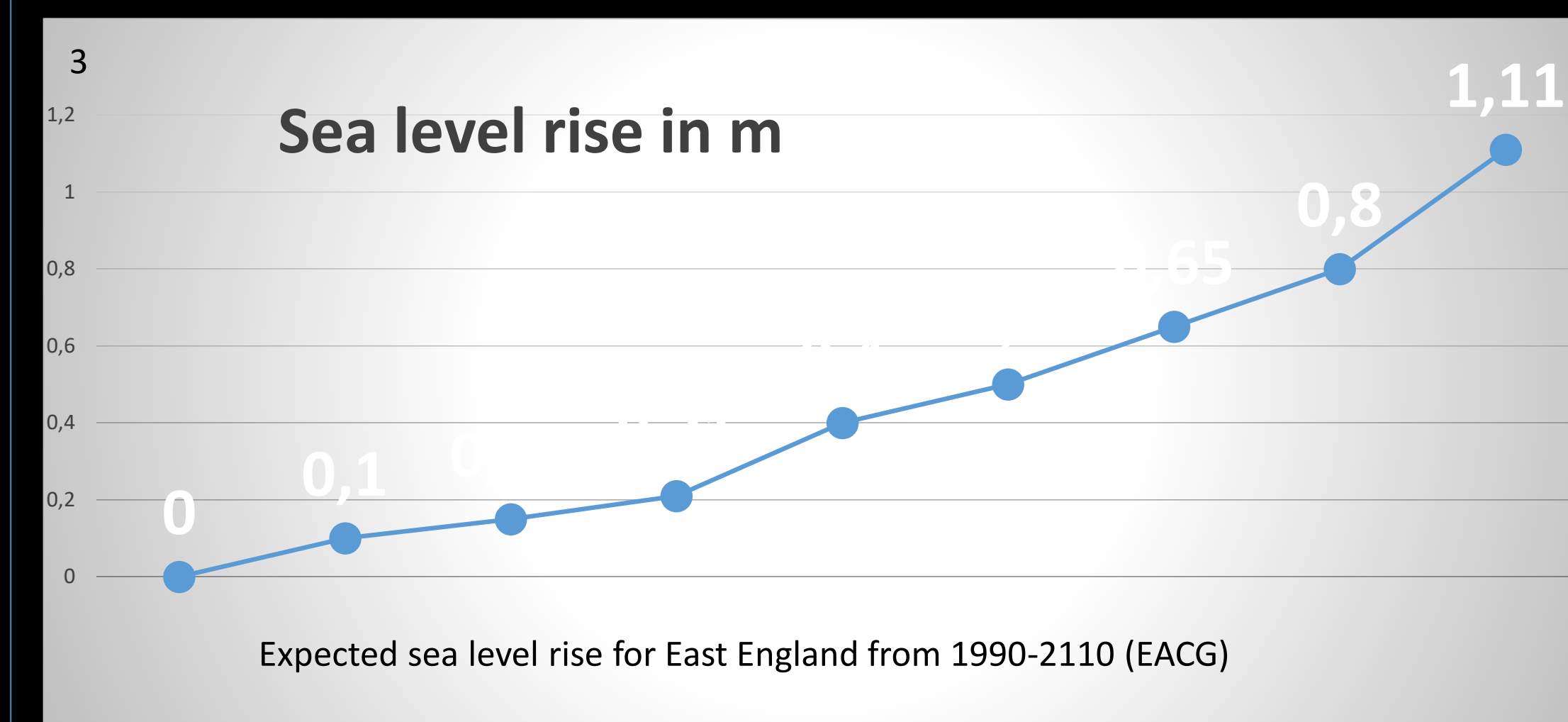


# THE CLIMATE CHANGE CHALLENGE

## Great Britain got damaged by the North Sea

The expected consequences of global climate change will place considerable demands on island and coastal protection on a scale never witnessed before. Accelerated sea-level rise and its secondary consequences pose risks for coastlines and coastal populations. Coastal flooding and erosion at the coastline are also significantly impacted by episodic storm surge and wave setup including astronomical tide (Kirezci et. Al.:2020). In Europe, the North Sea causes enormous damage, which, with its tides, influences the coastal zones. This poster will focus on Great Britain, especially Eastern England, and presents different Management Plans - Management Plans developed by the DEFRA or the EACG as policy directions to resist against the criticalities. Additionally, options for coastal protection are presented and are partially applied in the examples below.



Coast protection in GB is a very important topic right now and will be especially important in the future. The cliff chalk coasts in the South and the flat coasts in the East are affected the most as you can see in the map on the left, which shows future flooding areas and affected coasts. The diagram above shows how the sea level has risen and will be rising the following years because of the melting of glaciers and the thermal expansion of the water caused by temperature rise (NNDC).

### GREY INFRASTRUCTURE

Hard solutions (seawalls, dikes, breakwaters etc.)

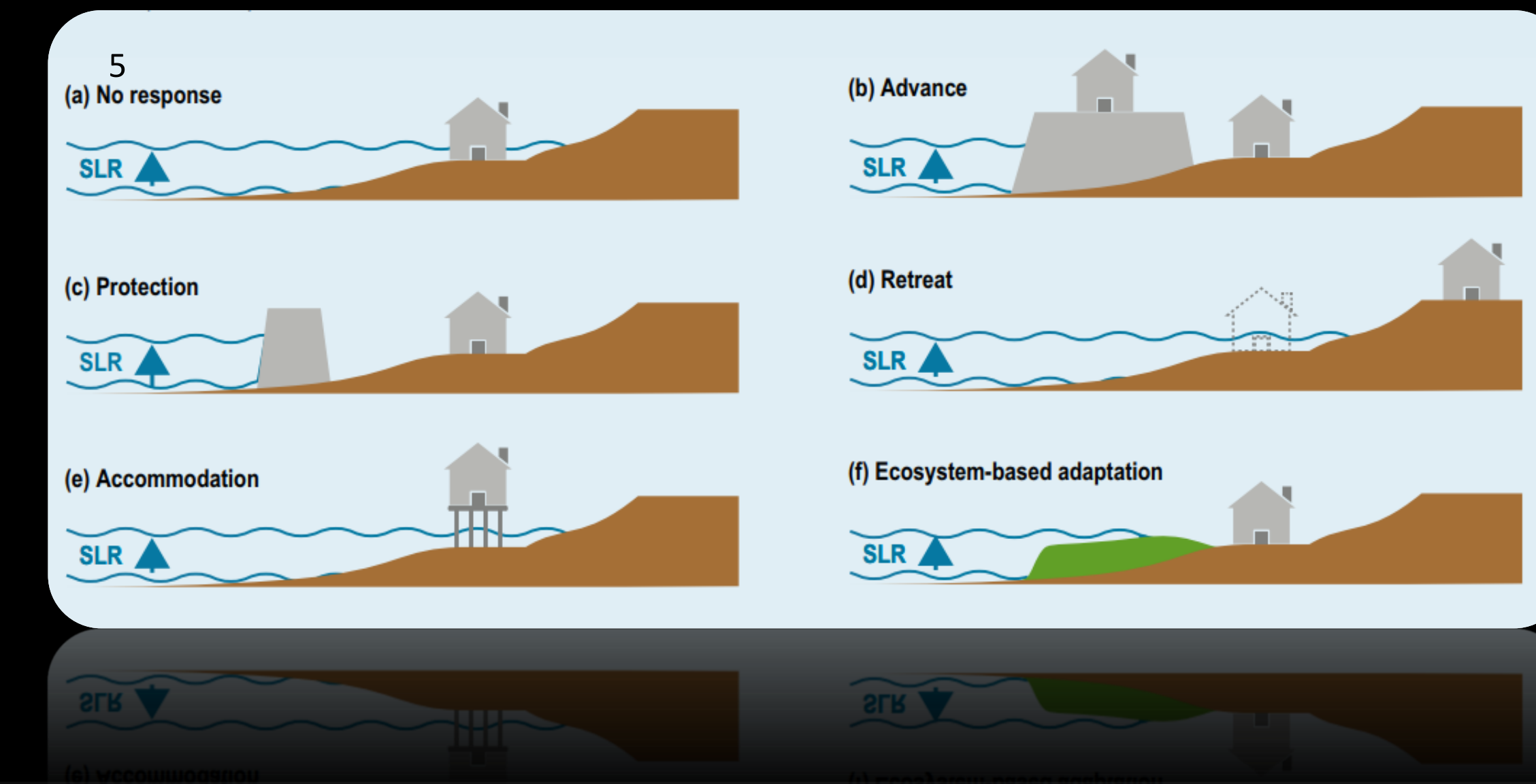
### HYBRID INFRASTRUCTURE

Combination of grey and green infrastructure (seawall with salt marshes in front e.g. Wallasea)

### SOFT INFRASTRUCTURE

Soft solutions (shore nourishments, ecosystem engineering like salt marshes, dunes, mangroves etc.)

On the left are various classified protection measures which are presented in reference to Schoones (2019). Below are different types of responses to coastal risk and sea level rise. The measures and the types of defending could be seen later in the examples as well.

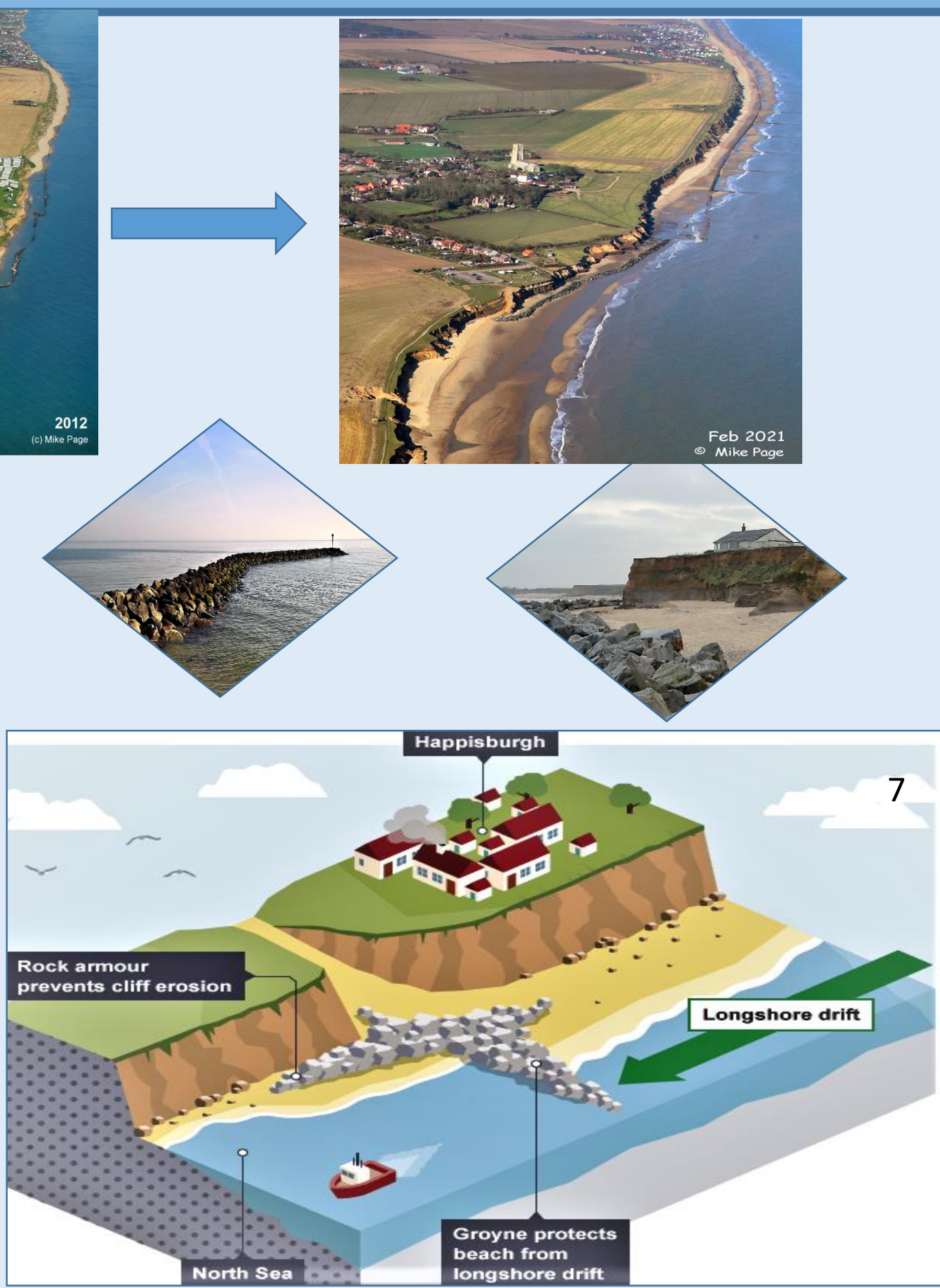


Already mentioned, the east coast of England is particularly affected by severe coastal erosion, so that some natural areas have already been lost to the North Sea. Past land reclamation measures combined with erosion have resulted in the loss of more than 90 % of tidal-influenced coastal marshes in recent centuries (WWF). Bellow are places which have been heavily affected by coastal erosion, e.g. Happisburgh. Another one is Wallasea Island, a project which uses naturalisation as a form of coastal protection and is supported by the DEFRA. The last example is a Shoreline Management Plan for the North Norfolk region assisted by the EACG.

## Happisburgh

Happisburgh is a very famous example for a collapsing coast. It is remarkable how the coastline has moved backwards over time. The houses have vanished. Retreat seems to be the only way to avoid falling victim to coastal erosion. The Video Link below shows some hard sea defence infrastructure as seawalls and goynes. Get an overview for yourself and click the link beyond to acquire more information about a sad story of people losing their home.

[Britain's collapsing coastline | Behind The Story -](#)



## Wallasea Island

habitat compensation 800 ha peninsula GB 2 m below sea level bursting of dikes 52 Mio. €

This project has the aim of renaturation. Salt marshes were to be created and the dike was to be moved back. This should result in a mixture of coastal protection function and nature reserve for humans and animals (WWF).

### What could we learn from the project?

This project delivers information that climate adaption measures can be used through planned relocation and renaturation. This leads to different advantages for tourism, nature conservation, coast defence, climate adaption and local recreation. The Wallasea Island Project can therefore be seen as a pioneer project for the mudflats.



## North Norfolk



This coastal area is affected by tidal changes and has a tidal range of up to 6.5 metres in Hunstanton. For the North Norfolk area, a separate Shoreline Management Plan has been written, which again divides the area into three frontages. The different frontages use different defences such as dunes, shingle ridges or earth embankments



The SMP focuses on the three main protection options: No active intervention, protection or retreat. Natural defences are preferred such as dunes or shingle ridges. In the future, managed realignments will also be considered as a possibility. Ultimately, appropriate adjustments are considered for each location within the region.

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- Schoones, T., Gijón Mancheño, A., Scheres, B. et al. Hard Structures for Coastal Protection, Towards Greener Designs. *Estuaries and Coasts* 42, 1709–1729 (2019). <https://doi.org/10.1007/s12237-019-00551-z>

**Abbildungen:**  
1) Newspaper – eigene Darstellung  
2) Google Maps – angelehnt an Kirezci et al.  
3) sea level rise – angelehnt an North Norfolk District Council  
4) Measures – angelehnt an Schoones et al. 2019

5) Defences – angelehnt an IPCC Bericht  
6) Happisburgh – Thanks to Mike Page for the permission to use [Home | Mike-Page.co.uk \(mike-page.co.uk\)](#)  
7) Werte auf Bestätigung zur Nutzung  
8) Google Maps

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1472291  
VL: Global Change –  
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der Erde?  
Prof. Dr. Glaser