



Scenario
DOCTORAL TRAINING PARTNERSHIP

NERC
SCIENCE OF THE ENVIRONMENT

Quantifying flow and nutrient dynamic changes of a major flood relief scheme in the lower River Thames to better manage water quality and aquatic ecology

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The Thames basin is very densely populated, containing one fifth of the UK population. It floods regularly, and climate change projections suggest that flooding will increase over the coming century, with 15,000 homes being at risk of inundation within the lower reaches of the catchment. Black and Veatch Ltd. (B&V) are currently assisting the Environment Agency in developing a major flood-alleviation channel scheme in the lower Thames. This studentship aims



Jubilee River near Windsor.
Inset: CEH water quality monitoring station

to develop detailed system understanding of the hydrology, nutrient dynamics and ecology of this scheme to contribute to the management of environmental impacts and help to maximize the environmental and social value that the scheme will provide. This will be achieved by studying an existing flood relief channel in the lower Thames: the Jubilee River. Working with CEH, the student will have access to existing, extensive water quality data, and will be responsible for producing new data utilizing automated water quality monitoring stations along the Jubilee River, and from extensive water sampling/river habitat/ecological surveys. These data will lead to detailed understanding of nutrient transformations along the channel, and how this impacts on algal growth and ecological community structure. The detailed system understanding and data sets will be used to develop a model (QUESTOR) representing hydrology, nutrient concentrations, algal biomass and dissolved oxygen concentrations for the Jubilee River. This will then be applied to the new flood alleviation scheme to test the design and operation of the new scheme, and determine how the system can be best managed for the benefit of its ecological and recreational value.

Training opportunities:

The project provides comprehensive training opportunities at CEH and University of Reading, incorporating lab and fieldworking skills, data interpretation techniques and hydrological / water quality modelling. Uniquely, the student will also gain extensive vocational experience working within B&V's consultancy environment.

Student profile:

This project would be suitable for students with a good degree (2:1 minimum) in environmental sciences, geography, hydrology or environmental engineering

Funding particulars:

This project in CASE supported by B&V.

<http://www.reading.ac.uk/nercdtp>