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Insights on a global Extreme Rainfall Detection System

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Brief overview of

Insights on a global Extreme Rainfall Detection System

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The Extreme Rainfall Detection System (ERDS) is an early warning system (EWS) developed for the monitoring and forecasting of rainfall events on a global scale. Within ERDS the near real-time rainfall monitoring is performed using the Global Precipitation Measurement (GPM) data, while rainfall forecasts are provided by the Global Forecast System (GFS) model. Rainfall depths determined on the basis of these data are then compared with a set of rainfall thresholds to evaluate the presence of heavy rainfall events: in places where the rainfall depth is higher than a rainfall threshold, an alert of a severe rainfall event is issued. The information provided by ERDS is accessible through a WebGIS application (http://erds.ithacaweb.org) in the form of maps of rainfall depths and related alerts to provide immediate and intuitive information also for nonspecialized users.

The chapter is structured as follow.

Section 4.1 reviews some of the most relevant satellite-based early warning systems.

Section 4.2 describes the main input data used by ERDS. Section 4.2.1 reviews the GPM data, while Section 4.2.2 brefly describes the GFS model.

Section 4.3 describes the extreme rainfall detection methodology currently implemented in ERDS.

Section 4.4 contains several case studies, as the 2019 Queensland (Australia) flood event, the 2017 Atlantic hurricane season and the 2017 Eastern Pacific hurricane season. These case studies are included to highlight the strengths and weaknesses of this EWS based on global-scale rainfall datasets.

Section 4.5 concludes the chapter.