AMMA-ALMIP-MEM project
soil moisture & µwaves Tb

P. de Rosnay, A. Boone, M. Drusch, T. Holmes, G. Balsamo, many others ALMIPers

(paper submitted to IGARSS)

• AMMA-ALMIP-MEM first spatial verification of SM/Tbs C-band

AMSRe-E
C-band
Tb

HTESSEL

Fig. 2. Time-latitude diagram of the horizontally polarized brightness temperature (K) observed by AMSR-E and simulated by ALMIP-MEM. Time axis is in Day of Year. For each ALMIP-MEM simulation a bias correction was applied, specifically computed for each LSM when comparing simulated and observed brightness temperature.

Result: HTESSEL+CMEM is un-biased and reproduces satellite obs. statistics!

Question: What happens in HTESSEL that deteriorates correlation?
EARLY FLOOD WARNING IN AFRICA: RESULTS OF A FEASIBILITY STUDIES IN THE JUBA, SHABELLE AND ZAMBEZI RIVERS IN AFRICA

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(1) Land Management and Natural Hazards Unit, Institute for Environment and Sustainability
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European Flood Alert System (EFAS)

Added value information for Member States towards preparedness for flood events 3-10 days in advance

Development:
- JRC since 2003 (following major transnational floods in Europe)

Support:
- DG Env, DG Enterprise,
- European Parliament,
- Member States
- Int. River Commissions
Schematic view of EFAS

INPUT

EU FLOOD GIS
Realtime data

Historical data

Static data

Europ. data

Meteo Forecasts

Expert knowledge from MS

EFAS reports
Pilot study:

Transfer of EFAS methodologies to Africa

• different climatic forcing: large scale, long durations

• little data and catchment descriptions

• Two pilots: Juba-Shabelle and Zambezi river basins

• joined projects with Washington State University (Zambezi) and Somalia Water and Land Information Management (Juba-Shabelle)
Juba-Shabelle River Basin

- shared between Ethiopia and Somalia
- 783000 km²
- Altitudes range from 3000 m to sea level
- mainly natural vegetation such as riparian forest, bush lands and grasslands, but also swamps
- in collaboration with Somalia Water and Land Information Management (SWALIM)
Setting up pilot basins for Africa

• Topography, soil and land use data available at JRC African Observatory

• River flow data obtained from Global Runoff Data Centre (GRDC/WMO) and African partners, e.g. SWALIM

• Weather *observations* (station and satellite data) from WMO, Washington State University, ECMWF (European Centre for Medium-range Weather Forecasts), and other sources

• Weather *forecasts*: ECMWF archived forecasts and re-forecasts for 2 events with state-of-the-art model
Climate in Juba/Shabelle

2 rain seasons

2 dry seasons
Long term High and low river levels

Bankful level

Belet Weyne 1981
Historical flood years

Long-term mean flows for upstream and downstream stations

Flow reduction from upstream to downstream: over bank spillage and irrigation diversion -> tuning of hydrological model necessary
VAREPS ensembles are being run for the period 15 Feb to 15 Apr 1978 (19 cases have been completed). These forecasts are run in the operational configuration, with model cycle 33r1. ICs are defined by ERA-40. Initial perturbations are scaled larger ($\gamma=0.020$ instead of 0.014) than in the operational EPS to take into account the fact that ERA-40 T159 analyses are less accurate than operational T799L91 analyses.

These plots show the 19-case average error of the ensemble-mean (blue with symbols) and the std (blue) for T850 over NH (left), Europe (middle) and North-west Africa ($12.5S\leq \lambda \leq 35N$, $-22.5^{\circ} \leq \Theta \leq 12.5^{\circ}$, left).
Preliminary results for Shabelle (Belet Weyne)

Observations exceed critical threshold

Simulations exceed critical threshold
Preliminary results for Juba (Luuq)

Observations exceed critical threshold

Simulations exceed critical threshold
Summary

- European Flood Alert System (EFAS) methodologies currently tested for African basins (Zambezi and Juba-Shabelle)
- Challenge to collect data for set-up, testing and verification
- First results show that
  - observed meteorological fields have much uncertainty
  - weather forecasts for historic events have limited skills
  - data collection is a challenge
  - flood events can be depicted by the simulations
- Successful set-up can be used for climate change studies
For more information:

http://natural-hazards.jrc.it

http://efas.jrc.it

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