Environment SYSTEMS
evidence and insight

Coastal habitat mapping - Regional Coastal Management Programme;

the use of aerial photography interpretation to define habitat types

Liverpool City Region's Coastal Designated Sites Evidence Strategy Workshop
13 - 14 September 2016

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Environment Agency

Sefton Council

Background

- National network of regional coastal monitoring programmes of England
- Report on extent & condition of habitats present
  - Losses and gains
- Identify and quantify regional coastal change
- Assist development of Biodiversity Action Plans
- Support Appropriate Assessments for Shoreline Management Plans and Flood and Coastal Defence Schemes
- Data requirements of shoreline management & monitoring

The project

- Sefton Council, CCO, Environment Systems Ltd, Nature Bureau
- Solway Firth to River Dee
  - incl. all major estuaries
- Establish a baseline habitat dataset
- Area of ~122090 ha
- Integrated Habitat Management System (IHS) & Phase 1

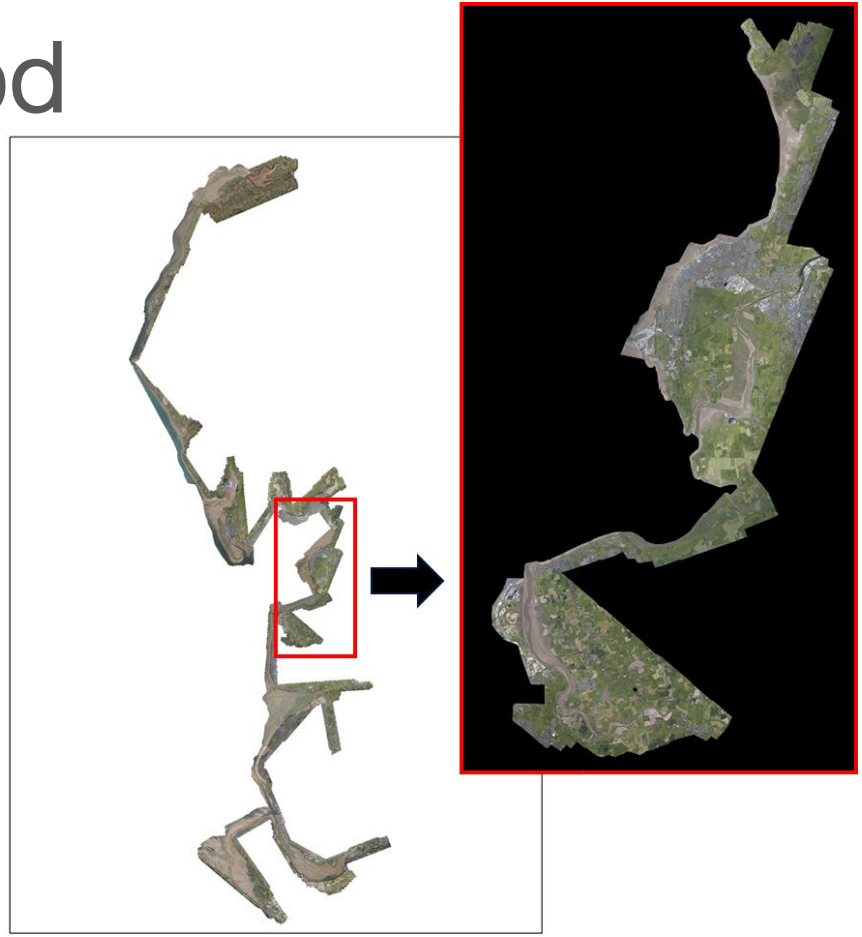
Base data & method

Data

- Aerial photography (RGB and NIR)
  - 0.1-0.2m resolution
- Lidar (height data)
  - Landward side: 2m resolution
  - Seaward side: 1m resolution
- Low-tide, summer image capture

Method

1. Create urban mask
2. Process & analyse imagery
3. Aerial Photograph Interpretation (API)
4. Validation – ground survey



Urban mapping

- Final map needed to be open access
- Unable to use OS MasterMap
- Fused OS Vectormap, OSM & hand digitised polygons to mask out urban areas

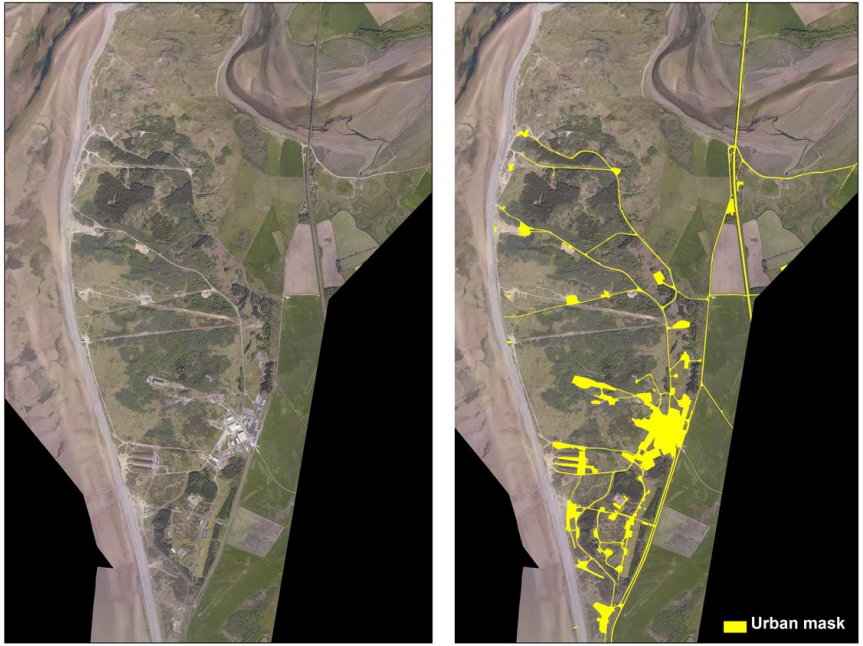


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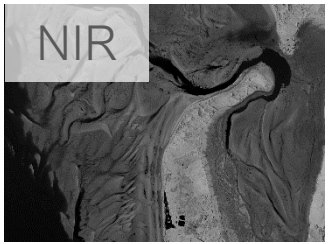
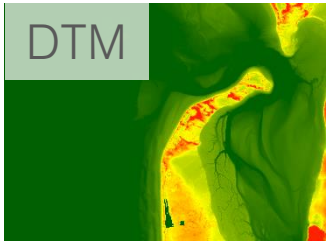
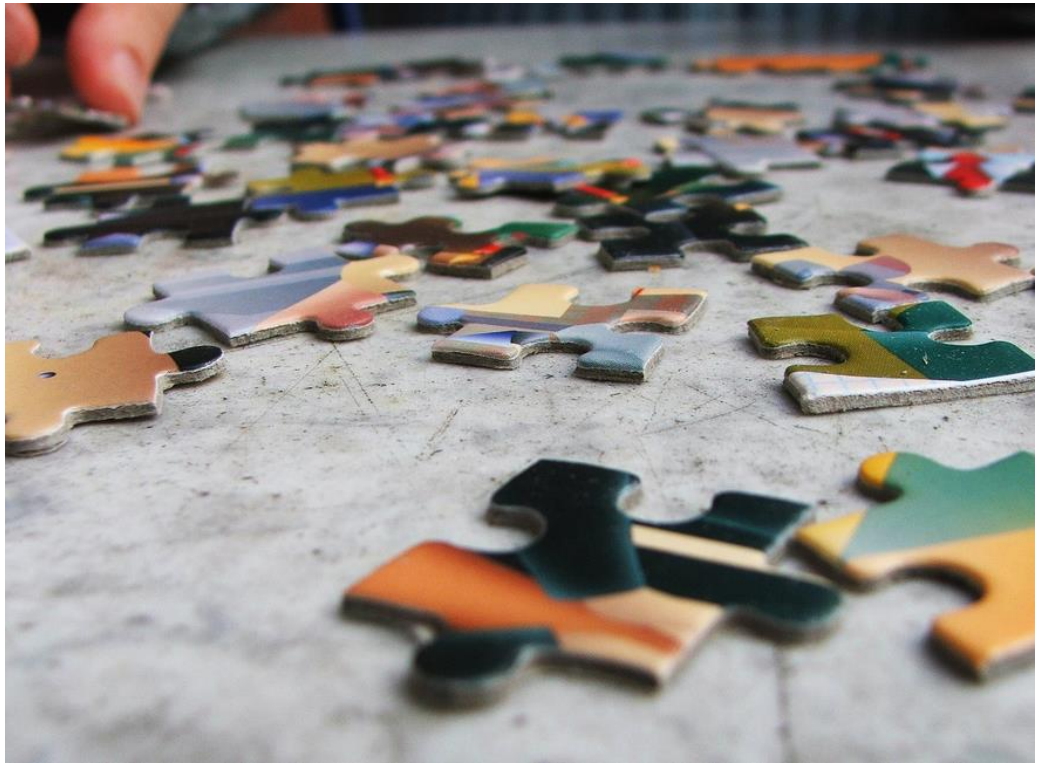
Image segmentation







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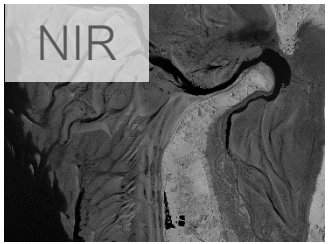

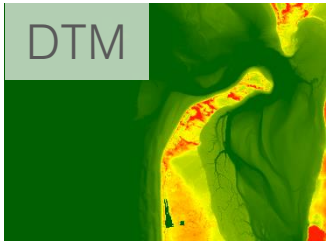

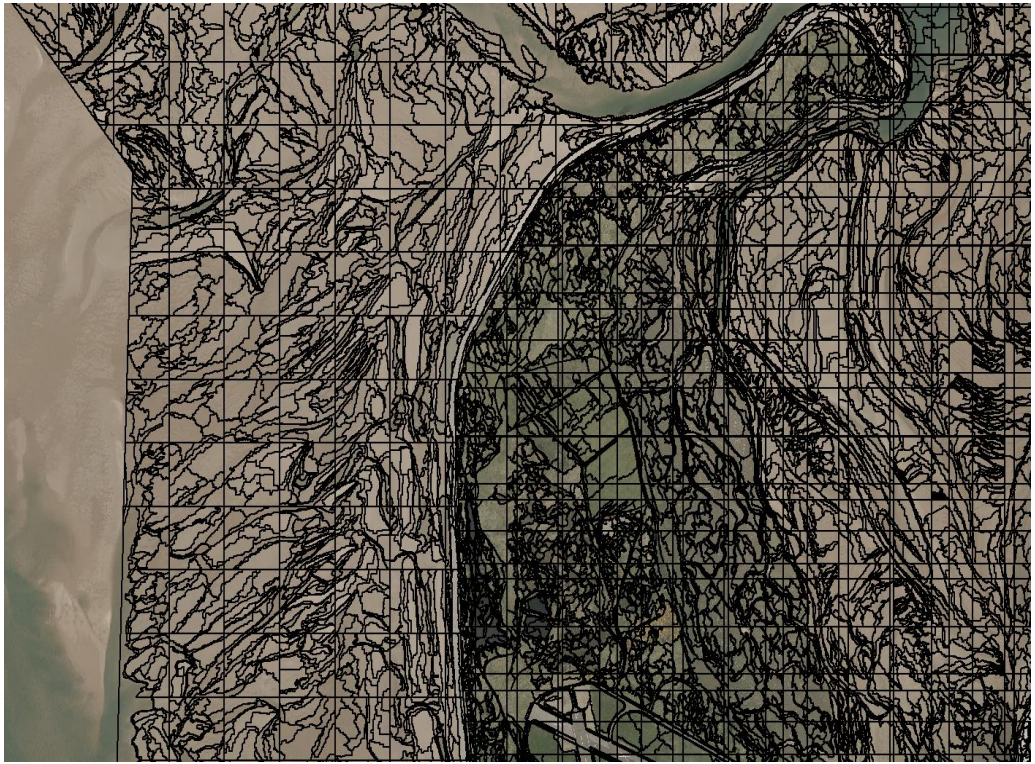

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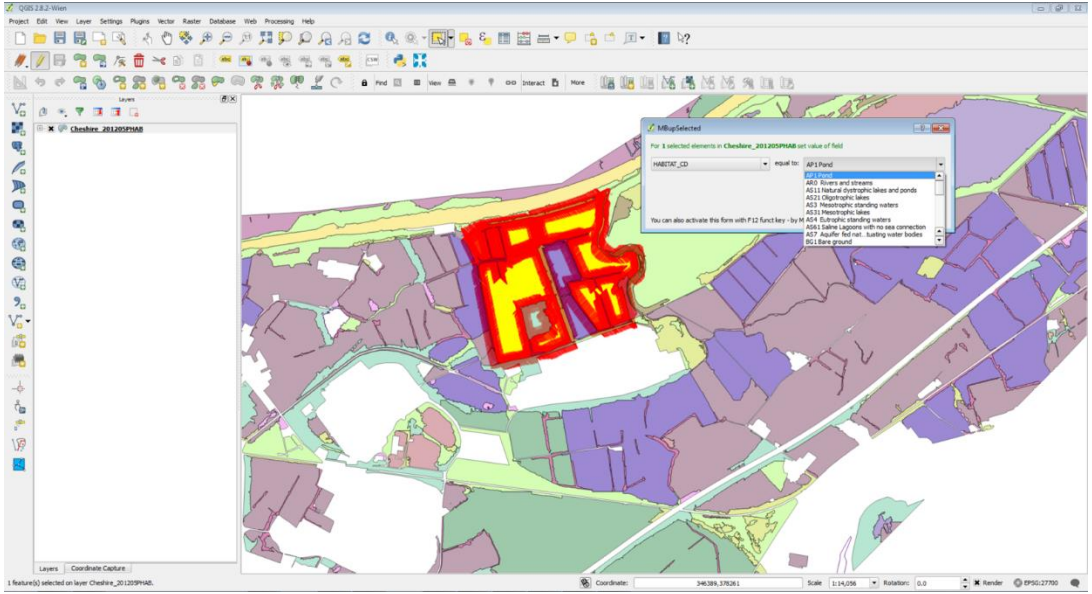
Aerial photographic interpretation (API)

- Team of ecologists working on QGIS
- Select habitats from a dropdown list
- Manual quality checking procedure
- Stakeholder reviews



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Ground surveys

- Each project region surveyed
- Random surveys
  - Investigating range of habitat types found across the project area.
- Targeted surveys
  - Focussed on specific habitat types

Minimum mapping units (MMU)

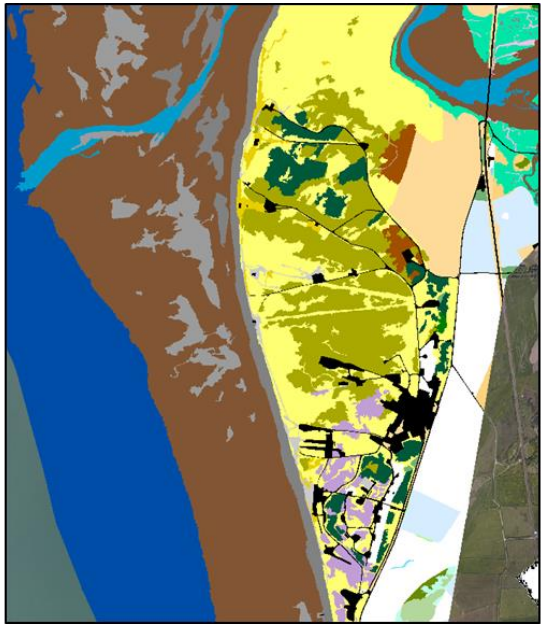
- Important to choose the right MMU
- Habitat specific
  - Terrestrial = 500m^2
  - Coastal = 10m^2
- Appropriate to the method

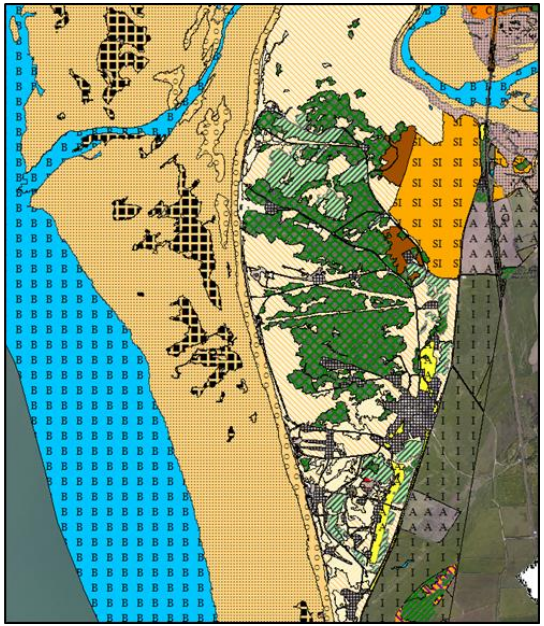
IHS code & description	MMU (m^2)
AP1 Pond	10
AR0 Rivers and Streams	10
AS61 Saline lagoons with no sea connection	10
EM11 Reedbeds	10
EM31 Fens [lowland]	500
LR4 Intertidal underboulder communities	10
GA1 Lowland dry acid grassland	500
WB34 Wet woodland	500

Example outputs channelcoast.org

IHS

Phase-1





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Challenges

- Image quality

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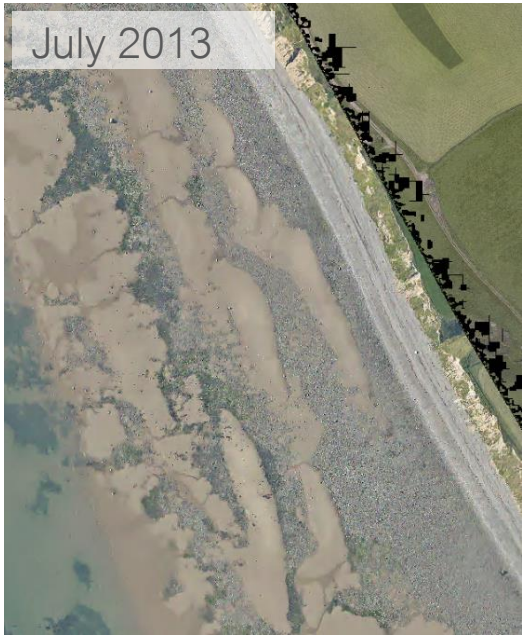
- Real world change

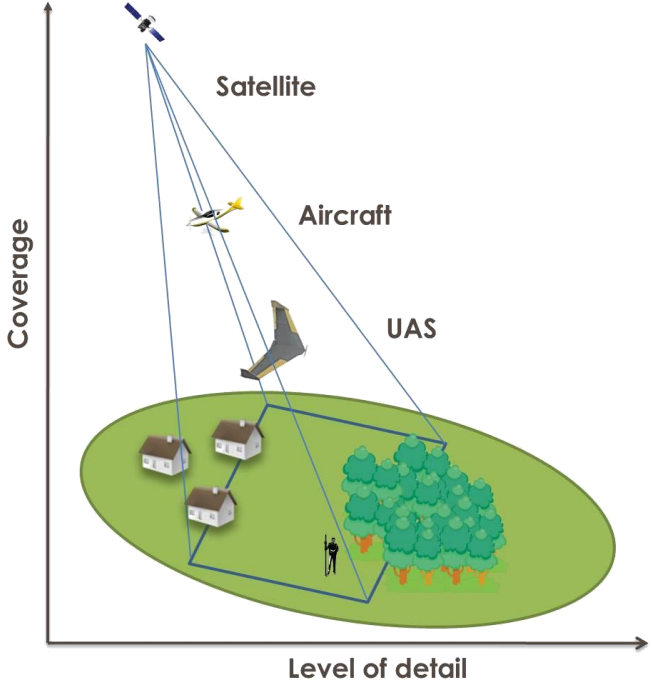


Challenges

- Image quality
- Real world change
- Bird’s-eye view vs ground-level surveys

Value of an Earth observation approach

- Question of scale…
- Impassable terrain
- Time taken & cost benefits
- Time-series analysis



Key factors for success

- Data management
- Internal quality controls
- OpenStreetMap
- Use of local ecological knowledge
- Use of EO as part of toolbox

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Thank you

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