

Dynamic Coast Research Summary (2021)

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AIM

The Scottish Government's Dynamic Coast project aims to:

- Improve the evidence on coastal change;
- Improve the awareness of coastal change;
- Support decision-makers to ensure Scotland's coast and assets can adapt to our future climate.

DYNAMIC COAST RESEARCH QUESTIONS

1. How rapidly are Scotland's erodible shores changing and how might this change with increasing sea level?
2. What assets are at risk from erosion and erosion-enhanced flooding?
3. Where and when should the public and private sector focus action on resilience and adaptational planning?
4. What monitoring techniques can be deployed to better inform decision making nationally and locally?
5. Which sectors of Scotland's communities are at most risk from coastal erosion?

DYNAMIC COAST KEY RESULTS

National-level modelling of Scotland's wave-dominated soft coast reveals:

1. Coastal erosion currently affects 46% of soft shorelines (an increase from 38% over that reported in 2017). The increase in extent of eroding shoreline impacts on the average erosion rate of ca. 0.43 m/yr, a value lower than the 1m/yr previously reported.

2. The extent and rate of coastal erosion, and the risk to coastal assets, is expected to increase under all emissions scenarios. Under a High Emissions Scenario, 75% of soft coasts are expected to be eroding by 2050. Under a Low Emissions Scenario erosion extent, rates and risk are lower, but they remain significant.



The National Coastal Erosion Risk Assessment considers anticipated changes alongside asset locations. It reveals:

1. At least £ 20B of assets (road, rail & residential property) lie within 50 m of our coast. Of this £ 5B of assets are protected by artificial defences, whilst £ 14.5B are protected by natural defences.
2. Under a cautious risk assessment (where both artificial and natural defences aren't maintained) and a High Emissions future, an estimated £ 1.2B of assets may be at risk of erosion by 2050. Under a comparable Low Emissions future around £ 814M of assets may be at risk by 2050. An optimistic assessment (where artificial defences are assumed to be maintained) has also been carried out.
3. The avoided damage costs of a Low Emissions future compared with a High Emissions future is around £ 395M over the next 30 years.
4. Impacts are expected to occur initially through increased erosion and erosion enhanced flood impact, followed by storm damage & landslips.
5. Modelling suggests that the decade 2020s is when erosion first influences the majority of shores. The 2020s is also the decade where the highest proportion of inland low-lying coastal flood risk areas are at risk from erosion-enhanced flooding.

RECOMMENDATIONS

- Undertake adaptive shoreline management for all erodible shores with assets at risk now and in the future;
- Improve the quality, extent and frequency of coastal monitoring data;
- Cooperate with shared approaches to develop better short-term resilience measures and formulate long-term adaptation plans;
- Recognise the scale of change anticipated at the coast and empower the planning system to secure adequate accommodation space for the coast and its assets to relocate to risk-free sites where necessary;
- Recognise that maintaining natural coastal defences is a key element in resilience and adaptation strategies.

Published by CREW – Scotland's Centre of Expertise for Waters. CREW connects research and policy, delivering objective and robust research and expert opinion to support the development and implementation of water policy in Scotland. CREW is a partnership between the James Hutton Institute and all Scottish Higher Education Institutes and Research Institutes supported by MASTS. The Centre is funded by the Scottish Government.

Funded by CREW, NatureScot and the St Andrews Links Trust and delivered by the University of Glasgow.

