

Climate change risks in coastal areas

23 September 2023

Claire Vincent – Deputy Director of Marine and Fisheries Strategy and Delivery

Colin Armstrong – Deputy Director of Marine and Fisheries Policy and Legislation

Acknowledgements

Fiona Lennon – DfI

Stuart McDougall – DfI

Mark Conn – DAERA

Paul Black - DAERA

Joanne Hanna – DAERA

Jill Connolly - DAERA

Existing departmental responsibilities (in context of coastal management)

DAERA

Marine licensing
Marine nature conservation &
protection
Marine Plan Authority
Coastal water management

DfI

Roads network (DfI Roads)
Rail network (Translink)
Coastal flooding (DfI Rivers)
Strategic Planning
Planning Policy

Councils have planning, leisure & tourism, waste & litter and economic development responsibilities



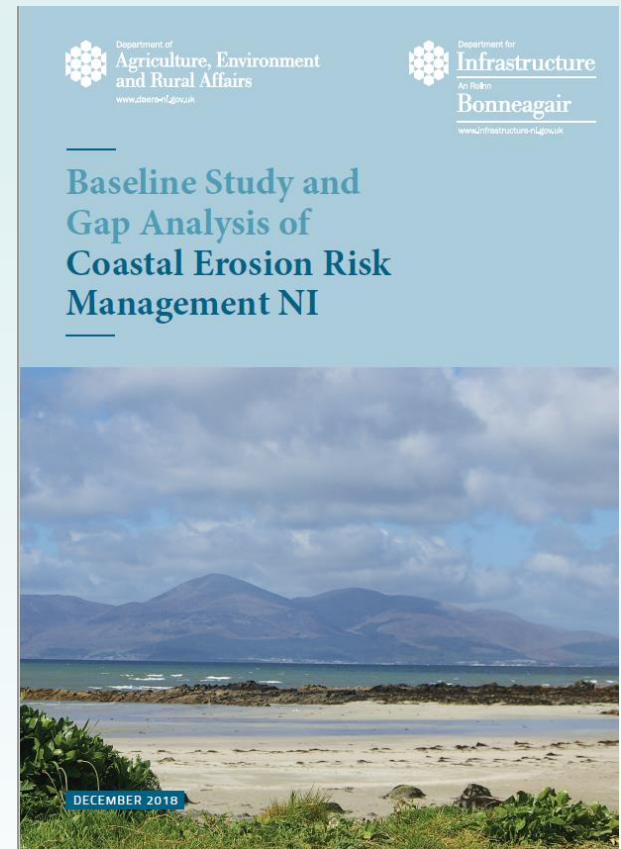
Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

***Sustainability** at the heart of a living, working,
active landscape valued by everyone.*

Background to Coastal Forum

- Formed in 2015, by Minister McIlveen (DRD) and Minister Durkin (DOE)
- Included 2 Departments, coastal council Chief Executives and National Trust
- Continued on in 2016 by Minister McIlveen (DAERA) and Minister Hazzard (DfI) who jointly commissioned Baseline Report (Dec 2017)
- Work taken forward by Perm Secs in absence of Executive
- Agreement from new Ministers 2021 to look at new policy options for coastal erosion risk management.
- First policy workshop – December 2021

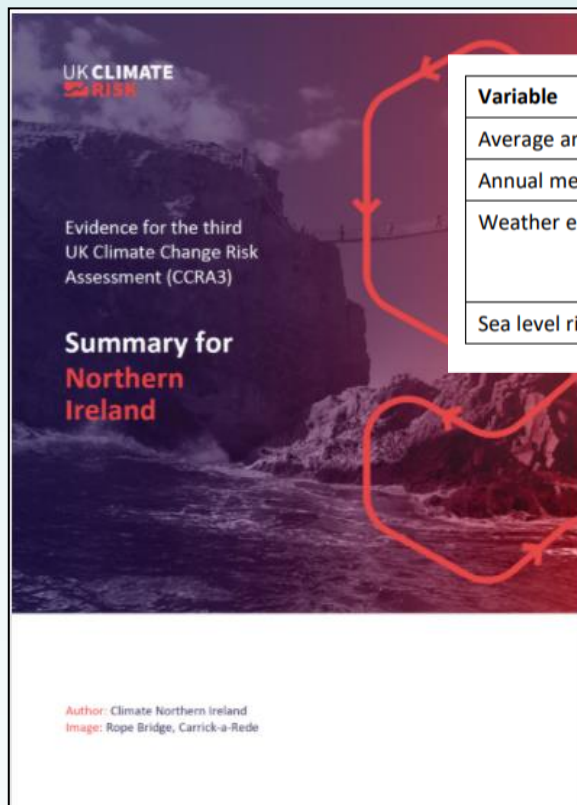


Aims of Coastal Forum

To work together in partnership to progress coastal management issues including:

- Provision of strategic leadership including on future policy direction.
- Consideration of the Coastal Change Risk Assessment (CCRA3) Report recommendations and how these can be implemented;
- Monitoring of the Coastal Forum Work Programme;
- Consideration of coastal change risks and opportunities including funding opportunities / arrangements;
- Exploring opportunities for continued partnership working;
- Oversight of pilot projects, research, and studies.

UK Climate Change Risk Assessment



Variable	Change in Northern Ireland
Average annual temperature	Increase of 0.7°C from mid-1970s to mid-2010s
Annual mean rainfall	Increase of 6.4% from mid-1970s to mid-2010s
Weather extremes	UK-wide increase in extreme heat events Little evidence yet on changes in extreme rainfall
Sea level rise	UK-wide increase of ~1.4mm per year since 1901 (16cm to date)

- ❖ Climate change governance
 - Climate Change Act (NI) 2022
 - No specific legislation to cover coastal erosion risk management

Main Risks at Coast (full list in briefing paper)

Risk	Nature of Risk	Urgency Score
N17 – Coastal species and habitats	Coastal flooding, erosion and climate factors	More action needed
I3 – Infrastructure services	Coastal flooding and erosion	Further investigation
B2 – Coastal business locations and infrastructure	Coastal flooding, extreme weather, erosion and sea level rise	More action needed
H4 – Viability of Coastal Communities	Sea level rise	Further investigation
H11 – Cultural heritage & coastal change	More action needed

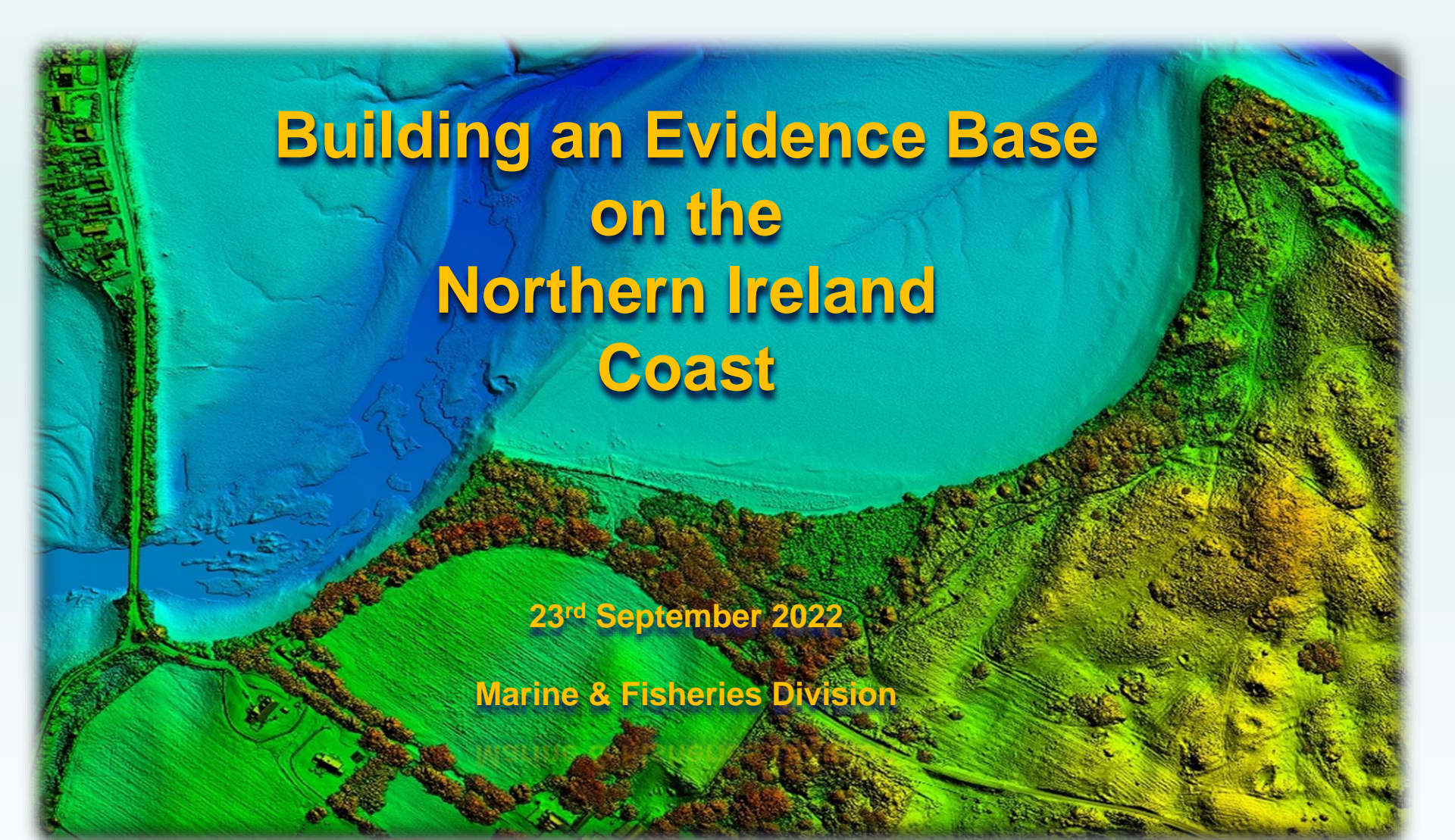
Next steps – from CCRA3

Further adaptation action on coastal erosion and coastal flooding should be **considered holistically inc N17, I3, H11, and B2**

Of UK – Good recent developments in the management of coastal change, but **action is still insufficient** to manage the future levels of risks.

Of NI

- Build on the baseline work and bring in integrated adaptation planning and SMP development and delivery. Coastal flood and erosion management should be driven by **integrated** engineering, planning, insurance and preparedness activities.
- Build **community or individual** led activities to increase resilience.
- Need to improve mapping and modelling
- Face the challenge of the potential future loss and impacts on communities from coastal erosion and flooding.
- System level change including a **thorough review of current governance and delivery** to ensure a strategic approach to managing the Northern Ireland coastline rather than the current patchwork of roles, responsibilities, policies and plans.



Building an Evidence Base on the Northern Ireland Coast

23rd September 2022

Marine & Fisheries Division



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

Partners



UK Hydrographic Office

Primary Role:

To provide technical oversight and quality assurance of data collected.

Responsibilities:

- 1. Data quality checks during acquisition**
- 2. Data validation and quality control**



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

1. BASELINE SURVEY

Northern Ireland 3D Coastal Survey

- Topographic LiDAR Survey & Orthophotography
- Satellite-Derived Bathymetry Data
- Pilot Bathymetric LiDAR Survey



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

***Sustainability** at the heart of a living, working,
active landscape valued by everyone.*

1. Baseline Survey – Lot 1

Topographic LiDAR Survey



**Area of capture:
285km²**



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

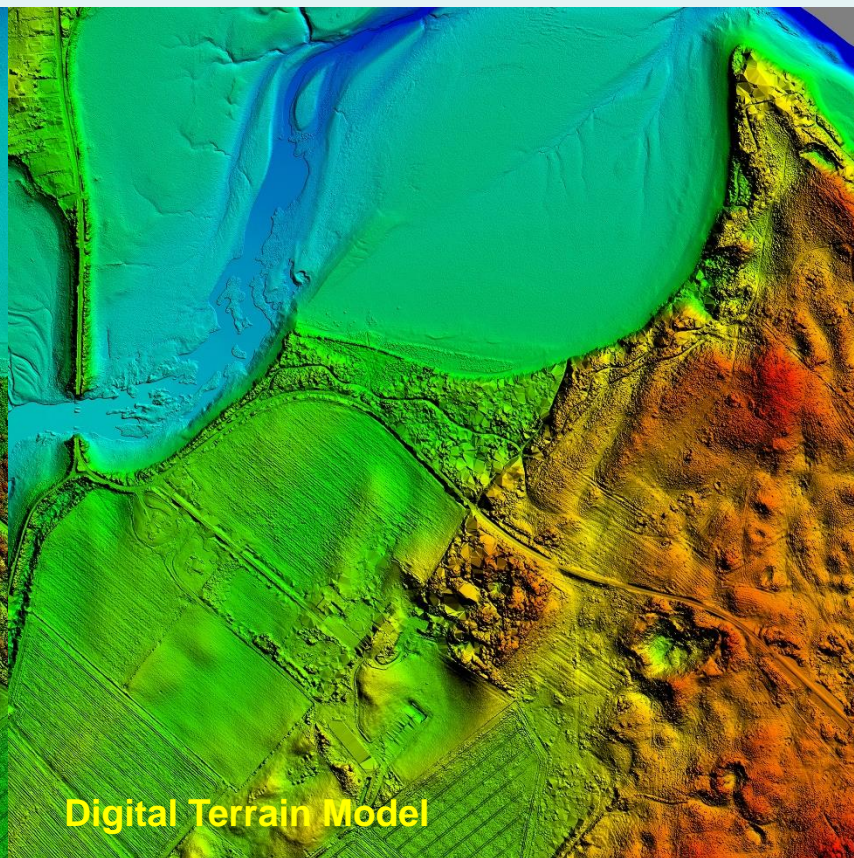
Sustainability at the heart of a living, working,
active landscape valued by everyone.



Orthophotography



Digital Surface Model



Digital Terrain Model



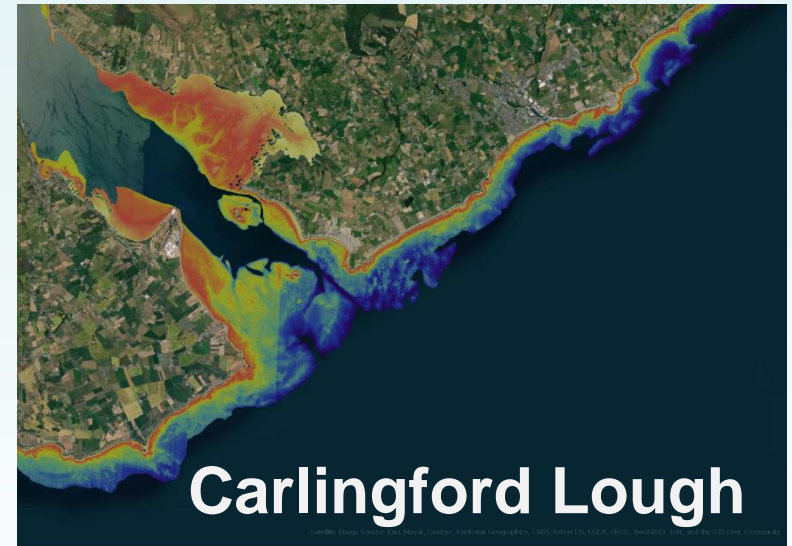
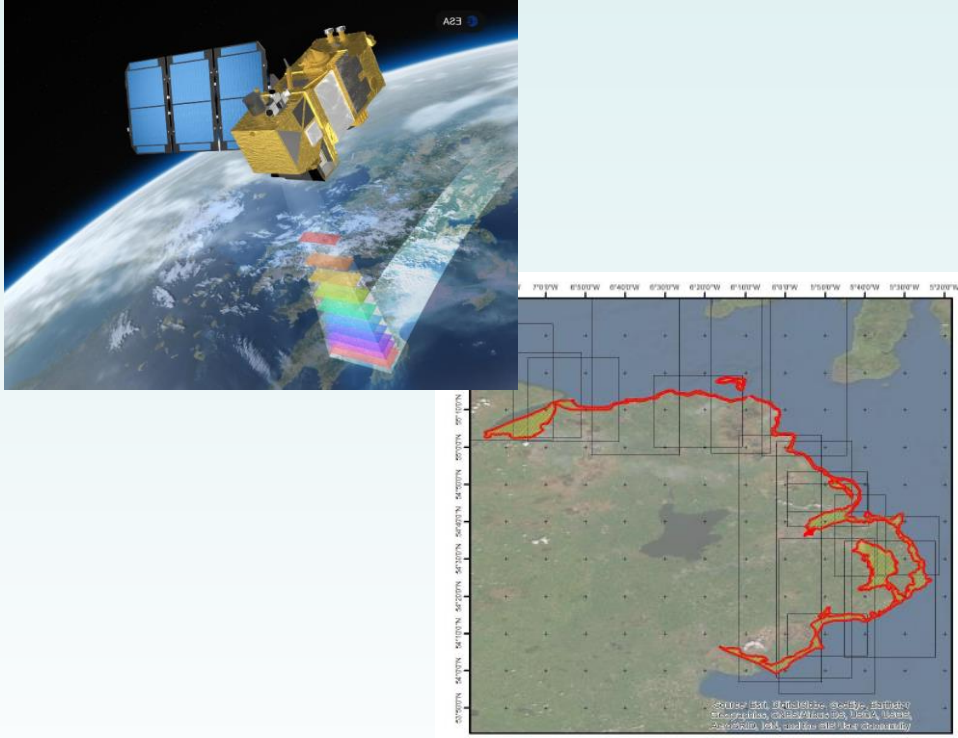
Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

1. Baseline Survey - Lot 2

Satellite Derived Bathymetry Data



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

1. Baseline Survey– Lot 3

Pilot bathymetric LiDAR survey



- ❖ **Rapid Airborne Multibeam Mapping System**
- ❖ **Dundrum Bay area selected as pilot**

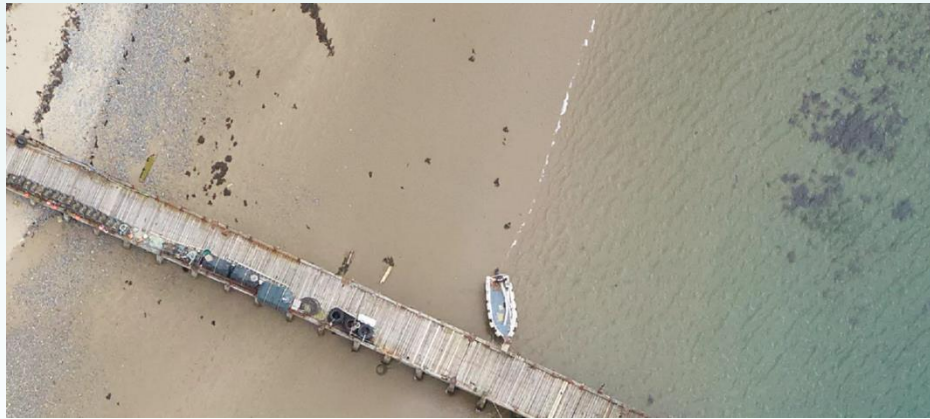
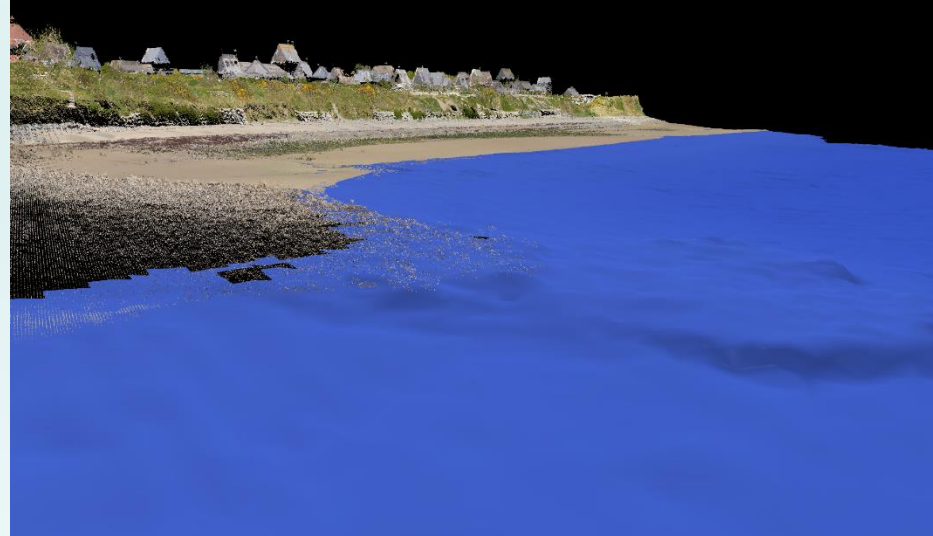


Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

*Sustainability at the heart of a living, working,
active landscape valued by everyone.*

Carlingford Lough – Bathymetry & Topo LiDAR



Department of
**Agriculture, Environment
and Rural Affairs**

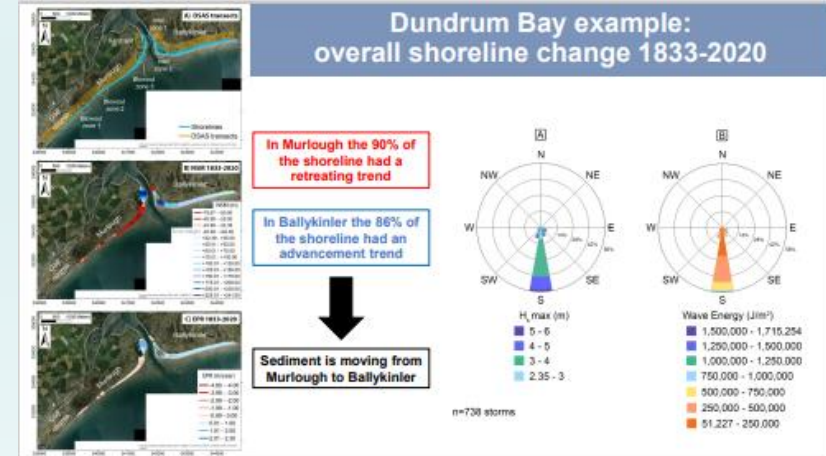
www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

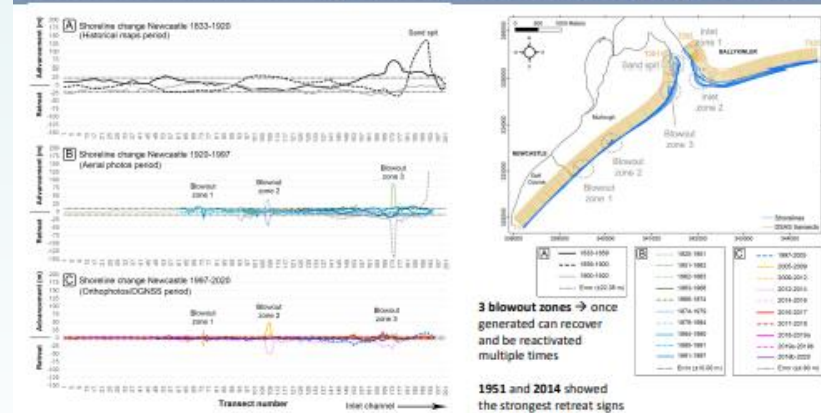
2. HISTORICAL SHORELINE ANALYSIS



Shoreline analysis: DSAS (Digital Shoreline Analysis System)



Results: shoreline change at Newcastle-Murlough (1833-2020)

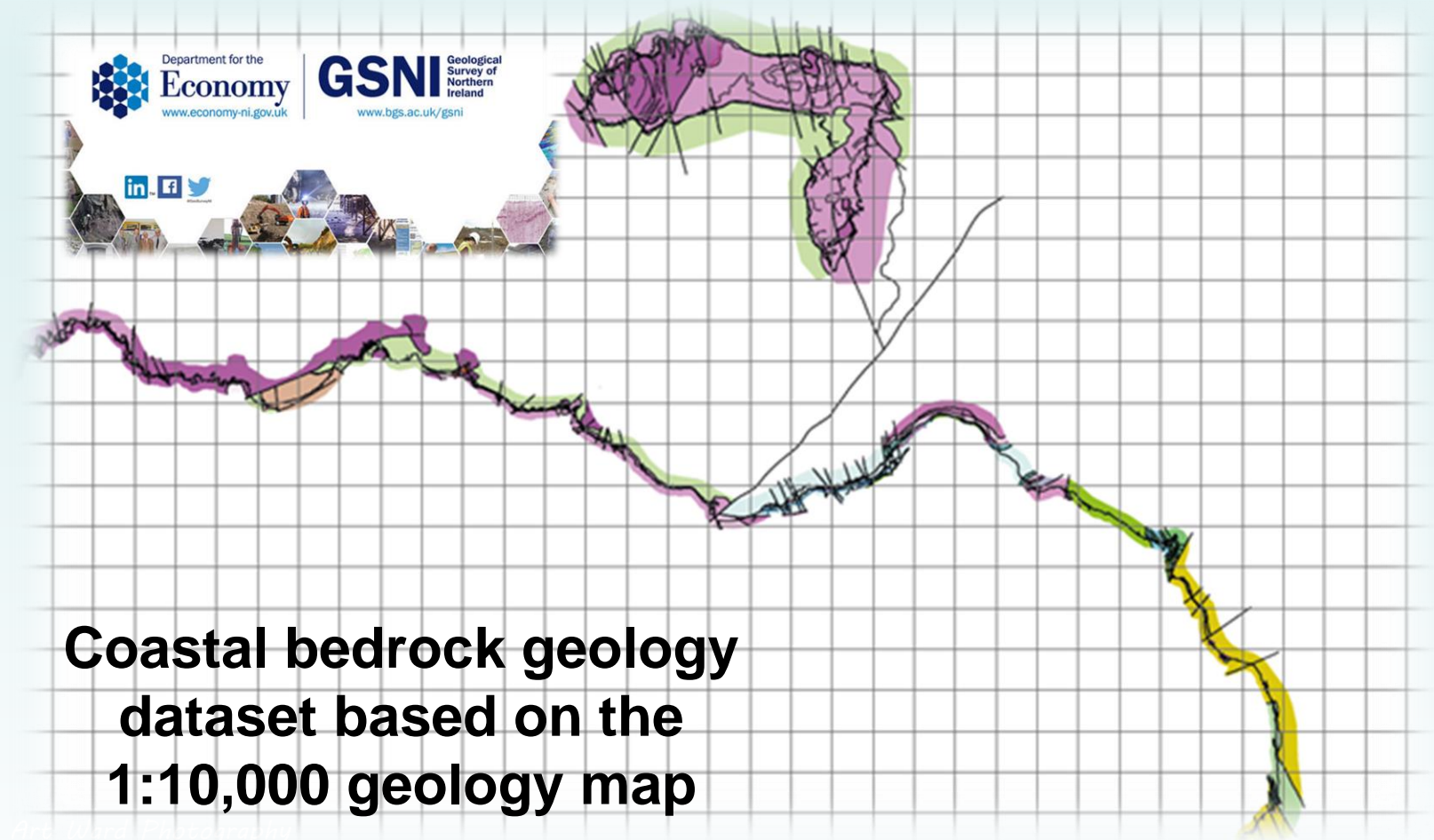


Department of
**Agriculture, Environment
and Rural Affairs**

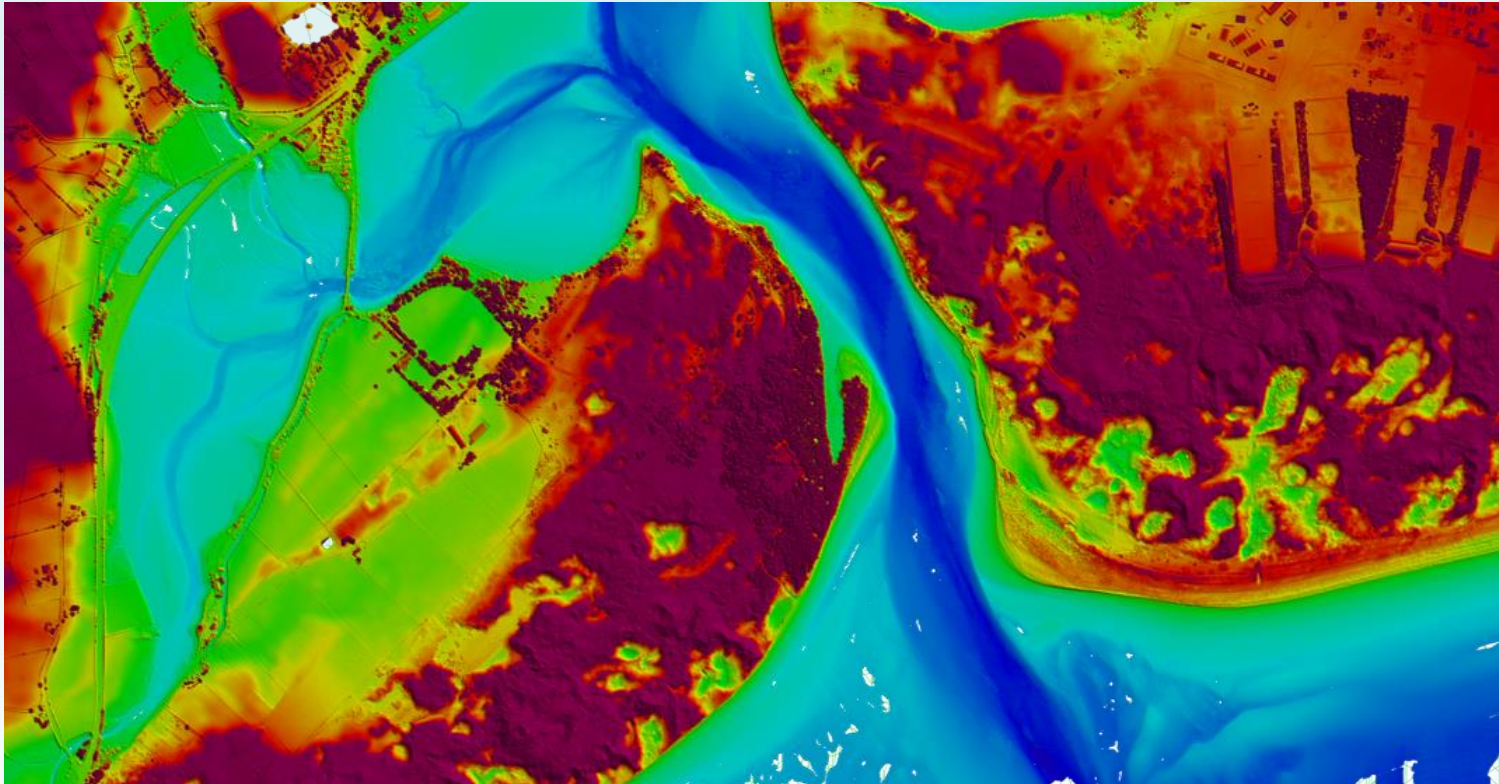
www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

3. GEOLOGICAL COASTAL DATASETS



4. NEARSHORE SEABED MAPPING



Dundrum Bay
Airborne LiDAR Bathymetry



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

***Sustainability** at the heart of a living, working,
active landscape valued by everyone.*

5. POST-STORM LiDAR SURVEY – north coast

Whiterocks Pre-Storms



Whiterocks Post-Storms



Magilligan Pre-Storms



Magilligan Post-Storms

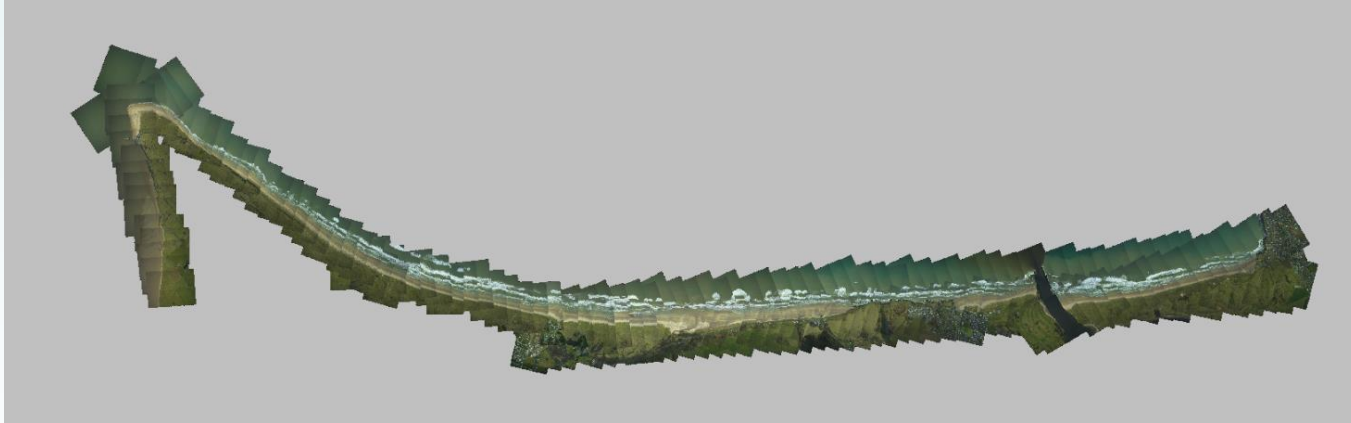
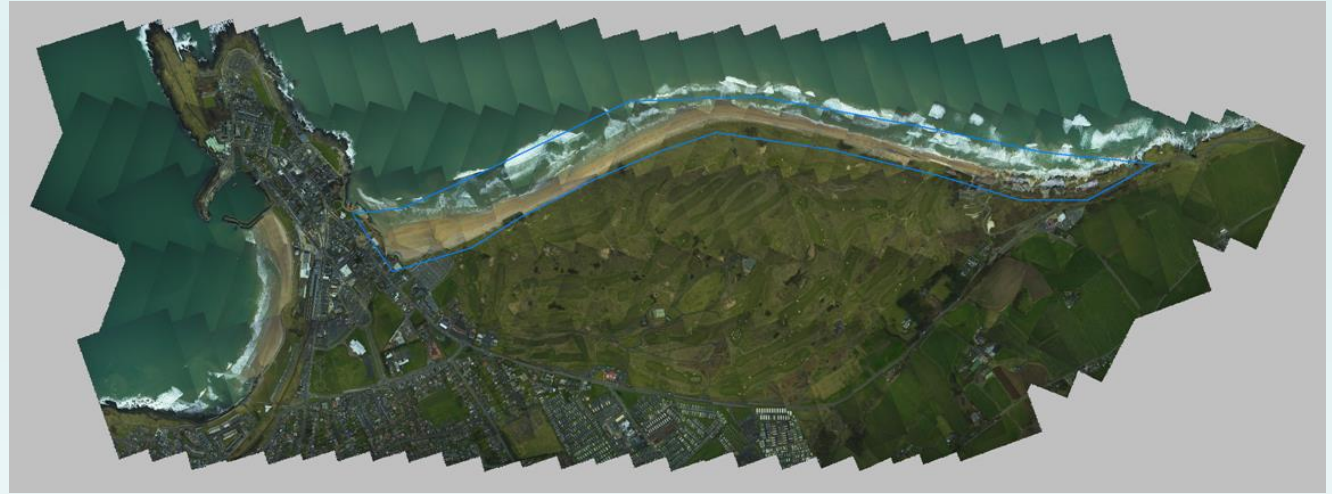


Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

5. POST-STORM LiDAR SURVEY – north coast



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

Initial analysis ...

Pre-storm 2021

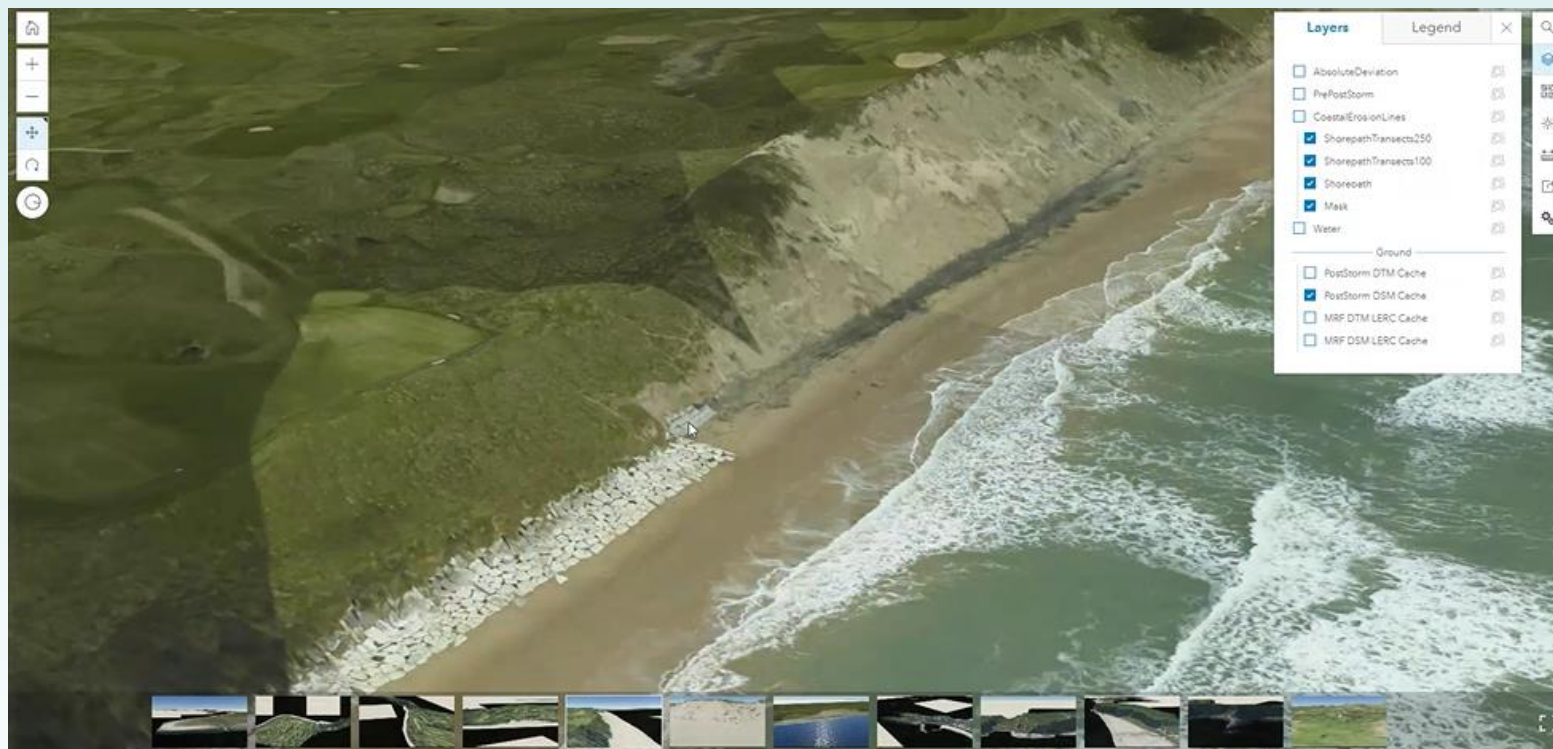


Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

Post-storm March 2022

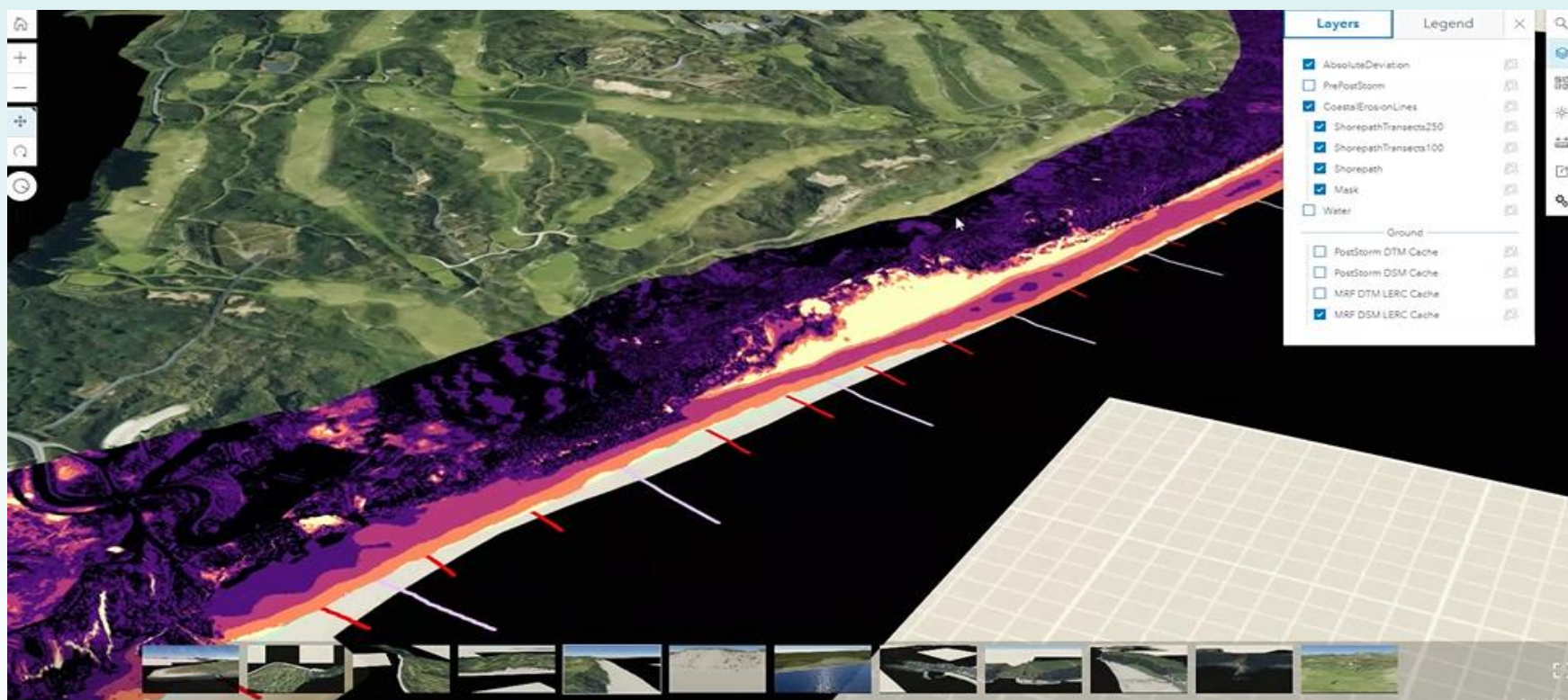


Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

Change detection between 2021 and 2022



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

6. Development of public viewer & data download capability – Coastal Observatory



Department of
Agriculture, Environment
and Rural Affairs

Welcome

Map Viewers

Reports

Gallery

On-going studies

Other

Northern Ireland Coastal Change Viewer

Demo Experience Builder

The NI Coastal Change Viewer brings together a wide range of coastal datasets, giving users the ability to view and download a range of information on the coast. This viewer has been established to make coastal datasets accessible and to improve the evidence base of coastal change in Northern Ireland.



Department of
Agriculture, Environment
and Rural Affairs

www.daera-ni.gov.uk

Sustainability at the heart of a living, working,
active landscape valued by everyone.

Points for Discussion

- What needs to be considered as we move towards the next Coastal Forum Policy workshop?
- What help can the new coastal data provide to your business area?
- Has your work area commissioned research and / or data linked to the impact of climate change in coastal areas that could be shared?
- What additional steps are being taken to protect assets you are responsible for in the medium and long term due to climate changes?