## **Accepted Manuscript**

Flood frequency analysis and generation of flood hazard indicator maps in a semi-arid environment, case of Ourika watershed (western High Atlas, Morocco)

Abdelhafid El Alaoui El Fels, Noureddine Alaa, Ali Bachnou, Said Rachidi

PII: S1464-343X(18)30036-0

DOI: 10.1016/j.jafrearsci.2018.02.004

Reference: AES 3136

To appear in: Journal of African Earth Sciences

Received Date: 2 February 2017
Revised Date: 8 February 2018
Accepted Date: 11 February 2018

Please cite this article as: El Fels, A.E.A., Alaa, N., Bachnou, A., Rachidi, S., Flood frequency analysis and generation of flood hazard indicator maps in a semi-arid environment, case of Ourika watershed (western High Atlas, Morocco), *Journal of African Earth Sciences* (2018), doi: 10.1016/j.jafrearsci.2018.02.004.

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

1	Flood frequency analysis and generation of flood hazard indicator maps in a semi-arid
2	environment, Case of Ourika watershed (Western High Atlas, Morocco)
3	Abdelhafid El Alaoui El Fels <sup>a*</sup> . Noureddine Alaa <sup>b</sup> .Ali Bachnou <sup>a</sup> . Said Rachidi <sup>c</sup> .
4	<sup>a</sup> Faculty of Sciences and Techniques of Marrakech, Laboratory Geo-Sciences and Environment, B.P.
5	549 Marrakech - Morocco, <u>elalaoui.abdelhafid@gmail.com</u> , <u>a.bachnou@uca.ma</u>
6	<sup>b</sup> Faculty of Sciences and Techniques of Marrakech, Laboratory of Applied Mathematics and
7	Computer Science, B.P. 549 Marrakech - Morocco, alaanoureddine@gmail.com
8	<sup>c</sup> Hydraulic Basin Agency of Tensift, B.P. 2388 Marrakech - Maroc, <u>rachidi@eau-tensift.net</u>
9	Abstract
10	The development of the statistical models and flood risk modeling approaches have seen remarkable
11	improvements in their productivities. Their application in arid and semi-arid regions, particularly in
12	developing countries, can be extremely useful for better assessment and planning of flood risk in
13	order to reduce the catastrophic impacts of this phenomenon.
14	This study focuses on the Setti Fadma region (Ourika basin, Morocco) which is potentially threatened
15	by floods and is subject to climatic and anthropogenic forcing. The study is based on two main axes:
16	(i) the extreme flow frequency analysis, using 12 probability laws adjusted by Maximum Likelihood
17	method and (ii) the generation of the flood risk indicator maps are based on the solution proposed
18	by the Nays2DFlood solver of the Hydrodynamic model of two-dimensional Saint-Venant equations.
19	The study is used as a spatial high-resolution digital model (Lidar) in order to get the nearest
20	hydrological simulation of the reality.
21	The results showed that the GEV is the most appropriate law of the extreme flows estimation for
22	different return periods. Taking into consideration the mapping of 100-year flood area, the study
23	revealed that the fluvial overflows extent towards the banks of Ourika and consequently, affects
24	some living areas, cultivated fields and the roads that connects the valley to the city of Marrakech.
25	The aim of this study is to propose new technics of the flood risk management allowing a better
26	planning of the flooded areas.
27	Keywords: flood, semi-arid, Frequency analysis, law, two-dimensional, risk.
28	Introduction
29	Floods are the most frequent natural climate hazards, the most damaging and the most deadly in the
30	world (Pulvirenti et al., 2011, Disaster, 2010). The economic losses resulting from major floods have

## Download English Version:

## https://daneshyari.com/en/article/8913525

Download Persian Version:

https://daneshyari.com/article/8913525

<u>Daneshyari.com</u>