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SCAPE METADATA

The study from which this data was derived was funded through the *Adaption and Resilience of Coastal Energy Infrastructure* project (ARCoES) by the EPSRC (grant EP/I035390/1), via the University of Liverpool. The study also benefited greatly from the Defra/ Environment Agency Managed Research Programme project *Cliff and Shore Sensitivity to Accelerated Sea Level Rise* (EA project SC120017), which provided a numerical model, input data and most of the scripts used for pre and post processing.

This element of the ARCoES project was tasked with quantifying the sensitivity of the erosion of coastal cliffs in the Glamorgan/ West Somerset region of the Bristol Channel to a long term sea level rise trajectory (which was defined by Jevrejeva[1]). An existing 2D *Soft Cliff And Platform Erosion* (SCAPE[2]) numerical model was used to achieve this (which was provided by Defra / EA project SC120017). The Jevrejeva sea level rise trajectory was set as a model input and the model was run to 2500.

The outputs have been provided as a non-dimensional values of 'Recession Sensitivity Index' (ω), which is defined in the following way.

$$\omega = \frac{TS}{R_{20}}$$

Where T is time (in years) measured from a predefine baseline year (2013 in this analysis), S is recession distance and R_{20} is the average 20th Century recession rate. Estimating ω through model simulations therefore allows prediction of future recession distance at time T in the following way:

$$S = R_{20}T\omega$$

The numerical model was used to capture the dynamic response of the shore profile shape to the changing sea level. The results were expressed in this non-dimensional form so that they could then be applied to cliffs with different geologies (and different 20th Century retreat rates). The derived ω values might therefore be used to account for the effect of future sea level rise on shore recession rates for regions of coast with varying geological conditions. A more complete definition of the definition and purpose of ω is provided in the outputs of project SC120017[3].

The results (which were generated in late 2016/ early 2017) are provided in spreadsheet form. The owner of this data is Dr. Mike Walkden of WSP | Parsons Brinckerhoff (mike.walkden@gmail.com, mike.walkden@wspgroup.com).

References

[1]Jevrejeva, S., Moore, J.C. and Grinsted, A., 2012. Sea level projections to AD2500 with a new generation of climate change scenarios. *Global and Planetary Change*, *80*, pp.14-20.
[2]Walkden, M.J.A. and Hall, J.W., 2005. A predictive mesoscale model of the erosion and profile development of soft rock shores. *Coastal Engineering*, *52*(6), pp.535-563.
[3]Cliff and Shore Erosion under Accelerating Sea Level Rise: Scoping Report. Report for Defra/ Environment Agency Managed Research Programme project SC120017 (in press).

Title

Recession Sensitivity Indices

Software Format

Spreadsheet (.xlsx)

Keywords

Coastal recession, normalised, long term, sea level rise.

Creators

Mike Walkden (WSP | Parsons Brinckerhoff) and the University of Liverpool.

Legal, ethical, and access restrictions

Use of the data is not restricted, however the data is provided ‘as is’ without warranty of any form.

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Contact details for accessing the file

The data will be stored within the University of Liverpool data archive.

Field descriptors / column labels to explain data

The data structure is straightforward – values of ω for each decade. The results are presented in a simple table structure, with row headings.

Other information

The modelling tool (SCAPE) may be downloaded from the Channel Coastal Observatory (http://www.channelcoast.org/iCOASST/SCAPE/) or GitHub (https://github.com/).