Extreme Rainfall Detection System (ERDS)

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1. ITHACA Overview
INFORMATION TECHNOLOGY FOR HUMANITARIAN ASSISTANCE, COOPERATION AND ACTION

Non-profit association
Provide scientific analysis and services to the WFP and the broader humanitarian community in support of environmental emergencies for disaster preparedness and response.

1. remote sensing
2. hydrology
3. meteorology
4. cartography
5. GIS
2. ERDS Aim and Datasets
Meteorological hazards are increasing in frequency and in damage potential.

Monitoring and forecasting of severe weather events allow more effective emergency preparedness and response.

Early Warning Systems are not often publicly available especially in developing countries.
The Extreme Rainfall Detection System (ERDS) is a service aimed at providing timely and easy to understand alerts related to exceptional rainfalls and potential flood events at global scale.

### INPUT DATA

1. Tropical Rainfall Measuring Mission (TRMM) Multisatellite Precipitation Analysis (TMPA) necessary for the near-real time detection of heavy rainfall (0.25° spatial resolution)

2. NOAA-GFS (Global Forecast System) deterministic model necessary for forecasted precipitation alerts (0.5° spatial resolution)

### OPEN SOURCE DATA
ELABORATION

Automatic procedure for the:

1. calculation of **accumulated rainfall**
2. correction of **rainfall thresholds** with **climatological coefficients**
3. identification of **alerts** using climatological rainfall thresholds
4. dissemination of alerts through an **open-source WebGIS** application
Alert Layers:

near-real time and forecasting alerts.

Dynamic table showing affected countries and affected population, which is automatically updated in accordance with the selected Alert Layer. Countries are ordered from the most affected to the less affected (in terms of population).

Three different alert levels can be visualized, based on a specific cumulated rainfall threshold, defined as the amount of precipitation for a given duration over a specific climatic area.

http://erds2.ithacaweb.org/
3. ERDS Live demo

ERDS application:
http://erds2.ithacaweb.org/
Heavy rainfall over south-western Turkey

Isolated but heavy thunderstorms over central Ethiopia and southern Somalia

Rainfall brought by TD ZORAIDA
Low to moderate alerts over south-western Turkey due to past 24h rainfall

Low to moderate alerts over central Ethiopia and southern Somalia due to past 24h rainfall

Moderate to heavy alerts over south-eastern Vietnam due to past 24h rainfall
ERDS AS OF 15/11/2013

No specific issues based on 7 days accumulated rainfall

TRMM 7 days heavy rainfall alerts

No specific issues based on 7 days accumulated rainfall

Moderate to heavy alerts over northern and eastern Somalia due to effects of Cyclone THREE
GFS 24h forecasted rainfall alerts

24h forecasted rainfall alerts due to TD ZORAIDA

Moderate to heavy showers/thunderstorms over central Ethiopia
GFS 3 days forecasted rainfall alerts

3 days forecasted rainfall alerts due to TD ZORAIDA

Low risk of heavy rainfall over central Ethiopia during following 3 days
Low risk of heavy rainfall over central Ethiopia during following 6 days
4. Case studies
October 9, 2013  GFS Forecasted accumulated rainfall for the next 6 days

Following layers have been downloaded from ERDS web-site as shape-files:

-24h GFS forecast
-24h GFS alerts
-3 days GFS alerts
-6 days GFS alerts
October 10, 2013 Alert map by administrative districts

Making an INTERSECTION of downloaded shape-files with administrative districts layers a warning map has been produced and disseminated to end-users
The same procedure has been applied on October 11th producing a warning map based on 3 days accumulated GFS alerts. Also the track of the cyclone, downloaded from JTWC, has been superposed to the alerted districts.
2. MOZAMBIQUE (14 - 23 January 2013)

✓ Flood event: 14-23 January 2013

✓ Analysis of archived TRMM and GFS cumulated rainfall

✓ Aggregation of near-real time and forecasted rainfall over the same areas

✓ Effective alert dissemination using reference data-sets
Aggregation of near-real time and forecasted rainfall over the same areas.

Near-real time alerts

Forecasted alerts

Integration of alerts: persistency of rainfall assessment
2. MOZAMBIQUE (14 - 23 January 2013)

MAGNITUDE AND VULNERABILITY ASSESSMENT

Providing analysis capabilities for the event magnitude and vulnerability assessment.
3. SOMALIA – Analysis of Tropical Cyclone THREE

November 9, 2013
Alerts for the next 24h
3. SOMALIA – Analysis of Tropical Cyclone THREE

November 9, 2013
Alerts for the next 24h

Alerts for next 3 days
3. SOMALIA – Analysis of Tropical Cyclone THREE

November 11, 2013
5. ERDS operational application
Thanks to ERDS further collaborators:

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**Federico Cuatto** - ERDS development support

**Andrea Ajmar** – Database administrator

**Walther Camaro** – Data analyst

... and thank you for your attention!

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ERDS application: 