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Dynamic Coast - National Coastal Change Assessment: Recommendations

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National Coastal Change Assessment
Steering Committee

Recommendations

Dynamic Coast – Scotland's National Coastal Change Assessment

Executive Summary

- The NCCA seeks to address a gap in the national understanding of the resilience and vulnerability of Scotland's coastal assets. No organisation has an overarching view of the past and recent coastal changes affecting the country nor the implications for society's adjacent assets. Whilst some Local Authorities and advisors have a good understanding of some local areas, the lack of consistent national overview hinders strategic assessments and the implementation of numerous national and regional policies by the Scottish Government and its public bodies.
- The NCCA assessment is summarised in 20 reports supported by web-maps that allow public access to the evidence base (dynamiccoast.com) and allow inspection of the underlying data and trends. The source data is available to public sector organisations and should be used to support the delivery of relevant statutory duties, particularly for flood risk management and climate change adaptation planning. The NCCA does not take account any future management choices (improving resilience) or accelerating erosion due to climate change (increasing vulnerability).
- The NCCA evidence base supports the 18 recommendations list in this report, which if adopted, may promote a step-change within public sector adaptation planning for coastal erosion.
- A key recommendation is that coastal erosion and coastal flooding are not mutually exclusive and require joint strategic consideration.
- The wording in both the Flood Risk Management (FRM) Act and the Coast Protection Act 1949 (CPA) require adjustment to take into account the need for an integrated approach in the light of climate change impacts.
- Ownership of joint coastal erosion and flooding issues may be best delivered via identified "coastal champions" within each public sector organisation with a coastal remit.
- Develop a Scottish Coastal Adaptation Plan, in support of the Scottish Climate Change Adaptation Programme, together with associated funding to ensure its delivery.

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Disclaimer

The evidence presented within the National Coastal Change Assessment (NCCA) must not be used for any property level scale of investigations. Given the precision of the underlying data (including house location and roads etc.) the NCCA cannot be used to infer precise extents or timings of future erosion.

The likelihood of erosion occurring is difficult to predict given the probabilistic nature of storm events and their impact. The average erosion rates used in NCCA often contain very slow periods of limited change followed by large adjustments during storms. Together with other local uncertainties, not captured by the national level data used in NCCA, detailed local assessments are unreliable unless supported by supplementary detailed investigations.

The NCCA has used broad patterns to infer indicative regional and national level assessments to inform policy and guide follow-up investigations. Use of these data beyond national or regional levels is not advised and the Scottish Government cannot be held responsible for misuse of the data.

1.0 Introduction

This document summarises the recommendations arising from the National Coastal Change Assessment (NCCA). Whilst it can be read in isolation another 20 reports summarise the assessment and are available on dynamiccoast.com.

2.0 The current position reviewed

1. The NCCA has demonstrated the successful use of the MHWS line to show that substantial national coastal changes have occurred over the time periods which, if continued, will present future management challenges. When plotted against the coincident assets at the coast, these changes provide a novel and informative approach to appraise the individual and shared indicative risk across society's coastal assets.

2. The NCCA has demonstrated that since the 1970s some 12 % of soft coast across Scotland is eroding, 11 % accreting and 77 % stable (which may be a transition phase between accretion and erosion). There is much variety between cells, nevertheless all cells have seen a reduction in accretion, increases in stability and many east coast cells an increase in erosion.

3. In comparison with the period 1890-1970, the rates of erosion have increased.

4. Together, this suggests a shift in the overall status of Scottish beaches from a bias toward accretion and sediment surplus (MHWS advance) up to the 1970s, to a modern bias toward erosion and sediment deficit (MHWS retreat), with the lengths of accretion reducing by 27% and the rates of retreat doubling from 0.5 to 1m/yr.

5. Additional work remains to enhance the utility of the NCCA and this agrees with the ASC report on SCCAP progress (2016) who recommend ongoing support for NCCA to inform adaptation priorities.

6. It remains that the policy drivers available prior to SCCAP do not *require* adaptation to take place (CPA, SPP, FRMA) and that the only policies e*xpecting* adaptation within existing assets (SCCAP and Marine Plans) are relatively new and have yet to be widely implemented.

3.0 Recommendations

3.1 General Strategy and Collaboration

1. Coastal erosion is a shared problem and its solution needs to be shared across government, its public bodies, private sector, and communities.
2. Coastal erosion and coastal flooding are not mutually exclusive and need to be considered jointly. The wording in both the FRM Act and CPA 1949 require adjustment, particularly in the light of climate change, and a broader need for an integrated approach. We recommend the Scottish Government consider this and direct the public sector to take greater consideration of coastal erosion.
3. Whilst Scottish Government leadership is clear within the Climate Change Act and Scottish Climate Change Adaptation Programme, with explicit duties across the public sector, strategic ownership and resource throughout organisations is recommended to ensure delivery via identified senior "coastal champions" within each organisation.
4. Such an approach may find greater traction if contained within a Scottish Coastal Adaptation Plan, underpinned by NCCA data.
5. There is also an urgent need for the resources to make adaptation planning happen and provisioned to grow in the longer-term as the need increases. Establishment of a parallel fund to facilitate the relocational adaptation of erosion-impacted residents should be explored, urging society toward adaptive resilience ahead of climate change impacts.
6. An Adaptation Sub-Committee (ASC) report identifies a lack of (and implementation of) well-developed specific polices for large sections of the Scottish coast with no Shoreline Management Plan (SMP) (ASC, 2016). The NCCA can serve as a tool to develop targeted SMPs for only key vulnerable areas within a local authority's coast (rather than all of it) and this is a recommendation here.
7. ASC (2016) suggests the Scottish Government set a long-term target for intertidal habitat areas created through managed realignment and the appropriate policy mechanisms to deliver. We recommend that reliable implementation data is gathered and funding sources identified to support managed realignment for flood benefit.
8. SEPA's Flood Risk Management Strategies (FRMS) focus on reducing vulnerability on developed coast where most people and property occur and may underestimate the importance of stretches of Scotland's undeveloped coastline vulnerable to flooding. Whether this accentuates the urban-rural divide and contributes to social disadvantage is a moot point. We recommend research to establish whether linkages exist between social vulnerability and coastal erosion and coastal flooding vulnerability.
9. The NCCA outputs, together with flooding and topographic data, provide support for Section 19 of the Flood Risk Management (Scotland) Act and informs SEPA's assessment of the utility of natural coastal protection features. A strategic position paper on coastal Natural Flood Management is recommended, including consideration of the need to assess any funding bias toward hard solutions for highest value assets.
10. The currency of some OS data has been problematic for the NCCA: some OS MasterMap MHWS changes have not been updated since the 1970s and the line metadata fails to detail the survey date, limiting its utility for calculating dates, time periods and rates of change. If this continues, NCCA-type assessments will avoid modern OS data. A key recommendation is that OS enact improvements in the survey interval of MHWS and publish accurate and more informative metadata.

3.2 Within the NCCA: next phase

1. The NCCA at a national level informs multiple strands within the SCCAP (2014) and ASC Report (2016 b & c), enabling a step change in the evaluation of risk and resilience of society's coastal assets. It is recommended that the NCCA is used to assess local risk and resilience assessments by Local Authorities.
2. The NCCA has identified that data availability is key and analysis works well where data has been promptly shared. However, in some sections of the public sector, data provision falls short of the open data agenda and INSPIRE compliance, if not in letter but in spirit. We recommend that data gathered and funded by the public purse is freely available to allow data sharing across organisations and enable insights and efficiencies.
3. Most of the sites investigated by the NCCA rely on a two-dimensional time series analysis whilst coastal changes are three-dimensional (3-D). An upgrade to 3D time series would provide a step change in understanding the local coastal sediment budget and, crucially, identify areas of sediment loss and gains. Whole-coast acquisition of regularly updated 3D time series data (e.g. via airborne LiDAR) is recommended.
4. NCCA reliance on MHWS as the key nationally available dataset to identify coastal change falls short where very low gradients and dense vegetation occur and where the coastal edge has receded independent of MHWS (e.g. within cultural and natural heritage sites). We recommend research to better diagnose change within such situations using, for example, coastal vegetation datasets.
5. Post-NCCA we recommend work to identify a methodology to inform SEPA's National Flood Risk Assessments 2 with erosion-enhanced coastal flood risk. Merging SEPA's coastal flood risk maps with inland extents of land below MHWS would enable the resilience or vulnerability of natural defence features to be established and better inform risk to adjacent assets. Such work supports many stakeholders and SEPA's duties under Section 19 of the Flood Management Act, which states that SEPA must map artificial structures and natural features that if removed would significantly increase the risk of flooding from a body of surface water.
6. In support of Section 19 of the Flood Risk Management Act, the development of a national dataset for natural and artificial coastal flood/erosion defence structures is recommended (see Defence Asset Database NCCA Report 7).
7. It is recommended that the NCCA data be compared against datasets for Critical National Infrastructure, Ministry of Defence and Waste Water Network alongside any other new data to identify any other areas at risk in the future.
8. The NCCA did not consider climate change risk. Reduction in accretion (all cells) and increases of erosion (east coast), an anticipated 20-30% uplift required for future sea level rise (Met Office, 2017) and the effects on flood frequency, indicate an assessment of the impact of climate change on coastal erosion is overdue and recommended.

References

ASC. (2016). Adaptation Sub-Committee Report: Scottish Climate Change Adaptation Programme: An independent assessment for the Scottish Parliament, Committee on Climate Change, September, 2016.

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