

Overview of UK Water Quality Interests

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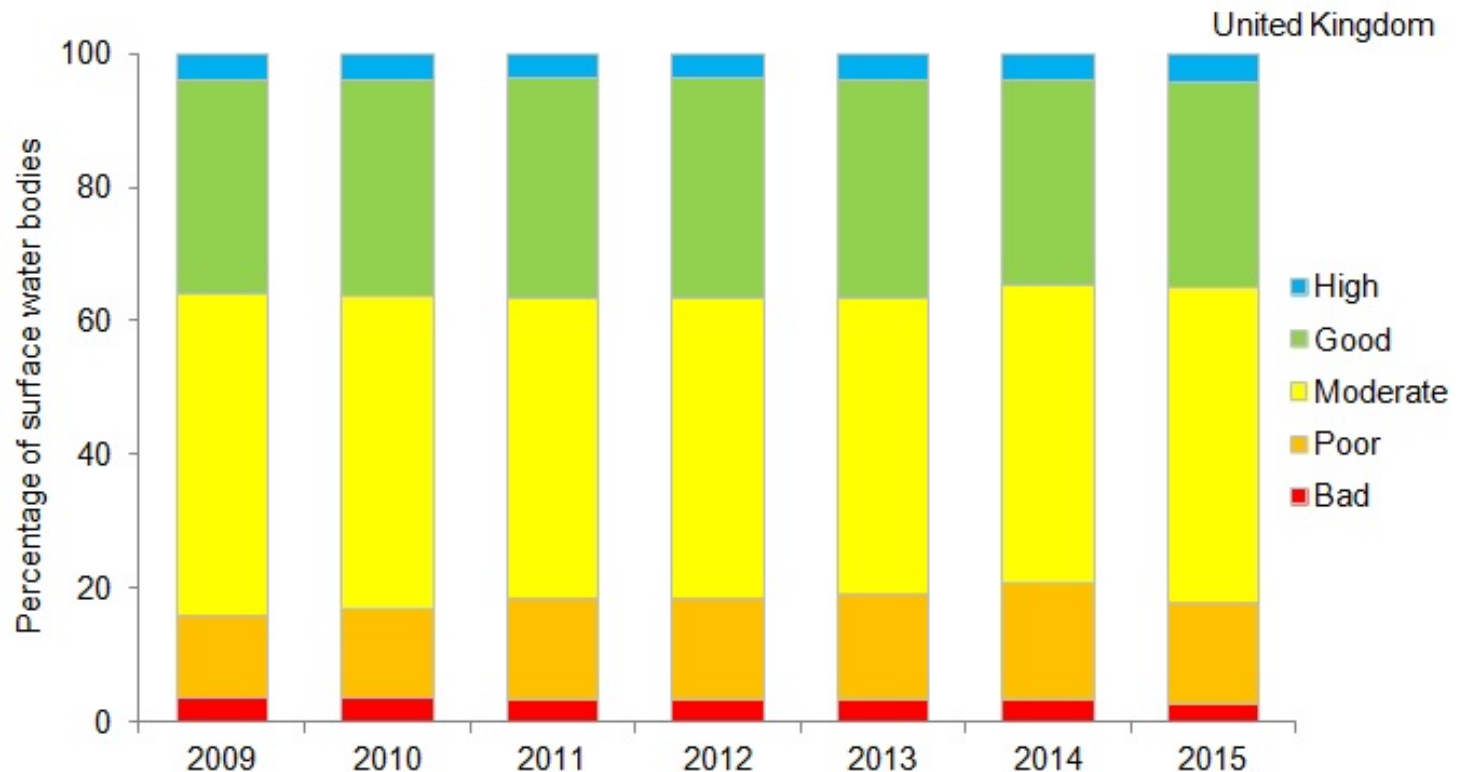
Water Quality in the UK

- EU Water Framework Directive (adopted in 2000)
 - A framework for the protection of rivers, lakes, estuaries, coastal waters and groundwater
 - Requires that the UK achieves 'good' status of all water bodies
 - Focus on tackling water quality issues at the catchment-scale
 - Surface water quality determined by ecological and chemical status
 - Groundwater quality determined by chemical and quantitative (level of abstraction) status



Current Water Quality Status

Status classification of UK surface water bodies under the Water Framework Directive, 2009 to 2015 (Source JNCC)



Water Quality Research Interests

- NERC and EPSRC support environmental and engineering research that address a range of water quality issues, including:
 - Projects looking at sources, transport and fate of a wide range of pollutants, such as pesticides, fertilisers, nanoparticles, organic matter and PCPs, and their impact on the environment
 - Long-term research on lake restoration, groundwater quality and algal blooms
 - Development of novel sensors to enable better monitoring of water quality
 - New technologies to reduce and mitigate pollution

UK Focused Research

- A £9.7m programme, Macronutrients Cycles, to quantify the scales of C, N and P fluxes and how these are changing
- Two £1m projects studying the impact of nanoparticles on freshwater environments
- Changing Water Cycle, a £10m programme with projects in the UK and India looking at impacts of environmental change on water quantity, quality and hazards

- ■ ■ A 3.9M Programme, TWENTY 65: Tailored Water Solutions for Positive Impact, looking at the use of 'tailored solutions' to address the challenges of increasing population, ageing infrastructure, and the need to better protect the natural environment all under conditions of uncertain climate change, by combining measures to suit specific circumstances and constraints to achieve flexible and adaptive water systems.
- ■ ■ A £1.1M Challenging Engineering Programme looking at Mitigating the risk of micropollutants in the environment.
- ■ ■ A £2M Project looking at Urban Flood and Water Resilience in an Uncertain Future.



International Research

G8 Research Councils Initiative on Multilateral Research Funding

The G8 Research Councils Initiative on Multilateral Research Funding is a coordinated effort to support multilateral research partnerships. The programme aims to support excellent research on topics of global relevance which best be tackled by a multinational approach.

As a contributor to the G8 Heads of Research Councils Initiative, EPSRC has recently sponsored a suite of grant international collaborative research programmes that seek to address the challenges posed by materials which are expected to double, with a commensurate impact upon the environment.

The grants funded under this initiative bring together international research teams from Canada, France, Germany, Japan, Russia, UK and the USA. Each funded consortium will bring together different sets of knowledge, perspective



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Groundwater quality and depletion in the Indo-Gangetic Basin mapped from *in situ* observations

A. M. MacDonald^{1*}, H. C. Bonsor¹, K. M. Ahmed², W. G. Burgess³, M. Basharat⁴, R. C. A. Dixit⁶, S. S. D. Foster⁷, K. Gopal⁸, D. J. Lapworth⁹, R. M. Lark¹⁰, M. Moench¹¹, A. M. S. Rao⁸, M. Shamsudduha¹³, L. Smith¹⁴, R. G. Taylor¹⁵, J. Tucker⁵, F. van Steenberg and S. K. Yadav⁶

Groundwater abstraction from the transboundary Indo-Gangetic Basin comprises 25% of global groundwater withdrawals, sustaining agricultural productivity in Pakistan, India, Nepal and Bangladesh. Recent interpretations of satellite gravity data indicate that current abstraction is unsustainable¹⁻³, yet these large-scale interpretations lack the spatio-temporal resolution required to govern groundwater effectively^{4,5}. Here we report new evidence from high-resolution *in situ* records of groundwater levels, abstraction and groundwater quality, which reveal that sustainable groundwater supplies are constrained more by extensive contamination than depletion. We estimate the

volume continues to increase at 2–5 km³ yr⁻¹ agricultural production. Abstraction is uneven yet supplies drinking water for rural and urban areas throughout the full extent of the IGB. The aquifer system as a single category on hydrogeological maps is complex and heterogeneous differences in permeability, storage, recharge, that can also vary with depth. This complex system how each part of the aquifer responds to home to the largest surface water irrigated constructed during the nineteenth century and to redistribute water from the Indus a



International agreements

We work with partners in the UK and abroad to help researchers and research organisations to get maximum value from international collaborations and opportunities. As well as undertaking joint funding activities in strategically important areas, we seek to put in place agreements with research funding organisations overseas where opportunities present themselves.

'Money follows Researcher' initiative - Science Europe

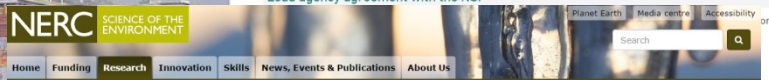
We have signed an agreement under the auspices of Science Europe to allow researchers to transfer grants between the UK and other Science Europe member countries, subject to RCUK-agreed conditions.

Lead agency agreements

Lead agency agreements provide a framework for joint peer review of proposals by two funding agencies in different countries. One organisation takes the lead in managing the review process, with an agreed level of participation by the other, and both agencies accept the outcome of the review process and fund the costs of the successful applications in their respective countries.

Through RCUK we have a lead agency agreement with Fonds National de la Recherche (FNRS) in Luxembourg.

Lead agency agreement with the NSF



Understanding & Sustaining Brazilian Biome Resources

Programme overview

The Understanding & Sustaining Brazilian Biome Resources programme seeks to improve our understanding of the role of biodiversity in the functioning of ecosystems; the drivers and impacts of change; and options for management and restoration, within Brazilian biomes. It is jointly funded by NERC and the São Paulo Research Foundation (FAPESP). The UK supports the programme through the Newton Fund, which forms part of the UK government's Official Development Assistance (ODA) commitment.



Programme news

Newton Amazon announcement

14 Apr 2016

As part of the UK Newton Fund activities, NERC in collaboration with the São Paulo Research Foundation (FAPESP) have agreed to support two projects under the joint NERC-FAPESP programme 'Understanding & Sustaining Brazilian Biome Resources'.

In this section

- Research programmes
- Brazilian Biome Resources
- News

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