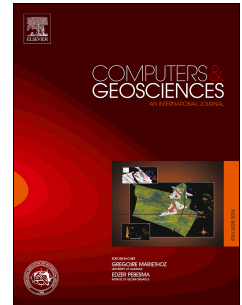


Accepted Manuscript

Forecasting of future earthquakes in the northeast region of India considering energy released concept

Amit Zarola, Arjun Sil



PII: S0098-3004(17)30600-3

DOI: [10.1016/j.cageo.2018.01.003](https://doi.org/10.1016/j.cageo.2018.01.003)

Reference: CAGEO 4076

To appear in: *Computers and Geosciences*

Received Date: 28 May 2017

Revised Date: 18 November 2017

Accepted Date: 5 January 2018

Please cite this article as: Zarola, A., Sil, A., Forecasting of future earthquakes in the northeast region of India considering energy released concept, *Computers and Geosciences* (2018), doi: 10.1016/j.cageo.2018.01.003.

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.

Forecasting of future earthquakes in the Northeast region of India considering energy released concept

Authors: **Amit Zarola and Arjun Sil**

Department of Civil Engineering, NIT Silchar, Assam, India, 788010

email: silarjun@gmail.com - correspondence email

ABSTRACT

This study presents the forecasting of time and magnitude size of the next earthquake in the northeast India, using four probability distribution models (Gamma, Lognormal, Weibull and Log-logistic) considering updated earthquake catalog of magnitude $M_w \geq 6.0$ that occurred from year 1737 to 2015 in the study area. On the basis of past seismicity of the region, two types of conditional probabilities have been estimated using their best fit model and respective model parameters. The first conditional probability is the probability of seismic energy ($e \cdot 10^{20}$ ergs), which is expected to release in the future earthquake, exceeding a certain level of seismic energy ($E \cdot 10^{20}$ ergs). And the second conditional probability is the probability of seismic energy ($a \cdot 10^{20}$ ergs/year), which is expected to release per year, exceeding a certain level of seismic energy per year ($A \cdot 10^{20}$ ergs/year). The logarithm likelihood functions ($\ln L$) were also estimated for all four probability distribution models. A higher value of $\ln L$ suggests a better model and a lower value shows a worse model. The time of the future earthquake is forecasted by dividing the total seismic energy expected to release in the future earthquake with the total seismic energy expected to release per year. The epicentre of recently occurred 4 January 2016 Manipur earthquake (M 6.7), 13 April 2016 Myanmar earthquake (M 6.9) and the 24 August 2016 Myanmar earthquake (M 6.8) are located in zone Z.12, zone Z.16 and zone Z.15, respectively and that are the identified seismic source zones in the study area which show that the proposed techniques and models yield good forecasting accuracy.

Keywords: Forecasting, Seismicity, Seismic Energy, Seismic source, Conditional Probability, Probability Distribution Models.

1. INTRODUCTION

The earthquake forecasting gives the probability of time, location and magnitude of occurrence of next earthquake which is necessary to understand the seismic hazard of any region (**Parvez and Ram, 1997**). An earthquake is the most precarious natural hazard that

Download English Version:

<https://daneshyari.com/en/article/6922187>

Download Persian Version:

<https://daneshyari.com/article/6922187>

[Daneshyari.com](https://daneshyari.com)