

# Environmental & Integrated Catchment Modelling at JBA



## A whole catchment approach

With recent advances in distributed hydrological modelling and nutrient budget modelling, a better understanding of whole catchment processes is now possible.

At JBA, we write bespoke GIS and data analysis tools, and use our hydrological expertise in areas such as flow naturalisation, to build this spatial information into statistical and physically based models.

We can use these models to identify causes and effects; and risks of failure of Water Framework Directive, Freshwater Fish Directive and Urban Pollution Management (UPM) standards.

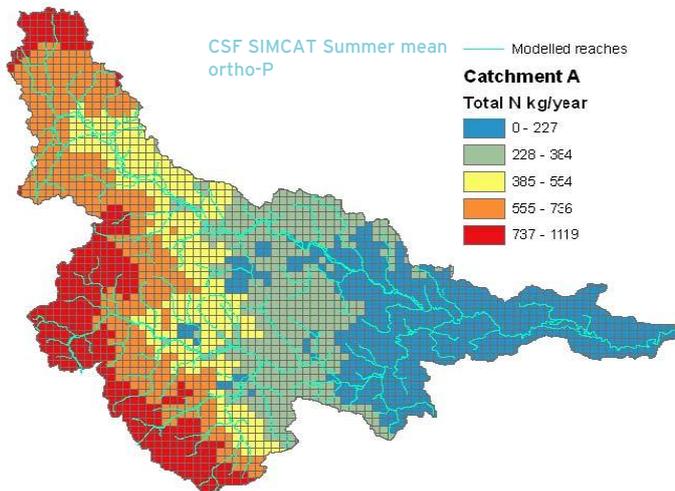
We have helped EA Evidence with development of their FACER model to understand the implications of CSF measures on reducing farm emissions and impacts.

The methods are data hungry so JBA has developed bulk data filtering and processing tools.

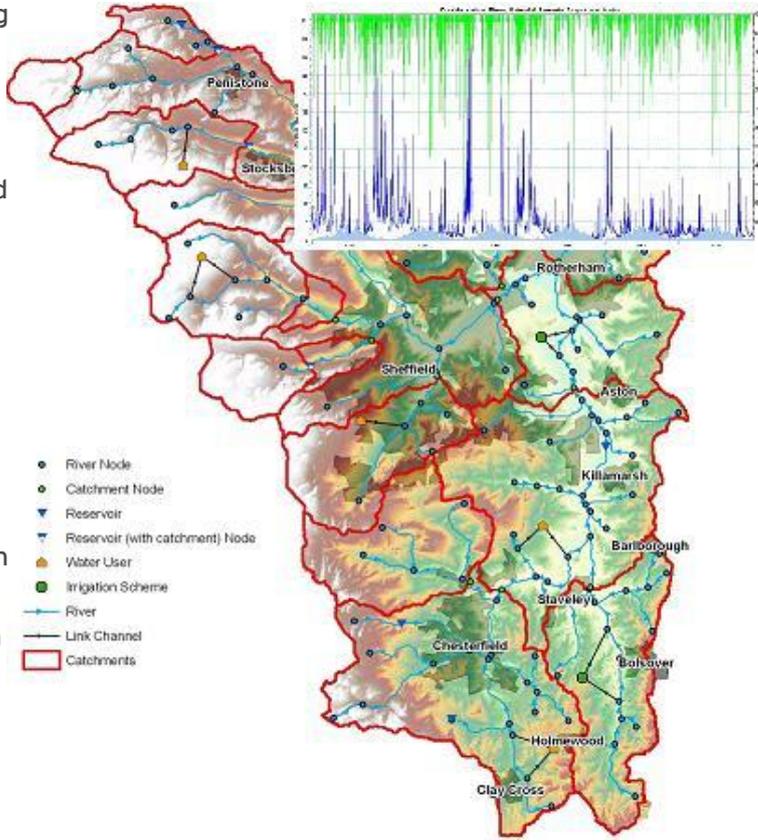
## Statistical modelling

We have worked with the Environment Agency to develop CSF SIMCAT models with distributed water flow balances, that incorporate diffuse nutrient loads.

Diffuse nutrients sources are derived by integrating outputs from models such as PSYCHIC-P or NEAP-N, or through using SAGIS.



Whole catchment solutions using MIKE BASIN for Yorkshire Water  
Rainfall runoff model component for each sub catchment



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## Physically based modelling

JBA is also involved in rainfall, time series driven models (MIKE BASIN, MIKE 11 Eco-Lab) to build up a detailed picture of integrated catchment behaviour.

Flows from rainfall-runoff modelling and sewer models driven by the same ten years of measured rainfall are combined and routed with point source, dry and wet weather flow and water quality inputs, abstractions and reservoir compensation releases all modelled.

Cause and effect modelling, together with compliance assessment of UPM Fundamental Intermittent Standards or WFD compliance can be investigated.

This work allows seasonal management of the water cycle across the whole catchment, with water resources and water quality being considered together.



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2012 finalists  
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