



Improving the resilience of East Anglian coastlines to climate change

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East Anglian coastlines

Counties of Essex, Suffolk and Norfolk: extensive low coastlines, characterised by mudflats, salt marshes and sand/shingle features.

Important economically, socially and for biodiversity and natural capital.



Relative Sea Level (RSL) rise in East Anglia

Two contributory factors:

Global sea level rise (climate change)

Isostatic adjustment since last ice age

RSL rate at **Felixstowe**:

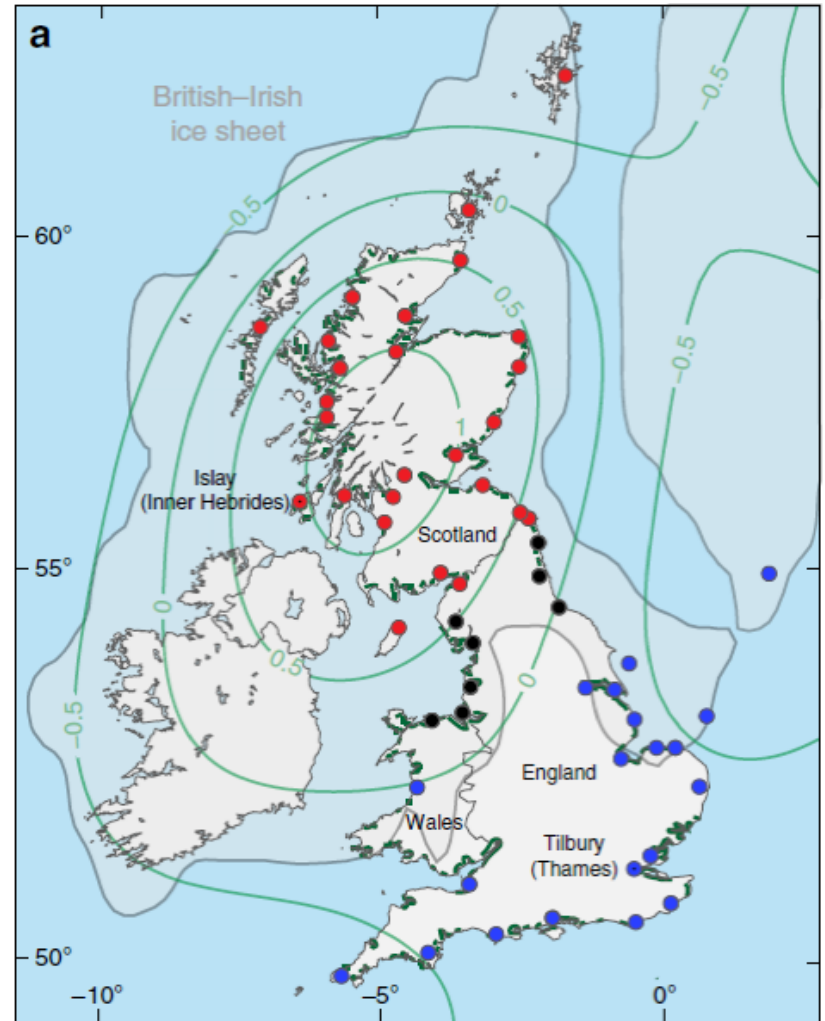
Period 2010-2030 2030-2050

IPCC Scenario

Low(2.6) +4.3 +4.7 mm y⁻¹

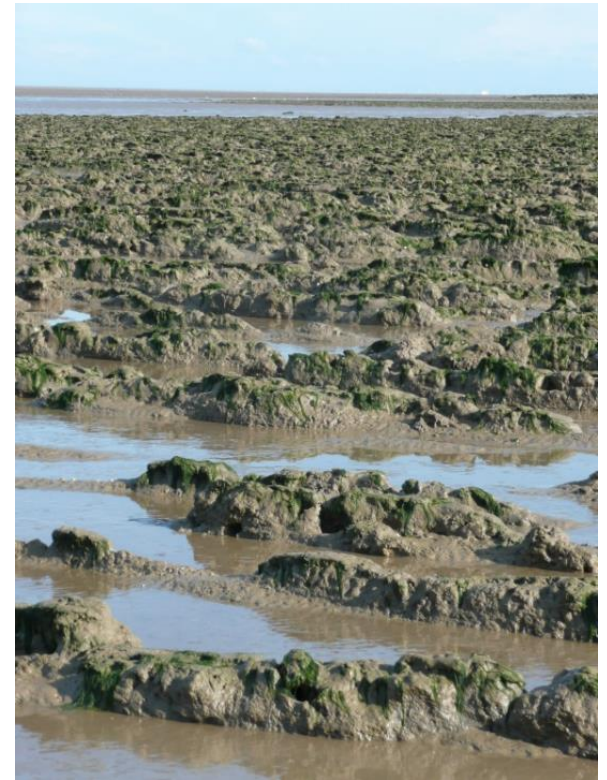
High(8.5) +4.6 +6.6 mm y⁻¹

Horton et al. (2018) Nat. Comm.





Rising sea levels increase coastal erosion, loss of salt marsh, and increase flood risk





Actions to increase coastal resilience

Actions:

(a) International actions on reducing greenhouse gas concentrations

even if successful, there is a built-in lag effect, RSLR will still occur.

Increasing coastal resilience.

Active interventions:

- Protect biodiversity (MCZs and other designations)
- Habitat recreation (managed realignments, engineering infrastructure)
- Habitat restoration (e.g. salt marshes)





“Greening Grey Infrastructure” e.g. incorporating salt marsh within sea wall repair



Environment Agency project (2012), to enhance biodiversity while maintaining coastal defence structures.

Cousins, et al (2017). Factors influencing the initial establishment of salt marsh vegetation on engineered sea wall terraces in south east England. *Ocean & Coastal Management*, 143: 96-104.

doi: 10.1016/j.ocecoaman.2016.11.010.

Linked to: NERC project, “integrated green grey infrastructure (IGGI)”.

www.biogeomorph.org/greengrey





Rebuilding salt marsh

Brightlingsea Harbour
Commissioners, with
ExoEnvironmental Ltd

*Project : Using sediment as a
resource (USAR)*

Sustainable / beneficial use
of dredgings to rebuild salt
marsh island protecting
moorings in Brightlingsea
Harbour

Using polders, stiff clay infill.





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Suffolk Estuaries. Defra Marine Pioneer

“*Marine pioneer*” projects, part of the *25 Year Environment Plan*.

Rationale: to test delivery of the 25 YEP and contribute to future iterations.

Joined-up integrated approach to planning and deliver, innovative finance



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Deben Estuary Partnership





Work on River Deben, salt marsh restoration

Loder's Cut, Deben Estuary.

Eroding salt marsh in mid estuary.

Restoration methods including partial sills over internal creeks to trap sediment

EA plans for wider restoration

Estimation of carbon store and value for fish of this marsh site



Loder's Cut, Deben Estuary.

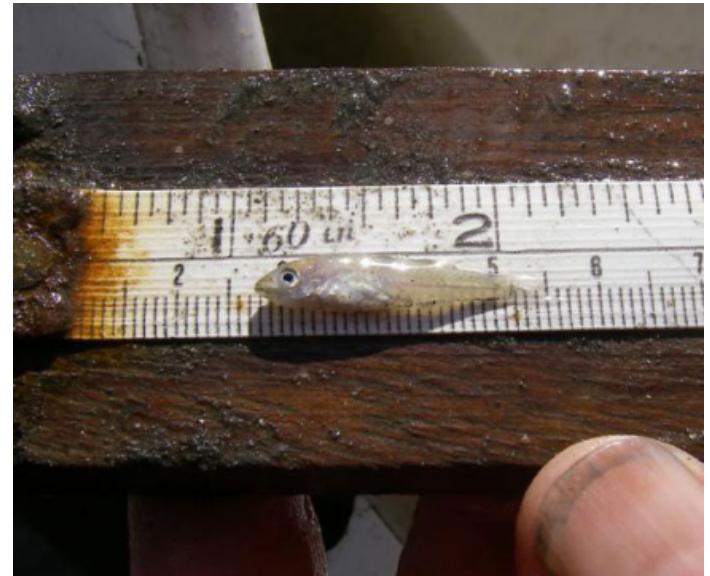
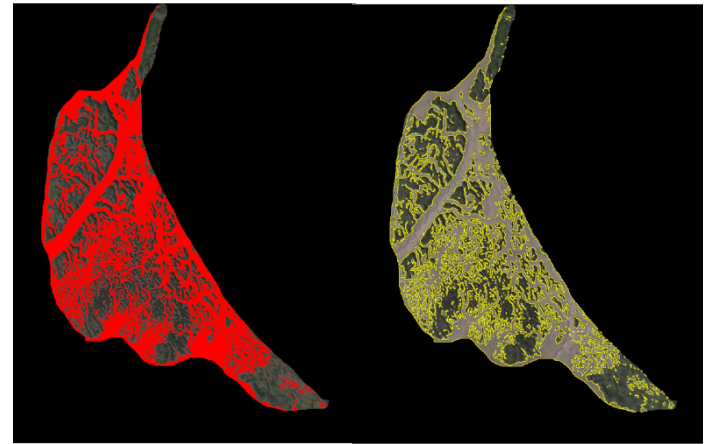


Restored Loder's Cut salt marsh would:

- Increase carbon stocks by **4,619 tonnes** in a restored salt marsh (£ value)
- Provide an additional **3.4 hectares** of salt marsh (£ value) [sea defence, amenity]
- Increase the potential use as feeding / nursery ground for Sea Bass (£ value)

Larvae: from **250** to **515** day⁻¹

Juveniles: from **76** to **133** day⁻¹



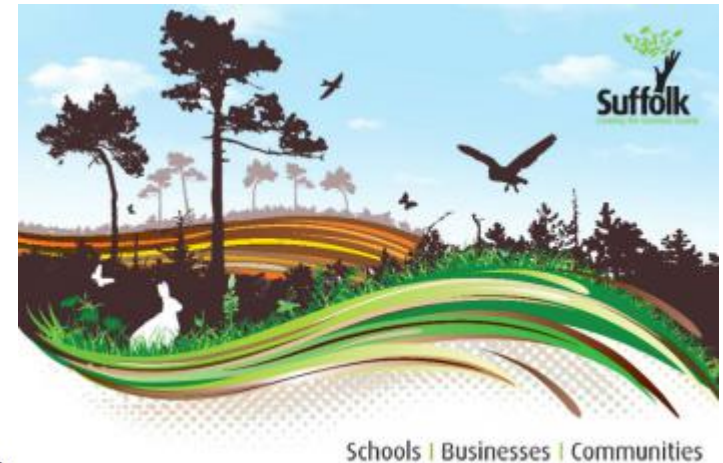


How to finance such work ? (Defra marine pioneer)

Suffolk County Council, “greenest council” initiative



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Encourage businesses to support local initiatives to provide environmental benefits .

(£ value) carbon credits, value for fisheries, value for sea defence, tourism,

To provide (match) funding for increased coastal resilience projects



Challenge of managing our coasts

Climate change poses a wide range of challenges to our East Anglian coastlines:

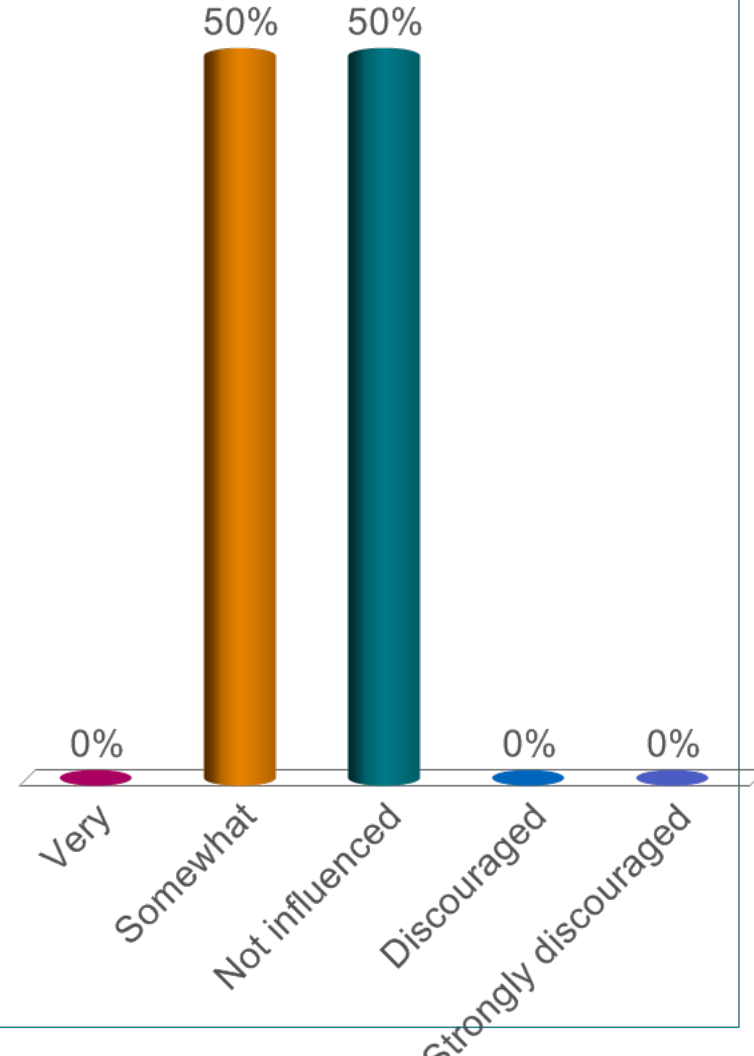
- Rising sea levels
- increasing water temperature
- increasing storminess
- direct human impacts



Approaches are being trialled to actively support coastal ecosystem functioning – working with natural processes. Local stakeholder engagement, local decision making, and new funding models.

How likely would you be to use a company that is partaking in a recognised “green” credits scheme (such as the Suffolk schemes supporting coastal resilience) in preference to any other company?

- A. Very
- B. Somewhat
- C. Not influenced
- D. Discouraged
- E. Strongly discouraged



What price differential would you be prepared to pay for goods/services in supporting a company with such green credentials?

- A. None
- B. + 0 - 5%
- C. 5 - 10%
- D. 10 - 20%
- E. 20+%

