North and East Yorkshire Ecological Data Centre (NEYEDC)

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an ALERC accredited LRC
Association of Local Environmental Records Centres

nature HACK

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and awarded by the Heritage Lottery Fund

heritage lottery fund

LOTTERY FUNDED

NatureHack

- NEYEDC; who we are and what we do.
- Why we need NatureHack.
- NatureHack; what's it all about?
- How can you get involved?

Mission

"To improve and inform environmental decision making, conservation, land management and sustainable development in North and East Yorkshire through the collation, management, analysis and dissemination of biodiversity information."

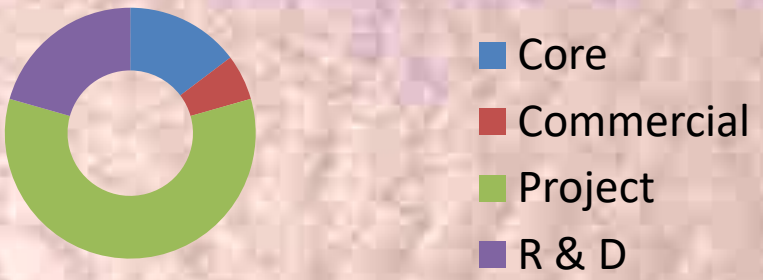
North and East Yorkshire Ecological Data Centre

An operating function of the Yorkshire and Humber Ecological Data Trust

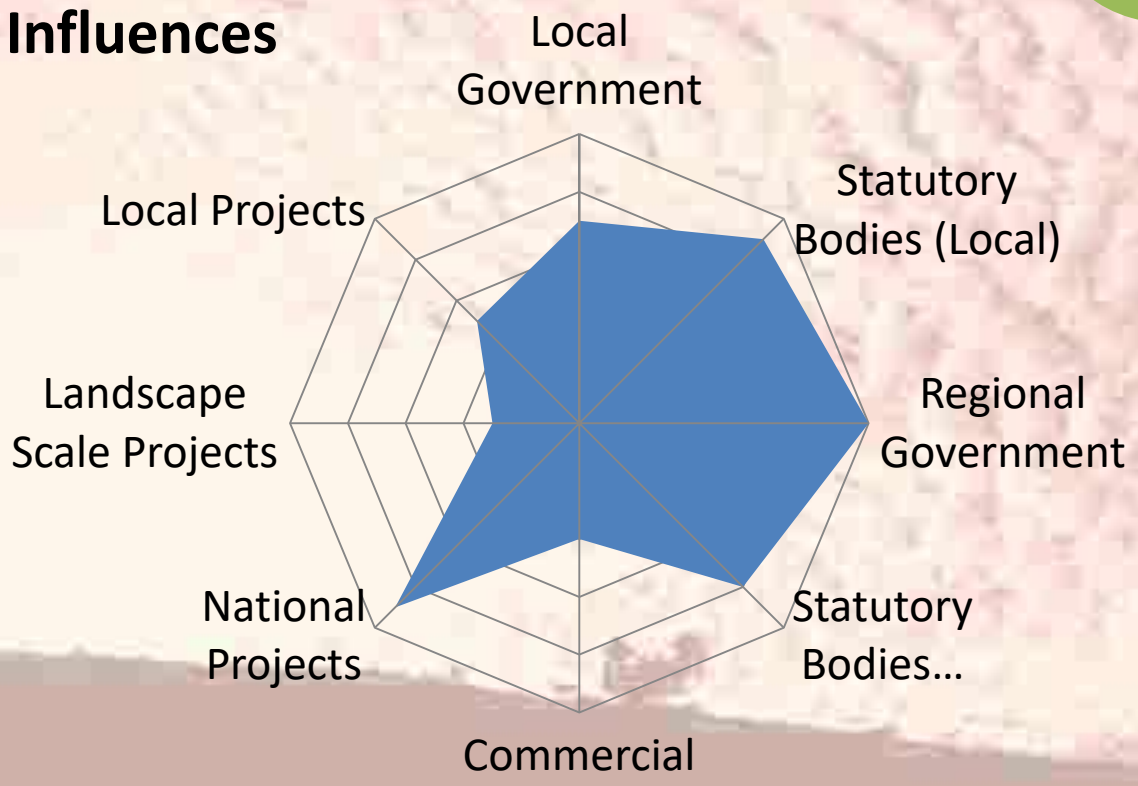
Regional Phase

Budget - £280,000 p.a.

Work balance



Influences



Key Drivers

1. Regional strategies
2. European and domestic legislation
3. Large sub-regional surveys
4. National technical developments

North and East Yorkshire Ecological Data Centre

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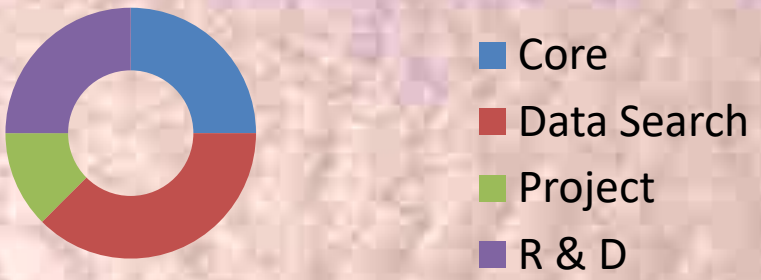
Work and Funding

Budget - £200,000 p.a.

Work balance



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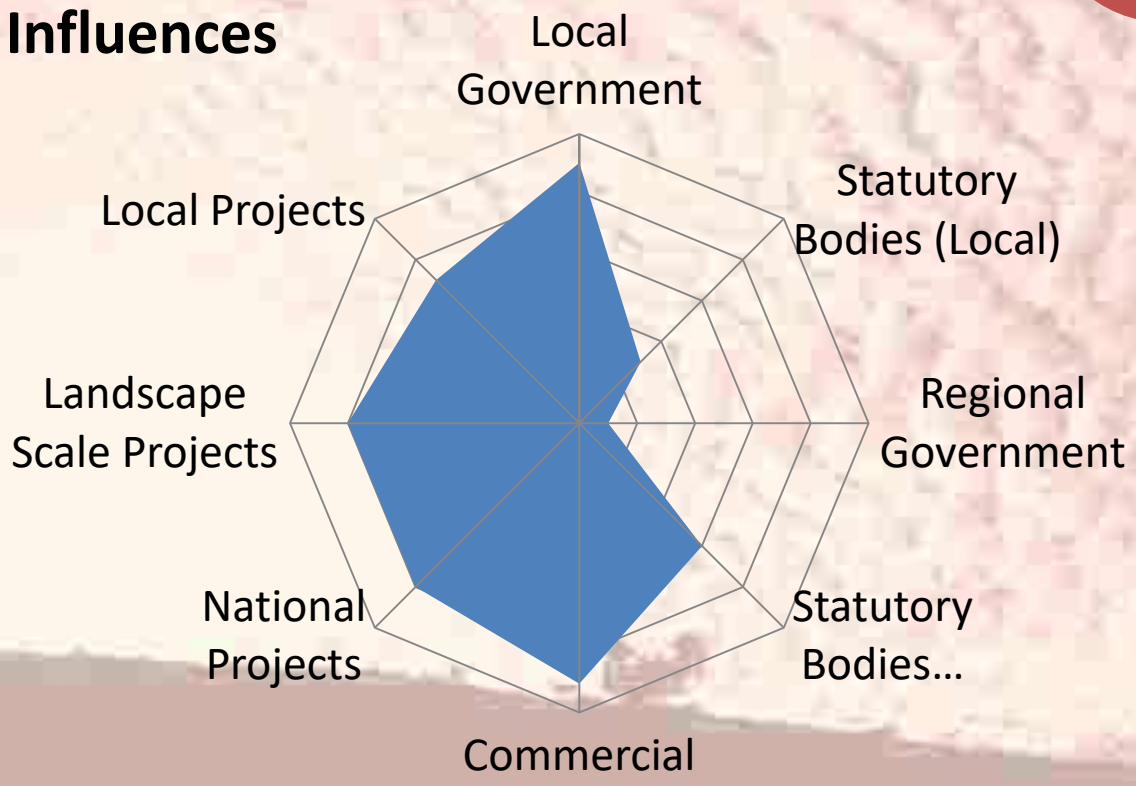


Key Drivers

1. NPPF & Defra family data strategies
2. Commercial good practice
3. Local authority strategic policy.

Data should be as widely and efficiently available as possible

- National biodiversity data framework from field to multiple users.
- Agreed data flows.
- Auditable data exchange agreements, which may in the future be replaced by open data licences.

Data should be of known quality and fit-for-purpose.

- National data standards
- Rigorous standards of validation, verification and versioning.
- Metadata; essential for good data management.
- Functionality rather than availability to lead data acquisition strategy.
- Structured data to allow increased confidence in decision making.

Technologies should be implemented as they become available, without unnecessary replication.

- Over arching technical standards and frameworks
- Species, habitat and site databases.
- Web services
- New Field Techniques
- New Analytical techniques
- Models


IF YOU'RE NOT
LIVING ON THE
EDGE
YOU'RE TAKING
UP TOO MUCH
SPACE

Why do we need NatureHack

In our sector: -

- There is a mismatch between the scale at which we invest in biodiversity monitoring and the scale at which we make decisions that effect conservation.
- The investment in novel technologies is disproportionate to the investment in technology development & open innovation.
- Little support for roll out of new technologies.
- Local solutions are seen as preferable to national systems, but many local solutions develop in silos.

What is NatureHack?

Hack$_{(n)}$ the intellectual challenge of creatively overcoming or circumventing limitations; a creative or elegant technical accomplishment, especially one with a playful or prankish bent.

Nature Hack – Knowledge Cascade Elements

Change and Consolidation within NEYEDC

Mentor support and focus groups

Focusing on key themes of technology, finance & communication, how should NEYEDC implement change?

Review NEYEDC business model; how can proposed changes to the Centres roles be supported?

Bespoke staff CPD

Consolidate existing technical expertise through training & knowledge transfer

Cascade Technologies to the Natural Heritage Data Community

Supported through mutual mentoring programme with S&RWT

Build capacity to deliver training and knowledge transfer

Engage 3 target audiences in the first instance

Delivered by NEYEDC staff with expert mentors

Provide training in at least 3 technologies including GIS as a gateway and linking technology

Mentored by NEYEDC Staff

NEYEDC provides opportunities to build experience

Find a sustainable way to put the Best New Technology in the Hands of Natural Heritage Community

Supported through advice and collaboration of regional LNP Network

Engender region-wide discussion on new technologies

Scope potential regional mechanisms for technology transfer and establish forum

Link data demand with technologies and expertise

Establish regional pools of equipment and resources?

Establish draft best practice for data legacy?

Key audiences – narrow and deep

- Peers in the ecological data sector as collaborators, facilitators and mentors.
- Professional and amateur conservationists that manage, often on minimal resources, small “stepping stone” sites in the landscape.
- Young urban technophiles that have yet to develop an interest in conservation.
- Potential data technology champions within our region

New technologies – just a cup full

- GIS (a gateway technology)
- Remote sensing.
- Acoustic monitoring
- eDNA and DNA barcoding.
- Computer modelling
    - Habitat suitability modelling
    - Ecological functionality of landscapes
    - Systematic conservation planning

NatureHack Phase 1

- Internal NEYEDC activities linked to new organisational strategic plan.
- General engagement – from 1 to 1 meetings to conferences.
- QGIS training
- NatureHack Roadshows
- Need analysis – matching technology to problems.

QGIS Training

- Devise a QGIS training programme that took people from first contact with QGIS to a point where they could begin to discover QGIS for themselves in the context of their own projects.
- Make the project available for other organisations to deliver.
- Identify the best way to support people learning QGIS.

NatureHack Roadshows

- 8 Roadshows and 2 Bioblitzes so far
- To meet people who are monitoring and managing small “stepping-stone” sites across Yorkshire and bring them into a network through the project.
- To identify potential technology champions
- To understand their needs and aspirations and the questions that they need to answer in order to manage their sites.
- To showcase technologies and to begin a dialogue on how they could both be employed on a single site and used collectively and collaboratively across sites.

Roadshows so far

Roadshow Activities

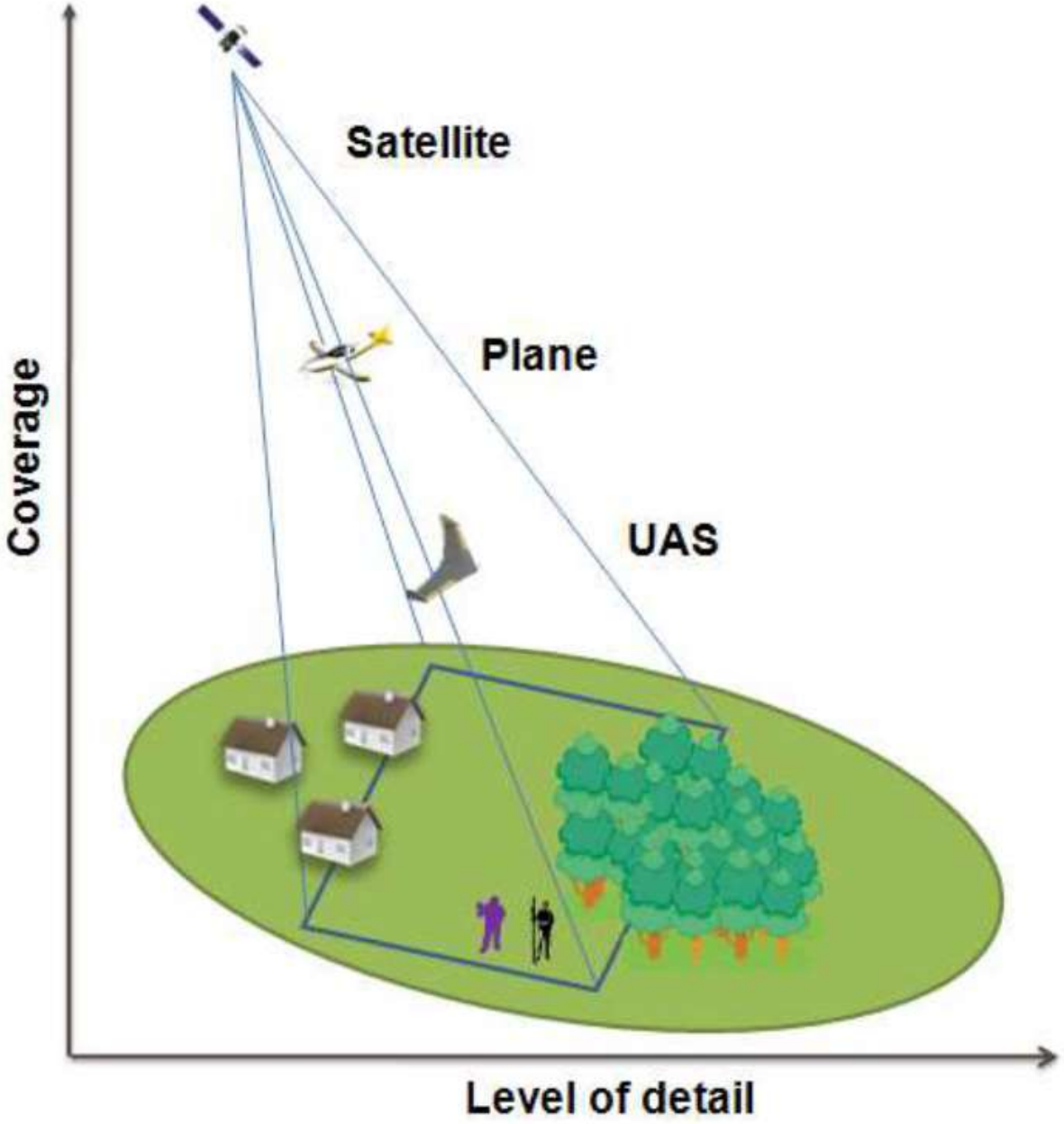
The Draw of the Drone

- High profile in the news with a hint of notoriety.
- The potential benefits are very obvious to many of the NatureHackers.
- There are quite clear links between remote sensing imagery, GIS & computer modelling.

Desmond

Pork Pie

Remote sensing

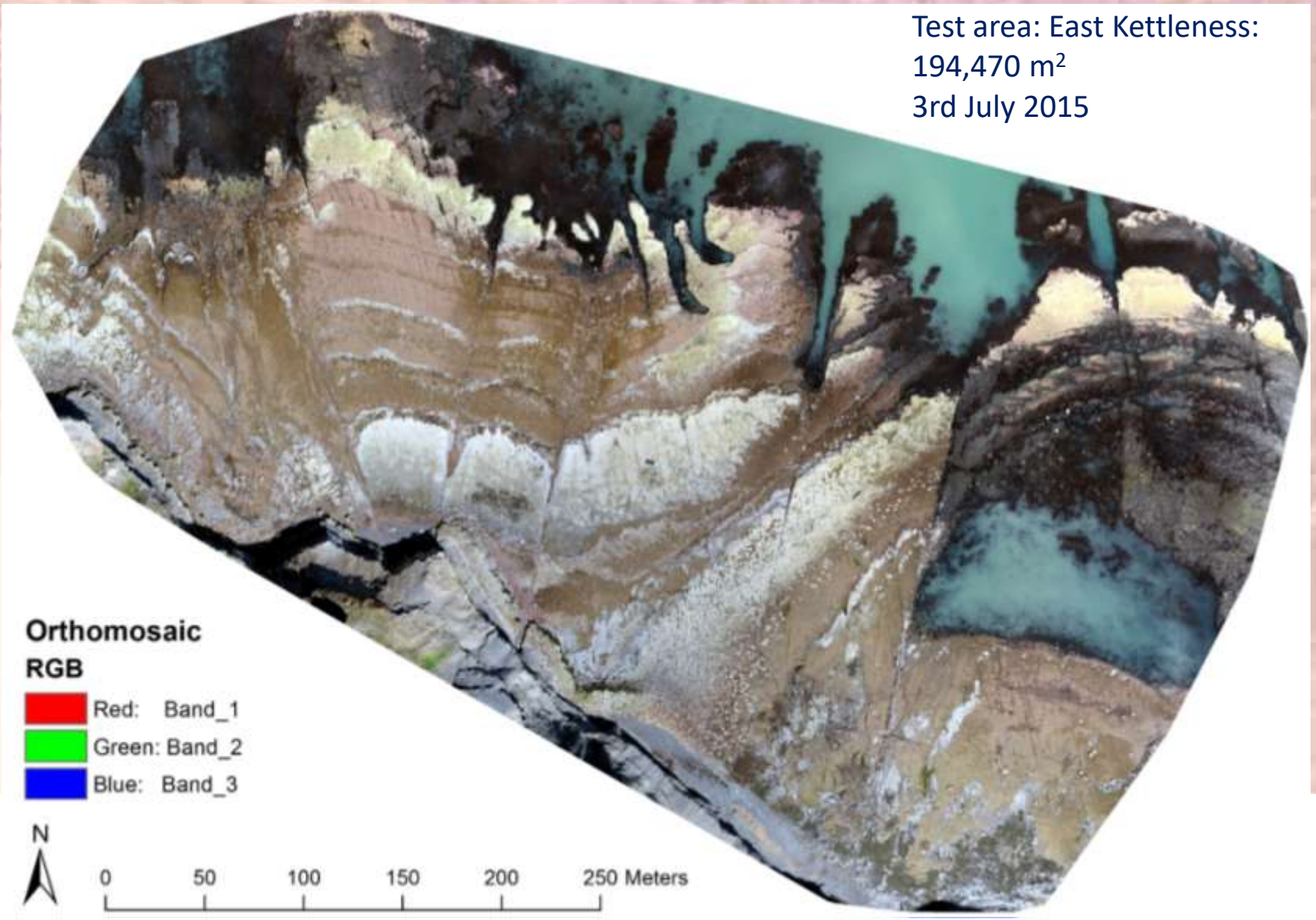


Integrated use of Earth observation systems and in-situ survey provides benefits from flexible **coverage** and **levels of detail**

JNCC

Environment SYSTEMS

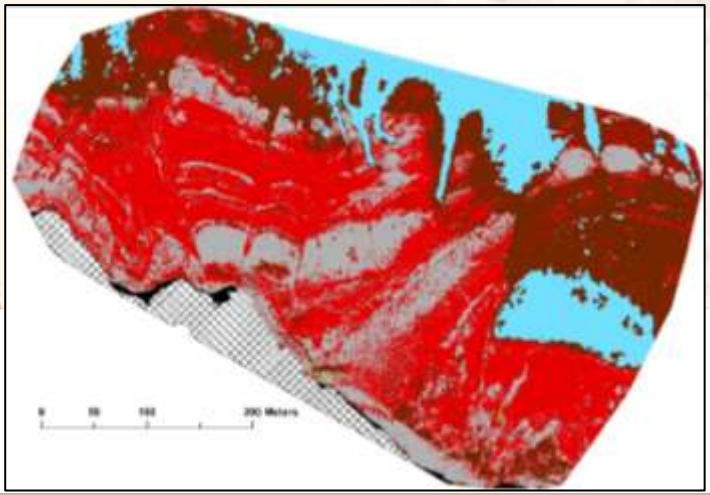
UAV Data Processing

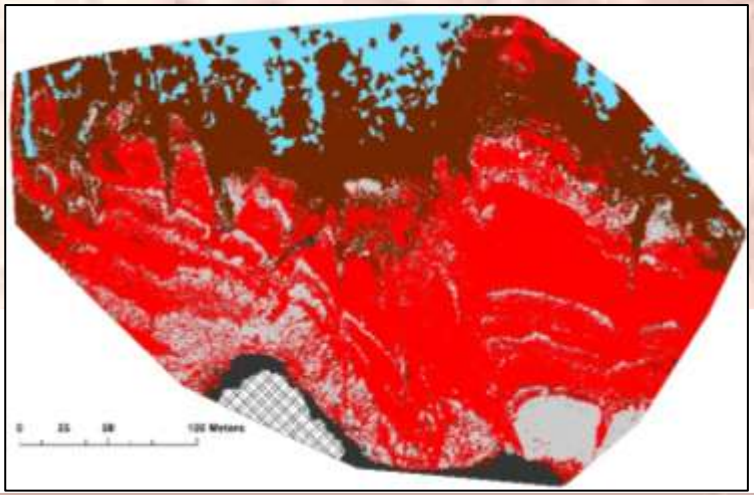


Results – broadscale maps

		Overall Accuracy	Kappa	Balanced Error Rate
Dataset 1 (July 2015)	Standard Nearest Neighbour (training samples a)	80%	0.67	14%
	Standard Nearest Neighbour (training samples b)	85%	0.76	44%
	Random Forest (training samples a)	95%	0.91	27%
	Random Forest (training samples b)	90%	0.83	10%
	Knowledge-based	84%	0.73	38%
Dataset 2 (Sep. 2015)	SNN (training samples a)	77%	0.62	19%
	SNN (training samples b)	87%	0.77	27%
	Random Forest (training samples a)	68%	0.46	48%
	Random Forest (training samples b)	88%	0.80	32%
	Knowledge-based	80%	0.67	28%

Example – broadscale habitat maps produced using the knowledge-based OBIA workflow:





Spin outs so far

- Digitisation of bird surveys (QGIS & UAV Data).
- Digitisation of invasive species data (GIS Data)
- Monitoring of the extent of aquatic plants (UAV and GIS)
- Evidence of reedbed harvesting for RPA (UAV and GIS)

NatureHack Phase 2 Highlights?

- Launch at the joint YNU / NatureHack conference in April https://www.ynu.org.uk/Conference2019
- More roadshows & QGIS
- Drone training and a crowd sourced drone survey.
- Acoustic monitoring Hack-a-Thon and The Big Listen.
- Knowledge transfer workshops

How can you help?

- If you would like to take part in NatureHack, sign up to our newsletter and get in touch.
- Even more importantly, if you would like to be involved in a conversation on how we build a sustainable knowledge and technology transfer cascade in the future, please get in touch.

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