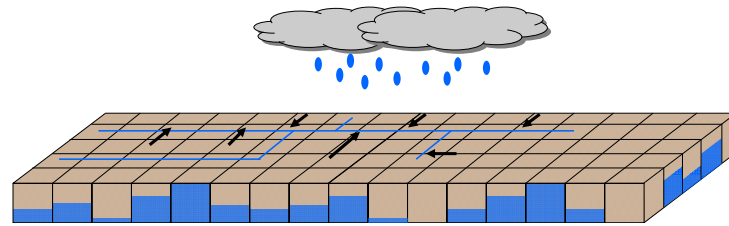
**With the support of Thames  
Water Utilities Ltd**

# Thames Basin



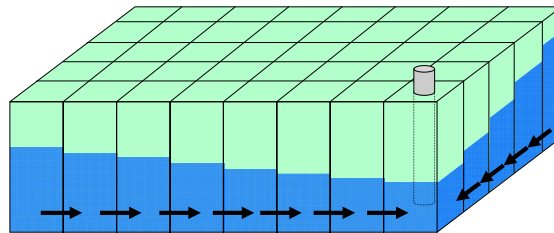
# Current Suite of Models

**ZOODRM**  
recharge  
model



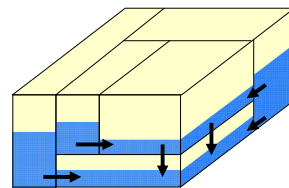
- **2D distributed** explicit model (1x1 km grid)
- **Daily** time-step
- Inputs: climate (rainfall and PET)
- Outputs: **overland flow**, soil moisture, **recharge**

**ZOOMQ3D**  
groundwater  
model (chalk)



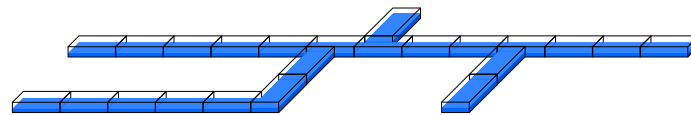
- **2D distributed** implicit model (1x1 km grid)
- **Variable** time-step
- Inputs: **recharge**, spring flow, abstractions
- Outputs: **baseflow**, groundwater head

**BGSGW**  
groundwater  
model  
(Limestone)



- **Semi-distributed** conceptual model (variably sized units)
- **Daily** time-step
- Inputs: **recharge**
- Outputs: **baseflow**, groundwater head

**Muskingum**  
river model  
(Thames)



- **1D distributed** river routing algorithm
- **Daily** time-step
- Inputs: **overland flow**, **baseflow**
- Outputs: **total flow**

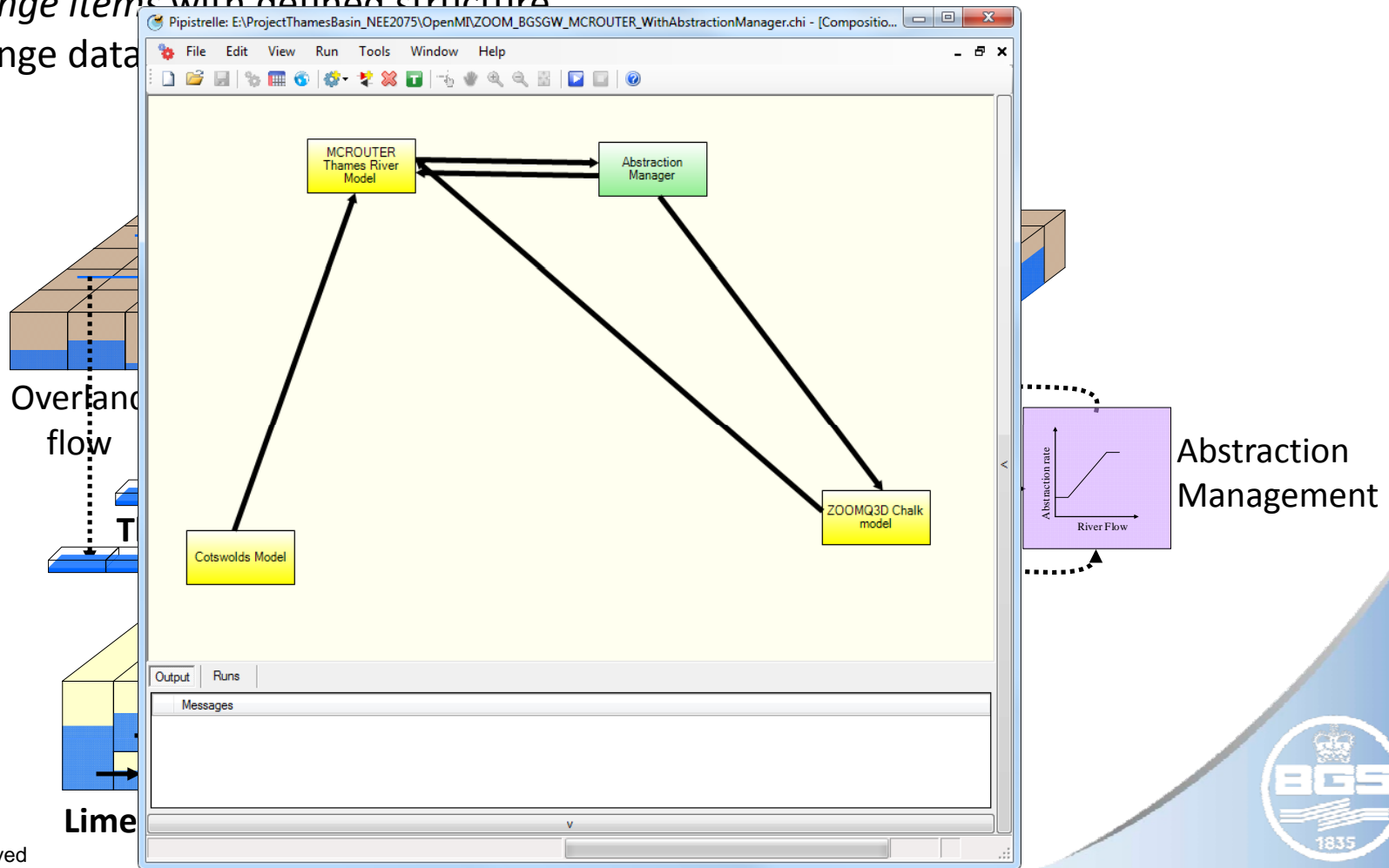
# The Open Modelling Interface (OpenMI) Standard



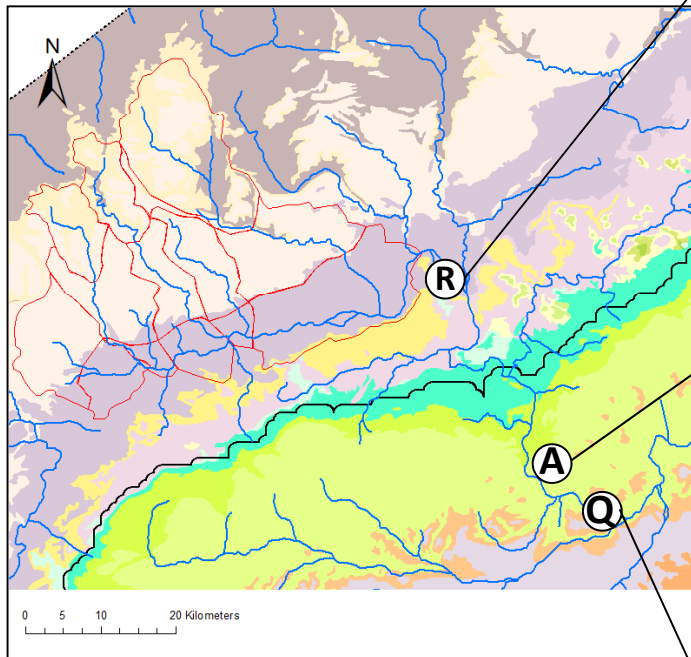
- An interface standard for model integration
  - Development initiated after Water Framework Directive (2000)

## •“OpenMI compliant” model

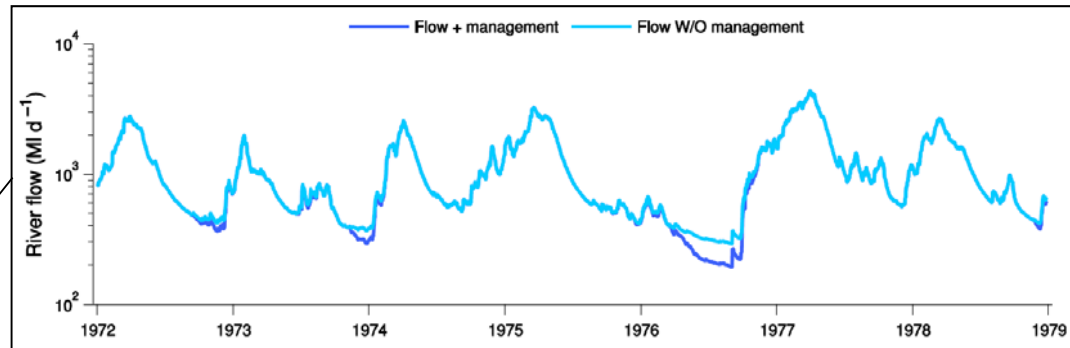
- Exchange items with defined structure
- Exchange data



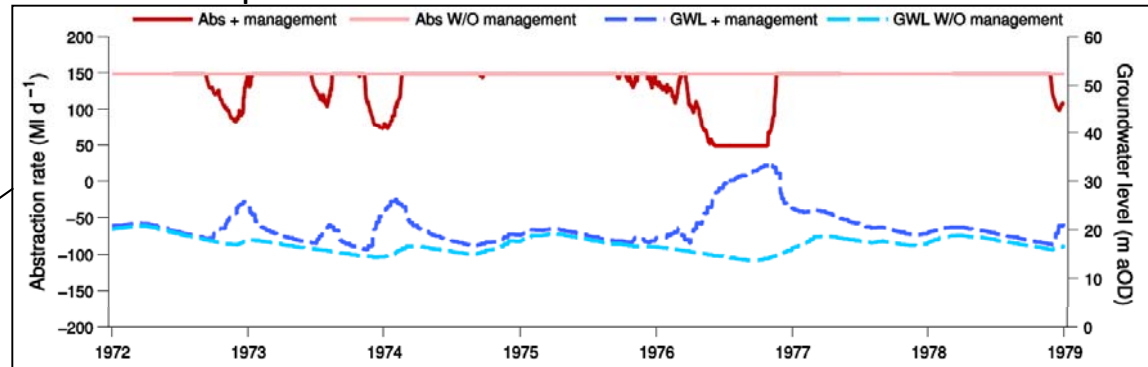
# Case Study: Preliminary Results



### Oxford



### Abstraction point



### Reading

