



Coastal & Offshore Modelling Symposium

COMS2026



National Coastal Erosion Hazard Mapping

Patrick Hall

Office of Public Works

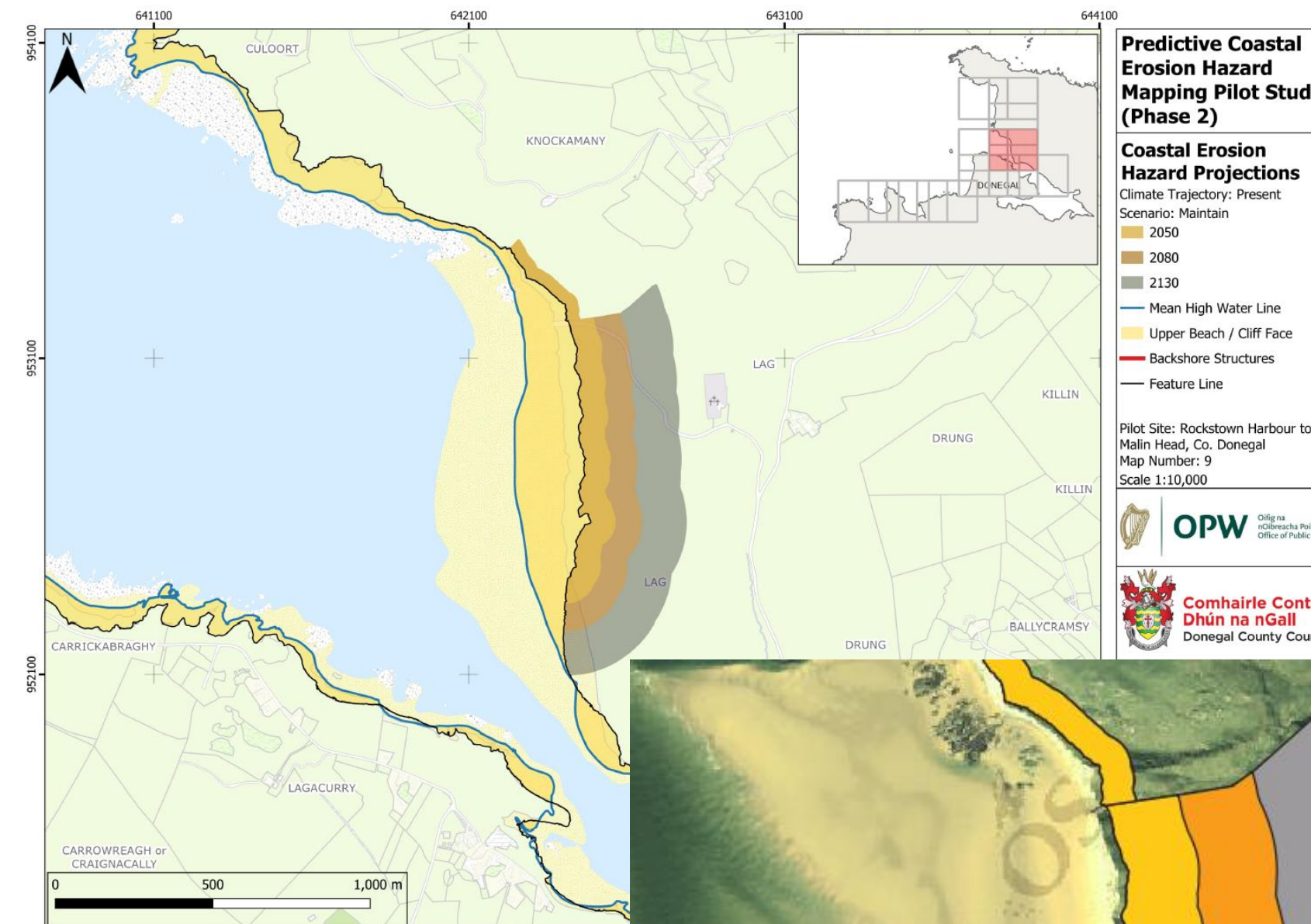


26 Feb, 2026
Cork, Ireland

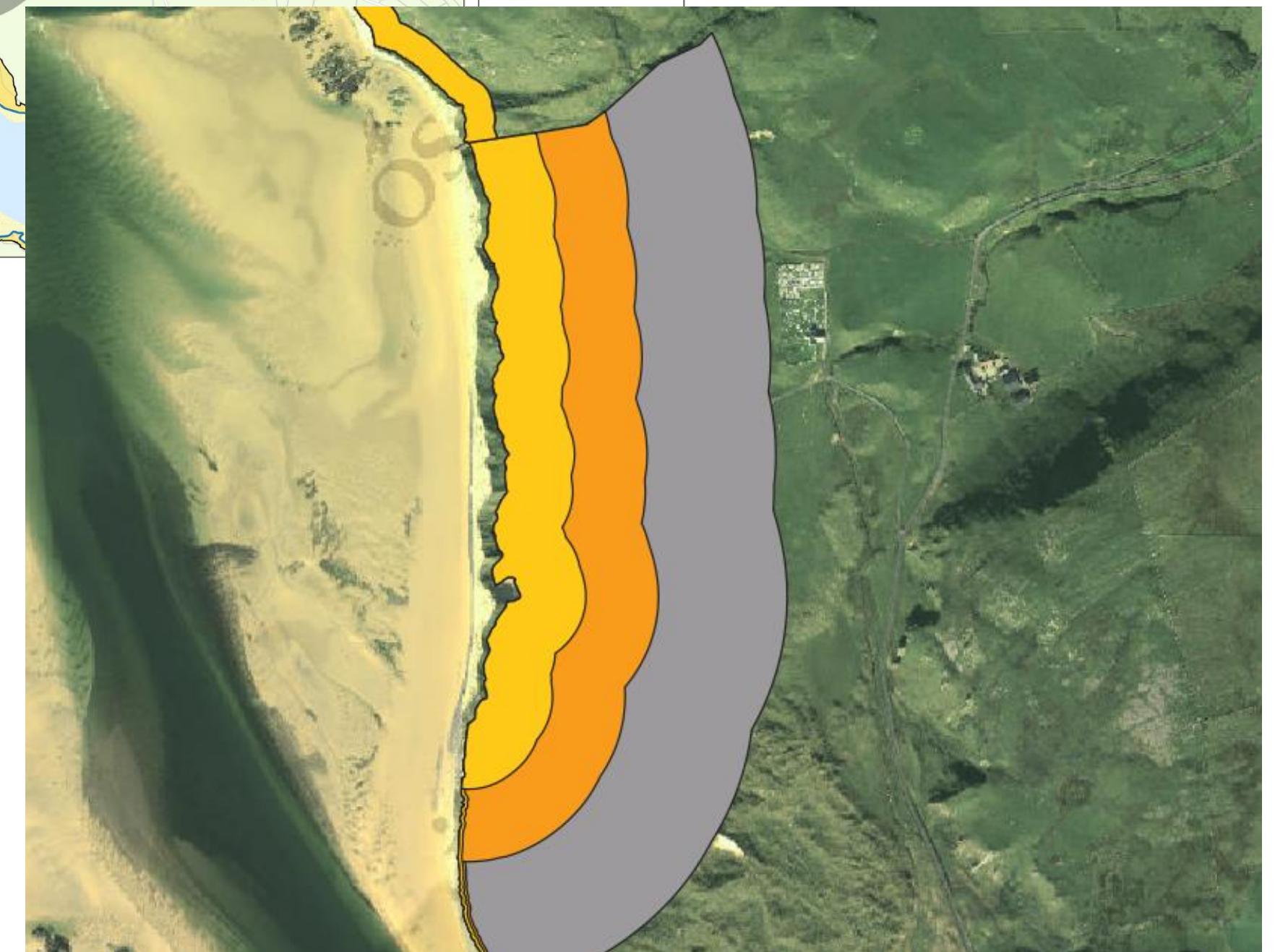
What is Coastal Erosion Hazard Mapping?



- A predictive map showing areas where coastal erosion may occur in the future
- The maps show the location and the potential extent of coastal erosion
- Maps are produced for different:
 - ✓ *Time periods*
 - ✓ *Management scenarios*
 - ✓ *Climate change trajectories*
- Very similar to flood mapping, but for coastal erosion



Sample Coastal Erosion Hazard Mapping from OPW pilot study completed in 2025



Why produce CEHM?



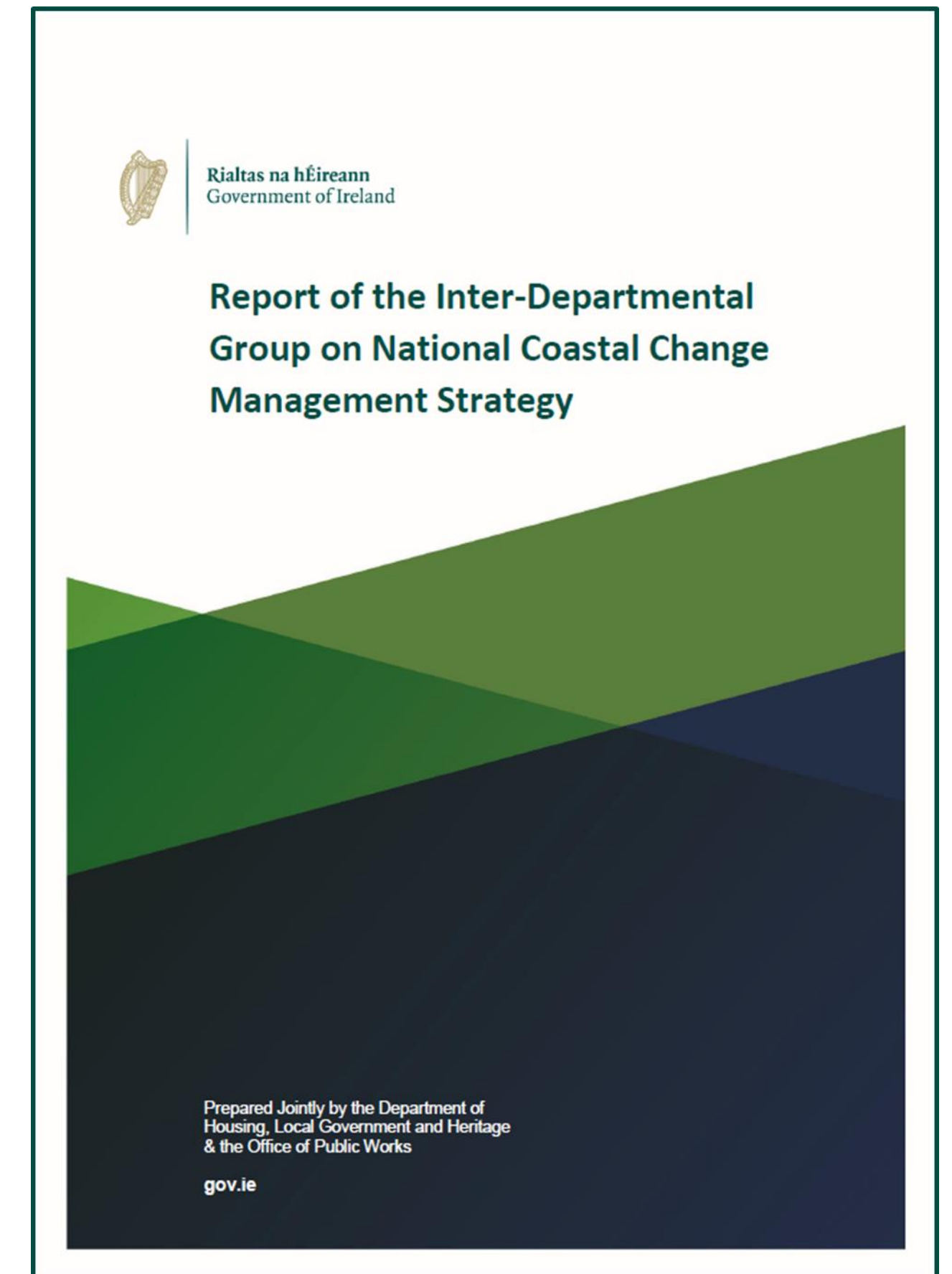
[Report of the Inter-Departmental Group on National Coastal Change Management Strategy \(2023\)](#)

Recommendation 1(d):

- “The Office of Public Works (OPW)...designated as the national lead coordinating body for the assessment of coastal change hazards and risks and the assessment of technical options and constraints outlined in Recommendations 3 to 7.”

Recommendation 6(a):

- “The OPW to develop **national-scale coastal erosion hazard mapping** and an associated risk assessment using the latest available data and methodologies.”



What is CEHM used for?



National-scale Coastal Erosion Hazard Mapping will support:

Recommendation 6(a):

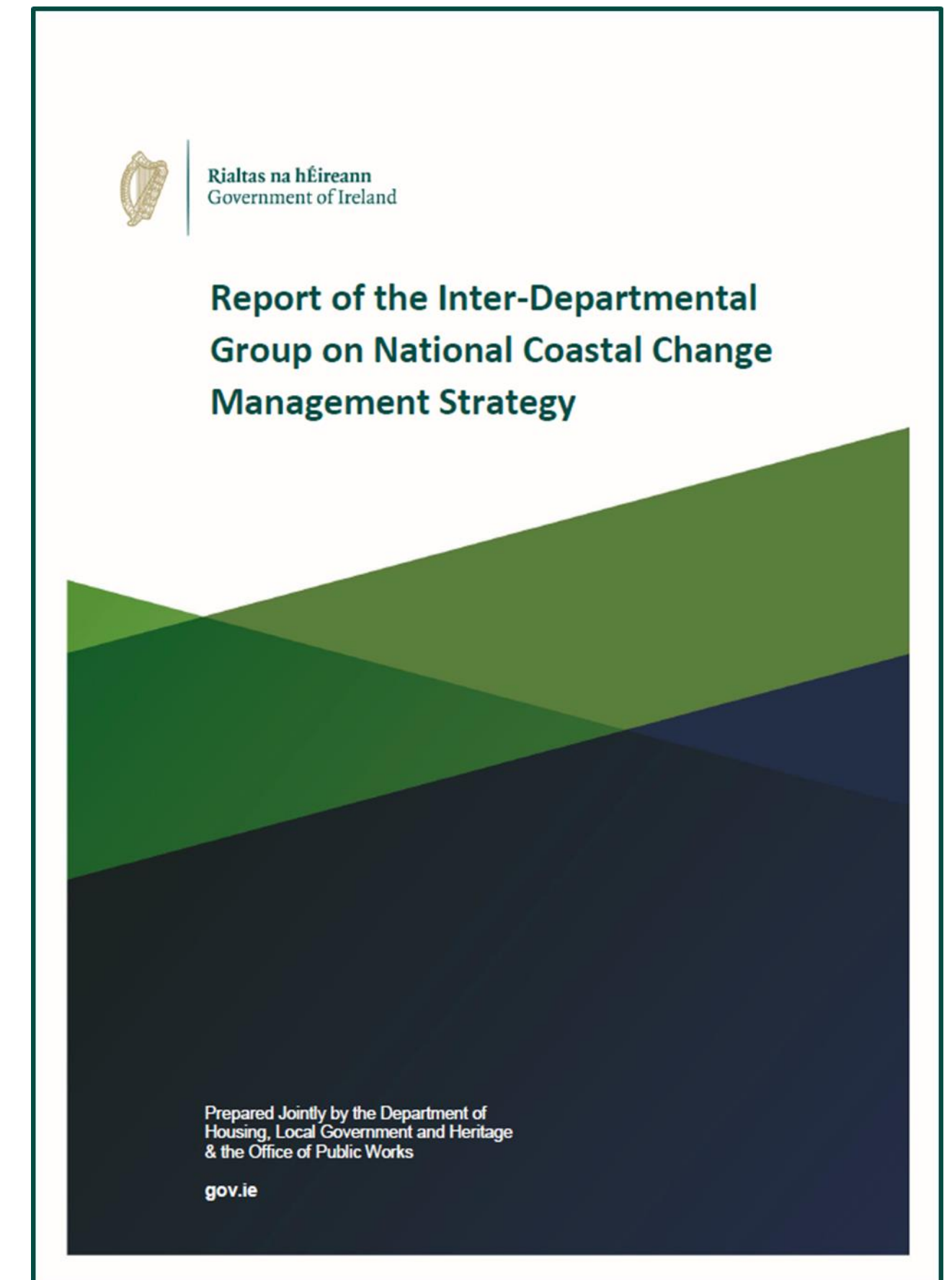
- “The OPW to develop **national-scale** coastal erosion hazard mapping and an associated **risk assessment** using the latest available data and methodologies.”

Recommendation 9(b):

- “The Interdepartmental Steering Group should...prepare a national set of **coastal change management plans**.”

Recommendation 12:

- “The Department of Housing, Local Government and Heritage should prepare and publish **spatial planning guidelines**.”



What will the NCEHM programme cover?



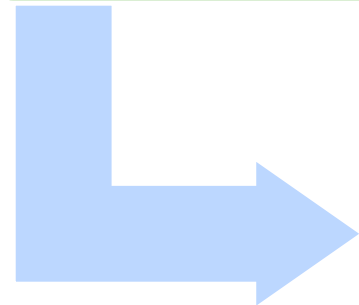
	ICPSS	NCEHM
Who was / is responsible?	OPW	OPW
When was it / will it be completed?	2013	2028 (planned)
Hard or soft coasts?	Soft coasts only, National	All coasts, National
Mainland and islands included?	Mainland only	Mainland and Islands
Estimated total coastline length assessed?	2,349km (≈300km mapped)	6,318km
Future climate change considered?	No	Yes
Manmade defences considered?	No	Yes
Coastal erosion hazard mapping produced?	Yes (2050)	Yes (2050, 2080 and 2130)

National Coastal Erosion Hazard Mapping



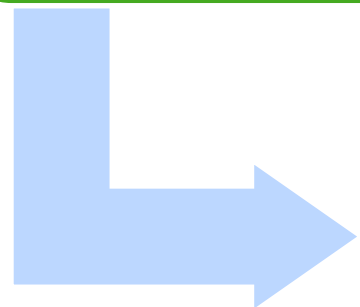
Available and readily derivable data

- Aerial imagery and historic mapping
- Current LiDAR and bathymetry
- GSI Historic Vegetation Lines



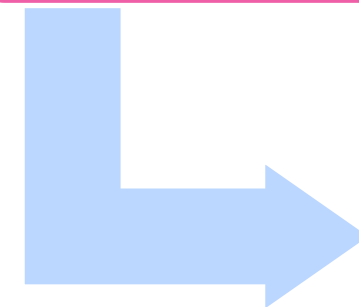
PCEHM Pilot Study

- Test and develop mapping methodology
- Programme and cost considerations for NCEHM



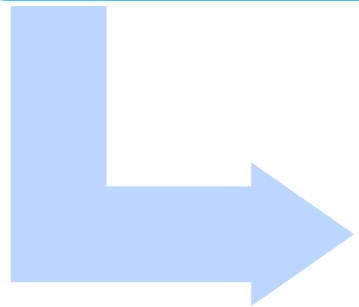
Formalise mapping methodology for CEHM

- Technical Methodology
- Standardised approach



National programme

- Starting in 2026
- Approximately 6,300km coast included
- All coast types

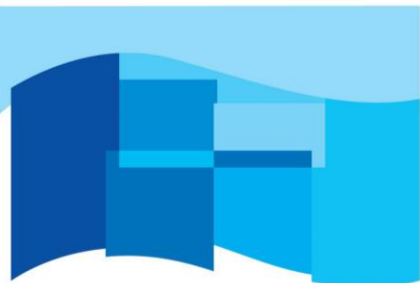


Follow on works

- National risk assessment
- Spatial planning guidelines
- Management Plans
- Next cycle of mapping



OPW



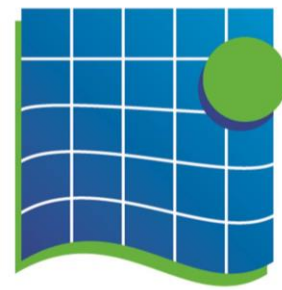
INFOMAR
Integrated Mapping for the Sustainable Development of Ireland's Marine Resource



Tailte Éireann



Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann



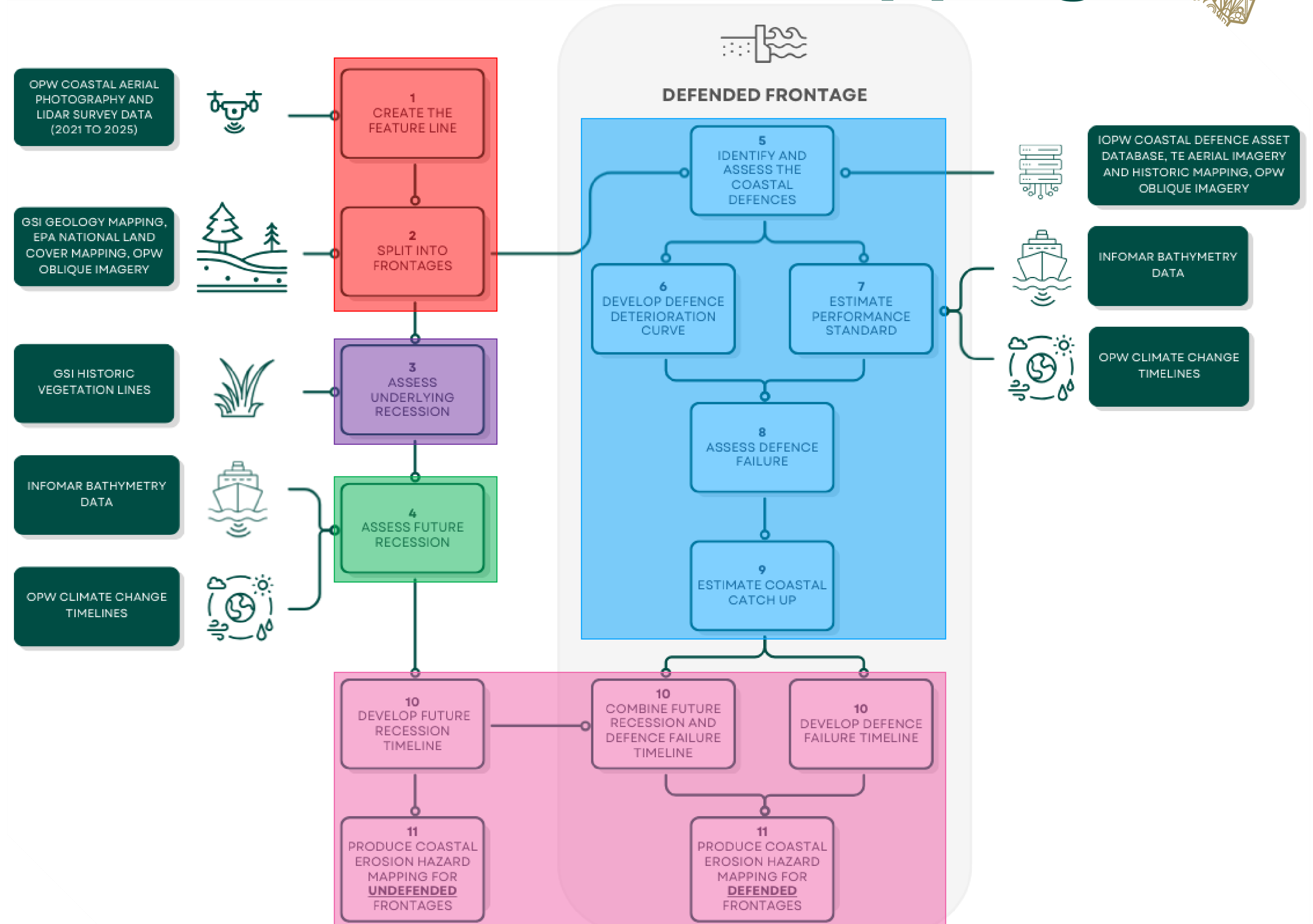
Foras na Mara
Marine Institute



National Coastal Erosion Hazard Mapping



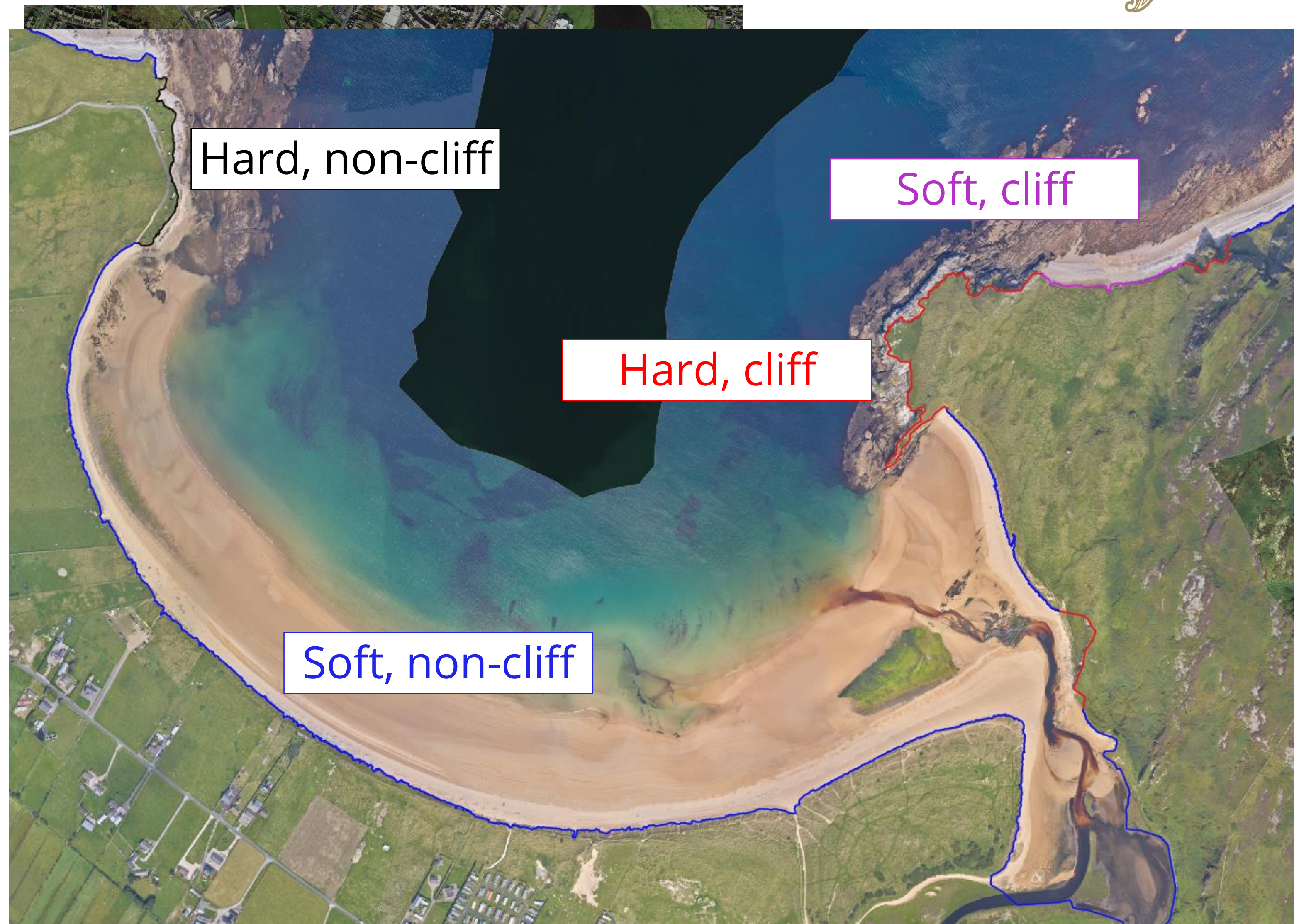
1. Coastal Feature Line and Frontages
2. Historic Coastal Change Assessment
3. Future Coastal Change Assessment
4. Manmade Coastal Defence Assessment
5. Future Coastal Change Timeline



Coastal Feature Line and Frontages



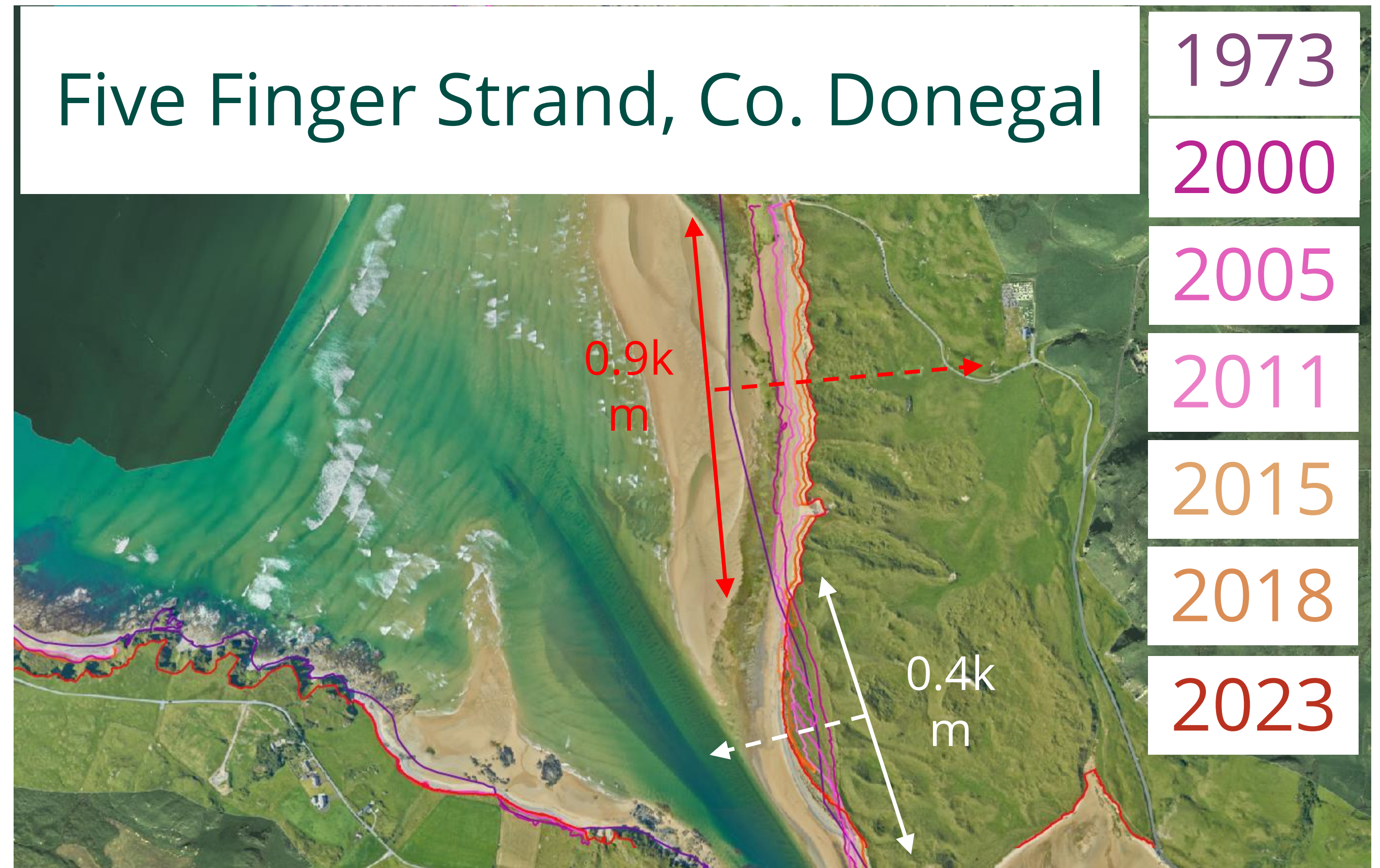
- Coastal 'feature' used as a proxy against which to measure coastal change
- 'Feature' varies depending on whether it is a cliff or non-cliff
- Split Coastal Feature Line into 'frontages' based on topography, hardness, orientation, and historic behaviour
- Each 'frontage' would be expected to behave in a similar way, so is assessed as one



Historic Coastal Change Assessment



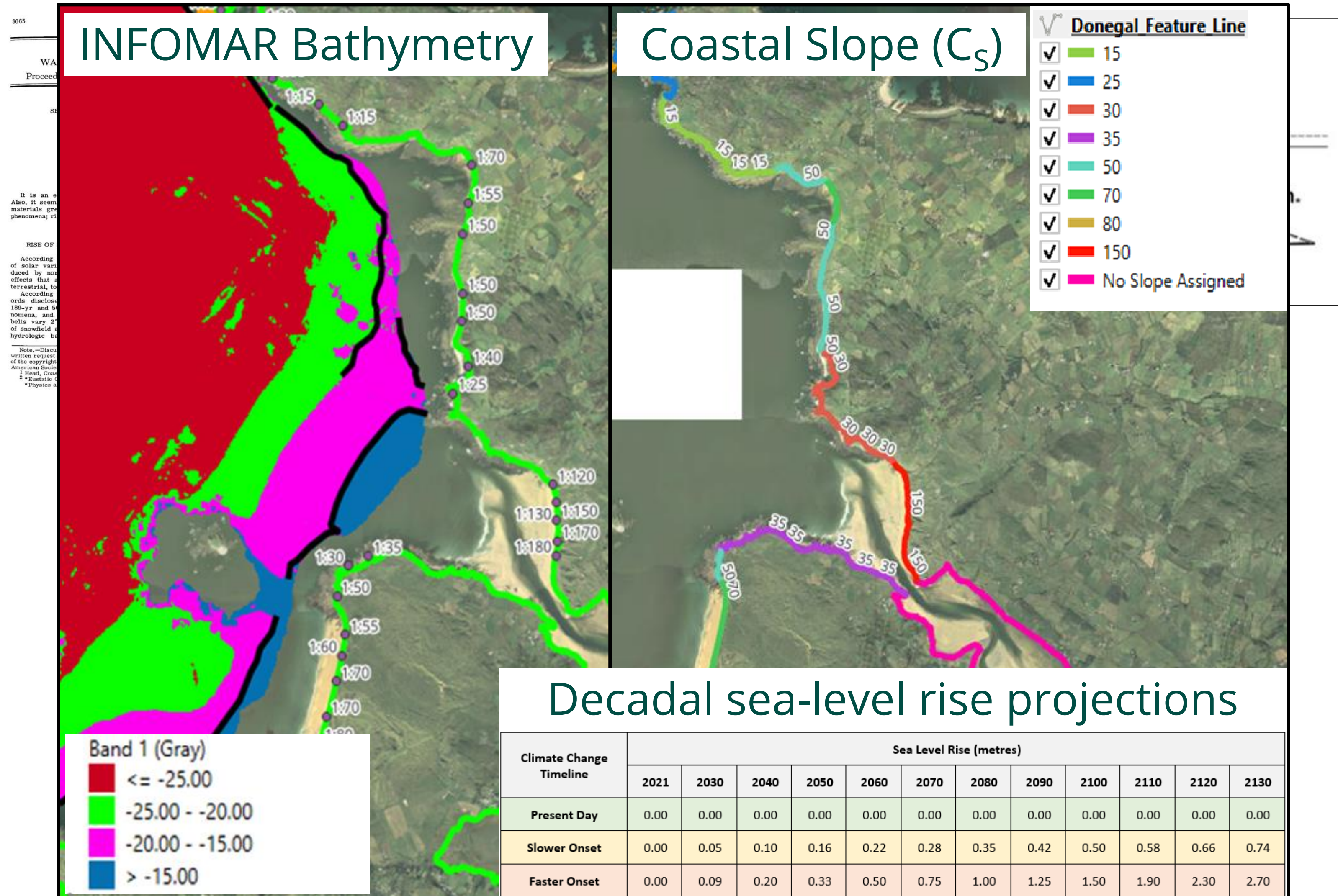
- Based on historic mapping and aerial imagery
- Determine a historic coastal change rate (metres per year)
- Spatial and temporal variation
- Long-term observations to inform long-term projections
- Make best use of what data we have



Future Coastal Change Assessment



- Based on established and widely used 'Bruun Rule' dating back to 1962
- Determine future coastal change rates (metres per year)
- Different rates for different climate change trajectories and time periods (due to SLR)
- INFOMAR bathymetry and sea-level rise projections for Ireland (EPA, 2023; Cámaro García et al, 2021) essential

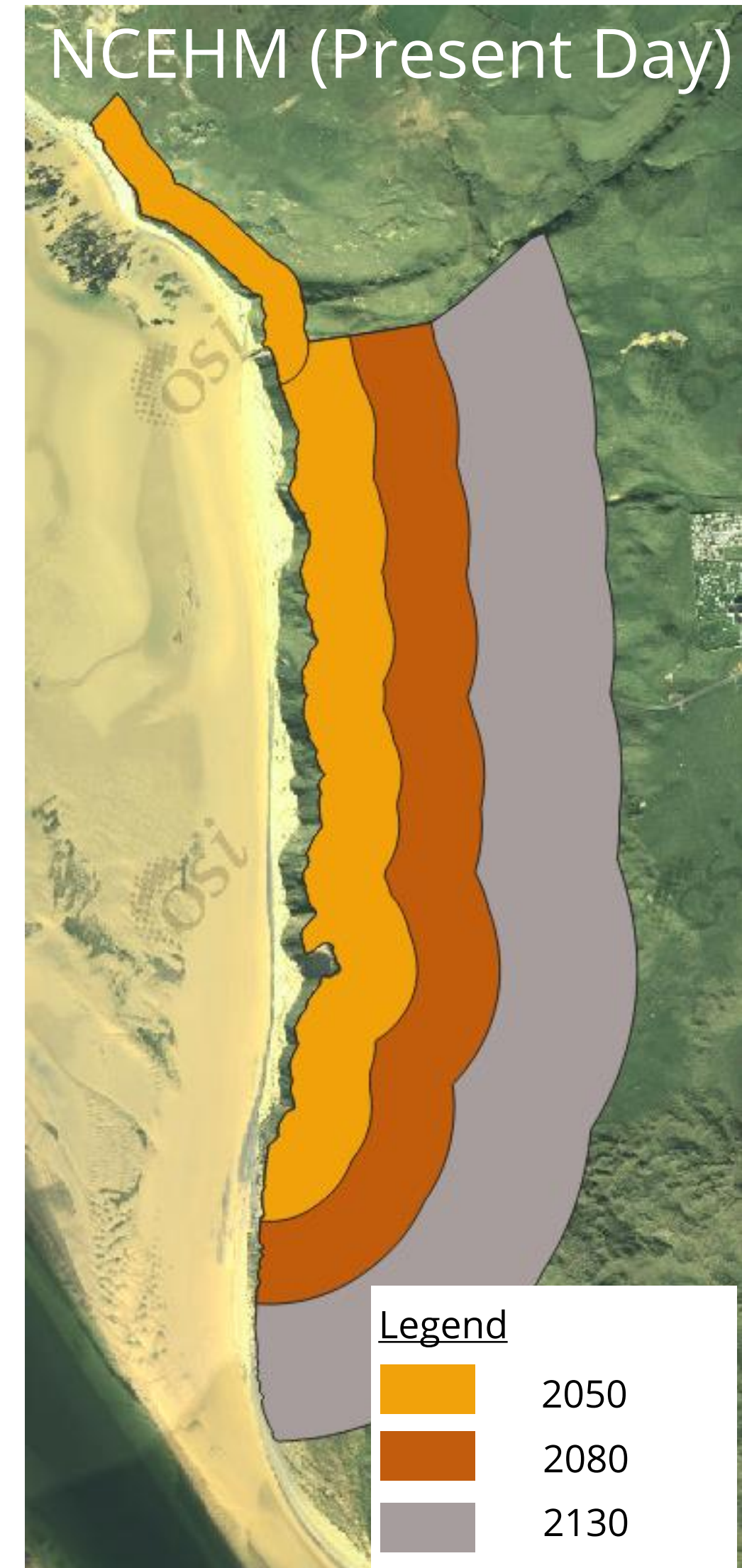
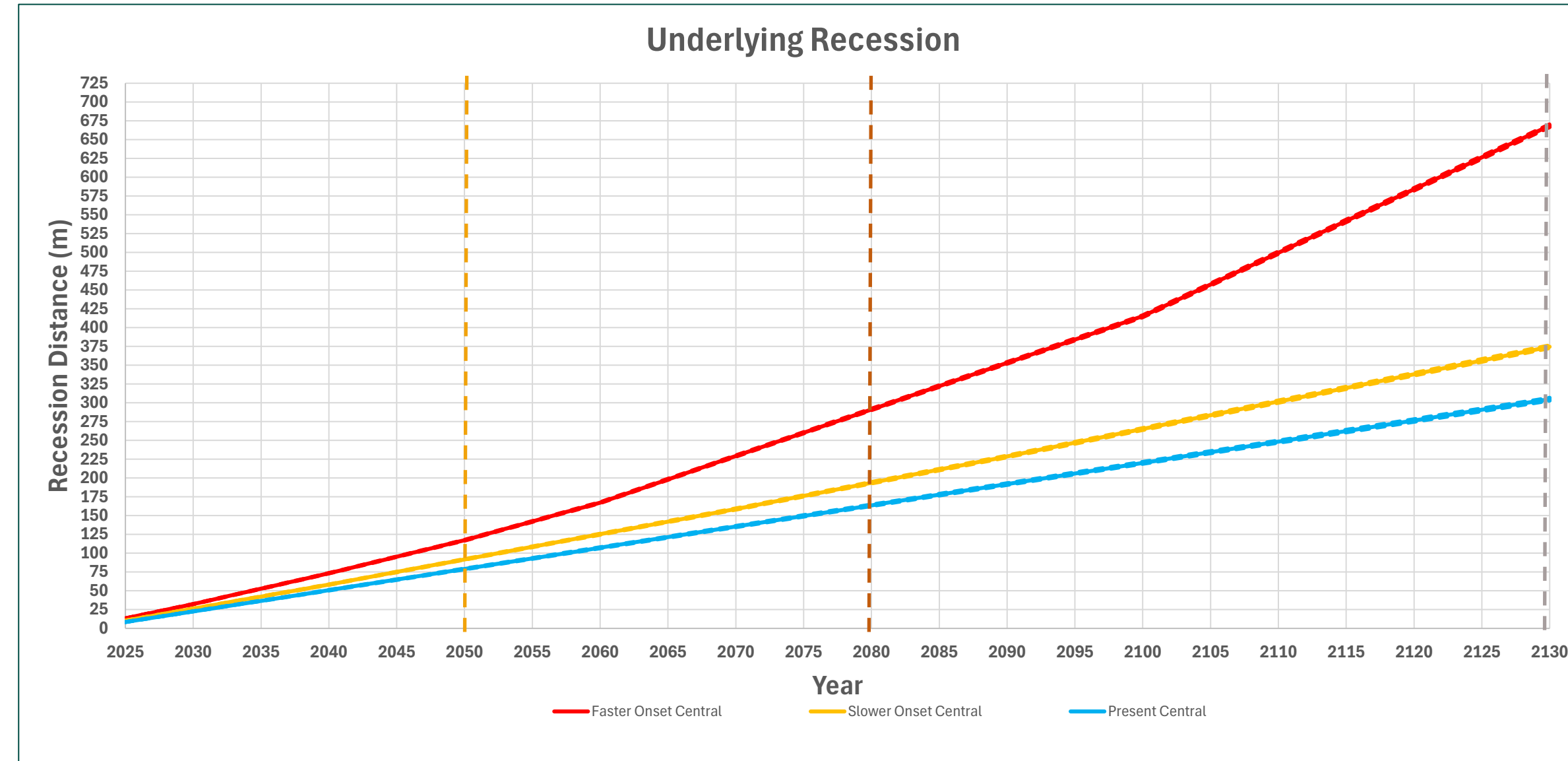


NCEHM Outputs (Undefended frontages)



Five Finger Stand, Co. Donegal

Historic coastal change rate = 2.82m/yr



	Present Day	Slower Onset	Faster Onset
2050	79.0m	91.7m	117.2m
2080	163.6m	193.6m	291.1m
2130	304.6m	374.3m	668.3m

Manmade Coastal Defence Assessment



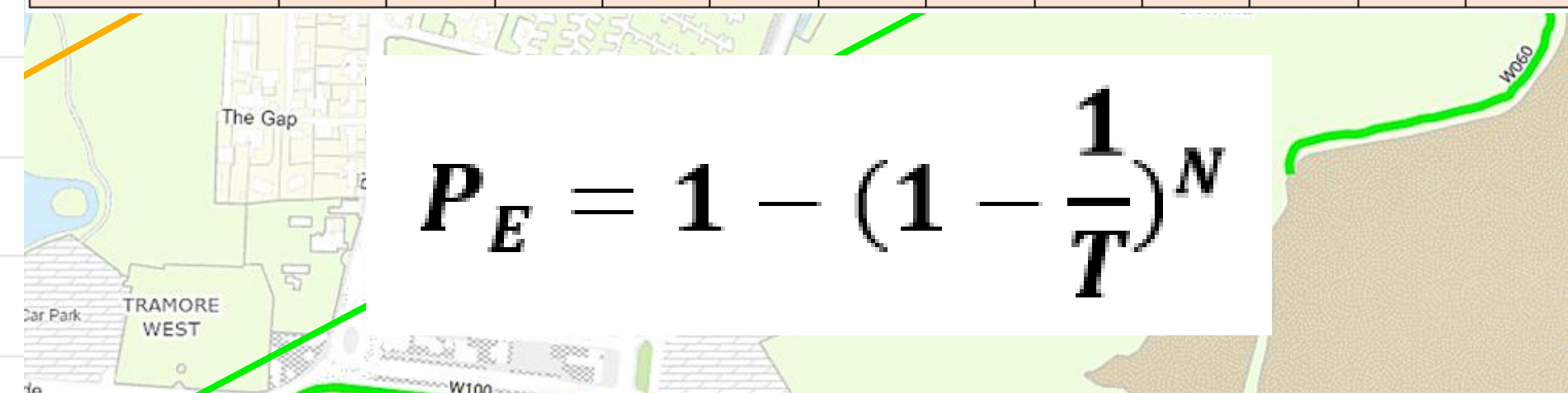
- New National Coastal Defence Asset Database (location, type, material, owner / maintainer)
- Oblique imagery to identify and evaluate assets at the coasts
- Assess defence deterioration under different management scenarios
- Assess probability of failure due to exceedance events
- High-resolution LiDAR essential



AEP	Scenario		
	Current	MRFS	HEFS
50%	2.26	2.76	3.26
20%	2.35	2.85	3.35
10%	2.42	2.92	3.42
5%	2.48	2.98	3.48
2%	2.57	3.07	3.57
1%	2.63	3.13	3.63
0.5%	2.70	3.20	3.70
0.1%	2.85	3.35	3.85

Decadal sea-level rise projections

Climate Change Timeline	Sea Level Rise (metres)											
	2021	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130
Present Day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Slower Onset	0.00	0.05	0.10	0.16	0.22	0.28	0.35	0.42	0.50	0.58	0.66	0.74
Faster Onset	0.00	0.09	0.20	0.33	0.50	0.75	1.00	1.25	1.50	1.90	2.30	2.70



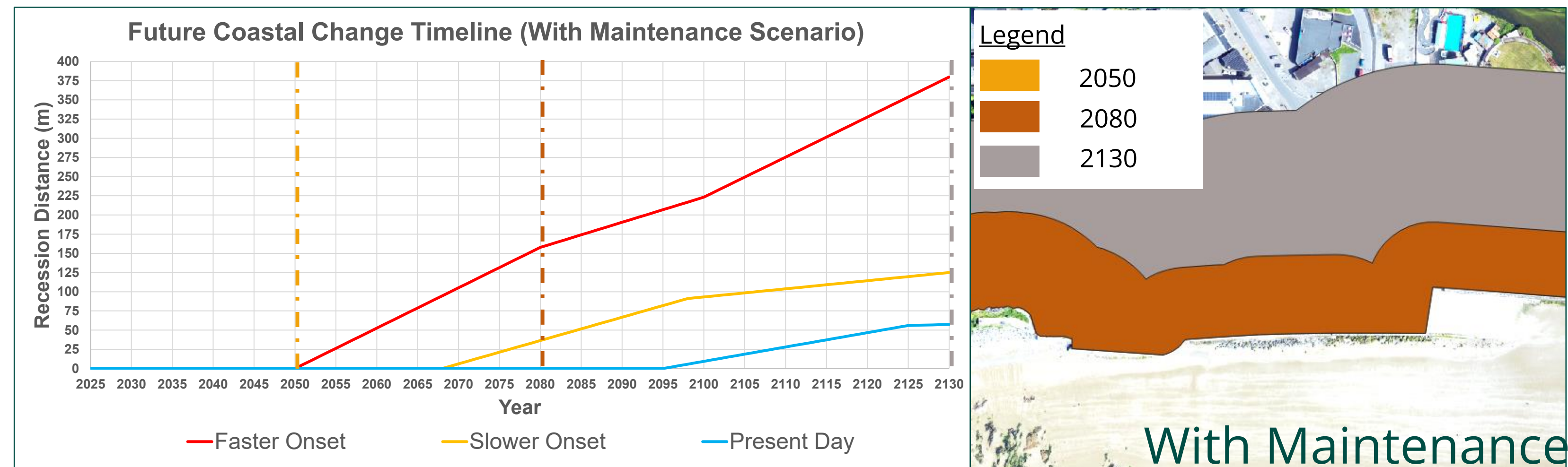
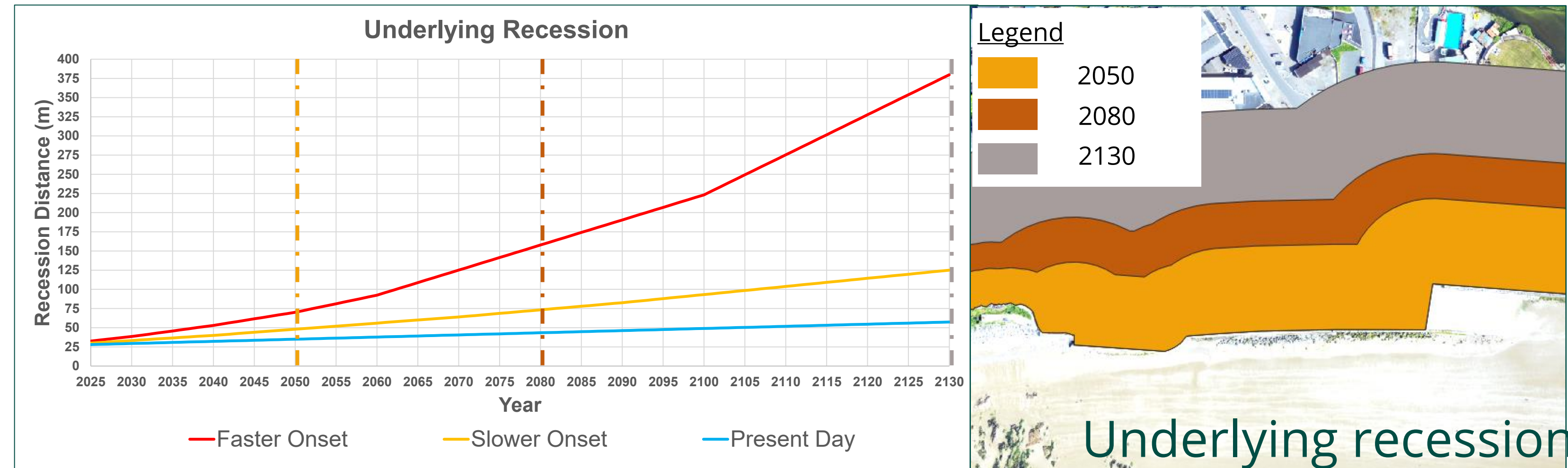
$$P_E = 1 - \left(1 - \frac{1}{T}\right)^N$$

$$P_E = 1 - \left(1 - \frac{1}{50}\right)^{15} = 0.26 \text{ (or 26\%)}$$

Future Coastal Change Timeline



- ‘Year of Defence Failure’ determined from Manmade Coastal Defence Assessment
- Combine with ‘Underlying Recession Timeline’
- Introduce ‘Coastal Catch Up’ phenomenon (Walkden, 2015) at ‘Year of Defence Failure’
- Extract ‘Total Recession Distance’ for defined Time Periods (e.g. 2080)



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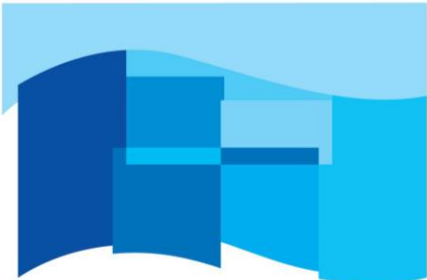
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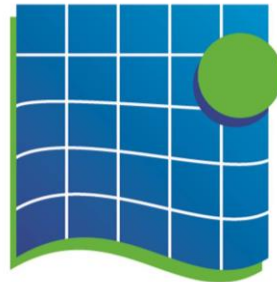
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Thank You