

# NERC Innovation: enhancing the impact of NERC's research investments

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## Natural Environment Research Council

Valuing Nature Programme – Business Impact School 2017



# Our vision



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

# Meeting society's needs



- Benefiting from natural resources
- Resilience to environmental hazards
- Managing environmental change
- Discovery science

“Enhancing the impact of NERC’s investments by transforming the knowledge, data, capabilities and skills of our community into new value-adding approaches, tools and solutions.”



# Knowledge Exchange Fellows

**Dr Katherine Baldock**

**University of Bristol**  
Improving urban habitat  
management for insect  
pollinators and people

**Dr Prue Addison**

**University of Oxford**  
Applying NERC-funded  
biodiversity research to  
improve corporate  
biodiversity strategies

**Mr Charlie Stratford**

**NERC CEH**  
Natural Capital Knowledge  
Exchange to Support Healthy  
Local Economies

**Dr Martin Dallimer**

**University of Leeds**  
Exchanging knowledge on  
the multiple values of urban  
green infrastructure in sub-  
Saharan Africa

**Professor Alister Scott**

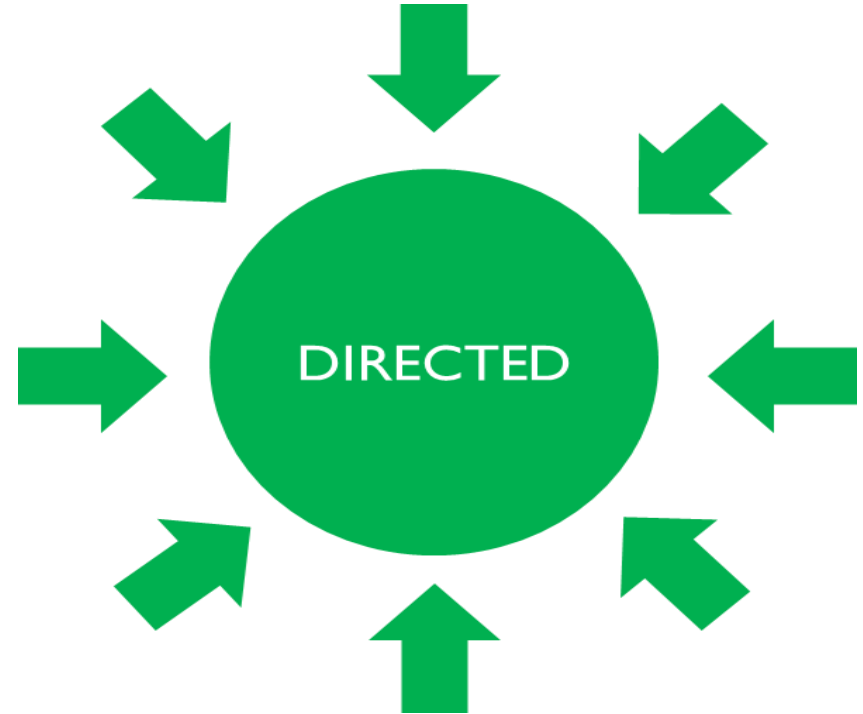
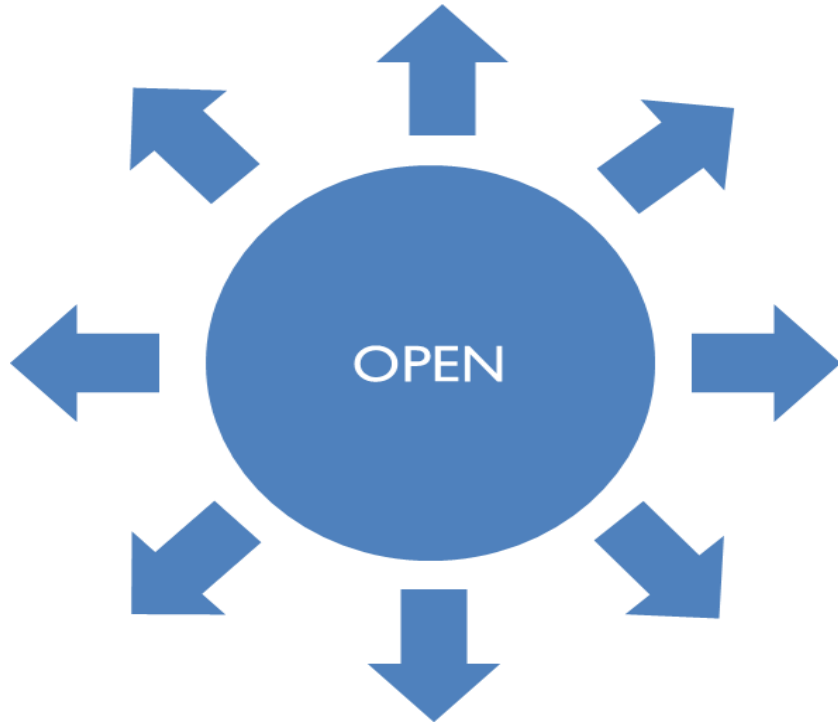
**Northumbria University**  
Mainstreaming green  
infrastructure in planning,  
policy and decision making:  
Translating NERC science  
into a co-produced spatial  
planning toolkit.

**Dr Beccy Wilebore**

**University of Oxford**  
Natural capital assessments  
in the UK: facilitating Defra  
Pioneer Projects with NERC-  
funded research

# NERC Innovation

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# Green Infrastructure

In 2016 NERC invested around £1.2 million in innovative projects designed to improve urban life and create sustainable cities by helping us make better use of 'green infrastructure' – natural spaces from roadside verges to parks and gardens.

**An Ecosystem Services  
Approach to Green  
Infrastructure  
Partnership Planning**

Dr Alex Collins, Imperial  
College London

**Valuing Green  
Infrastructure Through  
Tree Assessment  
Tools**

Dr Philip  
Wheeler, Open University

**A National Scale Model  
of Green Infrastructure  
for  
Water Resources**

Prof Jim Hall, University of  
Oxford

**Assessing the  
contribution of domestic  
gardens to urban  
ecosystem services**

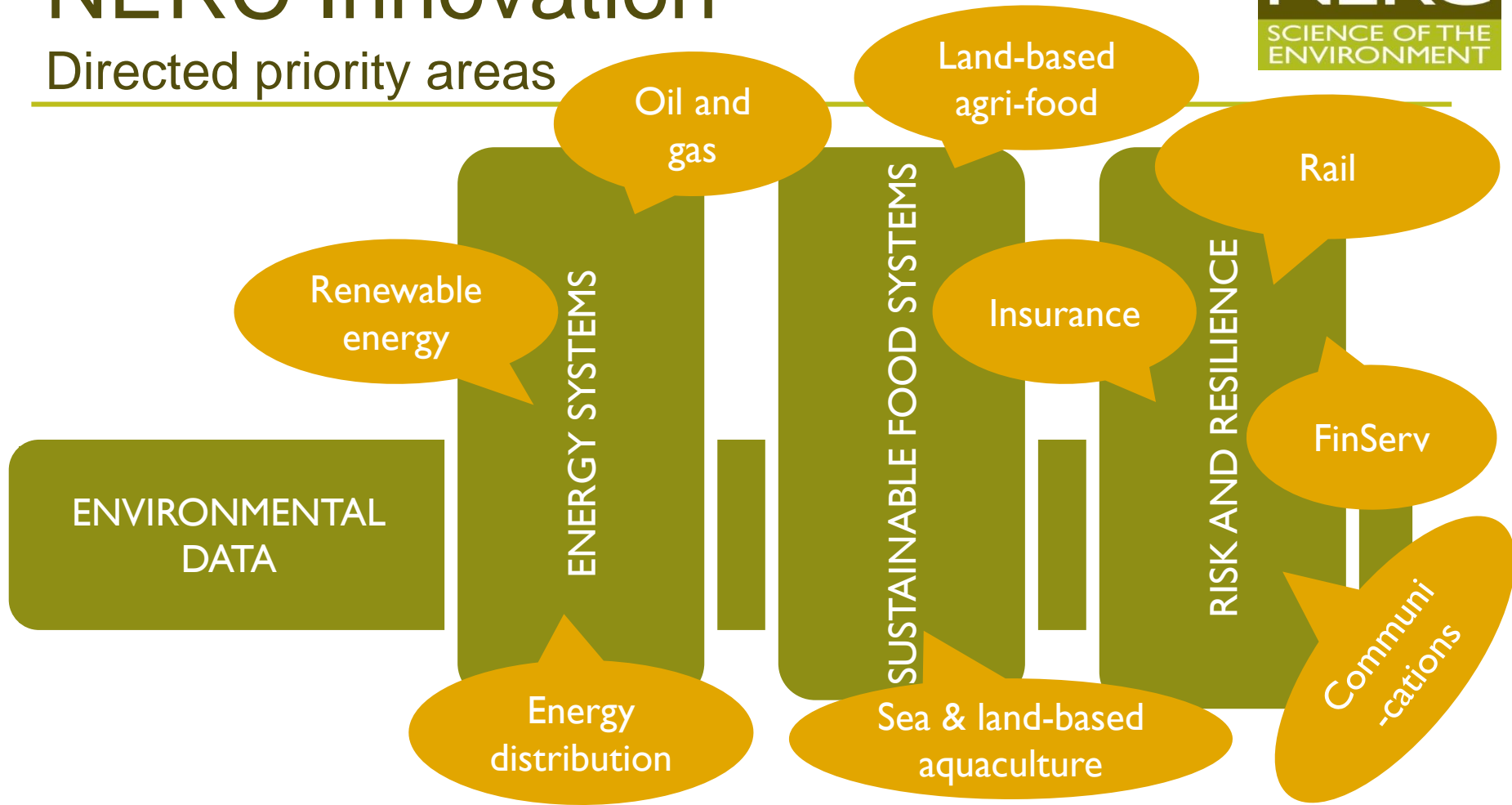
Claire Smith, University of  
Leicester





# NERC Innovation

Directed priority areas



# NERC Innovation

## Innovation programmes



# NERC Innovation

## Innovation programmes



**Environmental Risks to Infrastructure Innovation Programme**



**UK AQUACULTURE INITIATIVE**



**SARIC** • SUSTAINABLE AGRICULTURE RESEARCH & INNOVATION CLUB



**IPOG**  
Innovation Programme in Oil & Gas



# Sustainable Agriculture Research & Innovation Club (SARIC)



## Aim

- Address efficiency, productivity & sustainability of UK crop & livestock sectors

£10m  
investment

## Thematic foci:

1. Resilient & robust crop & livestock production systems
2. Predictive capabilities for sustainable agriculture

5 years

## Two funding streams:

1. Research – new, fundamental knowledge & data
2. Research translation - new tools & products from existing data

BBSRC  
co-fund



MONSANTO



# CROPROTECT

[www.croprotect.com](http://www.croprotect.com)



- Web-based knowledge exchange system to support growers in protecting crops using integrated pest management (IPM) and alternatives to pesticides.
- Online & mobile phone app
  - co-ordinates and connects grower data with information on pest, weed and disease management
  - provides appropriate pest management suggestions.
  - be a two-way system and to obtain a detailed picture of specific challenges growers face as conventional pesticide options are diminished for problems such as black grass in winter wheat and flea beetle in oilseed rape



# Satellites to improve agri-food systems

Projects to stimulate innovation to improve the productivity of agri-food systems using satellite technology

- **Project titles:**

- Precision soil mapping
- Advancing EO Applications in Agriculture
- SHiFT: Sentinel-2 - compatible historical datasets for future crop targeting
- FROST STIC
- Development of an on-farm handset for variable N management from satellite images

£3.75m  
investment

CR&D +  
Feasibility

Innovate UK  
co-fund



# UK AQUACULTURE INITIATIVE

## Aim:

- To develop a healthy, safe and sustainable UK aquaculture system

## Thematic areas:

1. Monitoring and control of health and disease
2. Sustainable, nutritional feedstocks
3. Understanding and managing the effects of aquaculture on the environment
4. Understanding and managing the effects of the environment on aquaculture
5. Breeding and genetics approaches for stock enhancement
6. Finfish welfare

## Cross-cutting issues

1. New facilities and technologies for monitoring and predicting risks, and to enhance the capacity of aquaculture
2. Data sharing and management
3. Safe food for human consumption

## Funding:

- Innovation projects call 2016 - Accelerate impact of capacity-building research projects. Project looking at the application of technology to detect algal blooms, salmon vaccines and genetic markers to improve herpes resistance in commercial oyster populations,
- Network in finfish and shellfish ARCH-NET - Delivery of a Research and Innovation Strategy
- Further funding calls

£6m  
investment

5 years

BBSRC  
co-fund

# Single Environmental Data Service

## A step change in data innovation

### Tools and Services

- Data sandpit environments
- HPC modelling
- Environmental Research Workbench
- Data Centre Expertise

### 'Common Fabric'

- 'Data lake'-based approach
- Data availability
- Data inter-operability
- Data usage statistics



### Operational Service

- Facilitation and brokerage to support external data consumers
- Capturing user feedback
- Producing impact reports
- Coordination of call for Ideas process

### Data Innovation Portal

- Data discoverability
- User registration data
- User feedback

£10m  
investment

Challenge-led  
innovation

Business  
focused

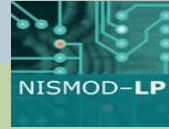


Internal

External

# Direction of travel for NERC data Innovation activities

## NERC Data Centres



'Environment space'

Improved data integration across UKRI

Working with other data hubs

Single organisation  
Single discipline

Multi-organisational

Multi-disciplinary

# NERC Innovation

## Regional Impact from Science of the Environment

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- RISE is dedicated to bringing research organisations together with businesses, policy bodies and other actors contributing to economic development specific to their location, to deliver significant regional impact from NERC environmental science.

**£2.5 - £5m**

### Awards 2016:

- South West Partnership for Environment & Economic Prosperity (SWEPP), worth £4 million over five years, aims to significantly improve the economic prosperity of the South West. The project will be led from the University of Exeter.
- Yorkshire Integrated Catchment Solutions Programme (Yorkshire iCASP), worth £4.7 million over five years and led from the University of Leeds, aims to generate economic impacts worth £50 million to Yorkshire.

**5 year  
invest-  
ments**

**2 to 3 per  
annum**

# Environmental Risks to Infrastructure Innovation Programme – to date

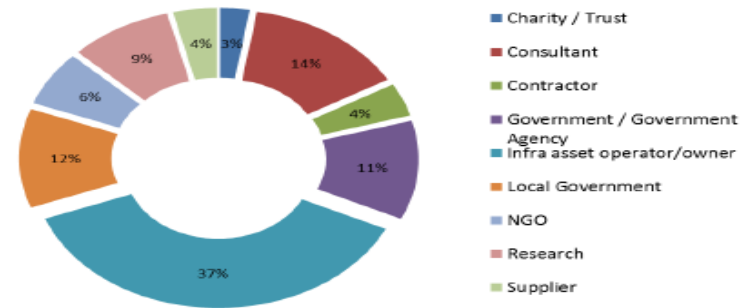
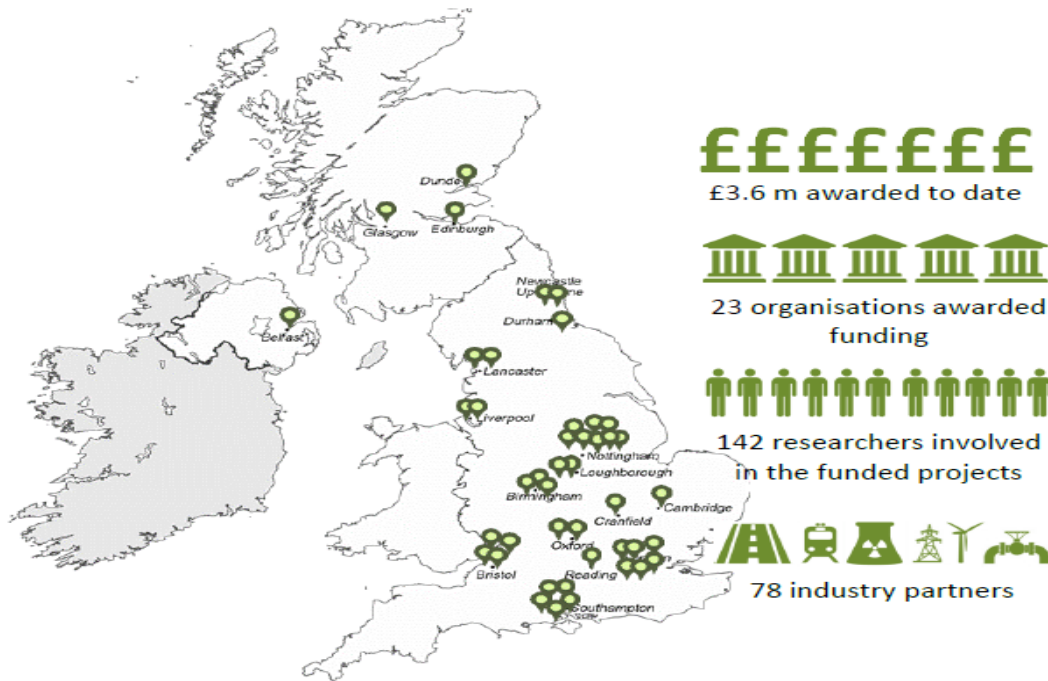


Figure 2: Types of organisation involved in funded projects



Figure 3: ERIP themes

# Predictive jellyfish bloom dispersal maps for UK coastal electricity generating facilities



Environmental Risks  
to Infrastructure  
Innovation Programme

- 2011 – EDF Energy’s Torness nuclear power plant closed for 1 week = £1m per day
- NERC investment £160k
- 18 month project to develop early warning tool

*“Jellyfish swarms are an occasional but challenging issue for our power stations. They can have an impact on the amount of electricity we are able to supply to consumers. . [we] are pleased to be working with the University of Bristol to develop a tool that will allow us to continue delivering, safe, secure and responsible nuclear electricity.”*

Pietro Bernadara, EDF Energy



# What next?

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- Exploring other areas where environmental research and innovation may be of use to business, including other areas of valuing nature.
- Future opportunities in UKRI for more interdisciplinary programmes.



**Emily Flowers**, Senior Programme Manager Innovation  
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