Overview of UK-India Collaborations in Hydrological Sciences

Dr Ruth Kelman

Head of Freshwater Sciences

Natural Environment Research Council

Who we are

- NERC is the UK's leading public funder of environmental science.
- We invest £330m each year in cutting-edge research, postgraduate training and innovation in UK universities and research centres.

UK Research Councils

Our Strategy

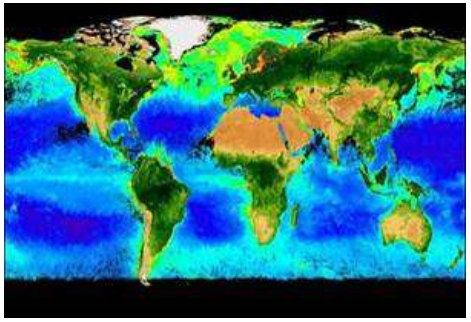
VISION

To place environmental science at the heart of responsible management of our planet

Launched 4th November 2013

Our goals

Fund excellent, peer-reviewed environmental science that helps us:

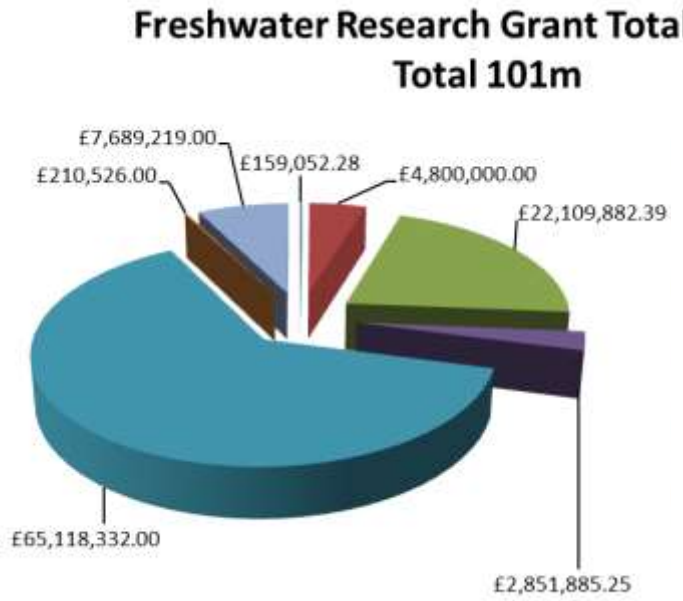


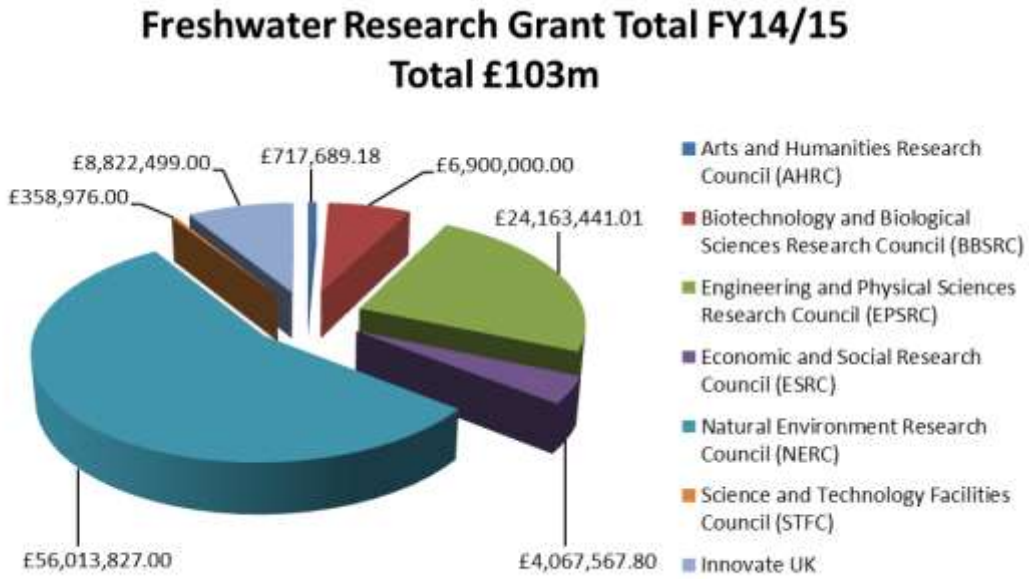
- understand and predict how our planet works
- manage our environment responsibly
- Meet society's needs :
  - Benefiting from natural resources
  - Resilience to environmental hazards
  - Managing environmental change

We support

- 3,000 scientists and 1,000 PhD students
- 1,000 research projects and 60 UK or international programmes
- 55 universities and 20 research institutes
- UK national capability: 4 ships, 7 aircraft, 6 polar stations, 6 data centres, 32 community facilities

Investment in Freshwater Research





Working Internationally

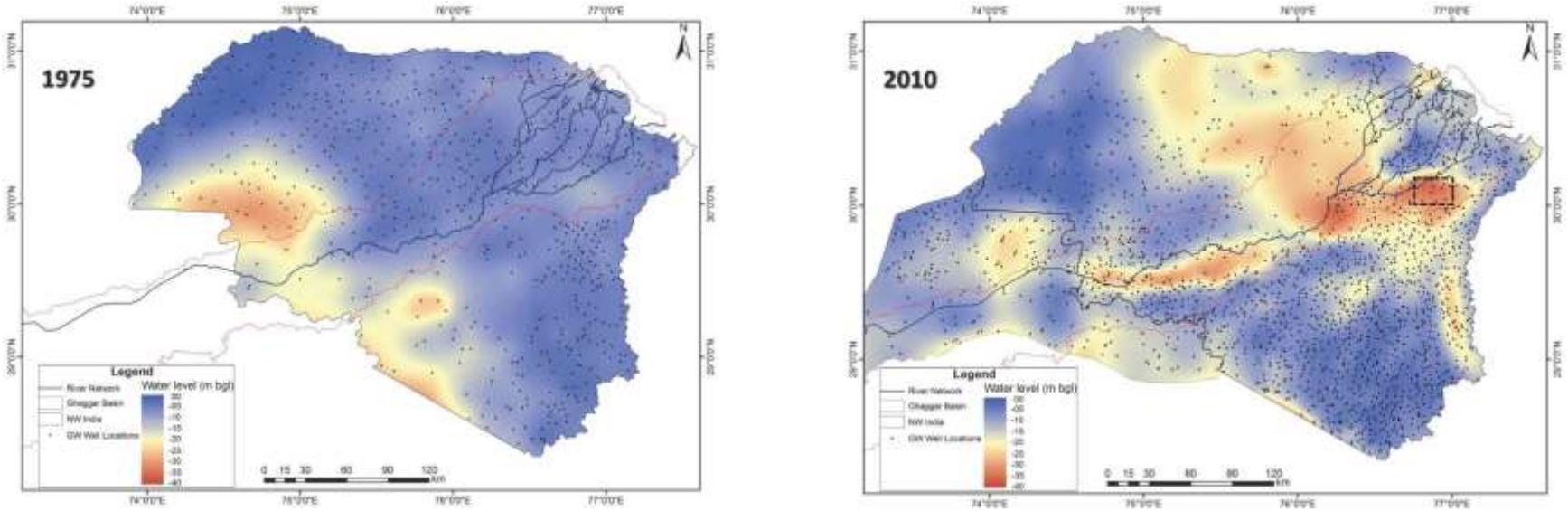
- NERC works with partners overseas to:
  - agree international research priorities and jointly tackle environmental research challenges
  - access all parts of the Earth in our quest to understand how it works and how it changes
  - make the best use of our resources by aligning national programmes, co-funding calls for proposals, and sharing capability
- NERC's support for international partnerships is embedded across all of our funding streams. For example, we welcome international project partners in all proposals for NERC research grants.

Partnership with MoES

- MoU with Ministry of Earth Sciences signed in 2013
- Enables scientific and technical collaboration in natural environmental research, including meteorology, climate variability and change, oceanography, hydrology, natural hazards and biodiversity

Changing Water Cycle

- 5 joint projects looking at improving understanding and predictions of regional precipitation, evapotranspiration, soil moisture, hydrological storage due to finish



Changes in Groundwater Level in Ghaggar Basin (Punjab & Haryana). From 'The structure and dynamics of groundwater systems in Northwestern India' project led by IIT Kanpur and University of Durham

Drivers of Variability in the South Asian Monsoon

- Part of the MoES National Monsoon Mission
- Three joint UK-India projects started recently
- The focus is on developing a better understanding of processes driving variability, seasonality and predictability in the South Asian monsoon, with the goal of improving predictions on all timescales.

Sustaining Water Resources for Food, Energy & Ecosystem Services

- Supported by Newton-Bhabha Fund, led by NERC and MoES
- Will use a whole systems approach to develop a framework for integrated basin-wide models of water resources
- Proposals being peer-reviewed
- Expect to fund 3 case studies, one in each of the Himalayas, Indo-Gangetic Plain and Peninsular India

Future Work

- Plan to continue water cycle research, in particular to further develop the whole systems approach by supporting the observation campaigns, fieldwork, laboratory analysis and model development needed to deliver integrated basin wide models
- Will support translation outcomes of NERC research based elsewhere to the Indian context, e.g. the Thames clean-up work
- Also exploring opportunity for joint training and capacity building activities
- We would welcome Ministry of Water Resources, River Development & River Rejuvenation involvement