Department
for Environment
Food & Rural Affairs

STFC Challenge Led Applied Systems Programme - Defra Group Digital Needs

5th November 2019

Environment Agency

Forestry Commission

NATURAL ENGLAND

Defra Group

We are here to make

- our air purer,
- our water cleaner,
- our land greener,
- our food more sustainable.

Our mission is to restore and enhance the environment for the next generation and to leave the environment in a better state

The importance of monitoring the environment

Beautiful **LANDSCAPES,** flourishing **WILDLIFE** and native species

Efficient **RESOURCE USE** and reduced waste

Sustainable **FARMING** and **FOOD**

To gain effective insight from the data gathered

Protecting **ANIMALS** and **PLANTS** from health risks

Healthy **SEAS** and **OCEANS**

Pure **AIR**, clean **RIVERS** and a resilient water supply

Our key challenges

We need to improve our understanding, but don't have the resources or funding for more data. So we need alternatives solutions, such as:

- Enabling others to gather data
- New technologies for monitoring and data analysis
- Sharing data so it can be collaboratively used by many
- Aligning data & evidence to make better use of what we have
- Alternatives to existing (soon to be obsolete) technologies
- New methods for monitoring in remote places
- Improving monitoring frequency and speed, so timely interventions can be made for incidents (flooding, infectious diseases, pollution events)
- Novel approaches to monitoring, enabled by emerging technologies

Underpinning these is the opportunity to engage the academic community.

Our applied systems research needs

Digital Twins for the Natural or Built Environment	Plant and Tree Health Risk: An Early Warning System
Citizen Science: Consistency in Coverage and Quality	Soil Health: Metrics for the 25 YEP and the ELM System
Internet of Things for Defra: A Demonstrator for the Future	Environmental Net Gain: Register of Habitat Gains & Losses
Operational Telemetry - Withdrawal of PSTN	Farming and Land Management
Broad Scale, Long Term Evidence Integration: A Systems Based Approach	Long-term Planning of Water Quality: Measuring the Usability of Water
Enhanced Air Quality Monitoring	Agent-based Modelling of Water Use
Predictive Analytics for 'Just-in-Time' Maintenance of Low-utilisation Flood Assets	Enhanced Volunteer Networks: Managing the Gaps
Integrating Data Using a Linked Data Model	Passive Recording Networks
Richer Flood Forecasting	Virtual Reality to Enhance Data
Digital Treescapes: A Holistic Landscape Approach Using Technology	Data Validation and Integration for Monitoring Biodiversity
Net Carbon Zero – Land Use/Energy Production What is the Optimal Mix to Mitigate Climate Change	Trees and Farming: Where & When to Plant Trees for maximum benefit

Defra Group Offer to CLASP

- Defra Group will support co-design of proposals e.g.

  - ❑ Provide end-user input to support design of proposals
  - ❑ Help document opportunities for routes to impact

- Defra Group will support co-delivery of proposals which are selected for funding e.g.

  - ❑ Provide policy/operational perspectives to steer projects,
  - ❑ Feed in data sets/technical knowledge,
  - ❑ Input into steering groups/committees
  - ❑ Provide channels to communicate and embed project outcomes into decision making

Please note, engagement with bidders is on a non-exclusive basis