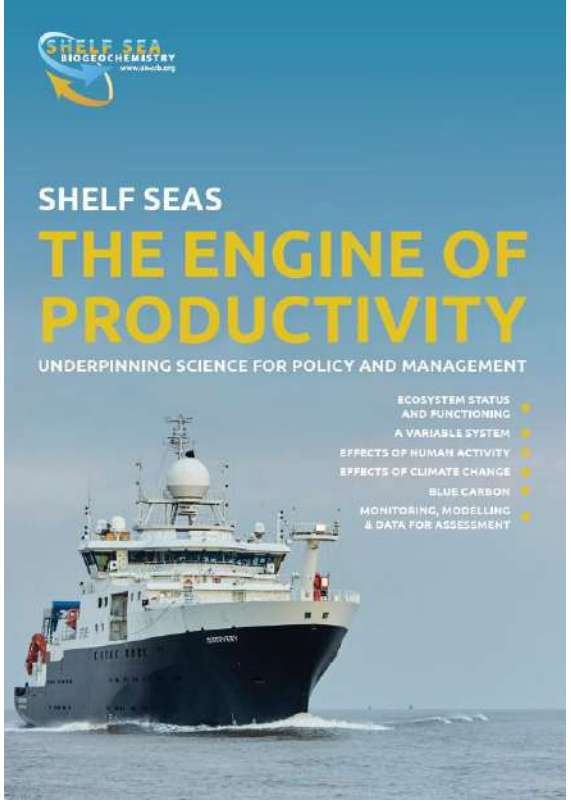
Blue carbon: *looking a gift horse in the mouth*

Phil Williamson University of East Anglia & Natural Environment Research Council

- Rates of carbon sequestration in coastal habitats seem impressive – but many uncertainties
- Removal must be reliably quantified and secure, otherwise
- (for climate accounting) it doesn't count
- Co-benefits provide main rationale for habitat conservation and restoration?

Coastal Futures 2019: 13.55 on 23 January

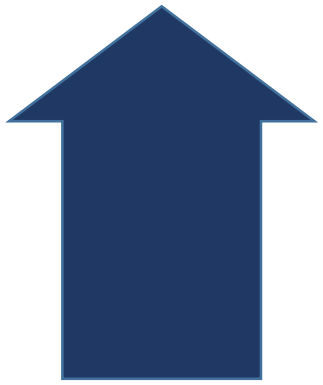
Photo: Julian Andrews

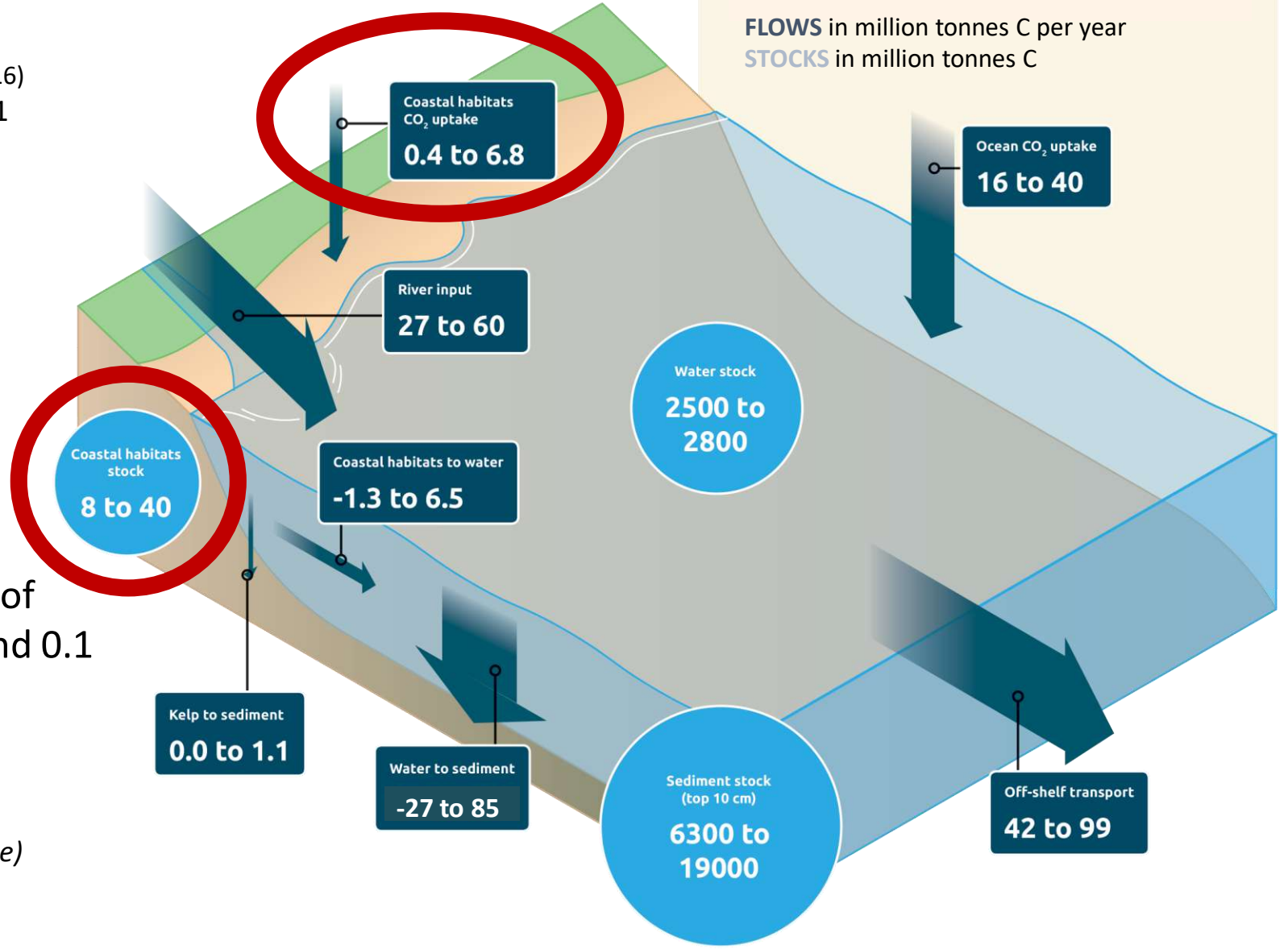


Carbon budget for the NW European Shelf

Context: UK emissions (2016)

~125 Mt C yr^{-1}



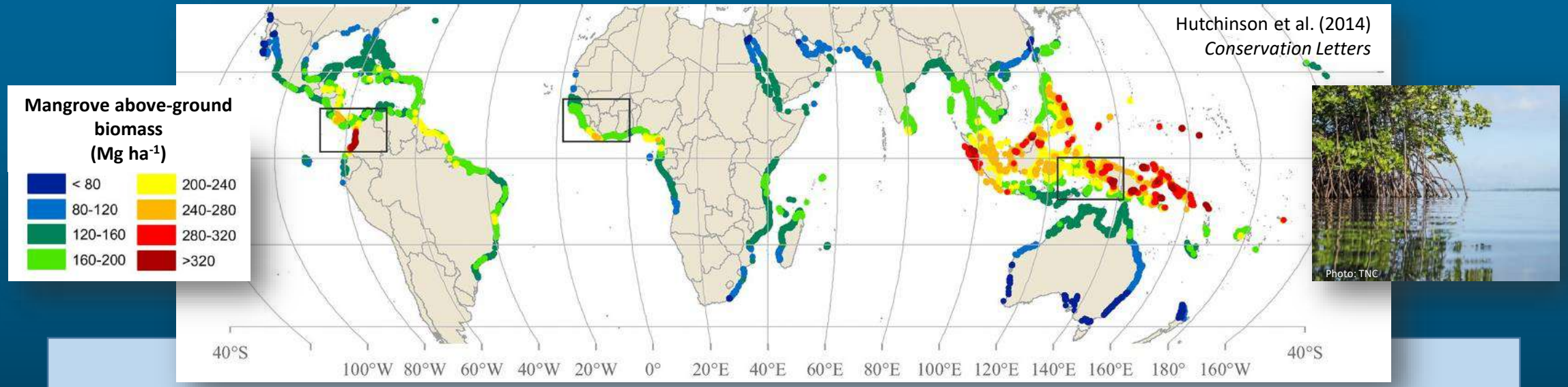


Coastal habitats account for only 2-15% of shelf sea C uptake from the atmosphere and 0.1 - 0.2% of the stock. But they are relatively intensive carbon stores, and potentially amenable to management.

Martin Johnson et al (Shelf Sea Biogeochemistry programme)

Coastal blue carbon likely to have greater climate role in tropical regions

Blue carbon commitments now included in climate policies (UNFCCC Paris Agreement) of 27 countries



Strategic programme proposal submitted to NERC:

"Determining the climatic benefits (and risks) of blue carbon, linking science to policy needs"

Proposers at UEA, Univ of St Andrews, Bangor University, UCL, NOC/Univ of Southampton, Univ of Portsmouth, Cefas, BGS, PML and SAMS

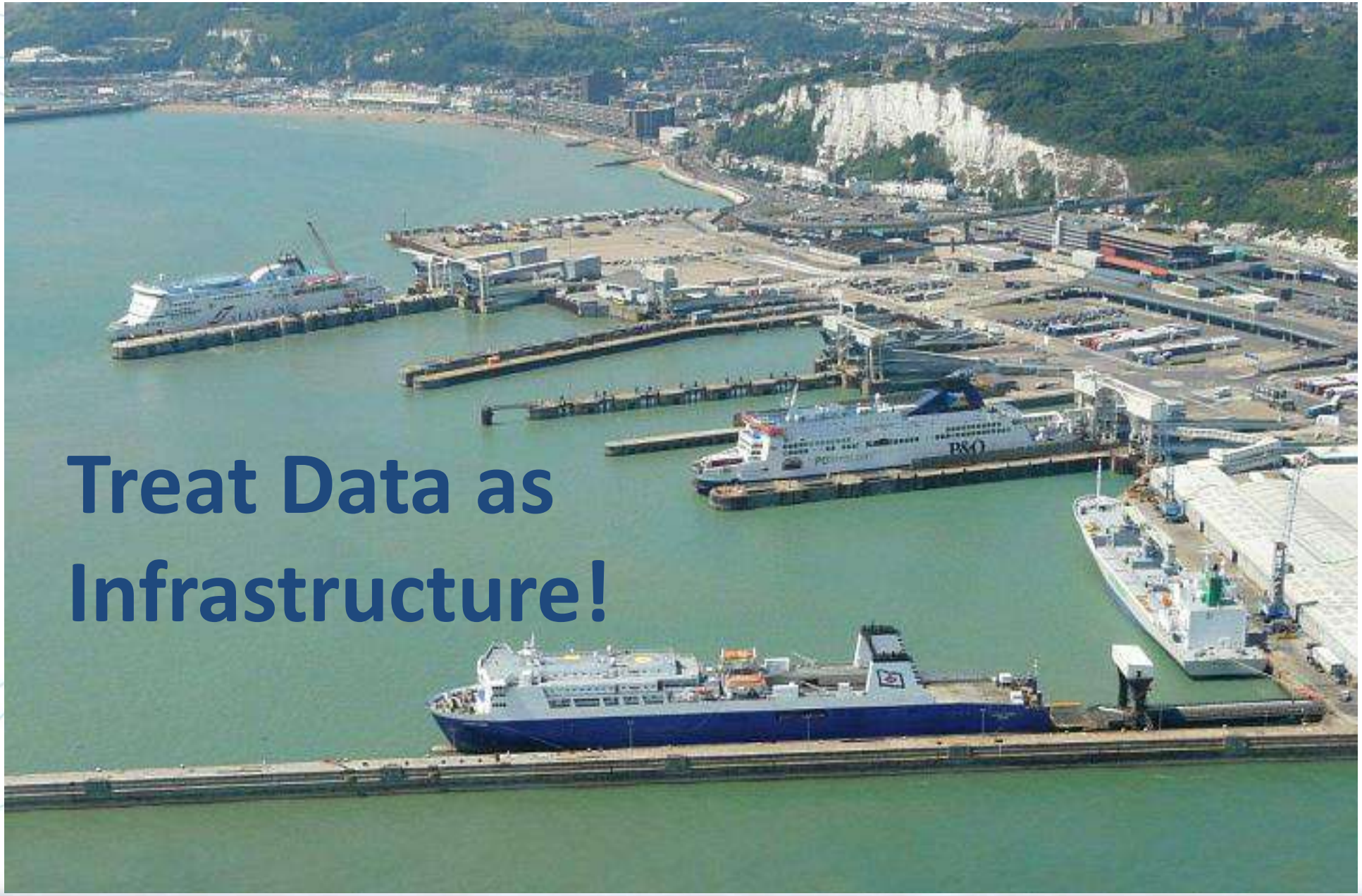
Potential partners include Defra, BEIS, Marine Scotland, JNCC, SNH, IUCN, The Nature Conservancy, Conservation International, UNEP WCMP, IOC of UNESCO and International Partnership for Blue Carbon

Further info: ***p.williamson@uea.ac.uk***

Why **Your** Data Matters!

- **Data is the most valuable asset in an organisation after its people**
- **Data is critical to the running of business functions and processes**
- **Without constant vigilance and effort to maintain order, data entropy exists**

Source: sciphilos.info


Treat Data as
Infrastructure!

We specialise in all aspects of marine environmental data acquisition and management

www.oceanwise.eu
john.pepper@oceanwise.eu

Measure once, use many times

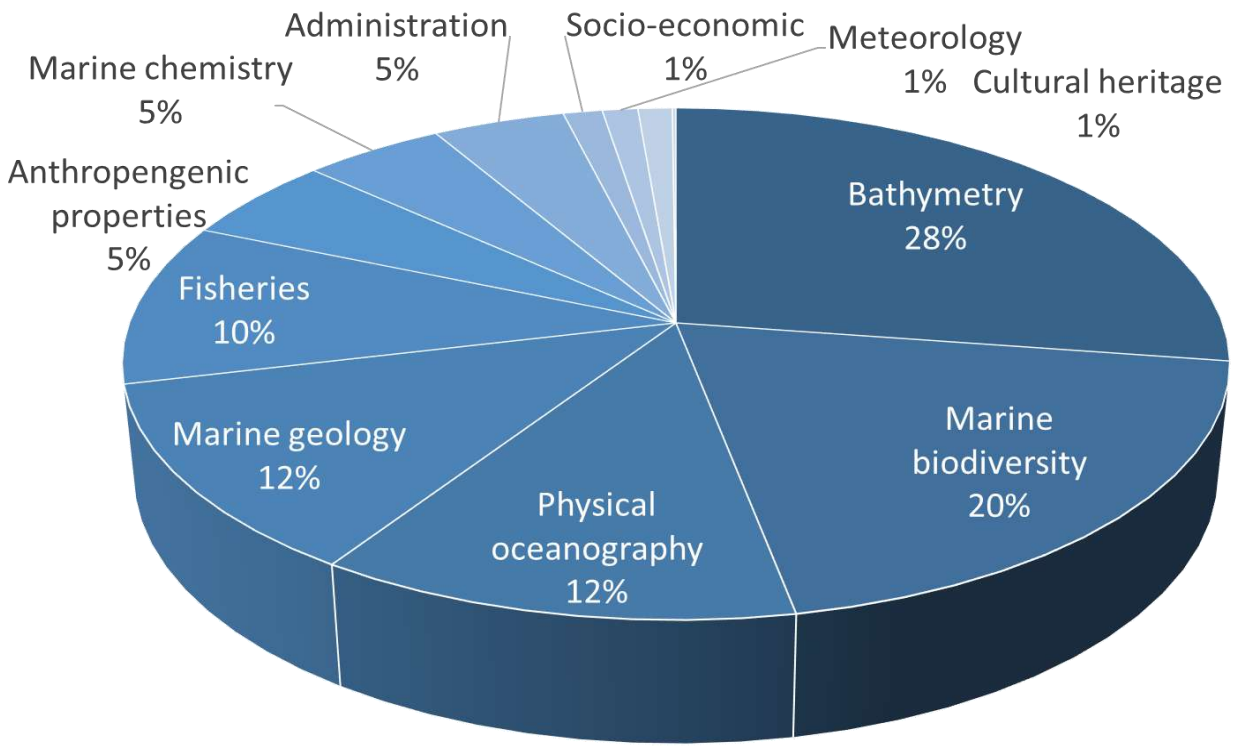
MEDIN
marine environmental data & information network

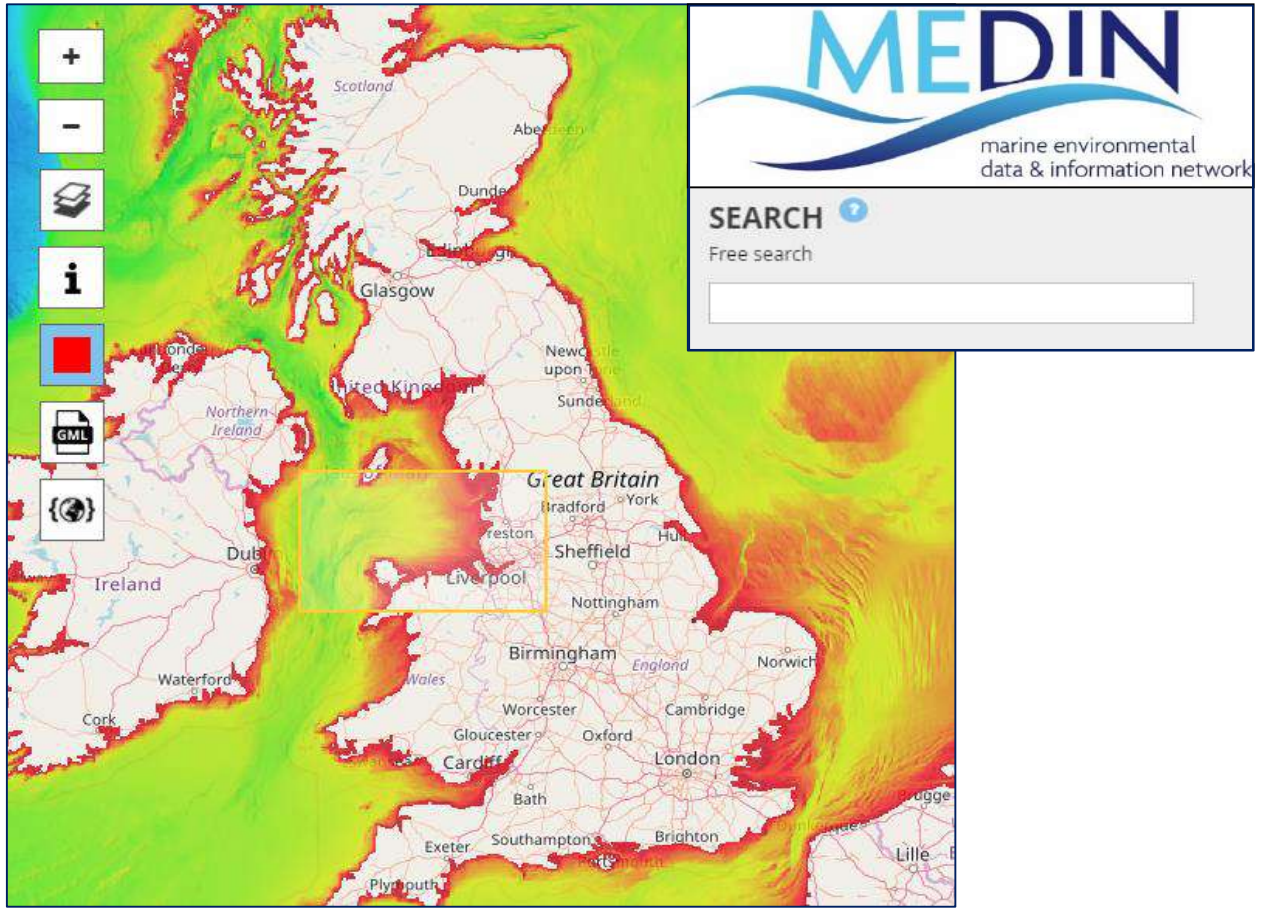
Working together to improve access to marine data

Charlotte Miskin-Hymas

The UK Hub for marine data

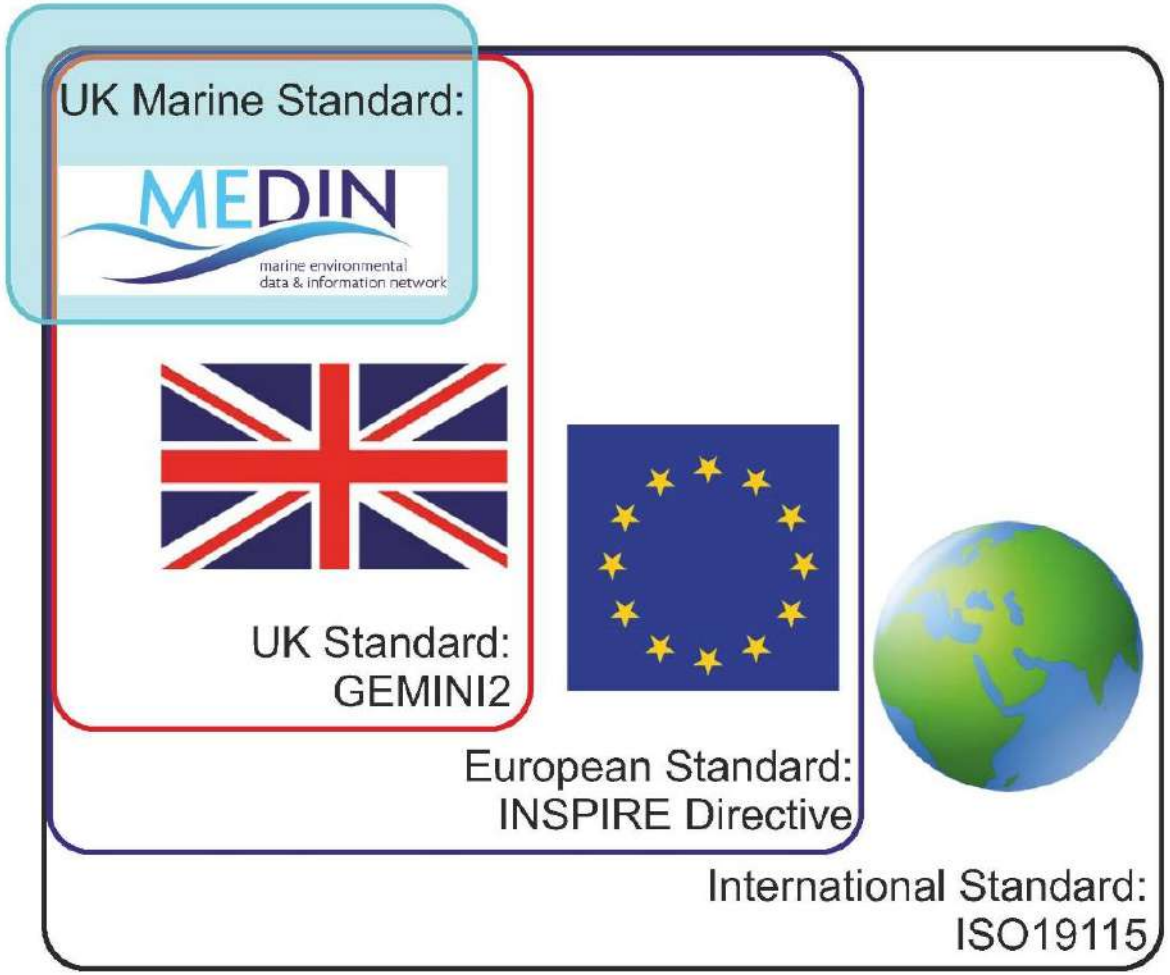
- Over 14,000 datasets available from over 400 different UK organisations





www.oceannet.org/finding_data/search/full

MEDIN Discovery Metadata Standard and MEDIN Guidelines



- Making data FAIR

Accredited Data Archive Centres

MEDIN
marine environmental data & information network

United Kingdom Hydrographic Office

BODC British Oceanographic Data Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL

Met Office

BGS 1835 British Geological Survey
Expert | Impartial | Innovative

HISTORIC ENVIRONMENT SCOTLAND

CBHC RCAHMW

ads ARCHAEOLOGY DATA SERVICE

DASSH The Archive for Marine Species and Habitats Data

DASSH

Cefas

marinescotland

Contact Us:
enquiries@medin.org.uk
www.medin.org.uk

POSEIDON

A Probabilistic Offshore Scour Evolution Model

What?
A model that can estimate scour erosion at offshore windfarm structures

How?
By calculating the sediment movement around the structure accounting for:

- Metocean conditions
- Seabed conditions
- Structural complexity
- Design life

Why?
So the loss of sediment can be accounted for in foundation design or scour protection design

So What?
Accurately predicting scour depths can help:

- Reduce the need for over engineering
- Save Developers money
- Reduce environmental footprint of the windfarm

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ATKINS
Member of the SNC-Lavalin Group

Amy Parry
Senior Marine Environmental Scientist
Amy.Parry@atkinsglobal.com

POSEIDON – Project Experience

- OSP
- WTGs
- 3 and 4 Legged Jacket
- Monopiles
- Scour Protection Design

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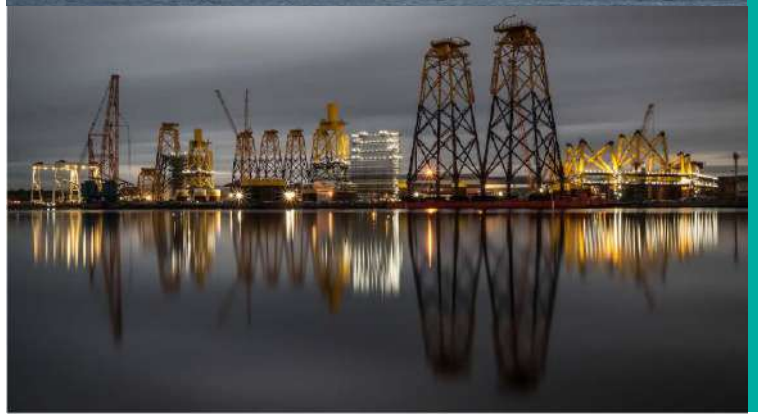

POSEIDON

A Probabilistic Offshore Scour Evolution Model

- As turbines and foundations get bigger and sites larger general rule of thumb assumptions of scour depths are unviable for Developers

- More accurate prediction of scour depth can:
  - Reduce the need for over engineering
  - Save Developers money
  - Reduce the environmental footprint of a windfarm
  - Through the use of POSEIDON we reduced scour protection requirement by 96% on a recent project

- Undertaking the assessments earlier in the process could:
  - Benefit programme and cost planning
  - Help reduce the worst case scenario assessed during EIA, E.g.
    - Reduced installation times and methods e.g. piling time
    - Reduced habitat loss
    - Reduced habitat disturbance
    - Reduced risk of INNS

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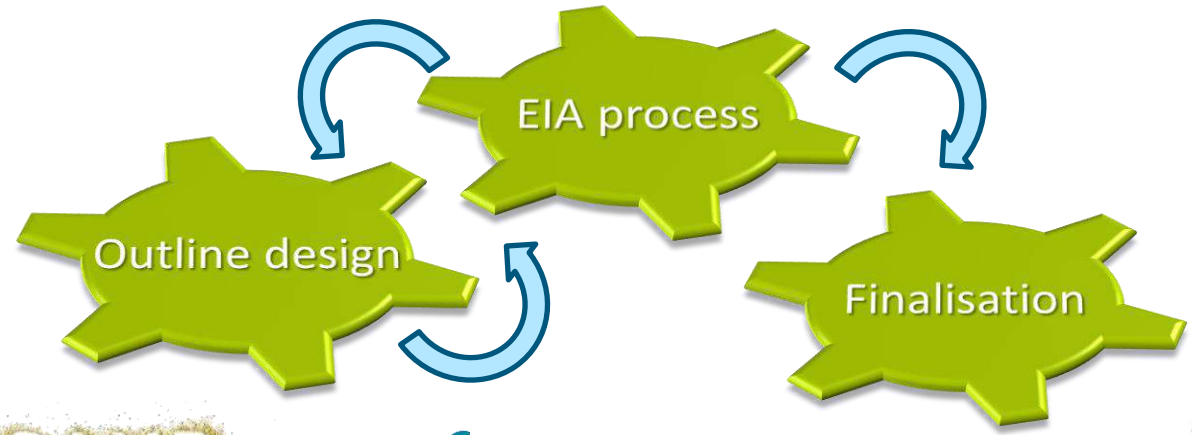
Building with Nature: Bacton Sandscaping Scheme

The scheme

Direct placement of up to 1.8 million m^3 of sand along the North Norfolk coastline

Joint approach to coastal management between the Bacton Terminal Operators and North Norfolk District Council for the protection of Bacton Gas Terminals and increased protection, with a longer design life, at the villages of Bacton and Walcott

Royal HaskoningDHV approach



SAND SCAPING
Catalyst for coastal communities

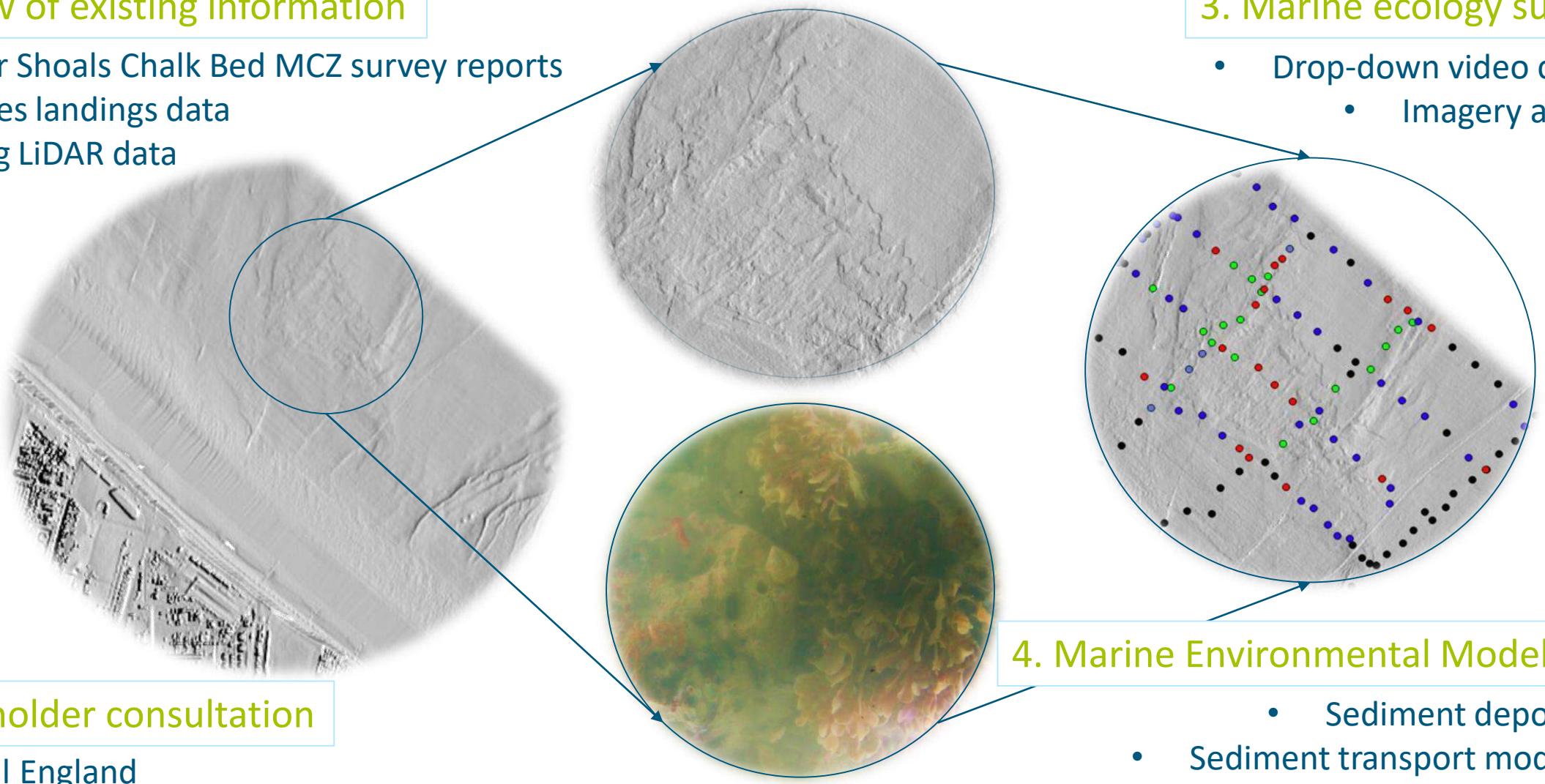
Royal HaskoningDHV
Enhancing Society Together

PERENCO

NORTH NORFOLK DISTRICT COUNCIL

1. Review of existing information

- Cromer Shoals Chalk Bed MCZ survey reports
- Fisheries landings data
- Existing LiDAR data



3. Marine ecology survey

- Drop-down video camera
- Imagery analysis

2. Stakeholder consultation

- Natural England
- North Norfolk Fishermen's Society
- Eastern Inshore Fisheries Conservation Authority

4. Marine Environmental Modelling

- Sediment deposition
- Sediment transport modelling
- Suspended sediment concentration

SAND SCAPING
Catalyst for coastal communities

Royal HaskoningDHV
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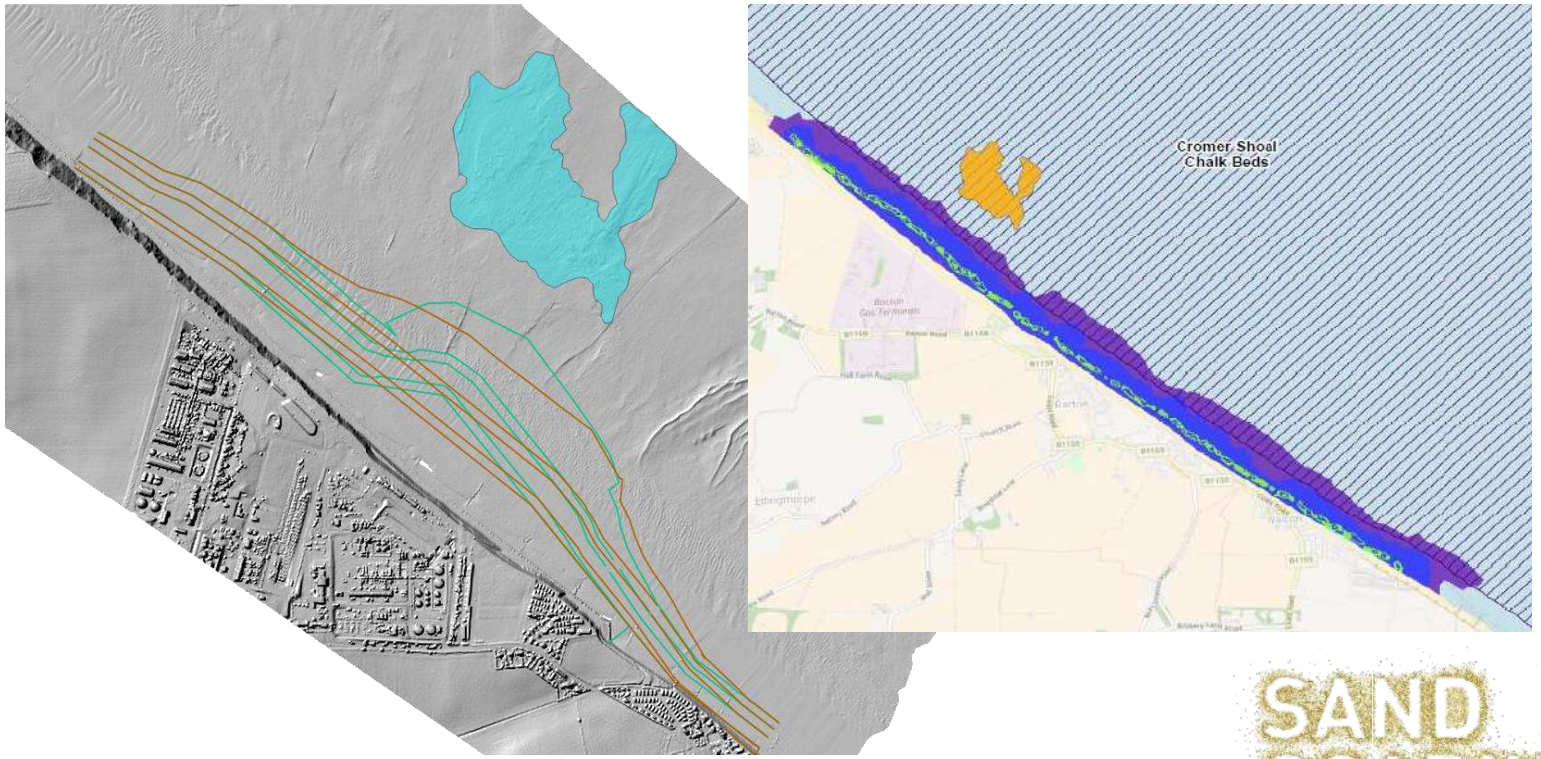
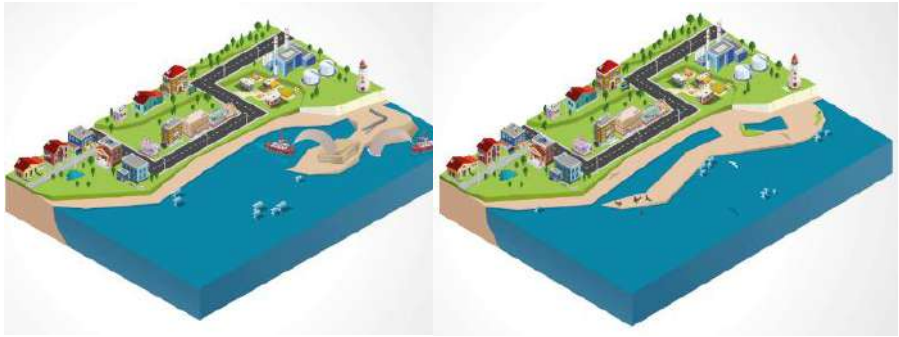
NORTH NORFOLK DISTRICT COUNCIL

Review of potential impacts

- Change in habitats within placement area
- Deposition from sediment plume
- Impact of hydrodynamic changes on sediment movement
- Increase in suspended sediment concentration





Design Considerations

- Long, narrow Sand Engine shape
- Limited fines content
- Predicted maximum SSC along the shoreward edge of the MCZ is <1mg/l
- Extensive contractor involvement

Residual Impacts

- Moderate and minor impacts reduced to minor and negligible with mitigation measures applied
- Major residual benefit to community
- Ongoing commitment to monitoring

SAND SCAPING
Catalyst for coastal communities

Royal HaskoningDHV
Enhancing Society Together

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NORTH NORFOLK DISTRICT COUNCIL

Tern it Up

Furthering the conservation of UK's terns

Leigh Lock, Senior Species Recovery Officer, RSPB leigh.lock@rspb.org.uk

Opportunities

34,000 Ha of habitat creation opportunities identified in Sustainable Shores, www.rspb.org.uk/our-work/conservation/projects/sustainable-shores/, providing a range of ecosystem services.

Need to design in specific safe nesting habitat for terns.
Must be above highest tides, suitable substrate, and with no disturbance.

Small areas can have huge impact
Major role for beneficial use schemes

RSPB have mapped the places where this could make the biggest difference and are looking for partnership opportunities to deliver win wins.

Tern it Up

Furthering the conservation of UK's terns

Leigh Lock, Senior Species Recovery Officer, RSPB leigh.lock@rspb.org.uk

Key messages

- Nesting terns and other shore birds under pressure from continued habitat loss and increased public access pressure.
- Without planning for new safe nesting areas we will lose these iconic birds from our coast.
- So we must design these safe nesting areas into our coastal futures.
- Work with the RSPB to deliver the best outcomes in the best places.

#TERNITUP

@Natures_Voice

Tern it Up

Furthering the conservation of UK's terns

Leigh Lock, Senior Species Recovery Officer, RSPB leigh.lock@rspb.org.uk


© Kevin Simmonds

Species under pressure: 5 tern species – Arctic, common, little, roseate and Sandwich.
Including associated species - ringed plover, oystercatcher

Threats:

1. Loss of safe nesting habitat : coastal squeeze, erosion, frequency of high tides.
   16 % of little tern nest lost in one weekend in June 2018.


© Wez Smith

2. Disturbance: few remaining areas under huge pressure for recreation.


© Kevin Simmonds

Without planning safe nesting areas, these iconic birds will be lost from our coasts.

ROUNDTABLE DISCUSSION:
MARINE PLASTICS – AN ACTION PLAN FOR SHIPPING

Institute of Marine Engineering, Science & Technology
IMAREST

Aim: To discuss the role of maritime activities, primarily shipping, in managing marine plastic pollution

Key sectors were represented including:

- Academia
- Certification bodies
- Consultancy
- Governmental agencies
- Shipping

Key roundtable objectives:

- Identify the issues and marine pollution sources
- Discuss current policy
- Propose concrete solutions

KEY OUTCOMES

1) Port reception facilities – Funding, training and installation needed to support & improve implementation

2) Policy – Need to address gaps in policy and align cross agency actions

3) Plastic reduction – Reduce plastic on board ships such as personal water bottles

4) Recycling – Increase the use of bio-plastic and bio-degradable plastics

June 2018 COFI/2018/Inf.31 E

COMMITTEE ON FISHERIES

Thirty-third Session
Rome, 9-13 July 2018
MICROPLASTICS IN FISHERIES AND AQUACULTURE: A SUMMARY[1] OF FAO'S STUDY

Marine plastics – changing the habits of global shipping

Alex Hammond, IMarEST alex.hammond@imarest.org

Institute of Marine Engineering, Science & Technology

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@TheIMarEST

Centre for Environment Fisheries & Aquaculture Science

British High Commission Singapore

e2i

Better Jobs For Life

Employment and Employability Institute

Marine-based plastics such as abandoned fishing gear and single-use plastics contribute to global marine plastic litter

NEXT STEPS – Education comes first!

- **Improve wider understanding of how shipping contributes to marine plastic litter through educational outreach**
- **Actions will be assigned to begin quantitative research, improve implementation of global regulatory frameworks at a local level and establish new initiatives**
- **IMarEST will use its consultative status at IMO to contribute to the development of global regulatory frameworks**
- **IMarEST will publish a full roundtable report**