Recovery of aggregate dredging sites: our developing understanding

Coastal Futures

21st January, 2016

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Cefas

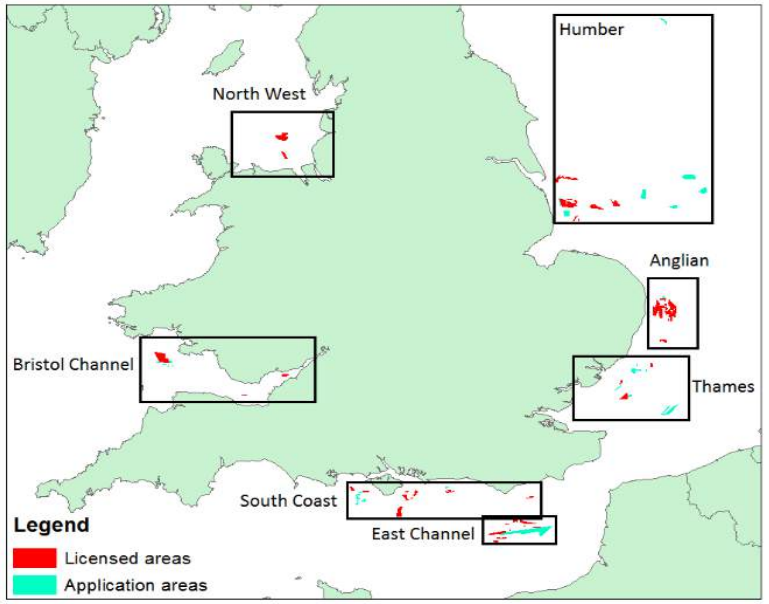
Presentation structure

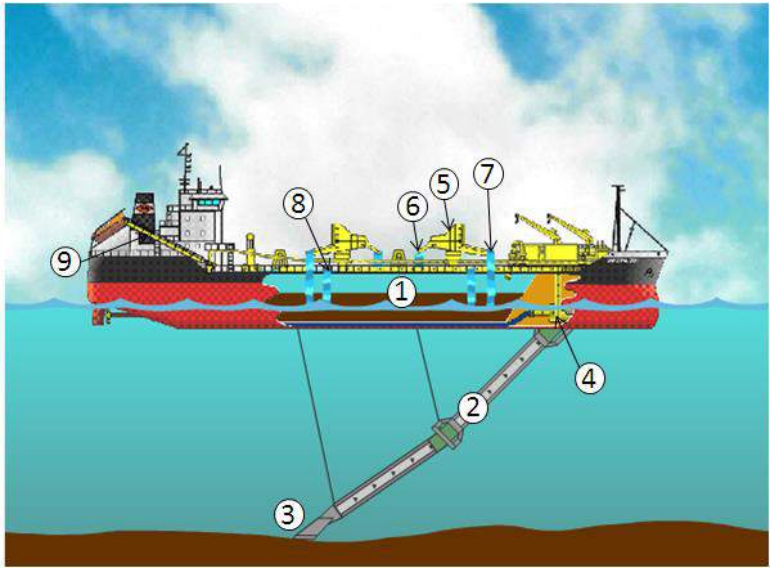
1. The Industry
2. Impacts
3. Recovery
4. Restoration
5. Monitoring

Cefas

1. The Industry

- Produces sand and gravel
- Licensed extraction areas
- Uses: construction, fill and coastal defense
- Purpose built vessels





(Source: www.bmapa.org)

Cefas

2. Impacts

- Direct:

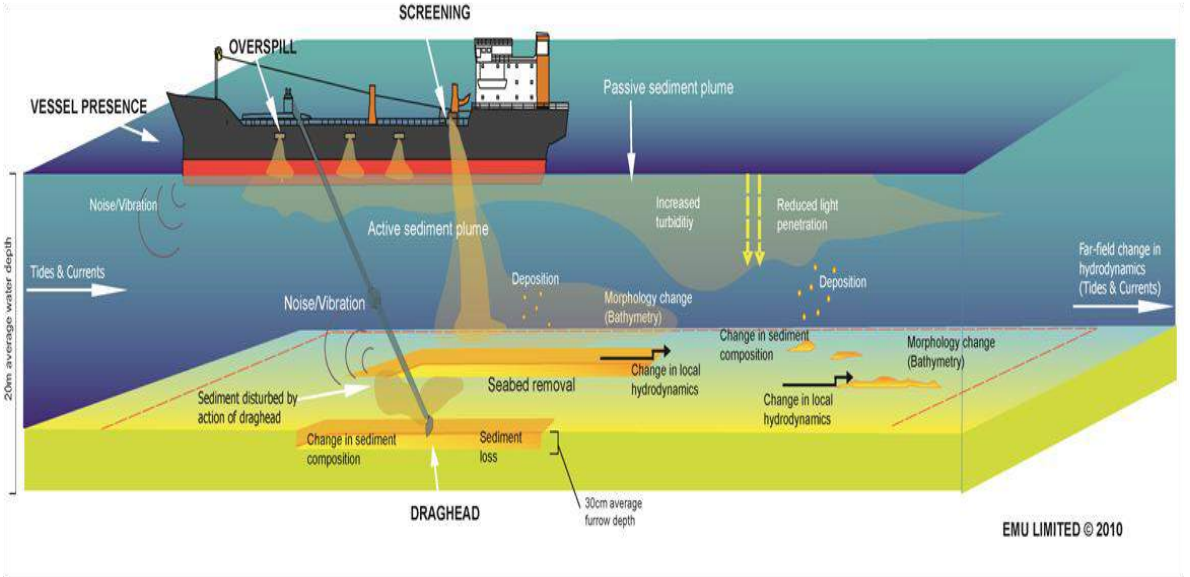
  - Seabed topography
  - Loss of fauna

- Indirect:

  - sediment plumes
  - sediment composition
  - smothering of fauna

- Impacts are variable

- Implications for recovery



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3. Recovery

- Wide variation in reported recovery times
- Lots of variables
  - *dredging*
  - *environmental*
  - *study design*
- Limited no. of studies

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Recovery rates of UK seabed habitats after cessation of aggregate extraction

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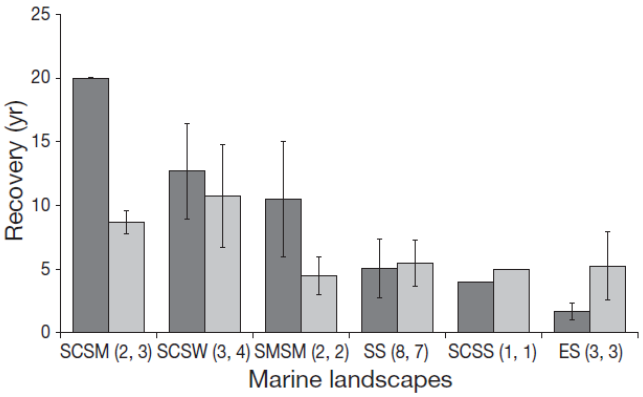
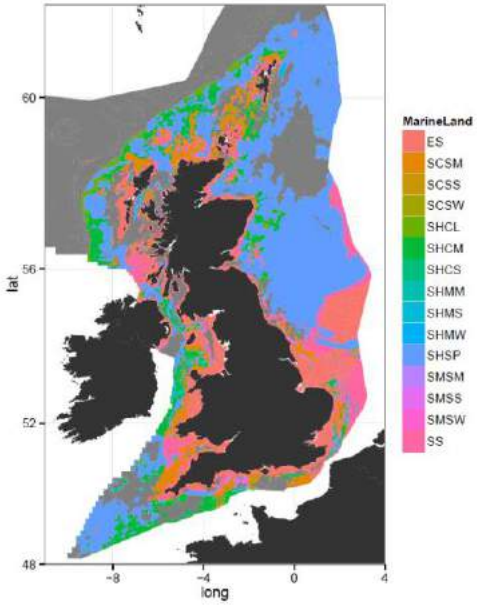
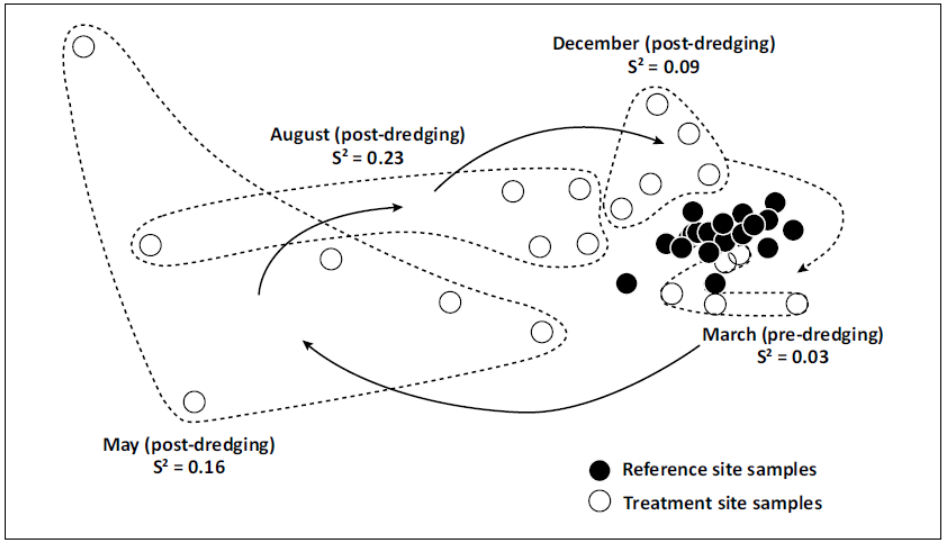




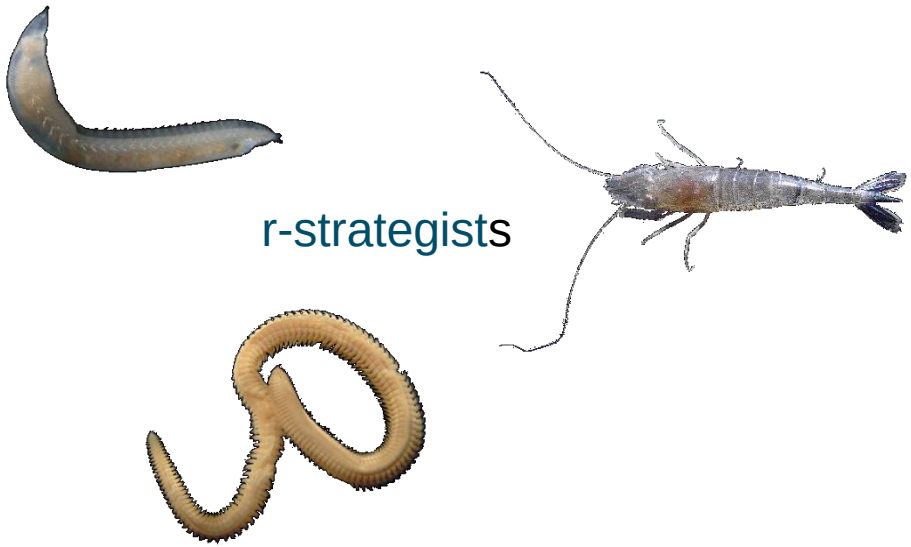
Cefas

3. Recovery (fast)

- Mobile sandy deposits
- Sparse faunal assemblages
- Faunal characteristics:
  - *Small body size*
  - *Fast growing*
  - *Early maturation*
  - *High reproductive rates*
  - *Wide dispersal of offspring*
- Naturally disturbance tolerant



Kenny & Rees (1994)



r-strategists

Cefas

3. Recovery (slow)

- Stable coarse sediments
- 15 year recovery

Contents lists available at ScienceDirect

Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

The effects of marine sand and gravel extraction on the sediment composition and macrofaunal community of a commercial dredging site (15 years post-dredging)

Georgia A. Waye-Barker [a], Paul McIlwaine [b], Sophie Lozach [b], Keith M. Cooper [b,*]

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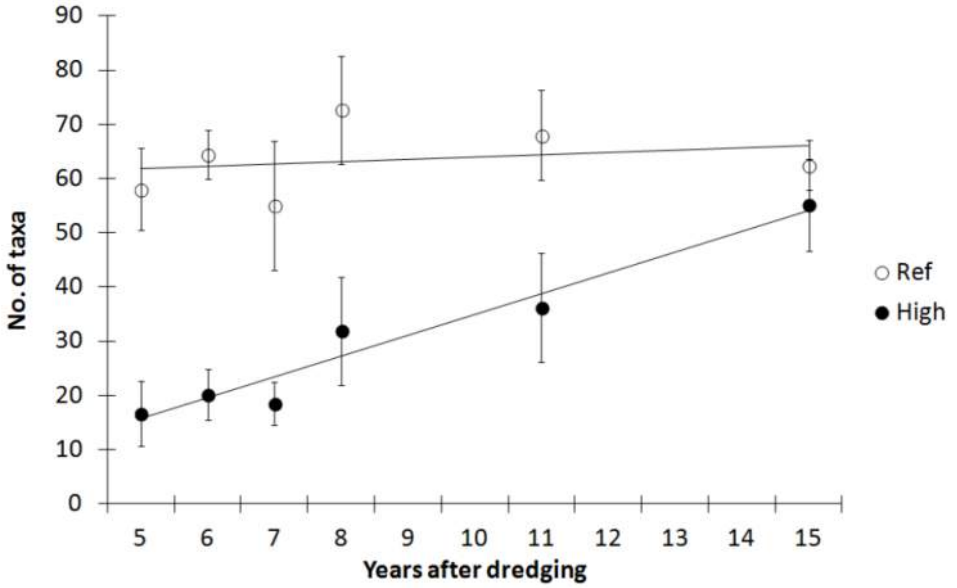

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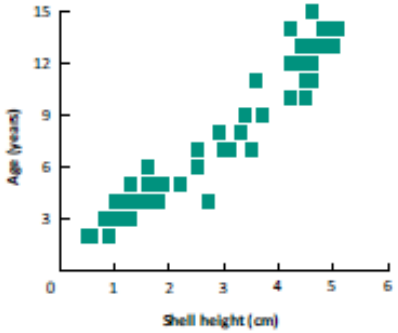
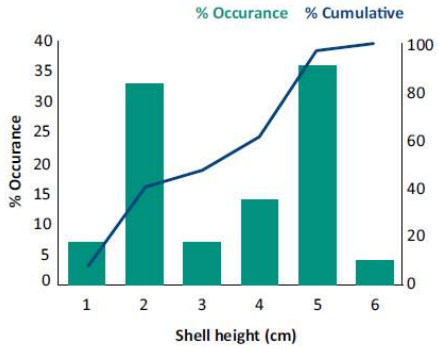
3. Recovery (slow)

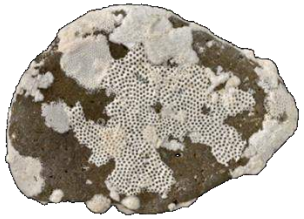
- Richer assemblages

- Faunal characteristics:
  - *Larger*
  - *Slow growing*
  - *Longer lived*
  - *Variable recruitment*
  - *Lower reproductive rates*
  - *Interactions*





Newell et al. (2004)



Brozoans

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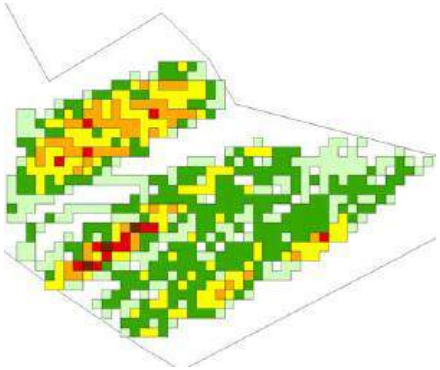
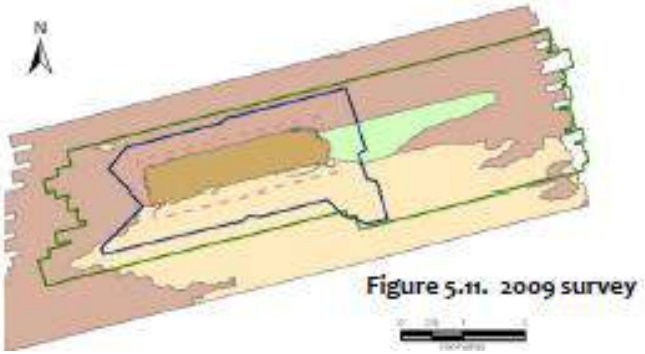
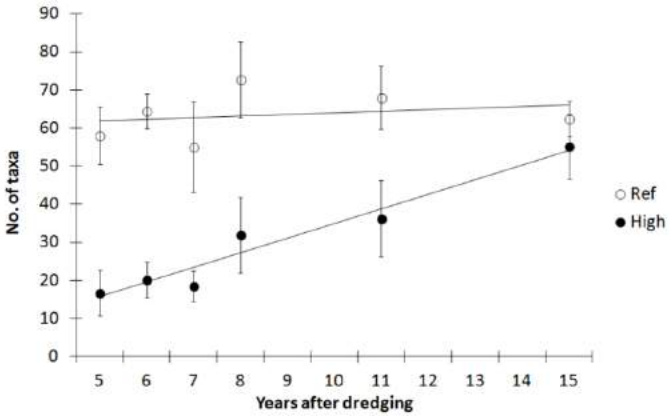
3. Recovery (other factors)

- Dredging intensity
- Length of dredging
- Dredging practices
- Persistence of physical impacts





The East Channel Association. 2011. The First Regional Monitoring Review for the East Channel Region.



Waye-Barker et al. (2015)

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4. Restoration

- Actions to promote recovery
- Passive vs Active
- Trials:
  - *Shell cultch (Collins & Mallinson, 2007)*
  - *Gravel seeding*
- Can be done
- Better termed ‘enhancement’

Contents lists available at ScienceDirect

Estuarine, Coastal and Shelf Science

journal homepage: www.elsevier.com/locate/ecss

Gravel seeding – A suitable technique for restoring the seabed following marine aggregate dredging?

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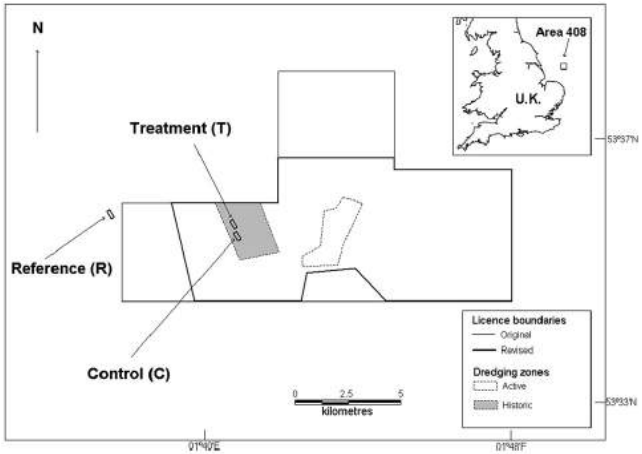


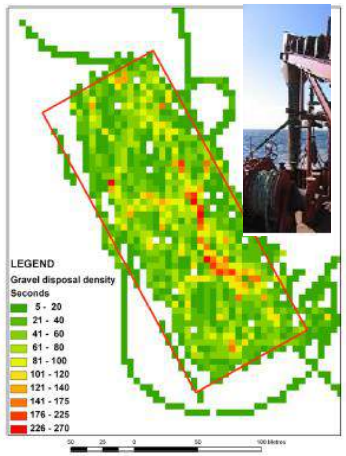
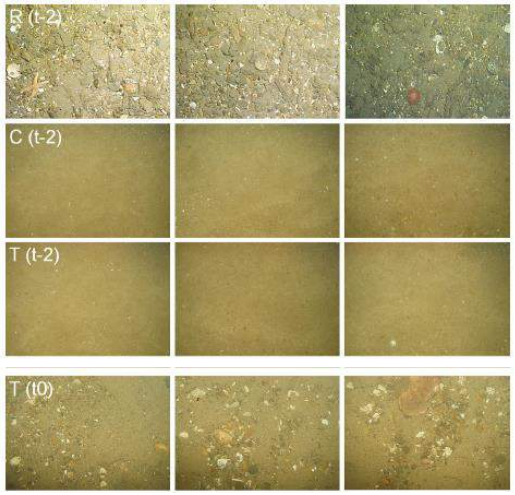
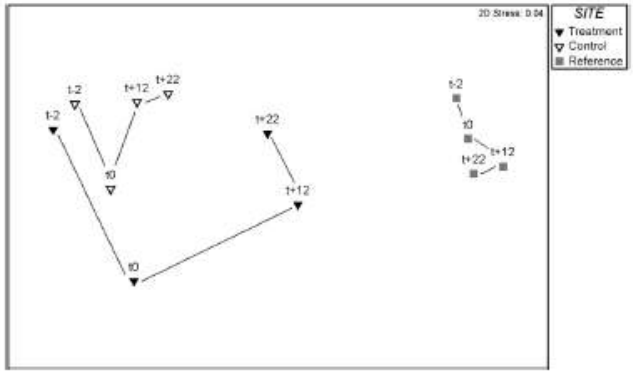


Fig. 3. Plot of vessel track (offset to discharge point) during discharge of material. Colour scale indicates density of coverage.





4. Restoration

- Challenging
- Expensive
- Failure of monitoring / management

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Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Can the benefits of physical seabed restoration justify the costs? An assessment of a disused aggregate extraction site off the Thames Estuary, UK

Keith Cooper [a,*], Daryl Burdon [b], Jonathan P. Atkins [c], Laura Weiss [a], Paul Somerfield [d], Michael Elliott [b], Kerry Turner [e,a], Suzanne Ware [a], Chris Vivian [a]

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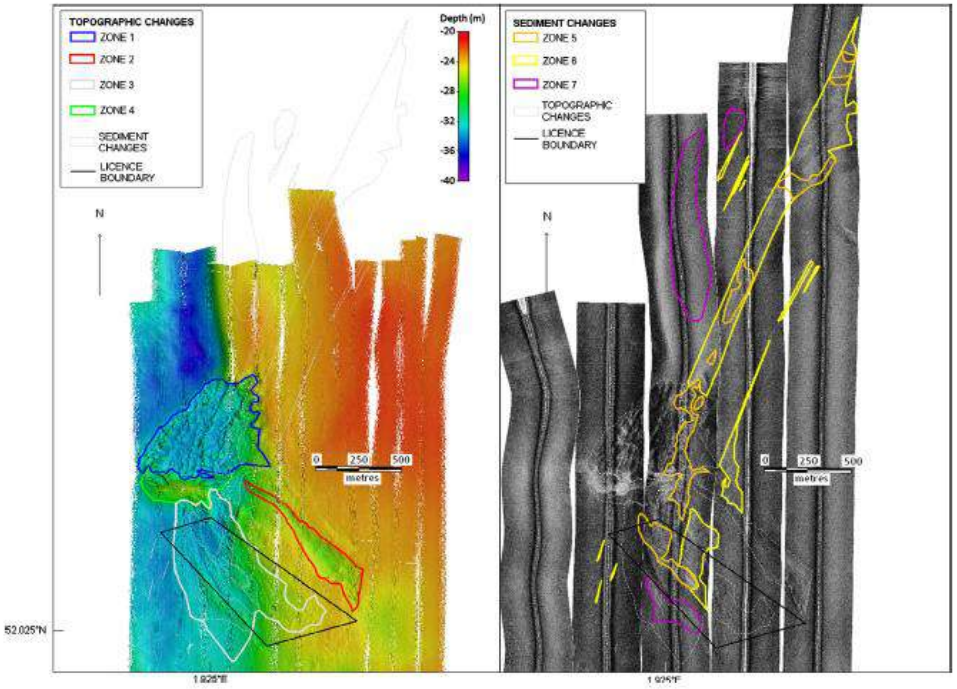

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5. Monitoring / Management

- Regional Seabed Monitoring Plan (RSMP)
- Relationship between fauna and sediments
- Acceptable Change Limits for sediment composition
- Ensure return of original faunal community after dredging
- Trial at a single extraction site

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Setting limits for acceptable change in sediment particle size composition following marine aggregate dredging

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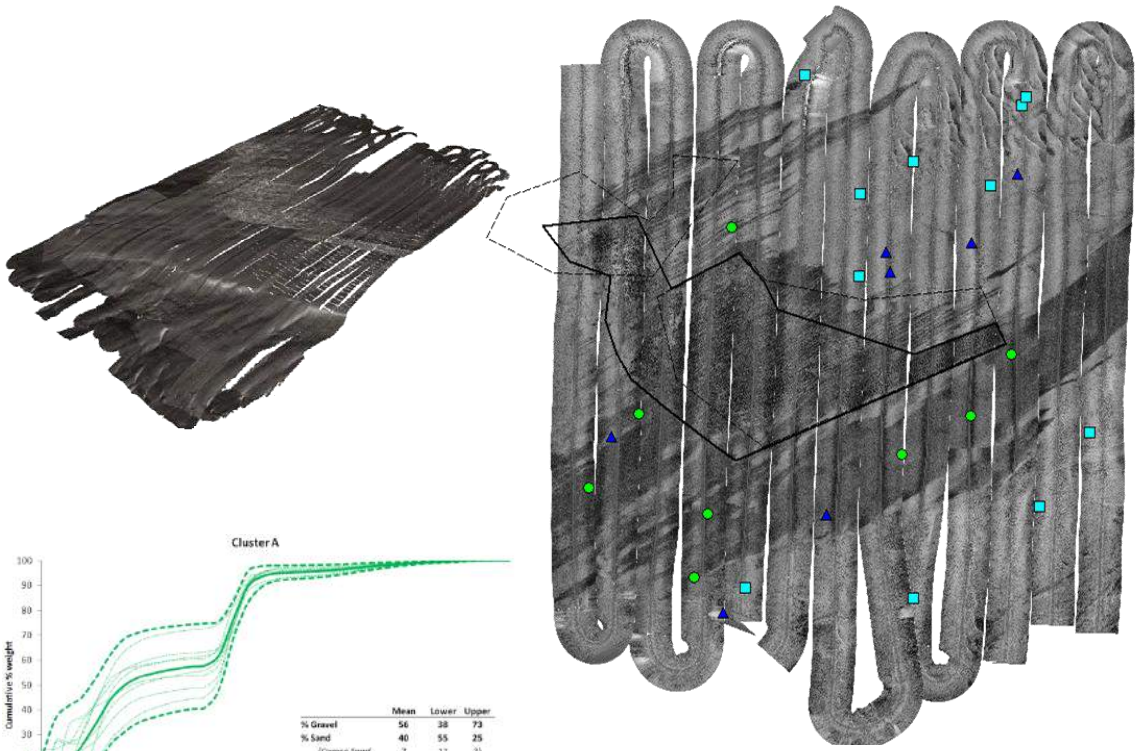

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5. Monitoring / Management

- Regional trial in the Eastern English Channel
- Approach rolled out across all UK dredging regions
- Collation of UK benthic data to help identify ACLs

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Setting limits for acceptable change in sediment particle size composition: Testing a new approach to managing marine aggregate dredging

Keith M. Cooper *

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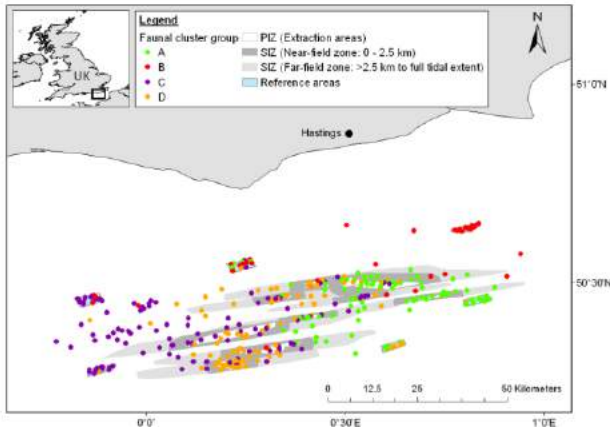

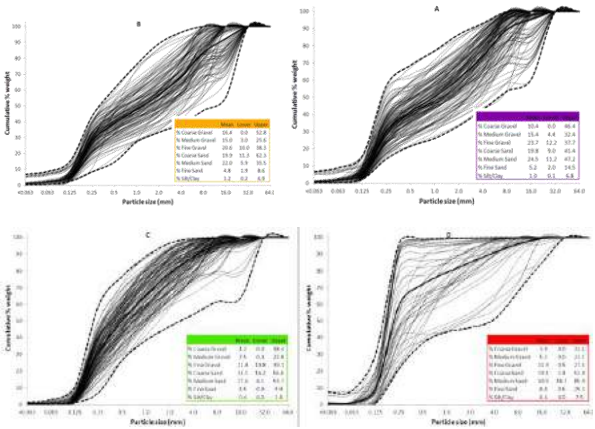

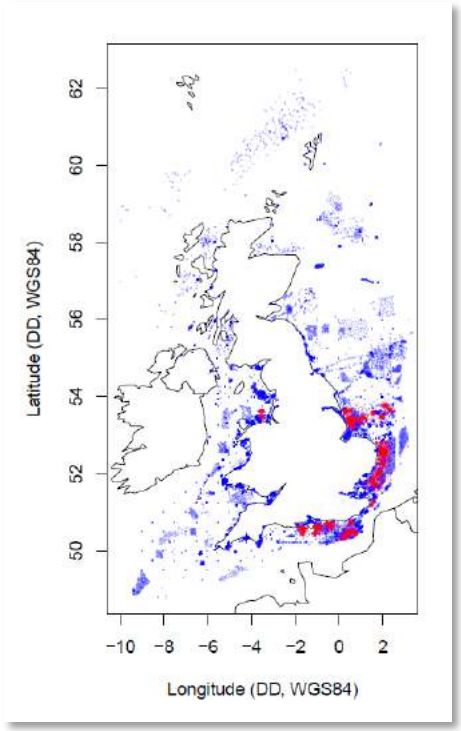

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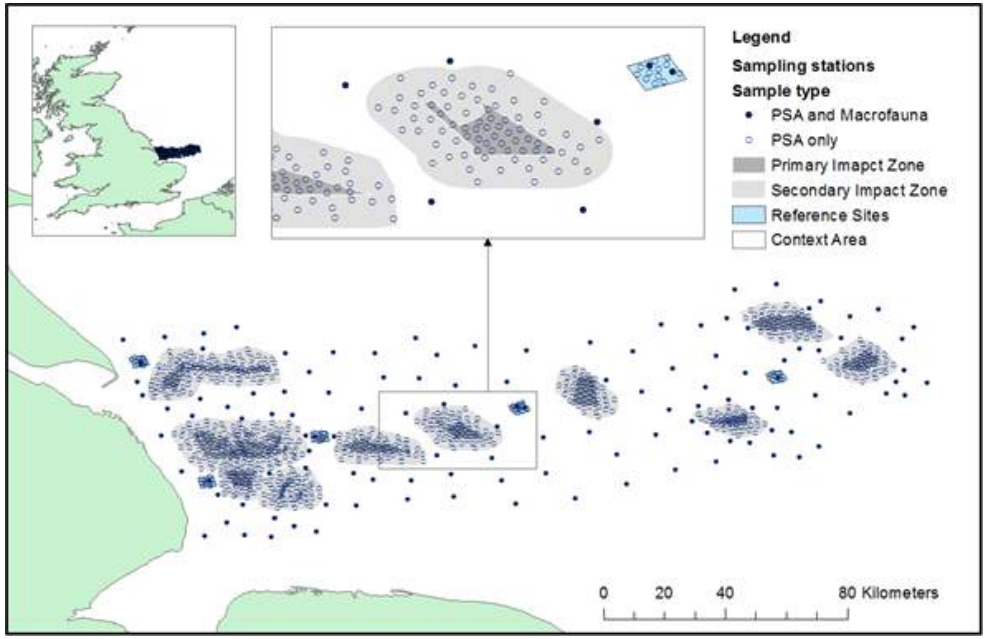
5. Monitoring / Management

- 3 elements to RSMPs
- Better environmental protection
- Lower cost
- Potential for wider benefits

Regional Seabed Monitoring Plans



RSMP Funders:

Department for Environment Food & Rural Affairs

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Marine Management Organisation

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Thanks for listening

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