# Irish Coastal Protection Strategy Study Phase 5 - North West Coast

## Work Packages 2, 3 & 4A - Appendix 4- Erosion Mapping

IBE0388/January 2014

# Office of Public Works

## Irish Coastal Protection Strategy Study - Phase 5

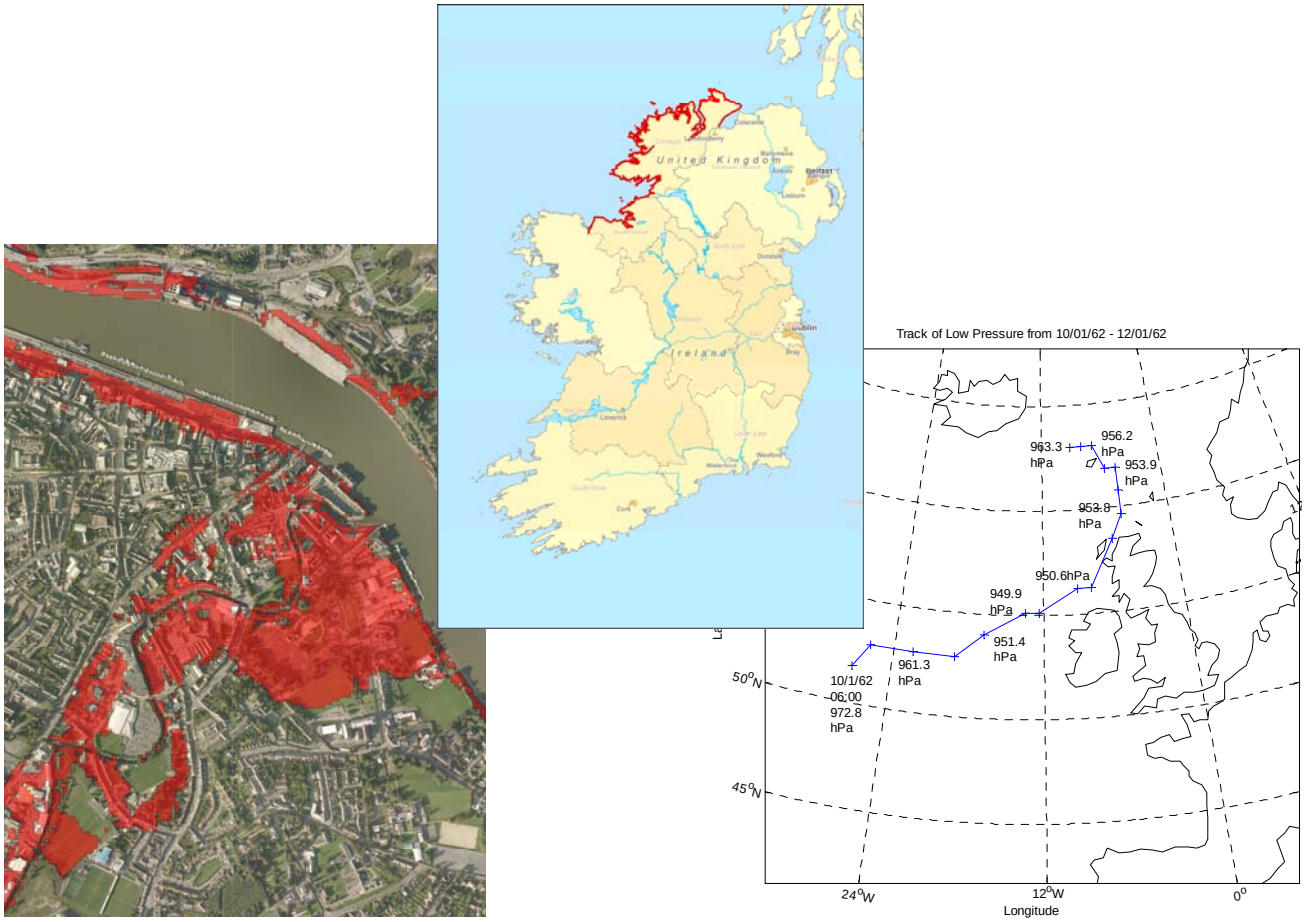
## Work Packages 2, 3 & 4A

## Strategic Assessment of Coastal Flooding and Erosion Extents

## North West Coast – Killala Bay to Lough Foyle

Appendix 4 - Erosion Mapping

January 2014



# Office of Public Works

# Irish Coastal Protection Strategy Study - Phase 5

# Work Packages 2, 3 & 4A

# Strategic Assessment of Coastal Flooding and Erosion Extents

# North West Coast – Killala Bay to Lough Foyle

Appendix 4 - Erosion Mapping

January 2014

## DOCUMENT CONTROL SHEET

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|---|---|---|---|---|---|---|
| Client | Office of Public Works | | | | | |
| Project Title | Irish Coastal Protection Strategy Study, Phase V, Work Package 2, 3, & 4A | | | | | |
| Document Title | Strategic Assessment of Coastal Flooding and Erosion Extents | | | | | |
| Document No. | IBE0388Rev01_APP4 | | | | | |
| This Document Comprises | DCS | TOC | Text | List of Tables | List of Figures | No. of Appendices |
| | 1 | - | 4 | - | - | 1 |

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# IMPORTANT DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE FOR EROSION MAPS

**Please read the disclaimer, guidance notes and conditions of use below carefully to avoid incorrect interpretation of the information and data provided on the maps contained in this volume. The maps must be used only in conjunction with these notes, and must not be used in isolation.**

## PURPOSE OF THE MAPS

The maps contained within this bound volume were prepared under the following project:

- ***Project Name: Irish Coastal Protection Strategy Study (ICPSS)***
- ***Project Period: 2006 – 2014***

The maps were prepared for the purpose of assessing the degree of erosion hazard and risk to assist in the identification and development of measures for managing the erosion risk. They may, however, also be of use to the public, Local Authorities and other parties as indicative maps of erosion-prone areas for a range of purposes, including raising awareness of erosion hazard and risk, assisting in planning and development decisions etc.

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# GUIDANCE NOTES

This bound volume contains two sets of erosion maps with the predicted future position of the coastline in 2030 and 2050 indicated. How these maps have been derived, and what they do and do not present, is described below.

## *Derivation of Maps*

The maps included within this bound volume are 'predictive' erosion maps, as they provide the future predicted position of the coastline, and are developed by various analyses as described below.

A comparison of the best available current and historical mapping and aerial photography was used to estimate the annual rate of change in the coastline position and hence to predict the likely future position of the coastline in the years 2030 and 2050. The rate of coastline change (annual erosion rate) for future years was assumed to be the same as in the past.

An erosion 'baseline' was derived from the visible vegetation line shown on the Ordnance Survey Ireland (OSi) year 2000 aerial photography, or where appropriate, the cliff top line, and this was used as the basis for generating the year 2030 and 2050 erosion maps.

In developing the erosion maps, the coast was divided into nominal lengths, typically 25m, and an annualised average rate of coastal retreat applicable to each sector established. The resulting preliminary erosion lines contained a number of steps, where the annualised rate of erosion derived from the comparison of aerial photographic series changed between adjacent sectors. These preliminary lines were subsequently reviewed by an experienced Coastal Engineer and the transitions between the various sectors modified based on an assessment of coastal form and underlying geology as derived from Geological Survey of Ireland (GSi) quaternary (subsoil) geological mapping.

The maps have been produced at a strategic level, and minor or local features may not have been included in their preparation. Therefore, the maps should not be used to assess the erosion hazard and risk associated with individual properties or point locations, or to replace a detailed local erosion hazard and risk assessment.

In contrast to the floodplain mapping, it was not possible to eliminate the effect of existing coastal defence structures from the erosion hazard and risk assessment. Consequently there will be areas where no erosion line is shown that are at risk from erosion, should the present defences fail or not be maintained in the future. Equally there may be an erosion line shown in areas that are now adequately defended by coastal protection structures that were introduced during or after the assessment period.

Detailed explanations of the methods of derivation, survey data used, etc. are provided in the relevant reports produced for the project under which the maps were prepared. **Users of the maps should familiarise themselves fully with the contents of these reports in advance of the use of the maps**.

### *Uncertainty*

Although great care and modern, widely-accepted best practice methods have been used to prepare the predictive erosion maps, there is a range of inherent uncertainties within the process of preparing these maps. These include:

- Uncertainty in the underlying geology and hence in the annual rate of coastal change
- Uncertainty in the protected status of the coast
- Uncertainty in the resolution of the assessment
- Uncertainty in the geographical accuracy of historical imagery (A principal source of inaccuracy in this analysis was the geo-referencing and rectification of historical aerial photography)

The erosion maps are therefore only indicative, and the potential for inaccuracy should be recognised if these maps are to be used for any purpose. Analysis of the confidence of the erosion lines or extents has not been undertaken for the south west, west or north west coastal areas.

### *Sets of Erosion Maps*

There are two sets of erosion maps presented, illustrating the estimated future position of the coastline in the years 2030 and 2050, together with the erosion baseline derived from the OSi aerial photography. These are displayed at a scale of 1:25,000 relative to OSi discovery series raster maps. Further details on these maps, including the methods of derivation, assumptions made, data used, etc. are provided in the relevant project reports.

Due to the various uncertainties within the process of preparing the maps (see 'Uncertainty' above), it is not possible to state that the maps are absolutely accurate.

### *Consideration of Projected Future Changes in Climate and Other Future Changes*

The erosion maps have been produced for existing conditions only and do not currently include for projected future changes in climate such as sea level rise, increased storm frequency or associated variations in erosion rates. Neither do they include for variations in erosion rates due to planned coastal protection or dredging works or other potential changes of a geological nature.

## CONDITIONS OF USE

Please read the following statements and conditions of use of the maps in this bound volume carefully. Use of these maps is conditional upon the following:-

The user of these maps shall be deemed to have agreed to, and unconditionally accepted all of these statements and conditions.

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## CONTACTS REGARDING MAP INFORMATION

Any user who has reason to believe that these maps contain an error, or who wishes to contribute additional information, is requested to contact the Office of Public Works Engineering Services Section at the following address:

Erosion Mapping Queries
Engineering Services
Office of Public Works
17-19 Lower Hatch Street
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