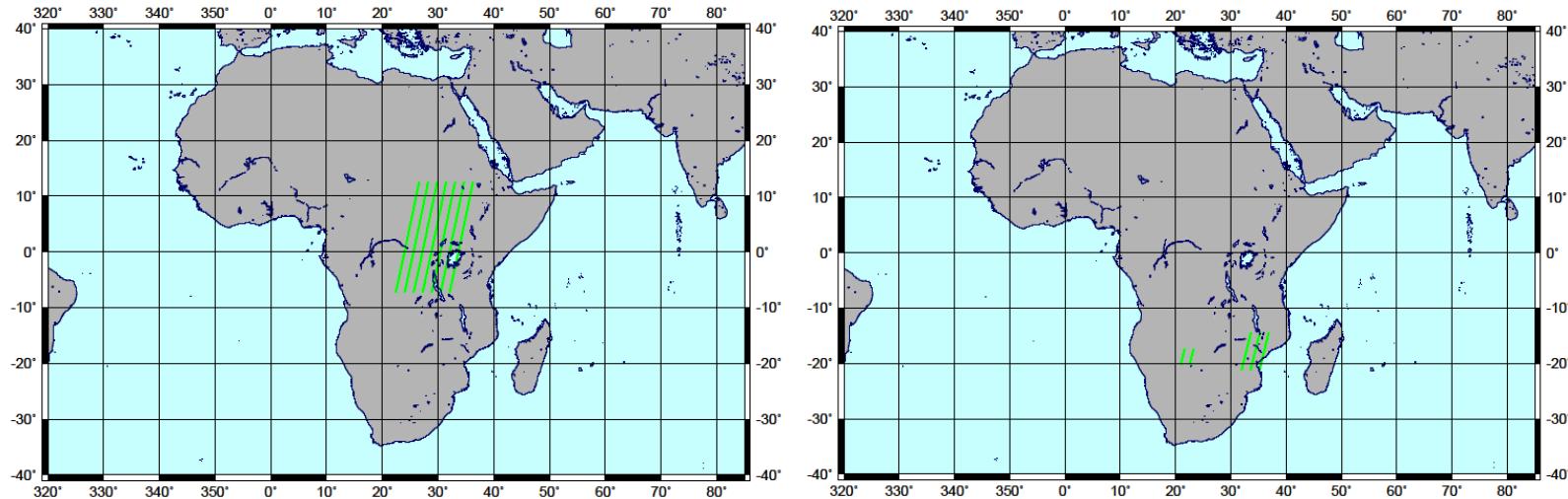


K&C Initiative, Phase II 2009-2011

1. Mapping and characterisation of wetland areas relevant to the Ramsar global wetlands inventory in prototype areas A (Nile Basin) and B (Zambezi Basin), using ALOS PALSAR (Auig FBS and FBD)
2. Mapping seasonal variations in inundation across prototype areas A (White Nile) and B (Zambezi), using ALOS PALSAR (ScanSAR)



ALOS

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Wetlands used extensively for agriculture and fisheries

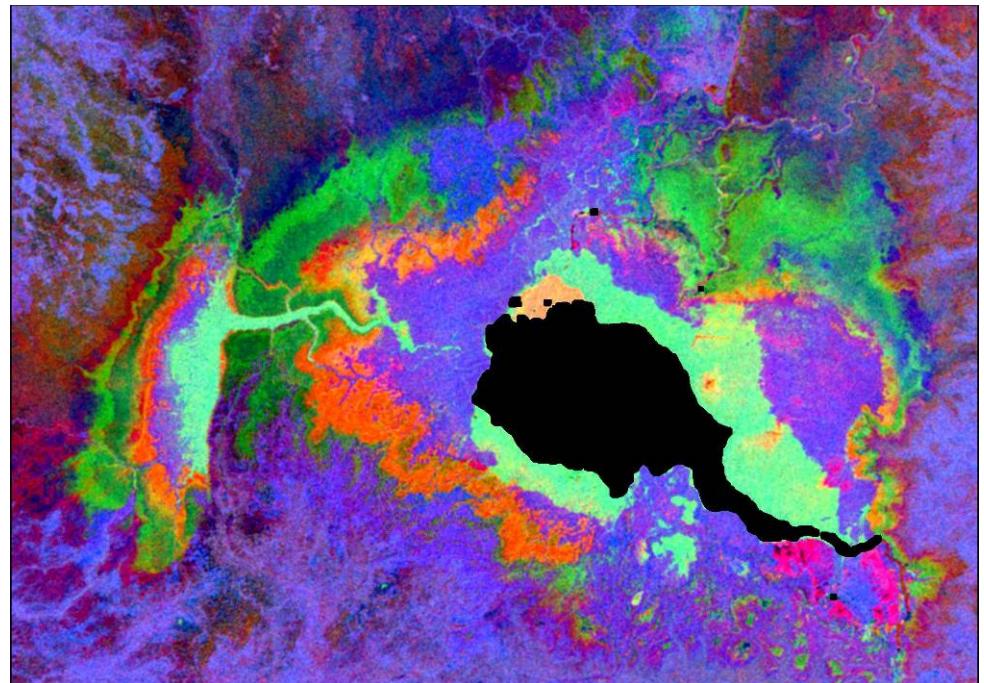
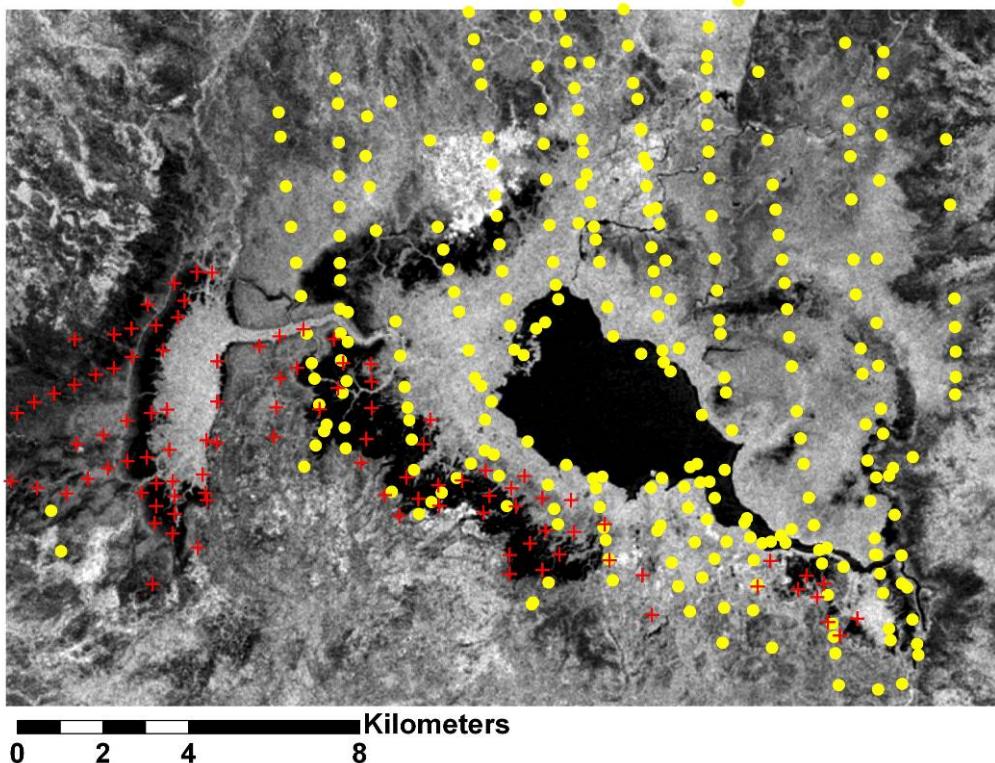


RS products key outputs, needs identified by resource managers

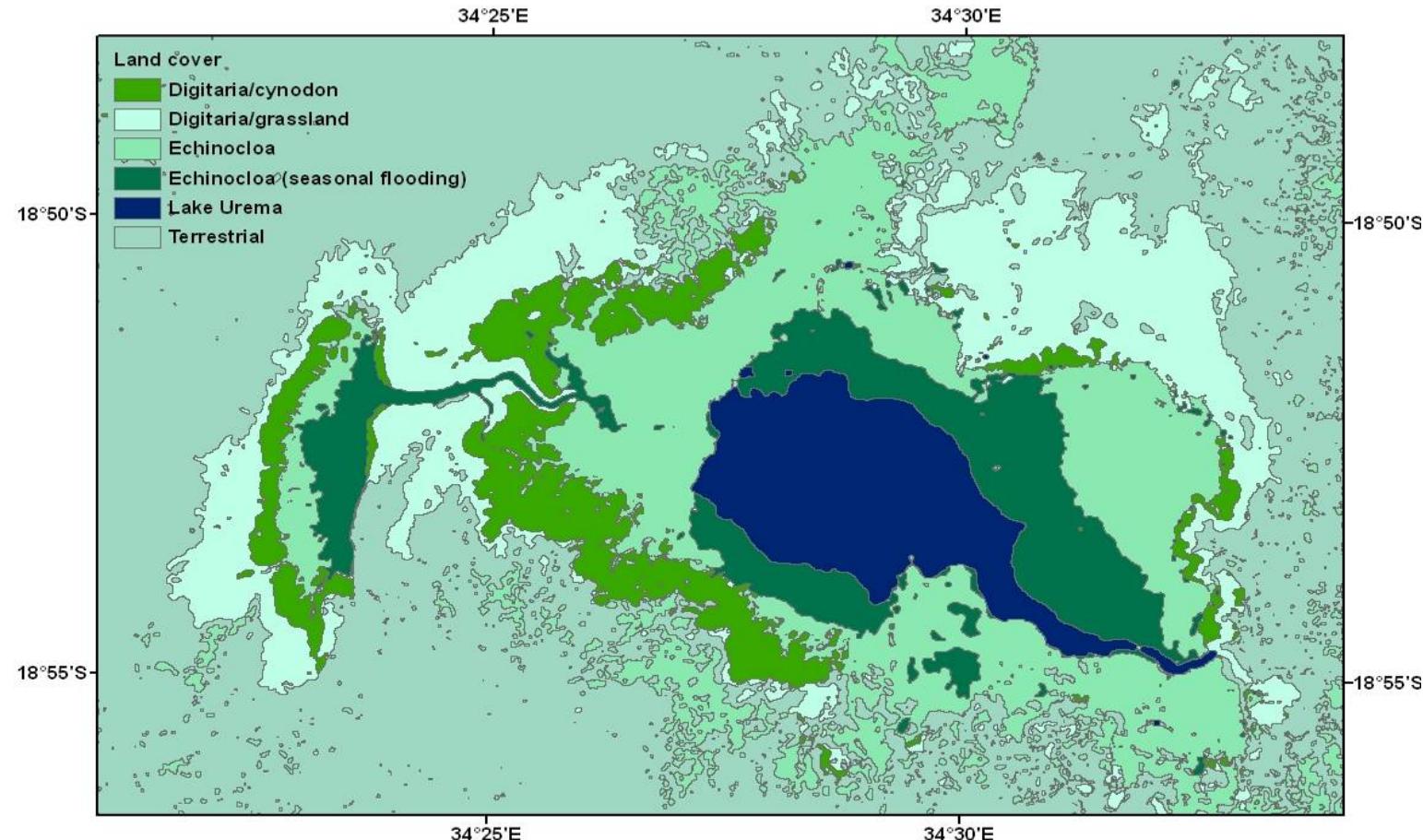
ALOS

K&C Initiative

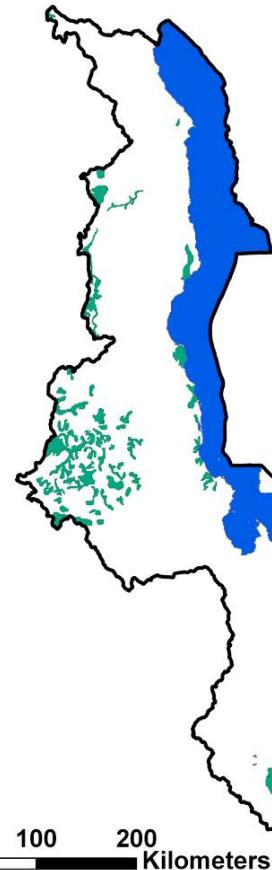
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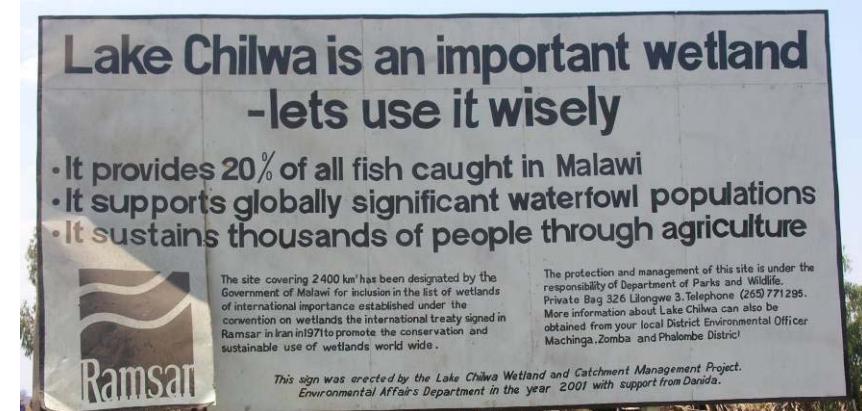
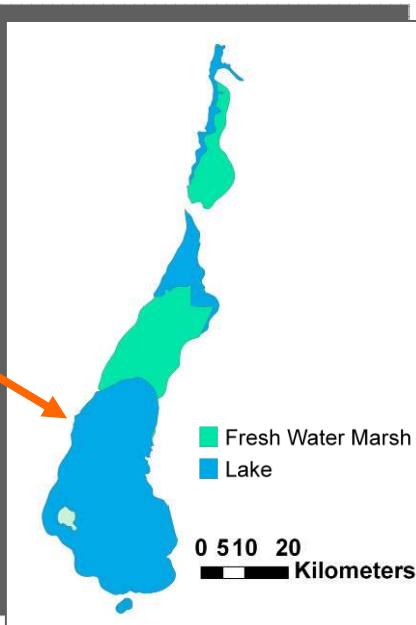
Lake Urema, Mozambique: Wetland classes based on flooding regime to guide management responses



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

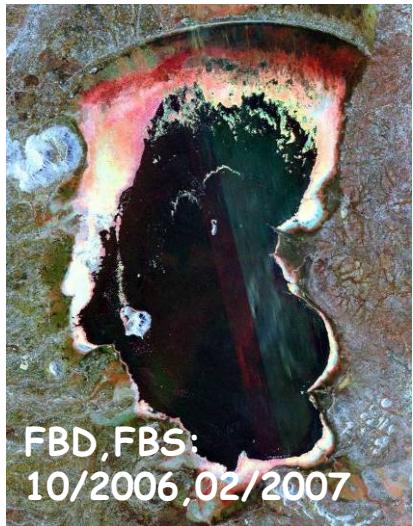


- Generate knowledge to assist in the sustainable management of wetlands
- Assist countries to put in place mechanisms that minimize degradation
- Provide baseline wetland information from remote sensing data
- Generate generic guidelines, tools and methodologies

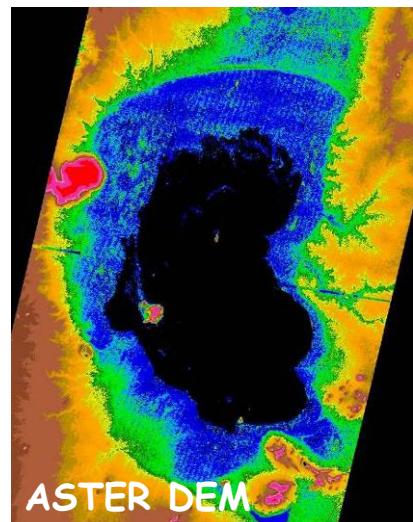
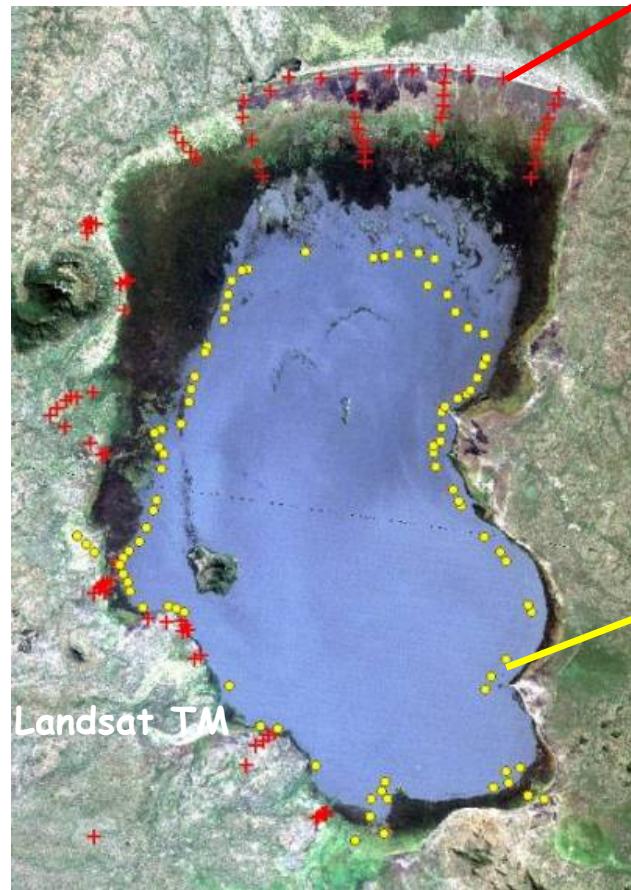


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- Airphoto locations
- ✚ Ground truth sites

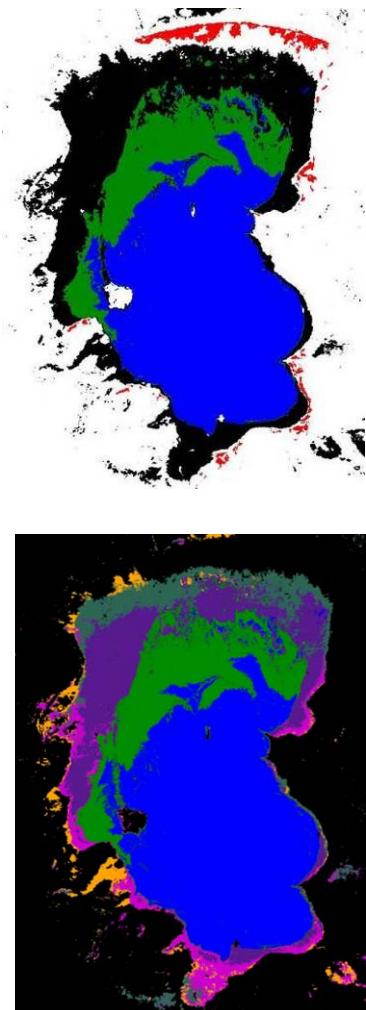


- Recently burned (May 2006)
- Permanent open water
- Seasonal Flooding
- Seasonal swamp

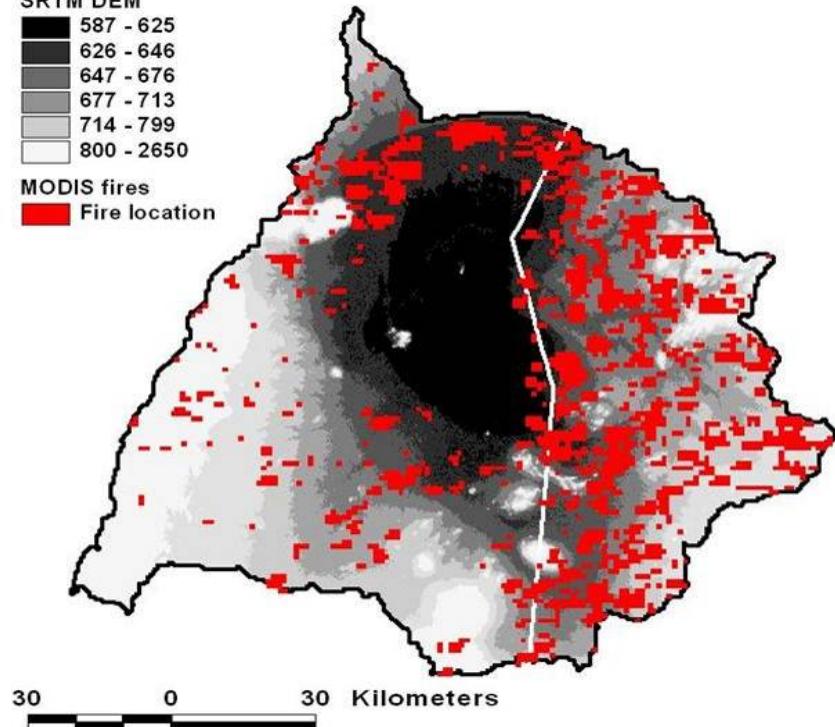
Broad wetland classes derived from annual flood dynamics

- Permanent open water
- Seasonal open water
- *Typha* dominant
- *Vossia* dominant
- Sedges/tall grass
- Cultivation

Distribution of wetland vegetation



- SRTM DEM
- | |
|------------|
| 587 - 625 |
| 626 - 646 |
| 647 - 676 |
| 677 - 713 |
| 714 - 799 |
| 800 - 2650 |
- MODIS fires
- Fire location



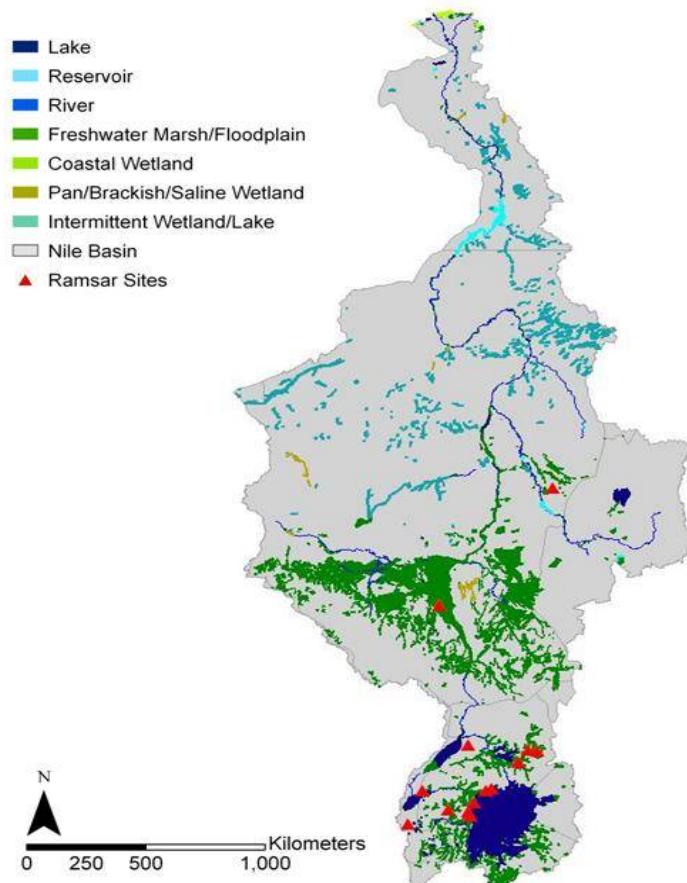
Rebelo, L-M., 2010. Eco-hydrological characterization of inland wetlands in Africa using L-band SAR. *IEEE Journal of Special Topics in Earth Observation and Remote Sensing* Vol 3 No 2

Science Team meeting #15 JAXA TKSC/RESTEC HQ, Tsukuba/Tokyo, January 24-28, 2011

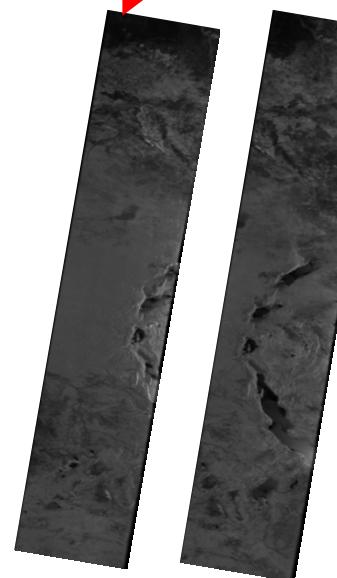
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Country	Wetland area (ha)
Eritrea	130
Chad	5110
Burundi	11,040
DRC	23,050
Kenya	57,270
Ethiopia	208,030
Rwanda	331,250
Egypt	497,210
Tanzania	1,247,260
Uganda	1,787,200
Sudan	14,181,930
Total	18,349,480



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June 2007



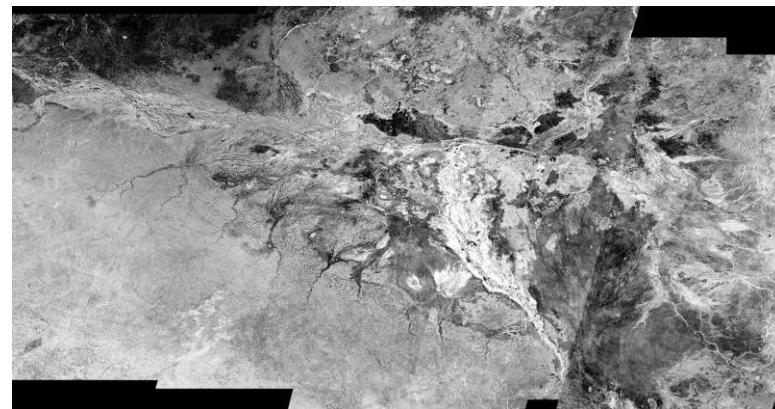
**December
2007**



September 2007

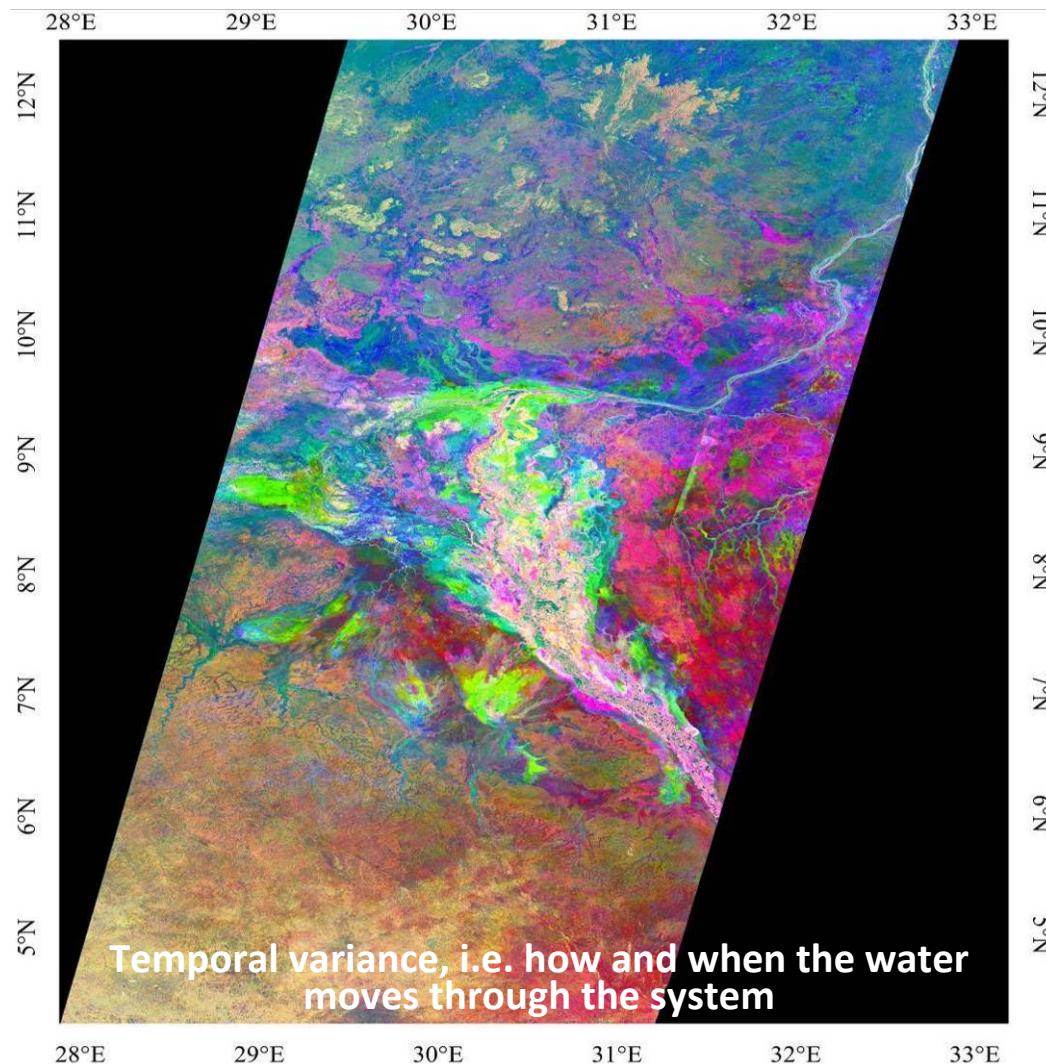


**Jan
2008**



**May
2008**





- Inaccessible due to civil war
 - CPA signed in 2005

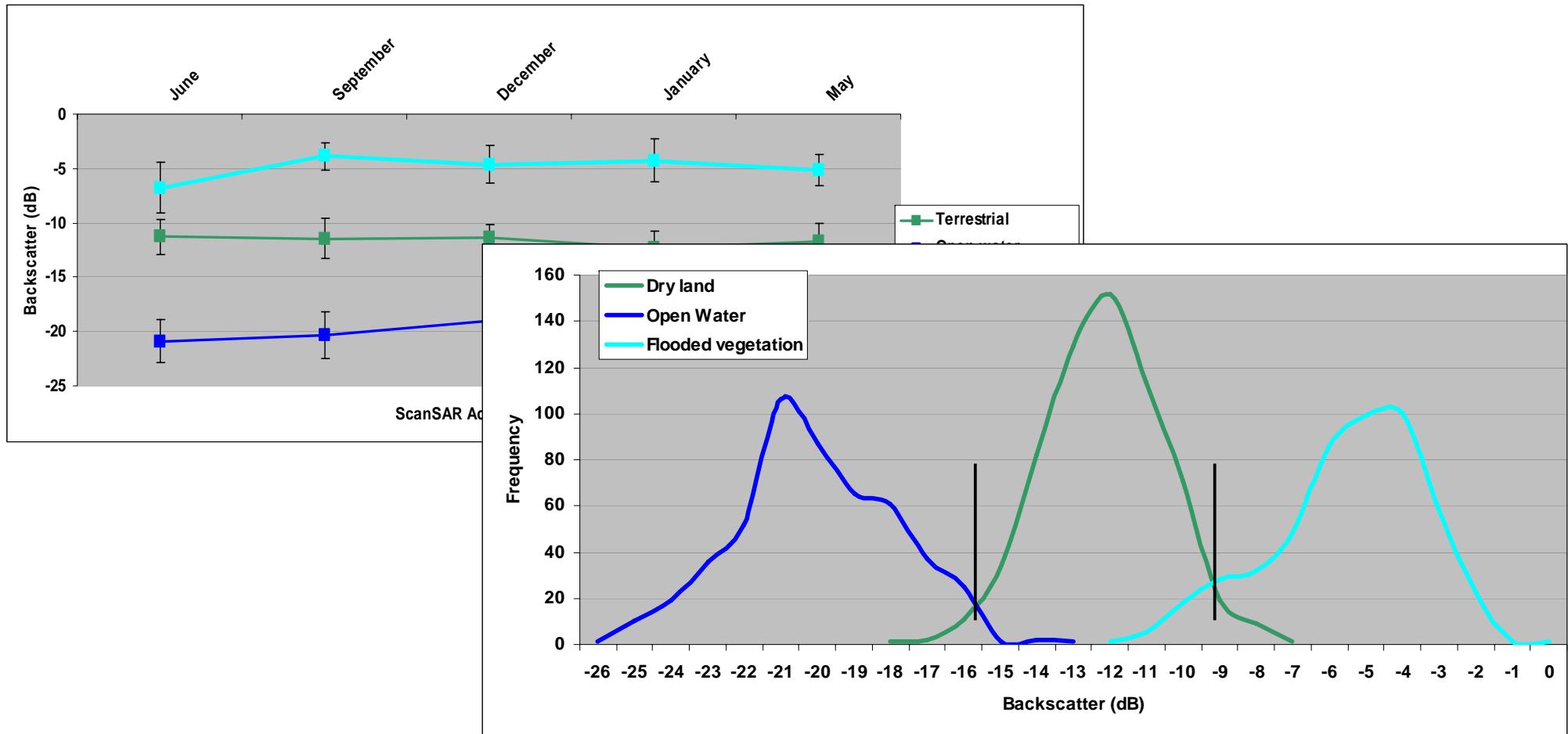
- Vast livelihood resource

- Various water resources interventions planned

- The area of, and the ET from the wetland is widely debated

Rebelo, L-M., Senay, G., McCartney, M.P. Flood pulsing in the Sudd wetland: analysis of seasonal variations in inundation and evaporation in Southern Sudan. *Earth Interactions*

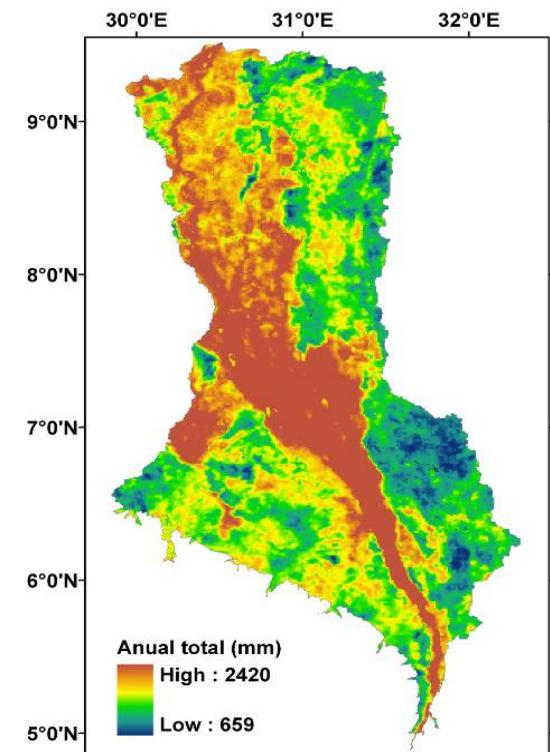
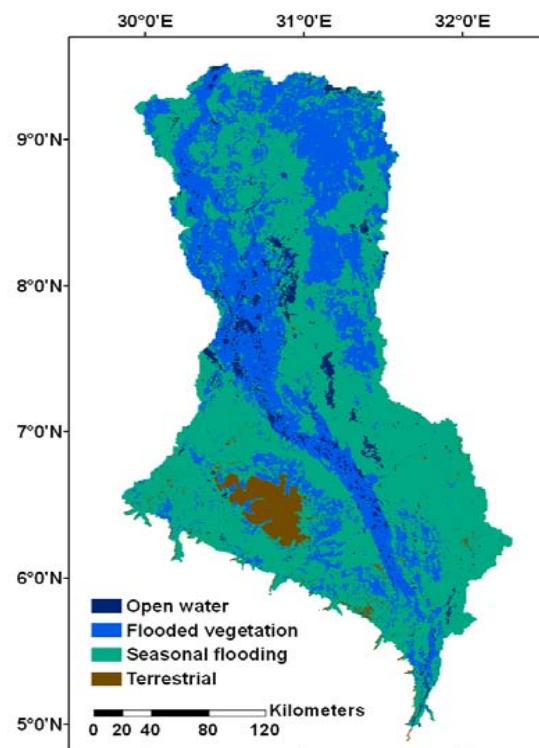
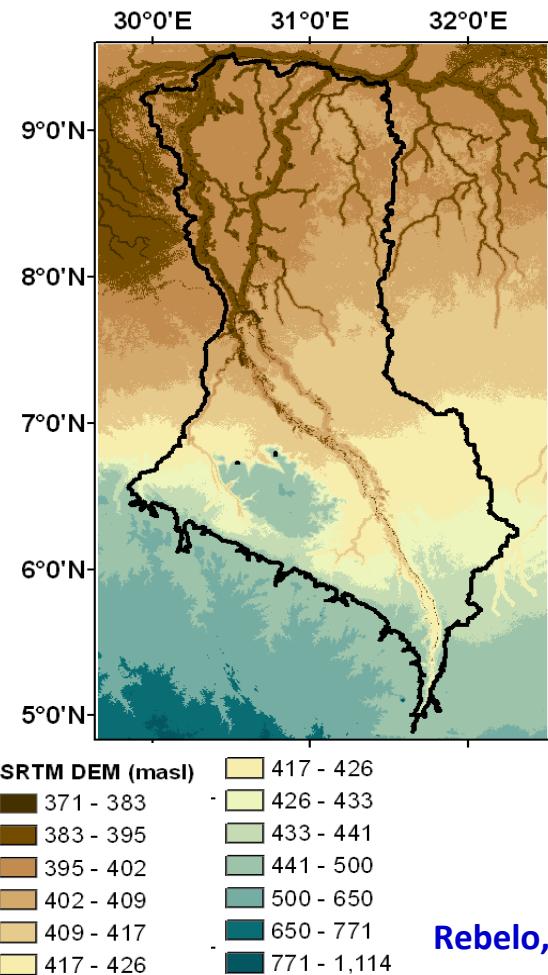
Backscatter signatures for key wetland components:



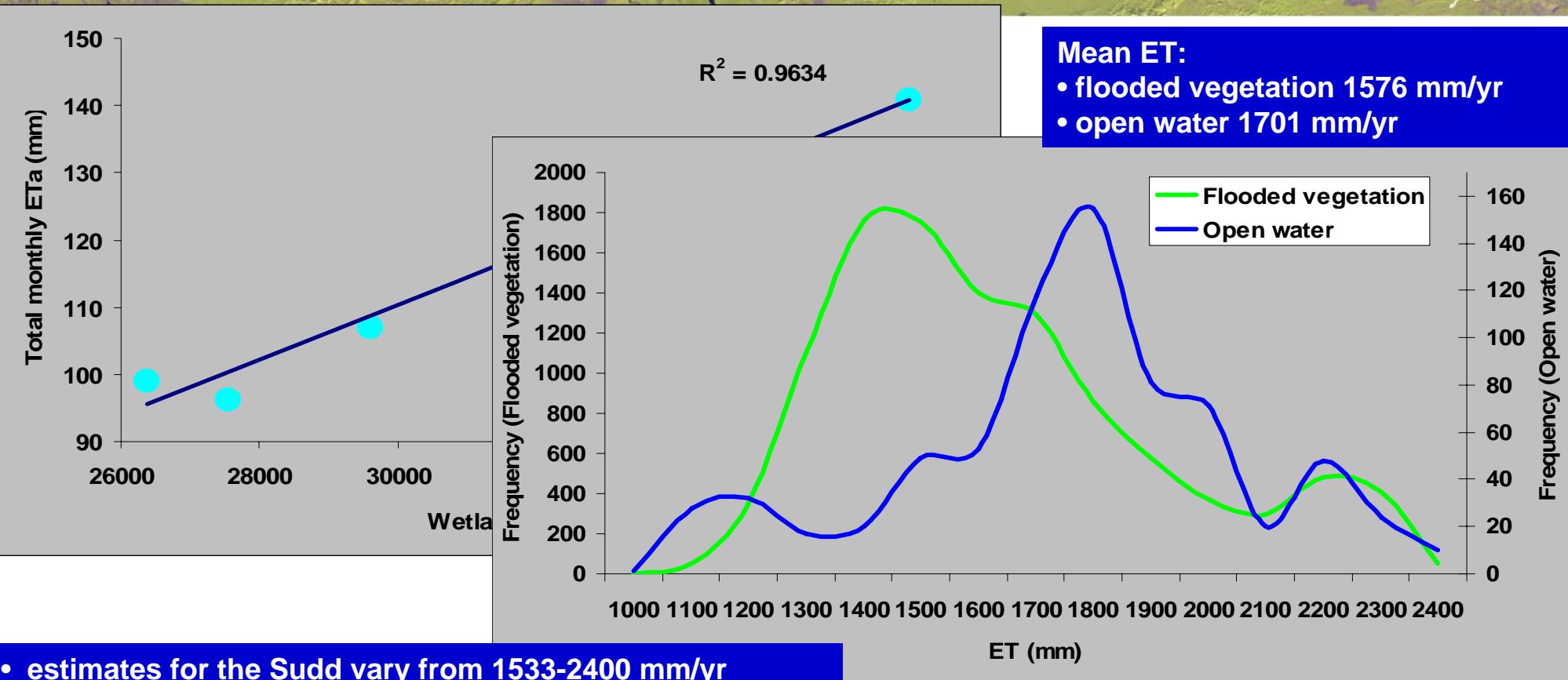
Rebelo, L-M., Senay, G., McCartney, M.P. Flood pulsing in the Sudd wetland: analysis of seasonal variations in inundation and evaporation in Southern Sudan. *Earth Interactions*

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No consensus in the literature as to whether the evaporation from an open water surface is greater, the same, or lower than from a vegetated wetland surface (same atmospheric and climatic conditions) (Mohamed et al *in press*)



Rebelo, L-M., Senay, G., McCartney, M.P. Flood pulsing in the Sudd wetland: analysis of seasonal variations in inundation and evaporation in Southern Sudan. *Earth Interactions*



- estimates for the Sudd vary from 1533-2400 mm/yr
- treat wetland as open water or vegetated surface?
- typically assume that the area is permanently wet

Combining high res maps of inundation patterns with spatially explicit monthly calculations of ET provided insights into variations in ET from the different wetland components

Rebelo, L-M., Senay, G., McCartney, M.P. Flood pulsing in the Sudd wetland: analysis of seasonal variations in inundation and evaporation in Southern Sudan. *Earth Interactions*

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Product Delivery Report for K&C Phase 2

Lisa-Maria Rebelo
International Water Management Institute

Science Team meeting #15
JAXA TKSC/RESTEC HQ, Tsukuba/Tokyo, January 24-28, 2011

K&C deliverables Papers and Reports

1. Published

- K&C Phase-1 and Phase 2 reports
- 2 contributions to K&C Booklet:
 - Mapping of threatened wetlands along the Nile River
 - Mapping wetlands in Africa to improve understanding of wetland-livelihood interactions
- Papers:
 - 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
 - Rebelo, L.-M., McCartney, M.P., Finlayson, C.M., 2010. The application of geospatial analyses to support an integrated study into the ecological character and sustainable use of Lake Chilwa. Journal of Great Lakes Research, doi:10.1016/j.jglr.2010.05.004
 - Rebelo, L-M., Senay, G., McCartney, M.P. Flood pulsing in the Sudd wetland: analysis of seasonal variations in inundation and evaporation in Southern Sudan. Earth Interactions
- Conference Proceedings:
 - Rebelo, L.-M. 2009. Mapping inland wetlands in Africa using long waveband radar. Proceedings of the Waternet Symposium, Entebbe, Uganda

K&C deliverables

**Data sets and Thematic products
(mosaics, classification maps etc.)**

2. Completed, but not yet delivered (please deliver ASAP)

- *Distribution of wetland vegetation, Lake Chilwa, Malawi*
- *Inundation patters, Lake Chilwa, Malawi*
- *Field data sets, Lake Chilwa, Malawi*

- *Classification of Lake Urema, Mozambique*
- *Field data sets, Lake Urema, Mozambique*

- *Maps of inundation patterns, the Sudd*
- ...