



HAL
open science

10b History of cliff retreat : theory and example from the English Channel

Vincent Regard, Thomas Dewez, Didier Boulès, Anne Duperret, Stéphane Costa, Laëtitia Leanni, Eric Lasseur, Kevin Pedoja, Grégoire Maillet

► **To cite this version:**

Vincent Regard, Thomas Dewez, Didier Boulès, Anne Duperret, Stéphane Costa, et al.. 10b History of cliff retreat : theory and example from the English Channel. EGU General Assembly 2010, May 2010, Vienne, Austria. pp.4025-1. hal-00533845

HAL Id: hal-00533845

<https://brgm.hal.science/hal-00533845>

Submitted on 8 Nov 2010

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



^{10}Be history of cliff retreat: theory and example from the English Channel

Vincent Regard (1), Thomas Dewez (2), Didier Bourlès (3), Anne Duperret (4), Stéphane Costa (5), Laetitia Leanni (3), Eric Lasseur (2), Kevin Pedoja (6), and Grégoire Maillet (7)

(1) LMTG, Université Paul Sabatier, Toulouse, France (regard@lmtg.obs-mip.fr), (2) BRGM, Natural Risks Department, Orleans, France (t.dewez@brgm.fr), (3) CEREGE, Université Aix-Marseille, Aix-en-Provence, France, (4) LOMC, Université du Havre, Le Havre, France, (5) GEOPHEN, Université de Caen Basse Normandie, Caen, France, (6) M2C, Université de Caen Basse Normandie, Caen, France, (7) Fac. des Sciences, Université d'Angers, Angers, France

What if coastal cliffs recession rates could be measured 60 times further in time than with classical methods? Coastal cliff evolution prediction for the next century would then not be so much of a stretch. In this work, we present a new method based on measurements and modelling of ^{10}Be concentration transect across present-day shore platforms to establish the recession rate of coastal cliff for the last ca. 6000 years. The numerical model predicts the shape of ^{10}Be concentration transects to be expected as a function of a given cliff recession rate, vertical coastal platform down-wearing rate and assumed time of sea level reestablishment to present-day level since deglaciation. Two independent transect features serve to fit long-term recession rate model to field observations: a major ^{10}Be concentration drop is predicted where the cliff was abandoned for ca. 100k years, during the glacial period, and a characteristic dome shape directly related to the recession rate of the cliff.

A retreating cliff site from the English Channel coast of France at Mesnil Val serves as a demonstrator of this method. Retreat rates were too fast to pinpoint the predicted glacial cliff position but ^{10}Be concentrations sampled across the shore platform nevertheless indicate that the cliff retreat rate since the mid-late Holocene is comprised between 10-30 cm/yr, with a preferred value at 25 ± 5 cm, which turns out to be fully coherent with a 30-years-long assessment.