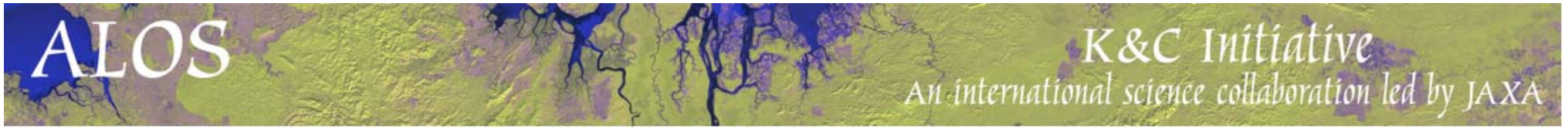


K&C Phase 3:

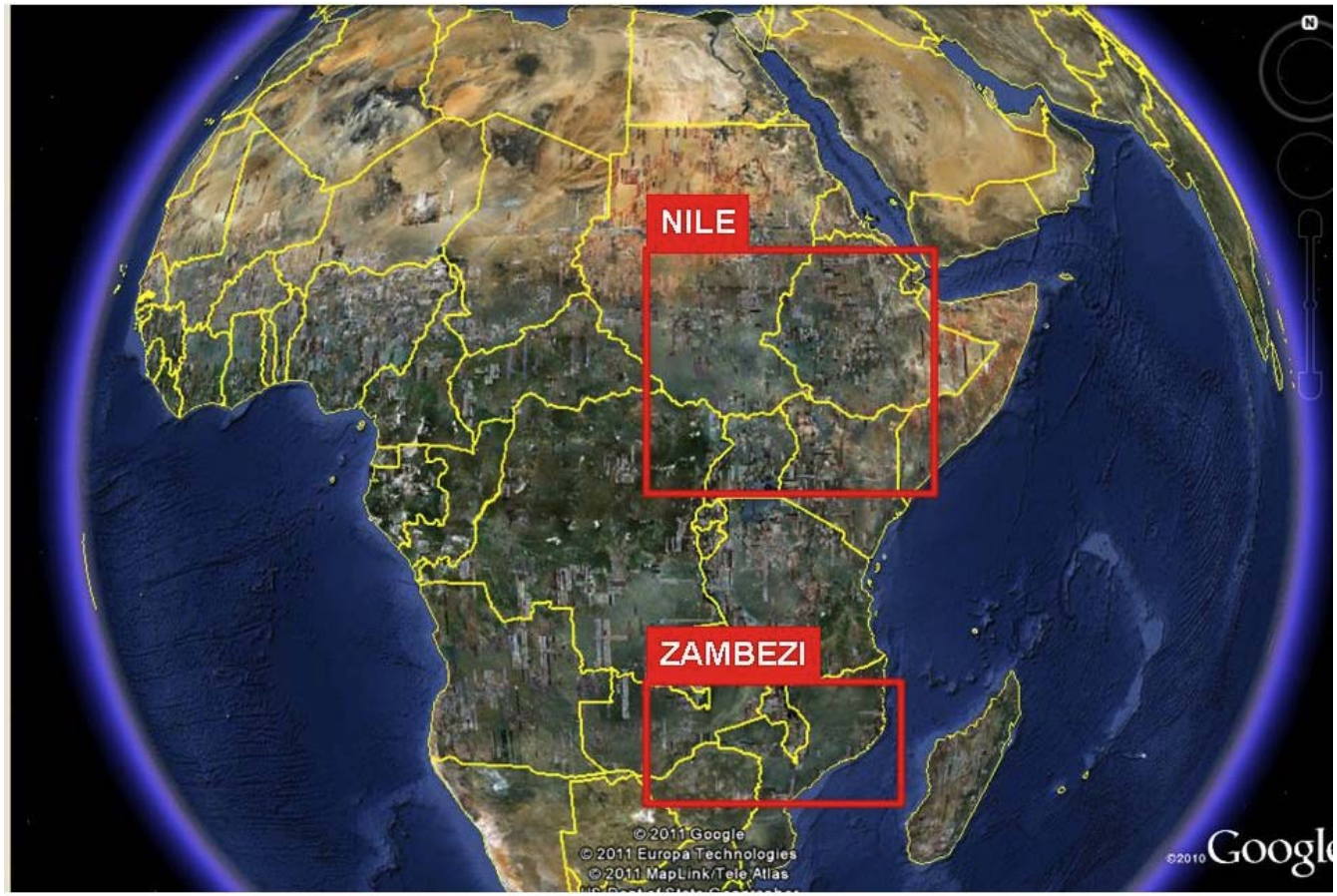
Characterization of wetlands in the Nile and Zambezi Basins

Lisa-Maria Rebelo
International Water Management Institute (IWMI)
Regional office for the Nile Basin and East Africa
Addis Ababa, Ethiopia

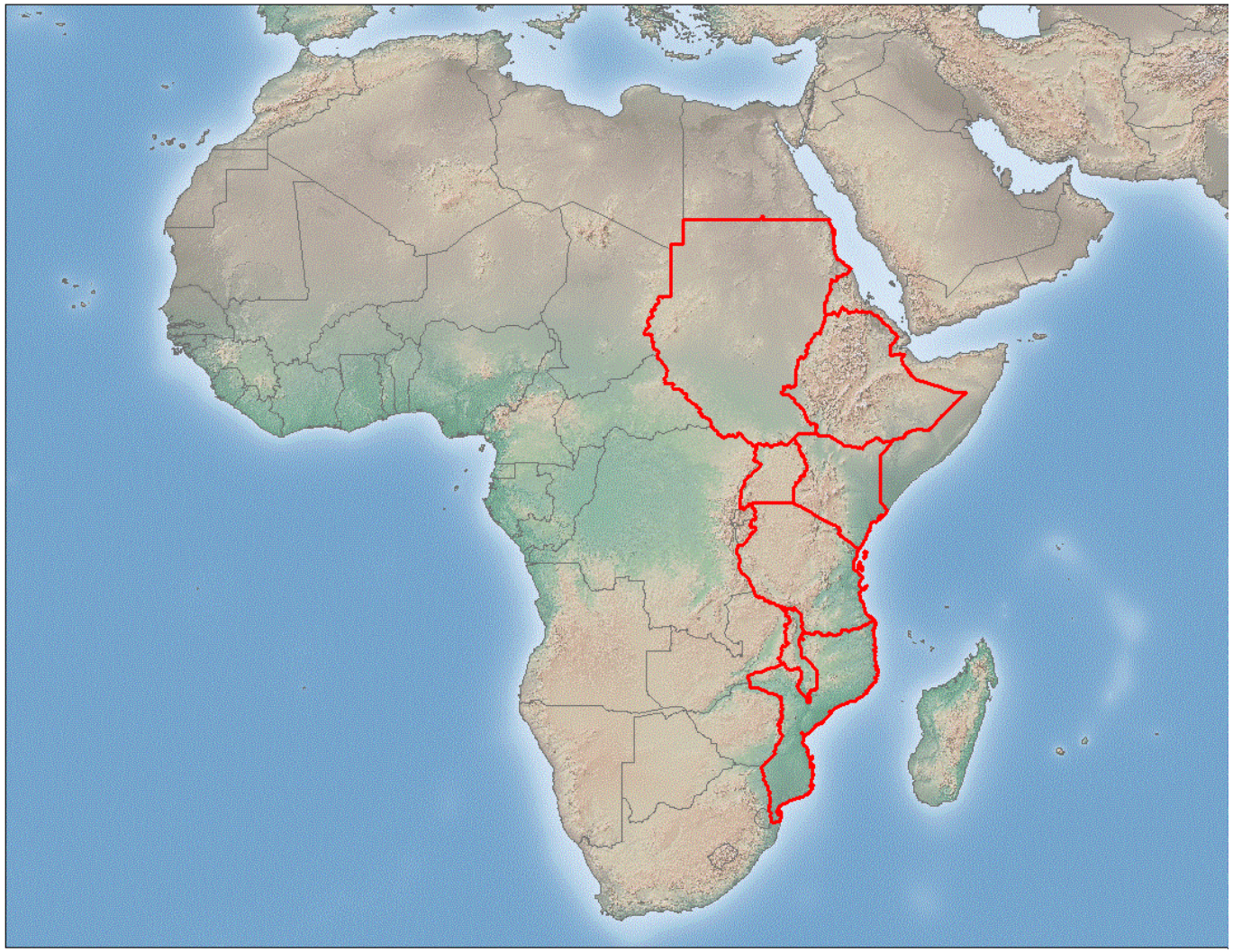
International Water Management Institute

Science Team meeting #16 – Phase 3 Kick-off
JAXA TKSC/RESTEC HQ, Tsukuba/Tokyo, October 17-21, 2011

Project sites



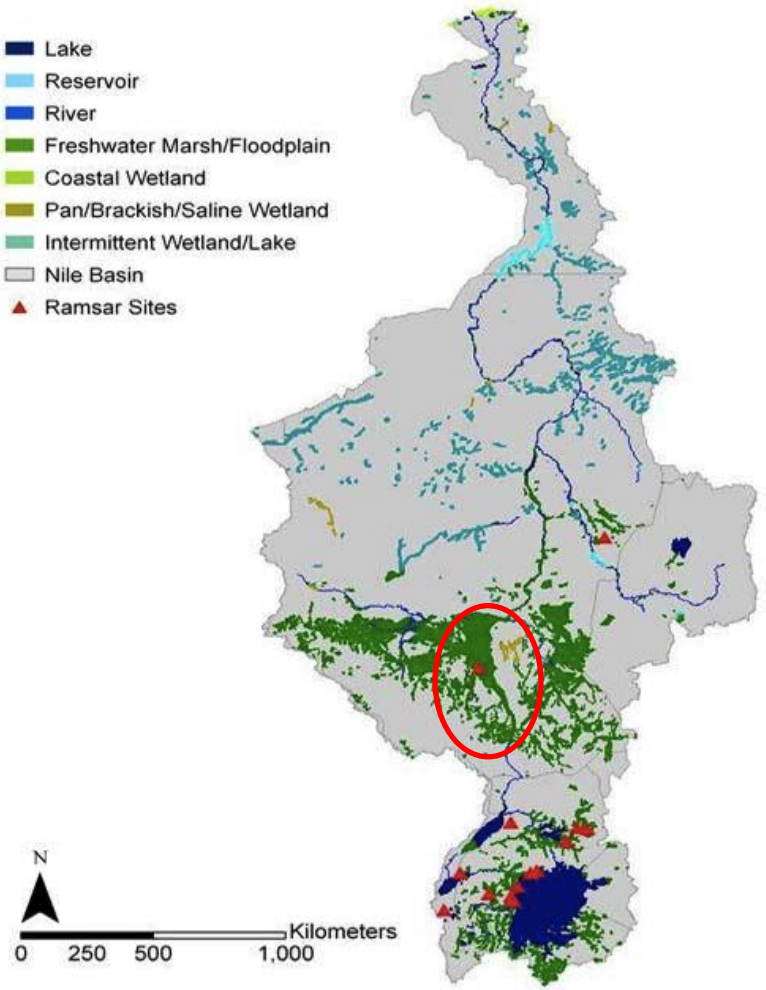
Project sites

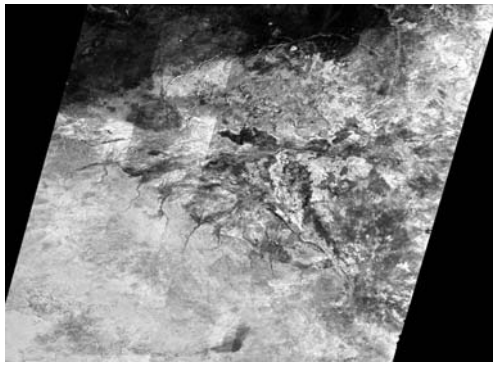


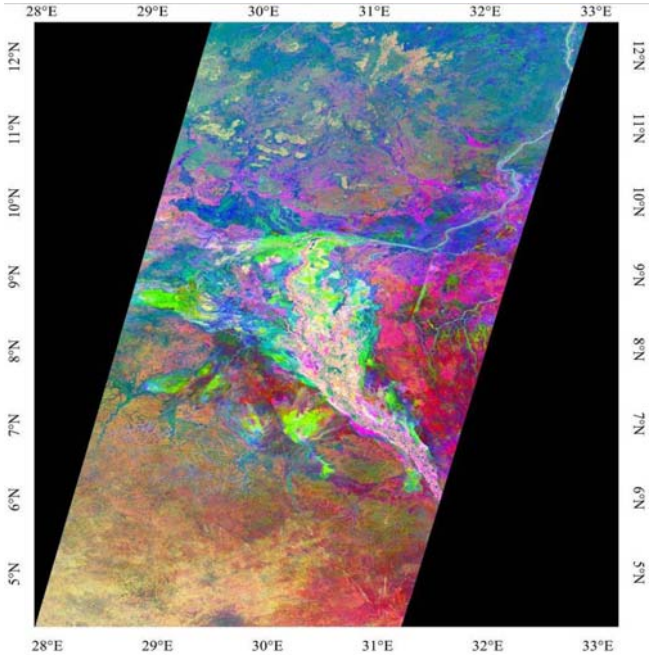
ALOS

K&C Initiative
An international science collaboration led by JAXA

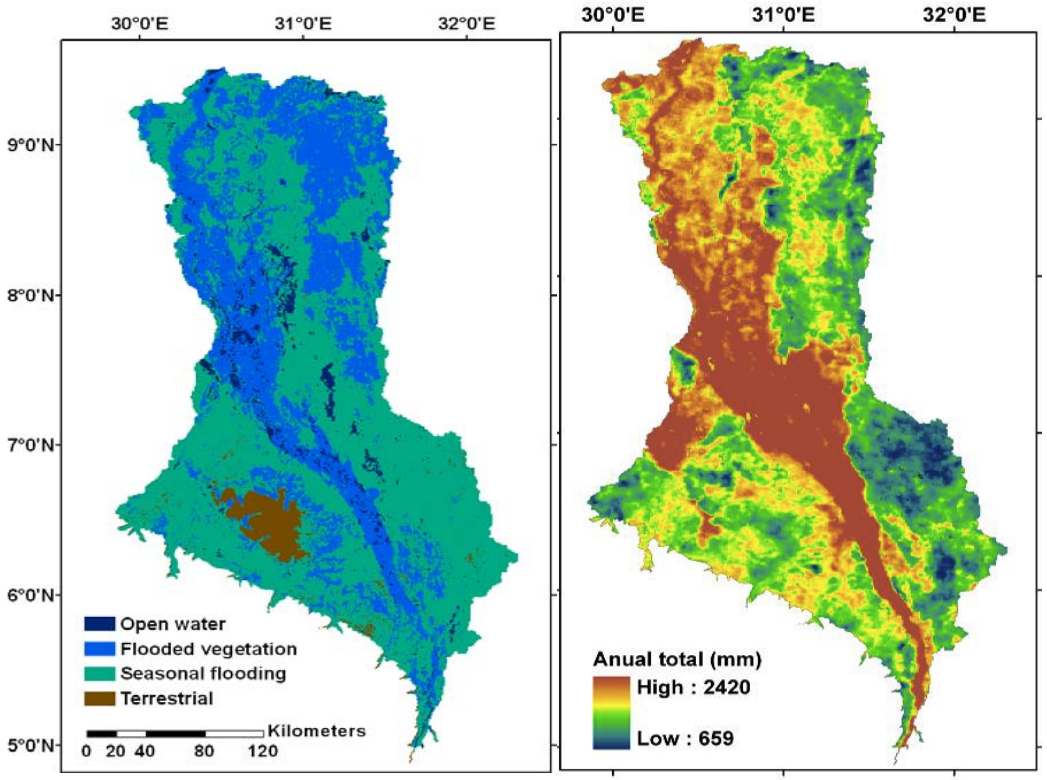
Inundation mapping, Sudan: The Sudd wetland and the Gash River

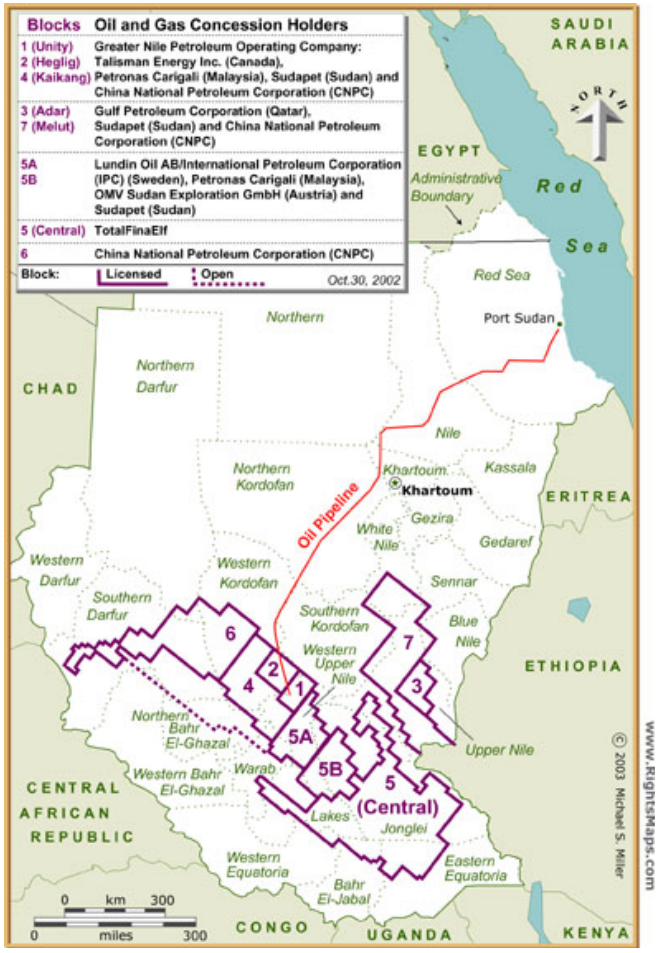




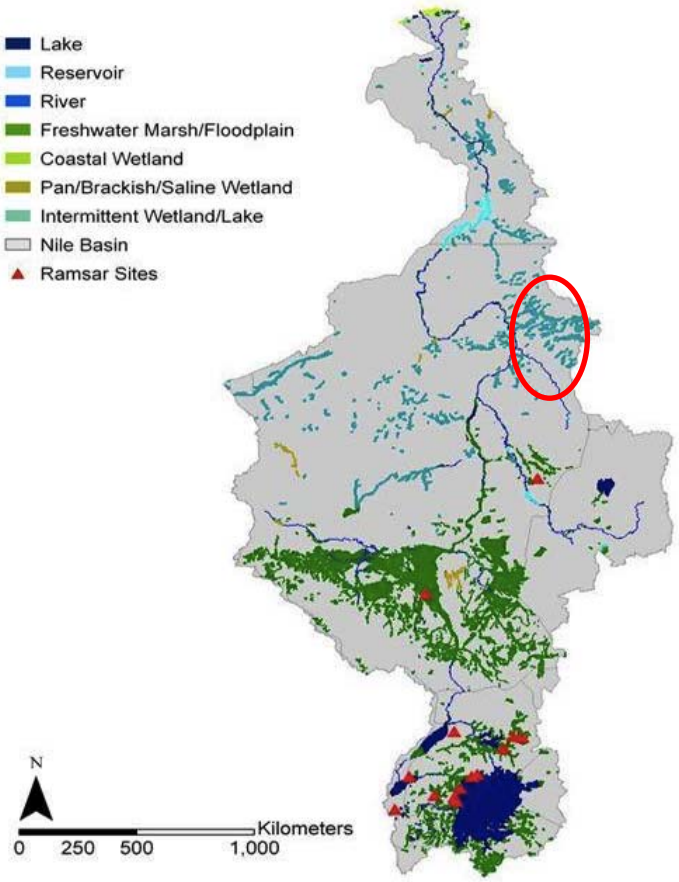


Inundation mapping, Sudan: The Sudd wetland





Inundation mapping, Sudan: The Gash River

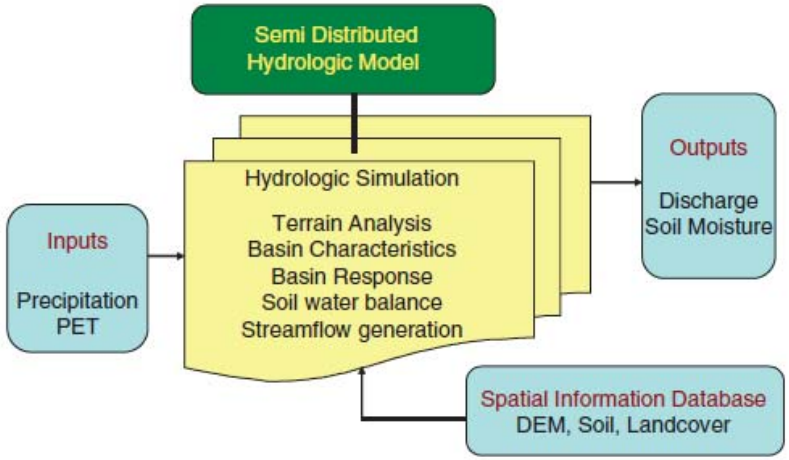


- IWMI is member of Sentinel Asia and Data Analysis Node
- Flood Working Group of Sentinel Asia (prediction, detection)

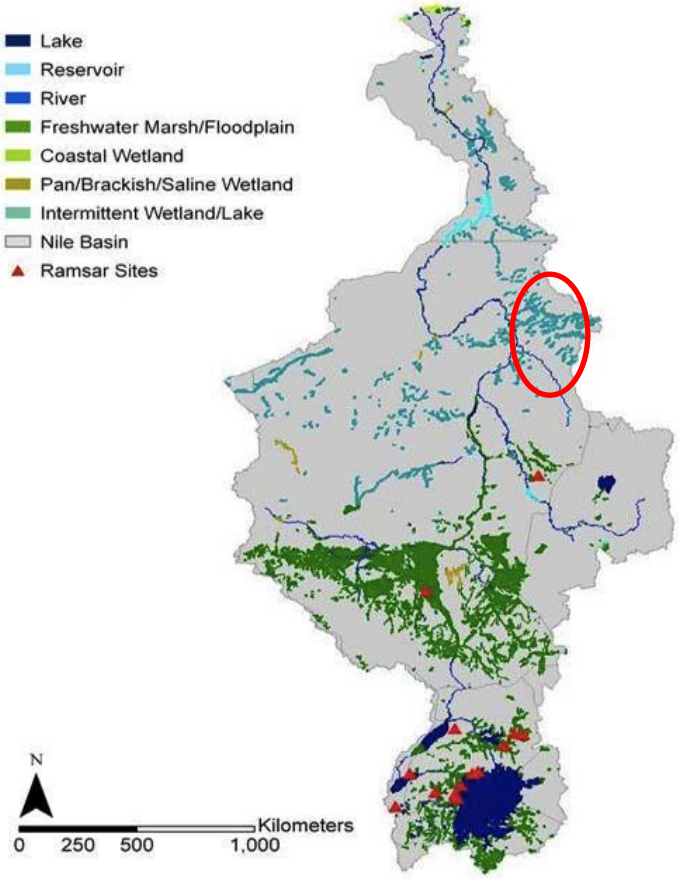
- Flood forecasting system for the Gash River, Sudan
- Near real time information to farmers
- Frequent rain-induced floods result in heavy losses in agriculture in this region

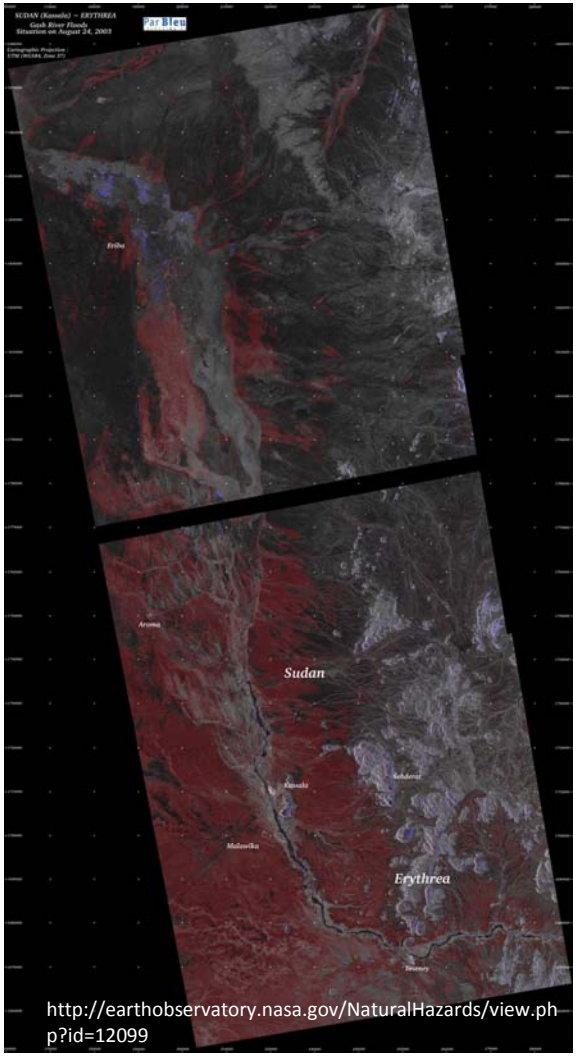
The GeoSFM is a semi-distributed physically based hydrological model that simulates the dynamics of runoff processes using RS data

Spatially distributed data is assimilated to simulate stream flow on a daily basis

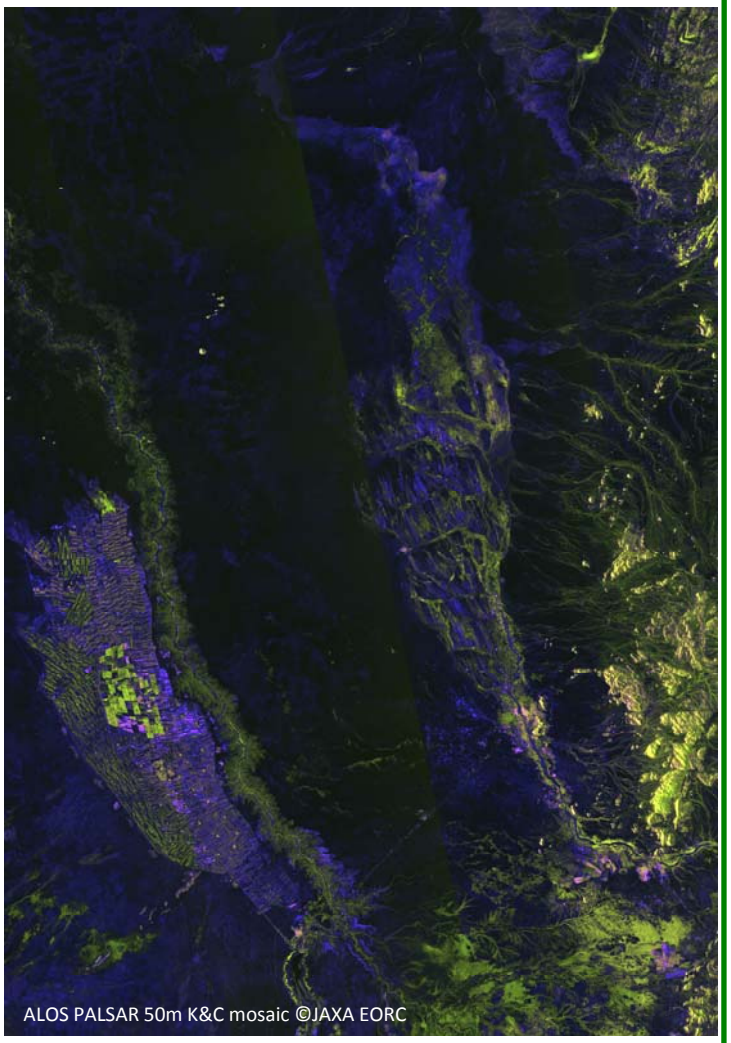


Inundation mapping, Sudan: The Gash River





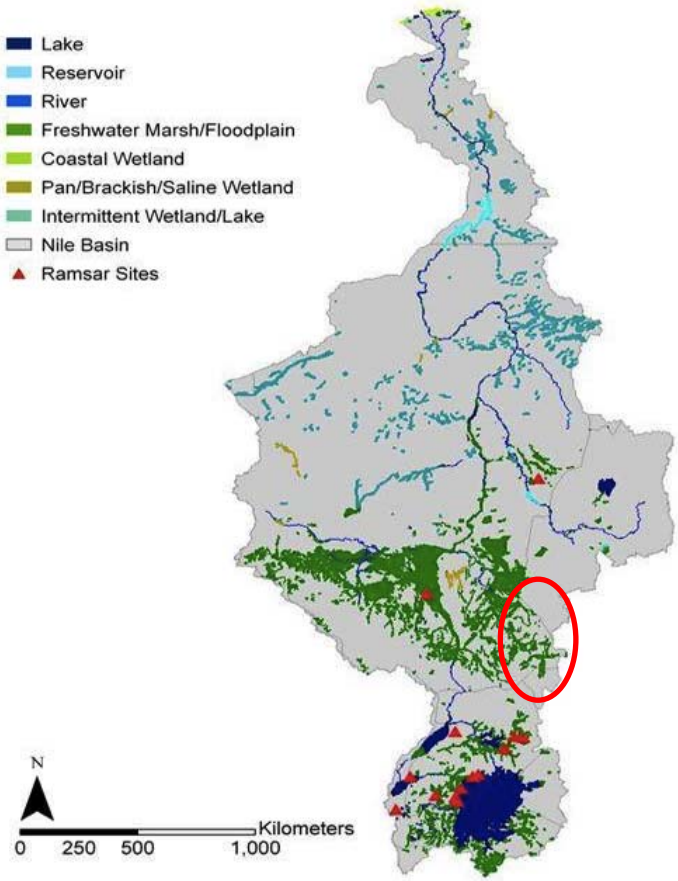
http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=12099

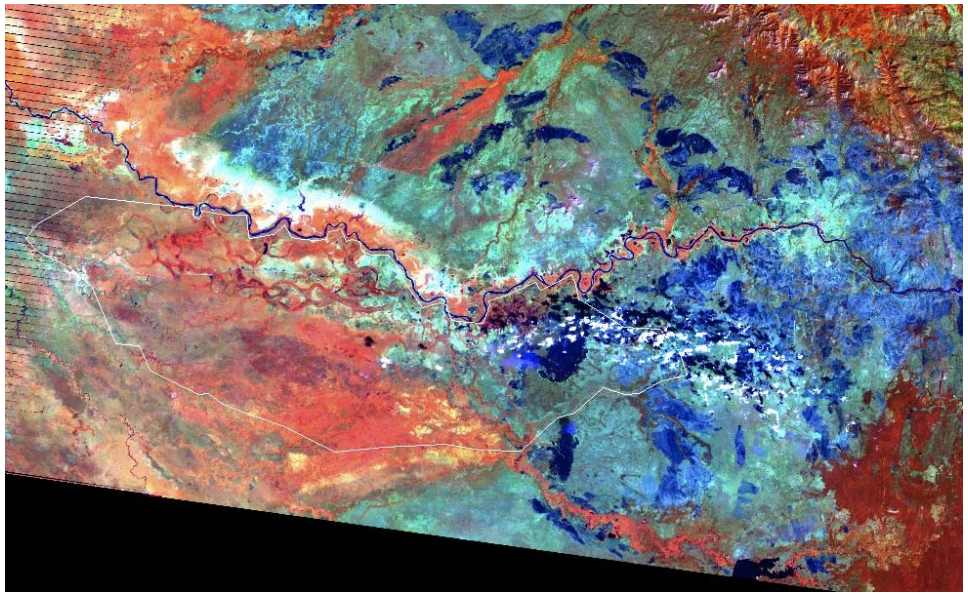


ALOS PALSAR 50m K&C mosaic ©JAXA EORC

Wetland mapping, assessment of irrigation and drainage needs Ethiopia

The study site is the Baro River, a tributary of the White Nile





- The area is flooded regularly. The flooded area, flood duration, soil moisture and green vegetation cover are important inputs into the hydrological analysis
- The climate refrains us from retrieving images during the wet season. L-band data is therefore essential

Ethiopia: wetland mapping and assessment of irrigation and drainage needs

http://e360.yale.edu/feature/agribusiness_boom_threatens_key_african_wildlife_migration/2377/

07 MAR 2011: **REPORT**

Agribusiness Boom Threatens Key African Wildlife Migration

The Ethiopian region of Gambella is home to Africa's second-largest mammal migration, with more than a million endangered antelope and other animals moving through its grasslands. But the government has now leased vast tracts to foreign agribusinesses who are planning huge farms on land designated a national park.

BY FRED PEARCE

Unreported, an environmental tragedy is unfolding in a remote corner of Africa, on the borders of the newly-designated state of South Sudan, that could imperil the second-largest mammal migration on the African continent.

But the park that is supposed to protect them is little more than a mark on the map. Two years ago, the Ethiopian ministry of agriculture declared that, whatever its wildlife credentials, the park had "a huge agricultural investment potential." And now the ministry is seeking to realize that potential through a series of major leases to foreign agribusinesses. Some 400,000 hectares, an area 80 times the size of Manhattan, much of it within the 1974 boundary of the park, has been promised so far.

> "Two years ago, Ethiopia's agriculture ministry declared that Gambella National Park had 'huge investment potential.'

Drive west from Gambella town, the capital of the region, and for most of the two hours it takes to reach Nyininyang near the Sudanese border, you are in the concession of the Indian firm Karuturi Global Limited. Take the road south and the bush suddenly gives way to the vast compound of the other large investor, Saudi oil billionaire Sheik Mohammed Hussein Ali Al Amoudi.

Wetland mapping, Ethiopia, Tanzania, Kenya

Ecosystem services, water budgets and basin trajectories: (i) assess how combined biophysical and socio-economic drivers have shaped water-based ecosystem services at the basin scale; and (ii) to develop and test an integrated suite of hydrological-ecological-crop (HEC) models to help simulate changes and inform future management through a tailored decision support system

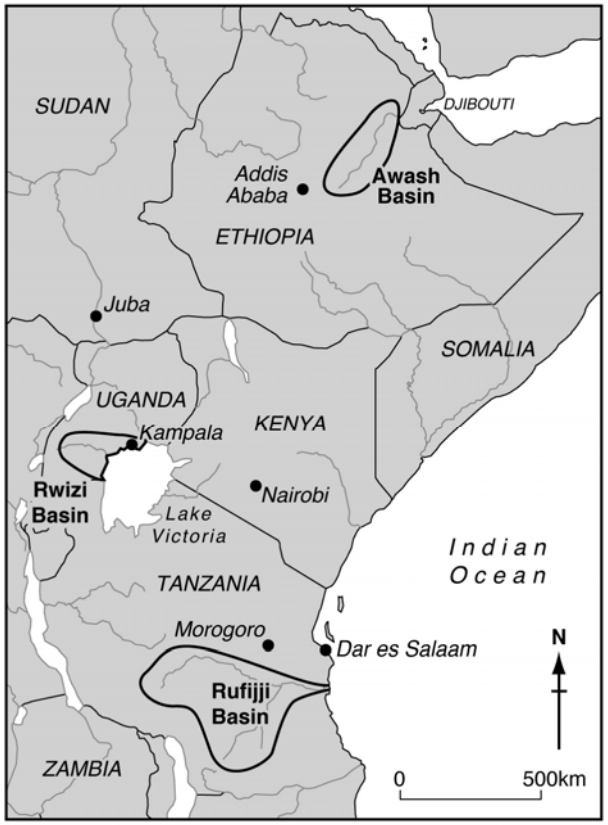
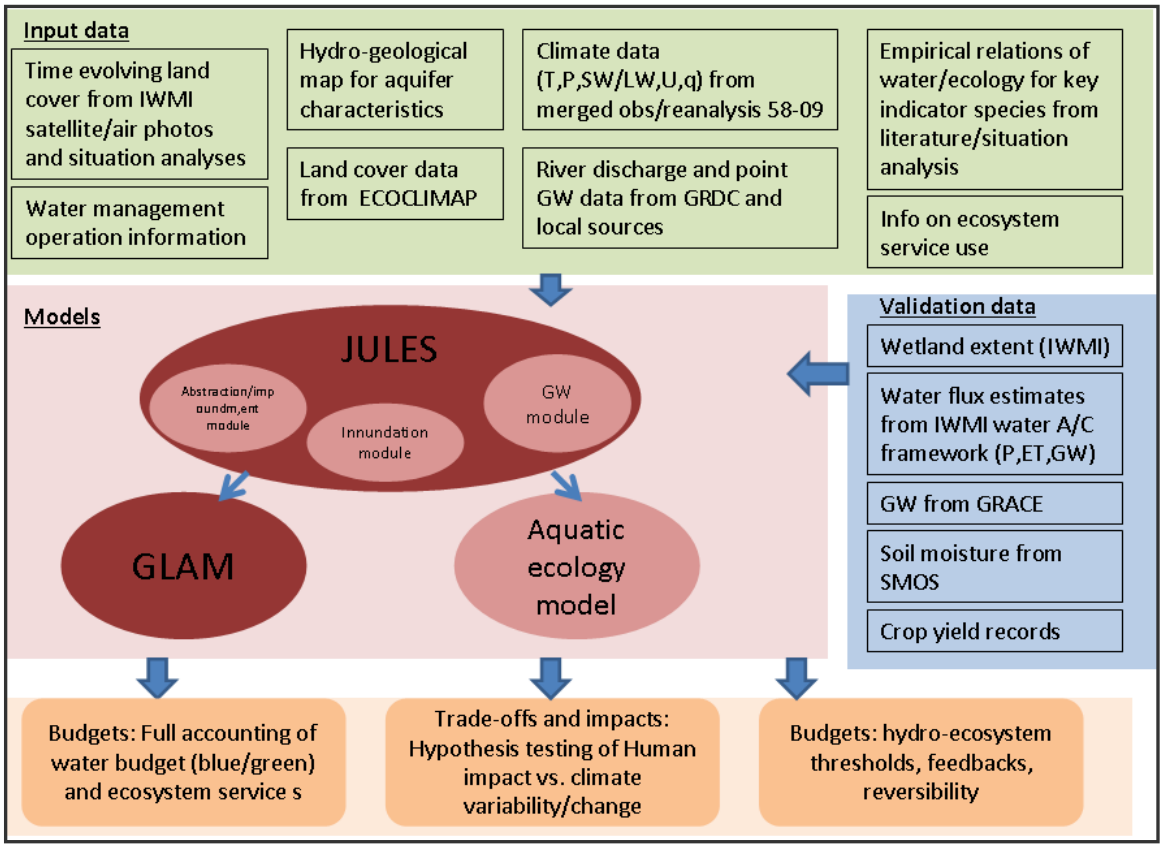
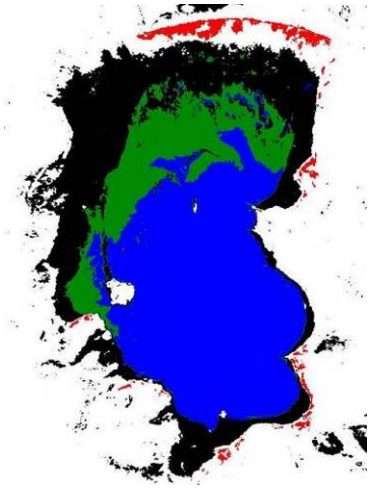


Figure 1. Water Futures study area including three focal basins



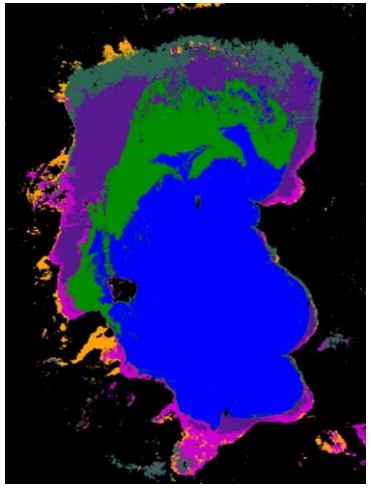
Wetland mapping; Malawi, Mozambique

Recently burned (May 2006)
Permanent open water
Seasonal Flooding
Seasonal swamp



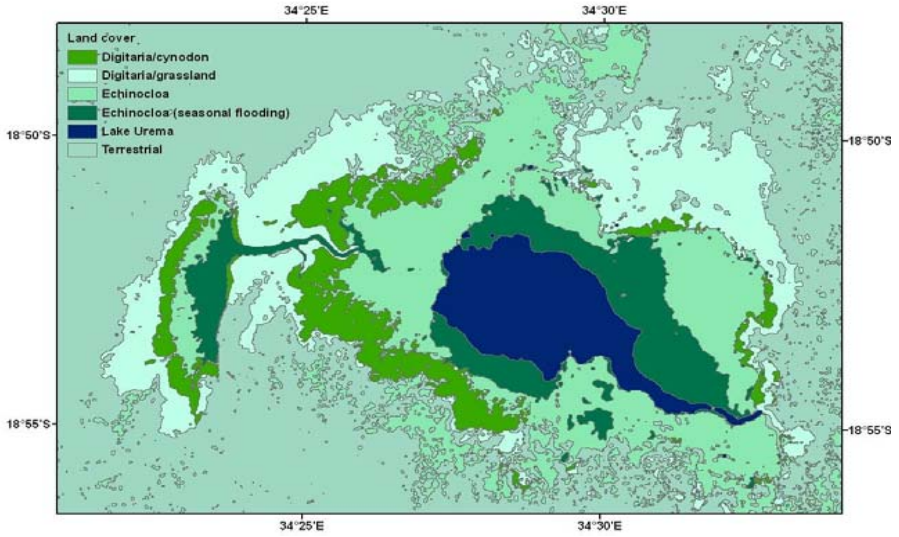
Broad wetland classes derived from annual flood dynamics

Permanent open water
Seasonal open water
Typha dominant



Distribution of wetland vegetation

Lake Urema, Mozambique:



Rebelo, L-M., 2010. Eco-hydrological characterization of inland wetlands in Africa using L-band SAR. *IEEE Journal of Special Topics in Earth Observation and Remote Sensing* Vol 3 No 2

Project objectives and schedule

Project objectives:

•Mapping regional scale patterns of flooding and inundation within the Nile and Zambezi Basins

•Characterization of individual wetland ecosystems within the Nile and Zambezi Basins

Relevance to the K&C objectives:

•Activities are of direct relevance to the Ramsar ***Convention*** on wetlands of international importance, and demonstrate the application of L-band SAR for wetland assessment, inventory and monitoring

•The deliverables will provide information required for ***conservation*** of wetlands in the Nile and Zambezi basins

Project deliverables and milestones:

•Maps of

- Minimum water extent (open water, flooded vegetation)
- Maximum water extent (open water, flooded vegetation)
- Seasonal variations in inundation

•Target dates, Jan 2013, 2014

Support to JAXA's global forest mapping effort:

- Geographical region: Nile and Zambezi basins, East Africa
- Land cover data from field study sites
  - Vegetation type
  - Inundation status
- Geocoded photographs from field study sites

Other activities in support of the K&C Phase 3 goals:

- Contribution to the "Mangrove Watch" including linking of K&C team to national institutions working on mangroves in order to support product validation
- Liaison, co-ordination and collaboration with the Ramsar Convention on wetlands of international importance through the Scientific and Technical Review Panel, in support of the JAXA/Ramsar MoU (signed in 2010)