Joining forces for food security – Linking earth observation and crowd-sourcing

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Outline

- The User Perspective
- Soil Moisture vs. Droughts/Food Insecurity
- POETS (Python Earth Observation Tools)
- The Role of Mobile Applications
- Conclusion

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Exosphere	Estimation of root-zone soil moisture, Data assimilation, etc.
Thermosphere	Microwave Remote Sensing (of Soil Moisture)
Mesosphere	Remote Sensing
Stratosphere	? ? ? ? ? ? ?
Trophosphere	Google Maps, etc.

Traditional Decision-Making of Aid Organizations

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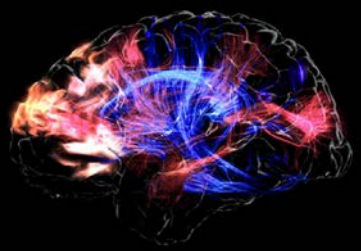
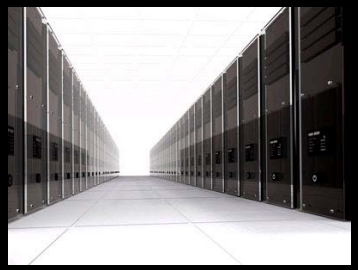
Droughts vs. Food Security

- Most complex of all natural disasters; Slow-onset
- No general definition of drought
- No physically measurable variable
- Two different fields of research (no “IPCC” for food security)
- Large gap between scientific findings and decision-making
- Satellite technologies (soil moisture) far from complete exploitation

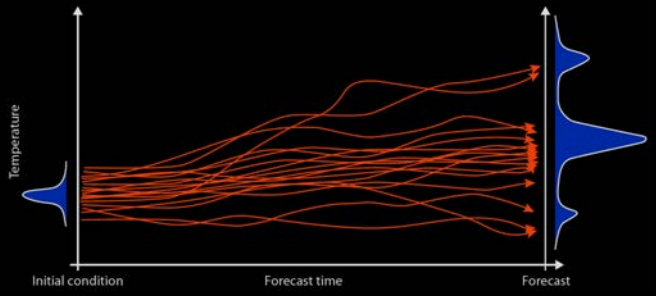
The Issue of Drought Management





Past

Future



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SATIDA

(Satellite Technologies for Improved Drought Risk Assessment)

In a nutshell:

- 18 months; Funded by the Austrian Research Promotion Agency
- Collaboration of researchers from different disciplines + MSF
- Main objective: Test and visualize the added-value of satellite-derived datasets and seasonal forecasts
- Link drought risk to socio-economic vulnerability via mobile applications (smart phones, tablets)
- www.satida.net

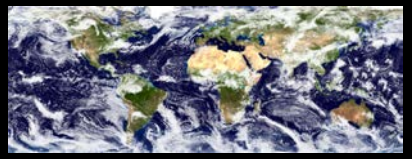
International Institute for Applied Systems Analysis

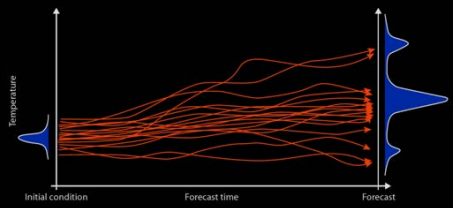
MEDECINS SANS FRONTIERES DOCTORS WITHOUT BORDERS

TU WIEN GEO VIENNA UNIVERSITY OF TECHNOLOGY DEPARTMENT OF GEODESY AND GEOINFORMATION RESEARCH GROUPS PHOTOGRAMMETRY & REMOTE SENSING

ZAMG

BOKU





Environmental Anomalies

Precipitation

Temperature

Vegetation

Soil Moisture

Combined Drought Index (decadal, 10 km)

DATABASE (POETS)

Assessment of Exposure/ Validation of the CDI

Collect Information

Smartphone Application

Access Data

Identify Time Lag between Precipitation, Temperature, Soil Moisture and Vegetation

Calibrate seasonal Forecasts

Estimate Future Vegetation Status; Quantify Uncertainties in seasonal Forecasts

Future Drought Risk

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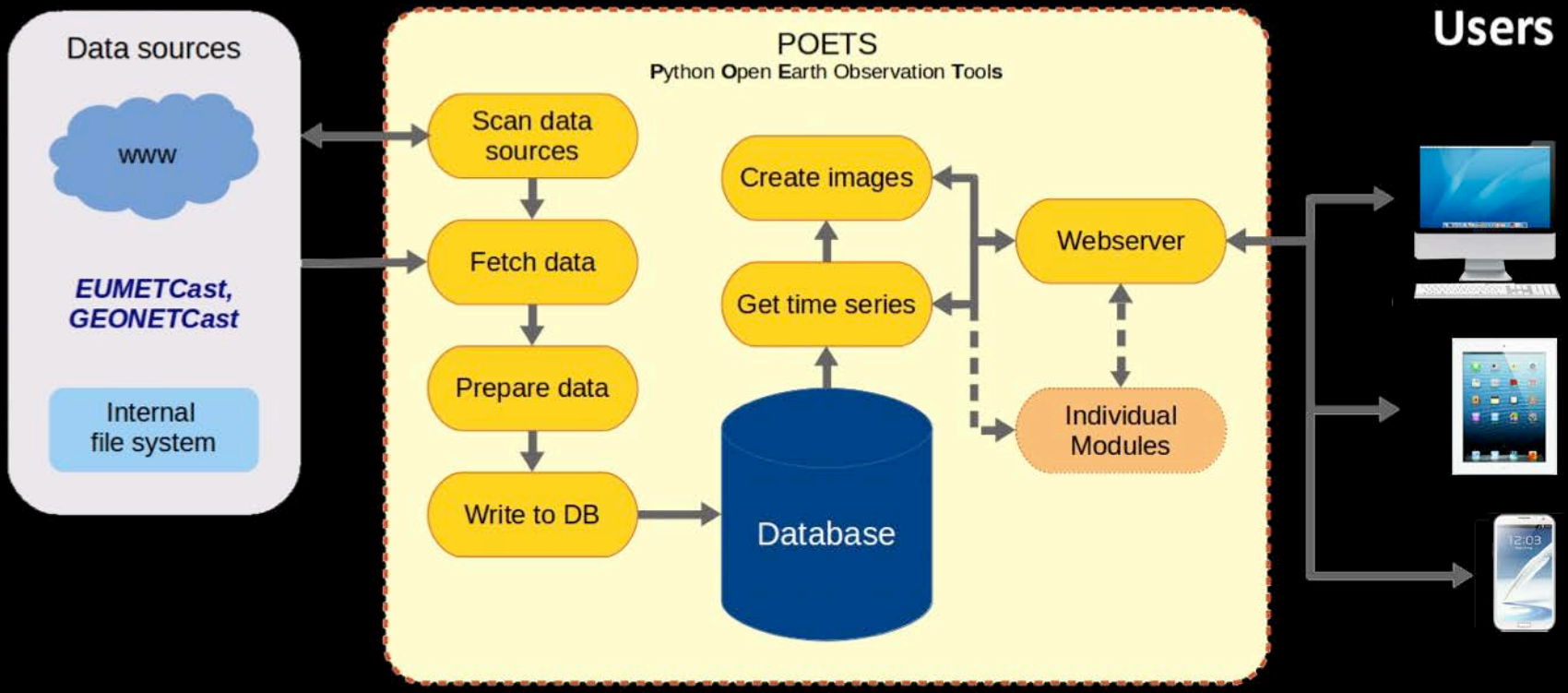
POETS (Python Open Earth Observation Tools)



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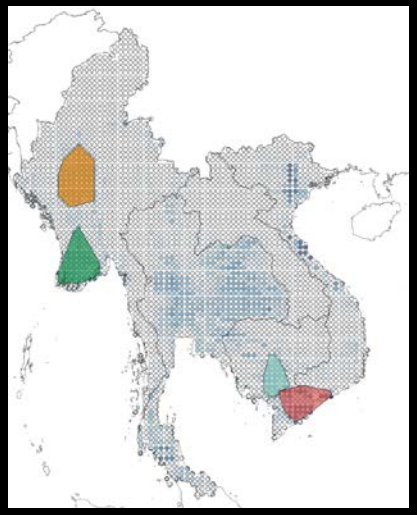
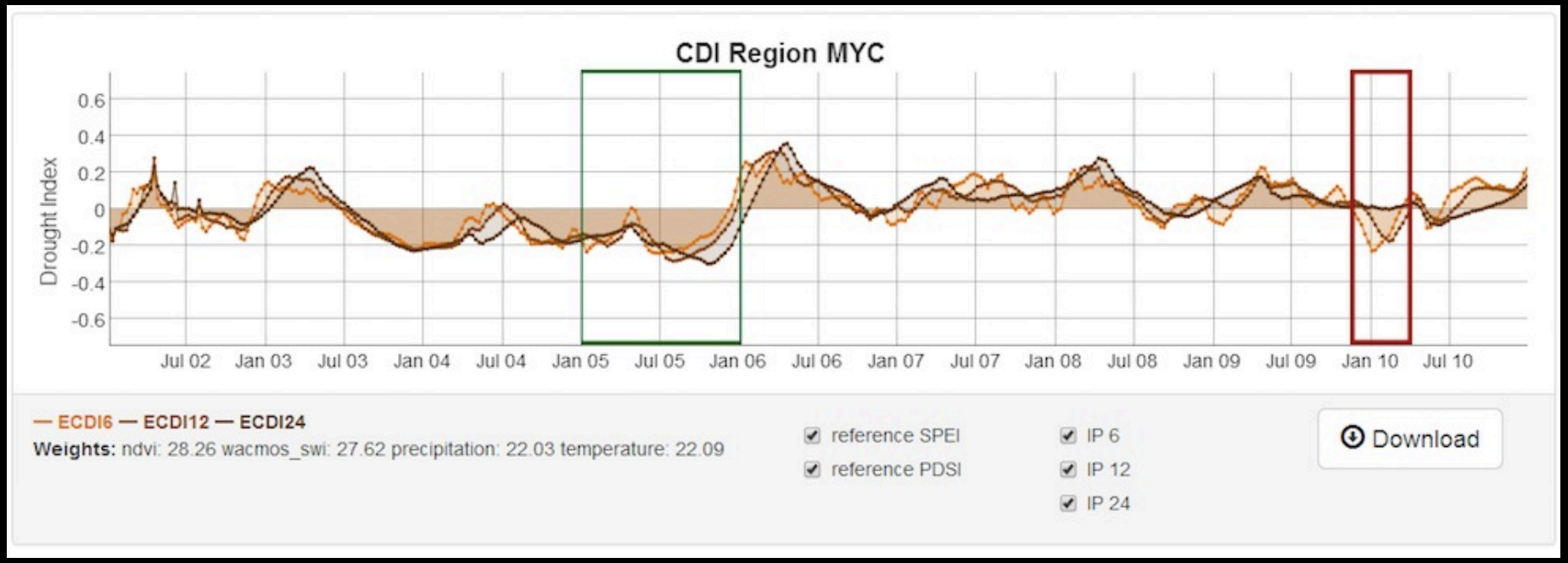
The Role of Mobile Applications

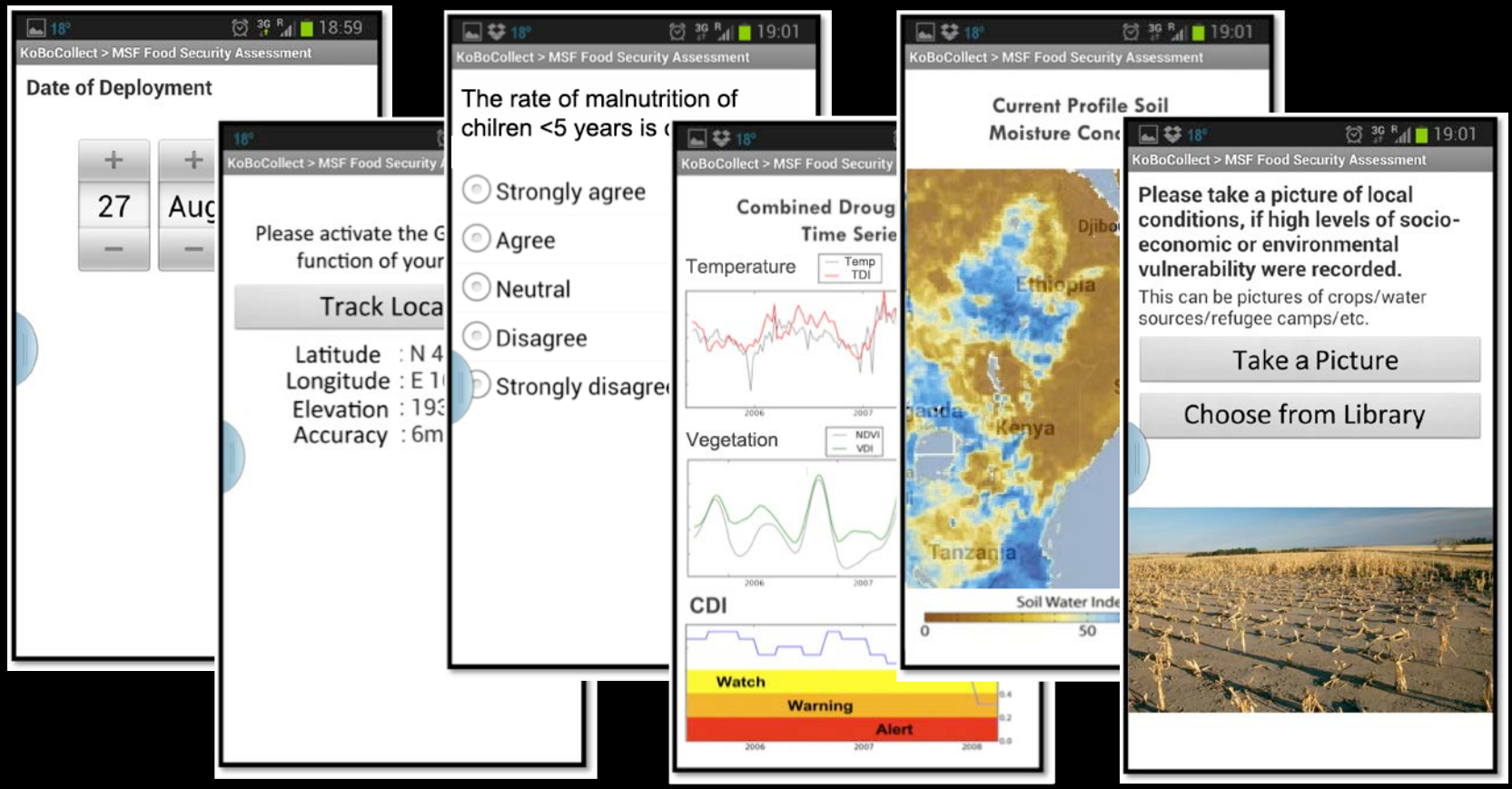
- Access to monitoring and forecasting datasets
- Full exploitation of smart phone features
- Collection of socio-economic information
- Questions focus on local drought conditions, level of malnutrition, food basket, access to resources, etc.
- Field test in Ethiopia and the Central African Republic with Doctors without Borders in March/April 2015



Statistical thresholds vs. Reality



Mobile Applications



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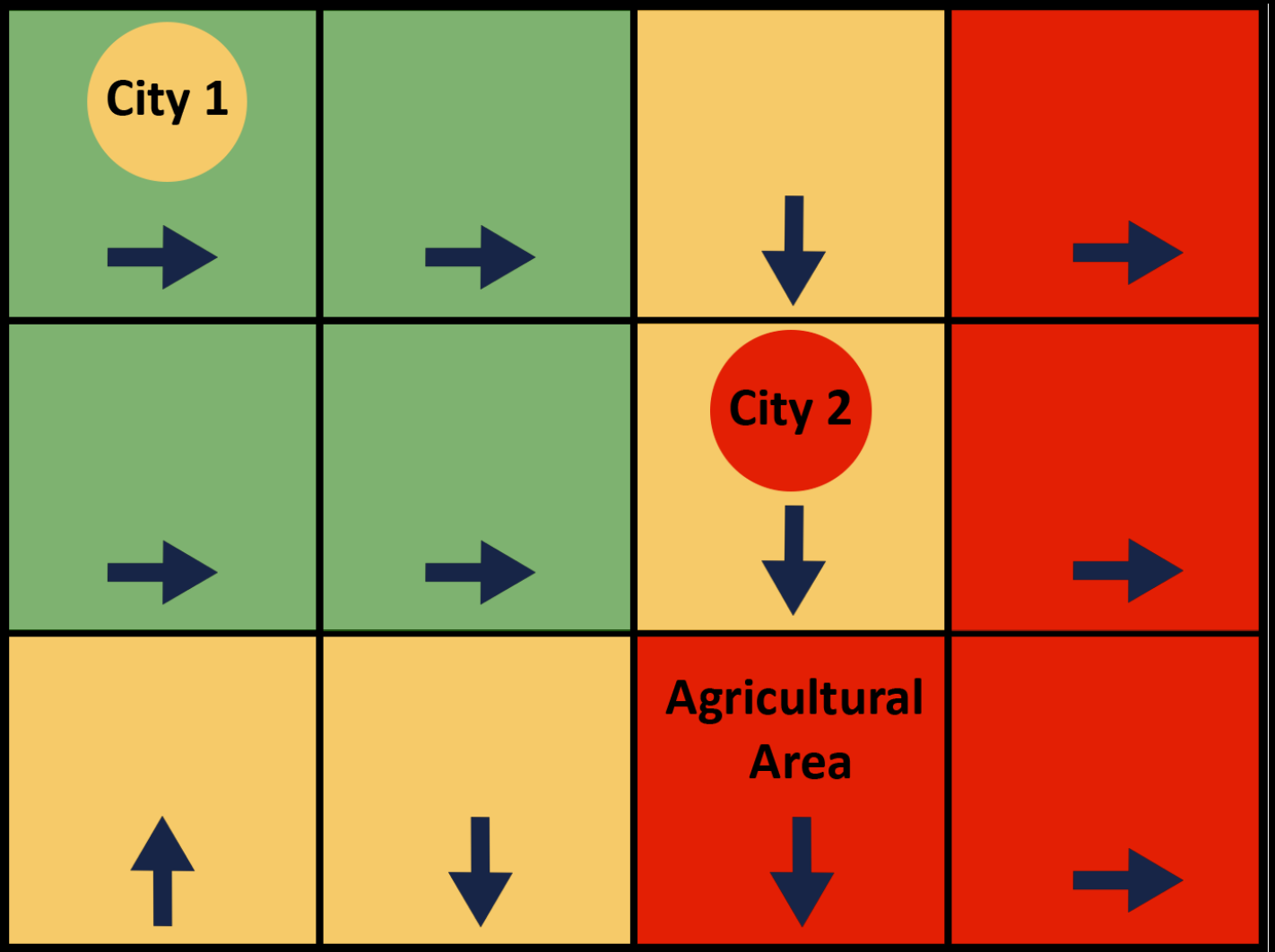
Conclusion (I)

- Simple data access and clear visualization are vital
- Added-value: knowledge base, increased lead time for logistics, HR, pro-active operational planning
- Decision-makers need information about environmental AND socio-economic conditions
- Mobile apps help to relate index-outputs to conditions on the ground
- Smart phones create a feeling of ownership


City 1
City 2
Agricultural Area

Conclusion (II)

- (Mobile) applications need a robust back-end
- They must work online/offline
- Strengths and limitations of EO need to be explained to the users
- Solutions need to be developed with, not for users
- Approaches like the EODC are promising, if they manage to create a network for mutual trust/understanding

History does not repeat itself,

but it does rhyme.

Mark Twain