

This work was written as part of one of the author's official duties as an Employee of the United States Government and is therefore a work of the United States Government. In accordance with 17 U.S.C. 105, no copyright protection is available for such works under U.S. Law.

Public Domain Mark 1.0

<https://creativecommons.org/publicdomain/mark/1.0/>

Access to this work was provided by the University of Maryland, Baltimore County (UMBC) ScholarWorks@UMBC digital repository on the Maryland Shared Open Access (MD-SOAR) platform.

**Please provide feedback**

Please support the ScholarWorks@UMBC repository by emailing [scholarworks-group@umbc.edu](mailto:scholarworks-group@umbc.edu) and telling us what having access to this work means to you and why it's important to you. Thank you.

EGU22-9075

<https://doi.org/10.5194/egusphere-egu22-9075>

EGU General Assembly 2022

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Assessing the viability of using CHIRPS-GEFS for landslide forecasting in the Lower Mekong Region

Miguel Laverde-Barajas<sup>1,2</sup>, **Sana khan**<sup>3,4</sup>, Dalia Kirschbaum<sup>4</sup>, Thomas Stanley<sup>4,5</sup>, Chinaporn Meechaiya<sup>1,2</sup>, Susantha Jayasinghe<sup>1,2</sup>, and Peeranan Towashiraporn<sup>1,2</sup>

<sup>1</sup>Asian Disaster Preparedness Center/SERVIR-Mekong, Geospatial department, Bangkok, Thailand (m.laverde@unesco-ihp.org)

<sup>2</sup>SERVIR-Mekong, SM Tower, 24th Floor, 979/69 Paholyothin Road, Samsen Nai Phayathai, Bangkok 10400, Thailand

<sup>3</sup>Earth System Science Interdisciplinary Center, University of Maryland, College Park, MD, United States

<sup>4</sup>Hydrological Sciences Laboratory, NASA Goddard Space Flight Center, Greenbelt, MD, United States

<sup>5</sup>GESTAR II, University of Maryland Baltimore County, Baltimore, MD, United States.

The Lower Mekong region is particularly prone to natural hazards caused by extreme rainfall. During monsoon seasons from June to October, heavy rainfall triggers severe flash floods and landslides, posing a threat to human lives and livelihoods. Global forecast products struggle to provide reliable estimates of extreme rainfall at regional scale, which is a big challenge in their integration in early warning systems. A newly released version of Climate Hazards Center InfraRed Precipitation with Stations (CHIRPS) Global Ensemble Forecast System (GEFS) dataset is a bias-corrected and downscaled product derived from **National Centers for Environmental Prediction (NCEP)**-GEFS. CHIRPS-GEFS product provides up to 16 days of rainfall forecasts at 5km/daily spatio/temporal resolution. This study evaluates the spatial and temporal performance of the CHIRPS-GEFS for extreme precipitation in the Lower Mekong region during monsoon seasons from 2014 to 2019. Rainfall forecasts from 1 to 5-days lead-time are analyzed against the bias-corrected Integrated Multi-satellite Retrievals for GPM (IMERG) over the lower Mekong region. The performance is assessed using both categorical and continuous statistics such as the probability of detection, false alarm ratio, critical success index, correlation coefficient, and root mean squared error. Results describe the spatial and temporal strengths and limitations of the CHIRPS-GEFS and the influence of geomorphological conditions on its performance. This analysis provides valuable information on CHIRPS-GEFS possible integration in the lower Mekong landslide forecasting model for region-based landslide hazard assessment and situational awareness (LHASA) along the lines of the global LHASA framework.