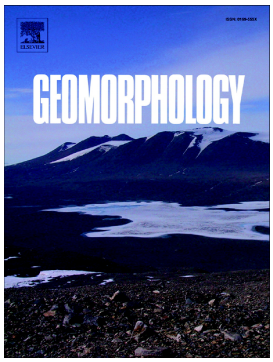
Accepted Manuscript



Innovative tidal notch detection using TLS and fuzzy logic: Implications for palaeo-shorelines from compressional (Crete) and extensional (Gulf of Corinth) tectonic settings

S. Schneiderwind, S.J. Boulton, I. Papanikolaou, K. Reicherter

PII: S0169-555X(16)30381-6
DOI: doi: 10.1016/j.geomorph.2017.01.028
Reference: GEOMOR 5905

To appear in: *Geomorphology*

Received date: 29 May 2016
Revised date: 10 January 2017
Accepted date: 22 January 2017

Please cite this article as: S. Schneiderwind, S.J. Boulton, I. Papanikolaou, K. Reicherter , Innovative tidal notch detection using TLS and fuzzy logic: Implications for palaeo-shorelines from compressional (Crete) and extensional (Gulf of Corinth) tectonic settings. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Geomor(2017), doi: 10.1016/j.geomorph.2017.01.028

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Innovative tidal notch detection using TLS and fuzzy logic: implications for palaeo-shorelines from compressional (Crete) and extensional (Gulf of Corinth) tectonic settings

Schneiderwind, S.[a,*], Boulton, S.J.[b], Papanikolaou, I.[c] and Reicherter, K.[a]

a) Institute of Neotectonics and Natural Hazards, RWTH Aachen University, Lochnerstraße 4-20, 52056 Aachen, Germany. Email: s.schneiderwind@nug.rwth-aachen.de
b) School of Geography, Earth and Environmental Sciences, Plymouth University, Plymouth, Devon PL4 8AA, UK.
c) Laboratory Mineralogy – Geology, Agricultural University of Athens, Iera Odos 75, 11855 Athens, Greece.

*Corresponding author. Tel: +49 (0) 241 80-95722; Fax: +49 (0) 241 80-92358.

E-mail address: s.schneiderwind@nug.rwth-aachen.de (S. Schneiderwind)

ACCEPTED MANUSCRIPT

Abstract

Tidal notches are a generally accepted sea-level marker and maintain particular interest for palaeoseismic studies since coastal seismic activity potentially displaces them from their genetic position. The result of subsequent seismic events is a notch sequence reflecting the cumulative coastal uplift. In order to evaluate preserved notch sequences, an innovative and interdisciplinary workflow is presented that accurately highlights evidence for palaeo-sea-level markers. The workflow uses data from terrestrial laser scanning and iteratively combines high-resolution curvature analysis, high performance edge detection, and feature extraction. Based on the assumptions that remnants, such as the roof of tidal notches, form convex patterns, edge detection is performed on principal curvature images. In addition, a standard algorithm is compared to edge detection results from a custom Fuzzy logic approach. The results pass through a Hough transform in order to extract continuous line features of an almost horizontal orientation. The workflow was initially developed on

Download English Version:

https://daneshyari.com/en/article/5780961

Download Persian Version:

https://daneshyari.com/article/5780961

Daneshyari.com