K&C Phase 4 – Status report

Inundation mapping in East and Southern Africa

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Science Team meeting #23
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Project outline and objectives

Development of regional-scale applications: identifying seasonal patterns of inundation

- PALSAR data will be used to determine flooding patterns and to map the temporal dynamics of inundation across selected regions

Project activities will involve mapping regional scale patterns of flooding and inundation across East and Southern Africa

- Initial assessment of these ecosystems and their seasonal dynamics was undertaken during the first phases of the K&C, and with data acquired by ALOS 1. The continuation of the data archives with acquisitions from ALOS 2 allows for the continued monitoring of these important wetlands, and provides the opportunity to better understand their dynamics over a longer period

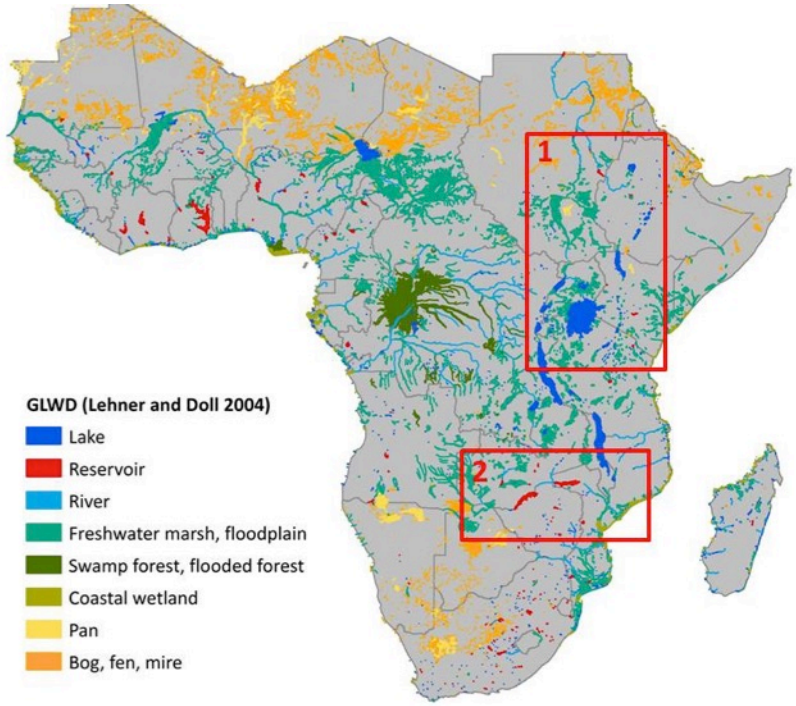
Links to the K&C "3C" thematic drivers:

- The activities are of direct relevance to the Ramsar Convention on Wetlands of International Importance, demonstrating the application and use of L-band SAR for wetland assessment, inventory and monitoring. The deliverables will also provide the information required for environmental conservation in the relevant regions

Deliverables etc.

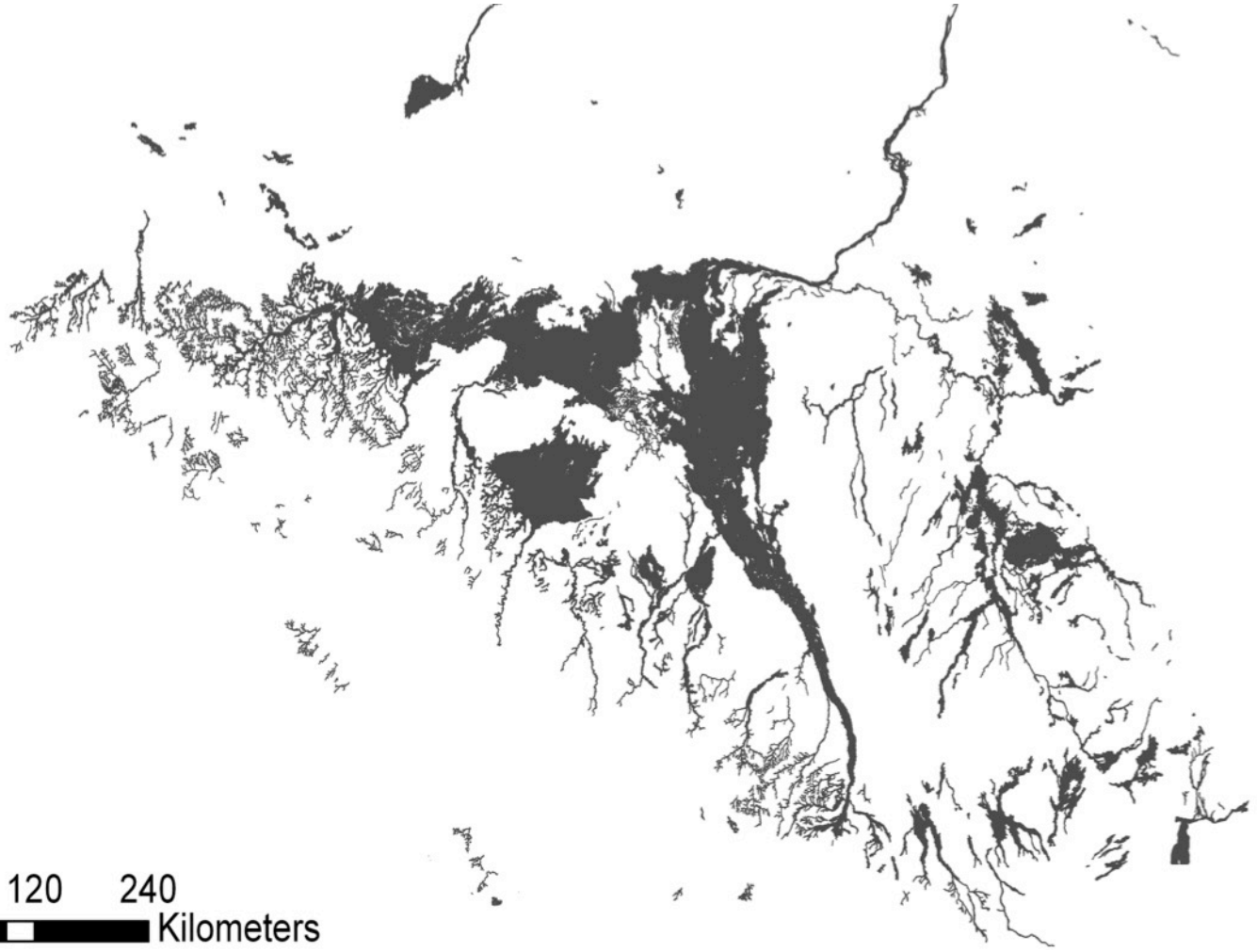
Proposed project deliverables include maps showing the spatial-temporal variations in inundation at a regional scale from ScanSAR data for the prototype areas including:

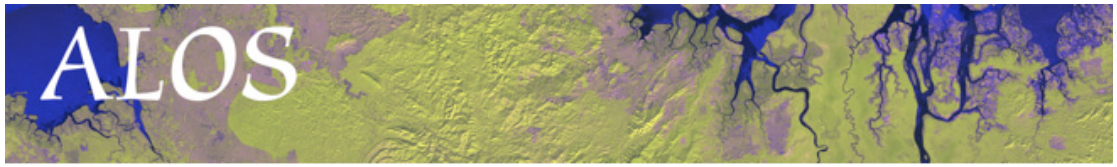
- Minimum water extent
- Maximum water extent
- Seasonally inundated land/floodplain extent
- Seasonal variations in inundation
- Analysis of intra as well as inter-annual variations and changes occurring to the wetlands during the full time period of analysis (2007 – 2018)



Results and significant findings thus far:

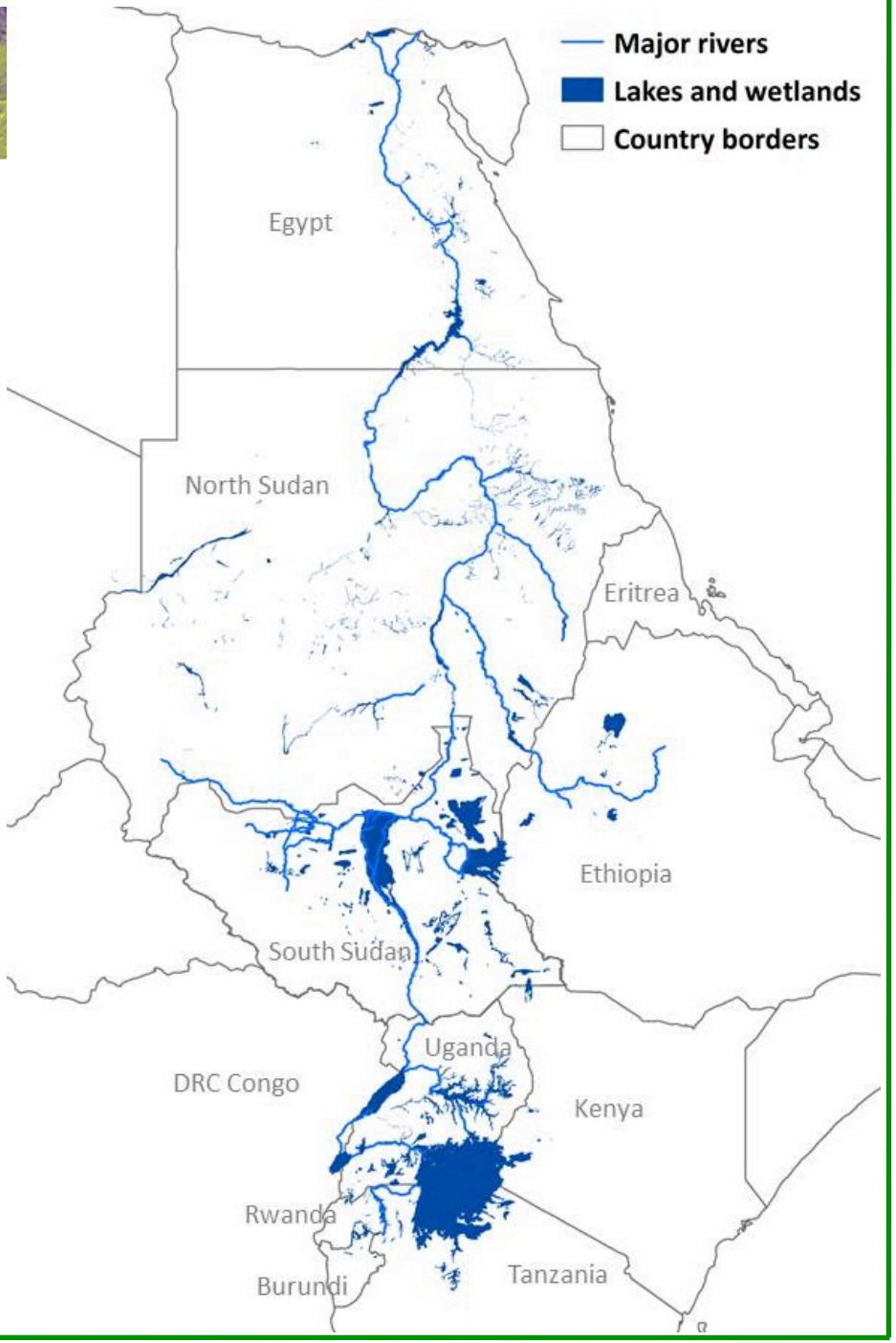
1. Assessment of variability and changes in water availability
   - Location of aquatic ecosystems, presence of open water and flooding under the vegetation
   - Inundation status, duration of inundation





1. Assessment of variability and changes in water availability
   - Location of aquatic ecosystems, presence of open water and flooding under the vegetation
   - Inundation status, duration of inundation

2. Guidance on wetland extent and changes



September 2015 - the 2030 Agenda for Sustainable Development was accepted by the UN:

- This Agenda documented the 17 Goals and 169 Targets deemed necessary to monitor development to achieve a sustainable future
- Taken together, the globally-agreed goals and targets are expected to provide a landmark framework that guides countries towards sustainable development

A dedicated water goal:

- Water-related ecosystems influence the water cycle, are the source of water for people and therefore are of direct importance to the achievement of Goal 6.
- Implementation of the monitoring of Target 6.6 will represent the first time that a global initiative has set out to monitor water-related ecosystems in such detail and with the endorsement of the global community.

ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

By 2020 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

Ecosystem category	Extent indicators
Vegetated wetlands (vegetation and water dominated ecosystems such as swamps, swamp forests, marshes, peatlands and mangroves)	Spatial extent/area Water quality Wetland health indices
Inland open waters (lakes and reservoirs)	Spatial extent/area and Quantity (volume) Water quality Ecosystem health indices
Rivers and estuaries	Quantity (streamflow) and environmental flows Water quality Biological indices or Ecosystem health indices
Groundwater	Quantity (depth to groundwater table) Water quality

Indicator for Target 6.6.1;
Change in the extent of water-related ecosystems over time

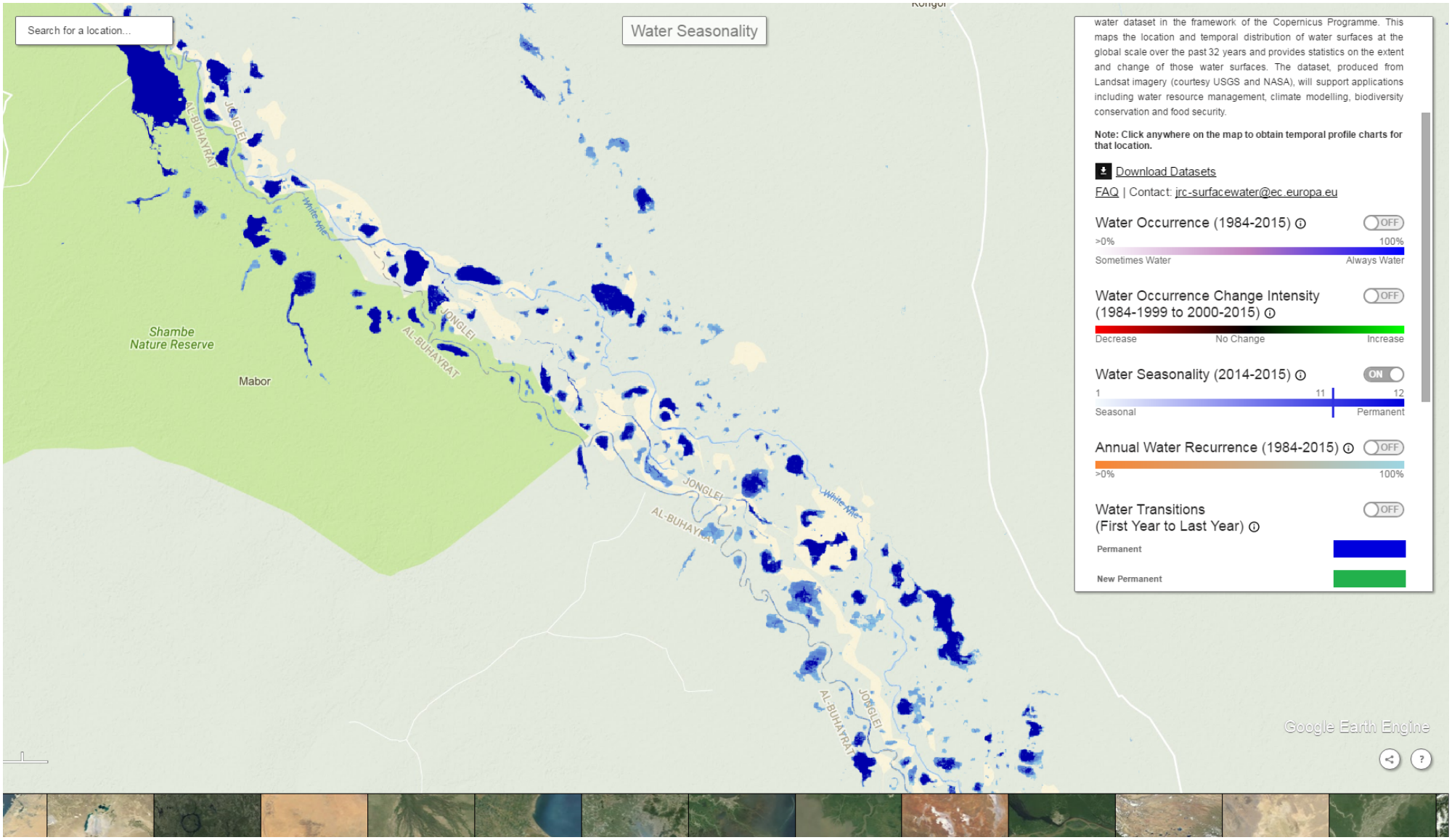
Guidance on wetland extent and changes:

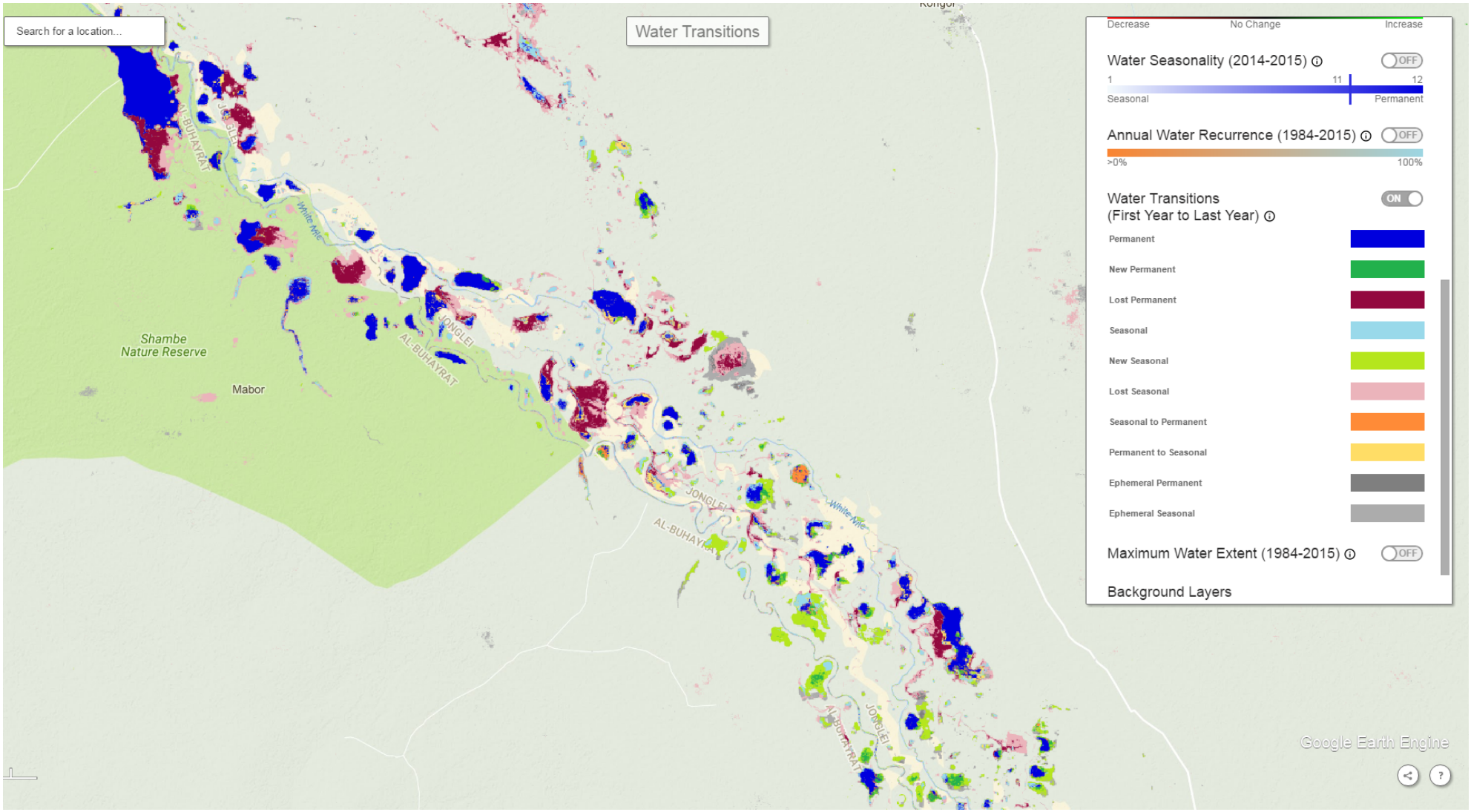
Optical datasets acquired by a single sensor rarely provide sufficient information to determine *maximum* wetland extent

Provide useful information during the dry season and can be used to identify areas of “permanent inundation”; but

- Cloud cover during period of maximum inundation
- Vegetation can not be used as a proxy during the wet season

Countries need Analysis-Ready-Data which is available at the national level to use as a baseline and to report on in 2017


Search for a location...
Water Seasonality
Shambe
Nature Reserve
Mabor
AL-BUHAYRAT
JONGLEI
White Nile
water dataset in the framework of the Copernicus Programme. This maps the location and temporal distribution of water surfaces at the global scale over the past 32 years and provides statistics on the extent and change of those water surfaces. The dataset, produced from Landsat imagery (courtesy USGS and NASA), will support applications including water resource management, climate modelling, biodiversity conservation and food security.
Note: Click anywhere on the map to obtain temporal profile charts for that location.
Download Datasets
FAQ | Contact: jrc-surfacewater@ec.europa.eu
Water Occurrence (1984-2015)
OFF
>0%
100%
Sometimes Water
Always Water
Water Occurrence Change Intensity (1984-1999 to 2000-2015)
OFF
Decrease
No Change
Increase
Water Seasonality (2014-2015)
ON
1
11
12
Seasonal
Permanent
Annual Water Recurrence (1984-2015)
OFF
>0%
100%
Water Transitions (First Year to Last Year)
OFF
Permanent
New Permanent
Google Earth Engine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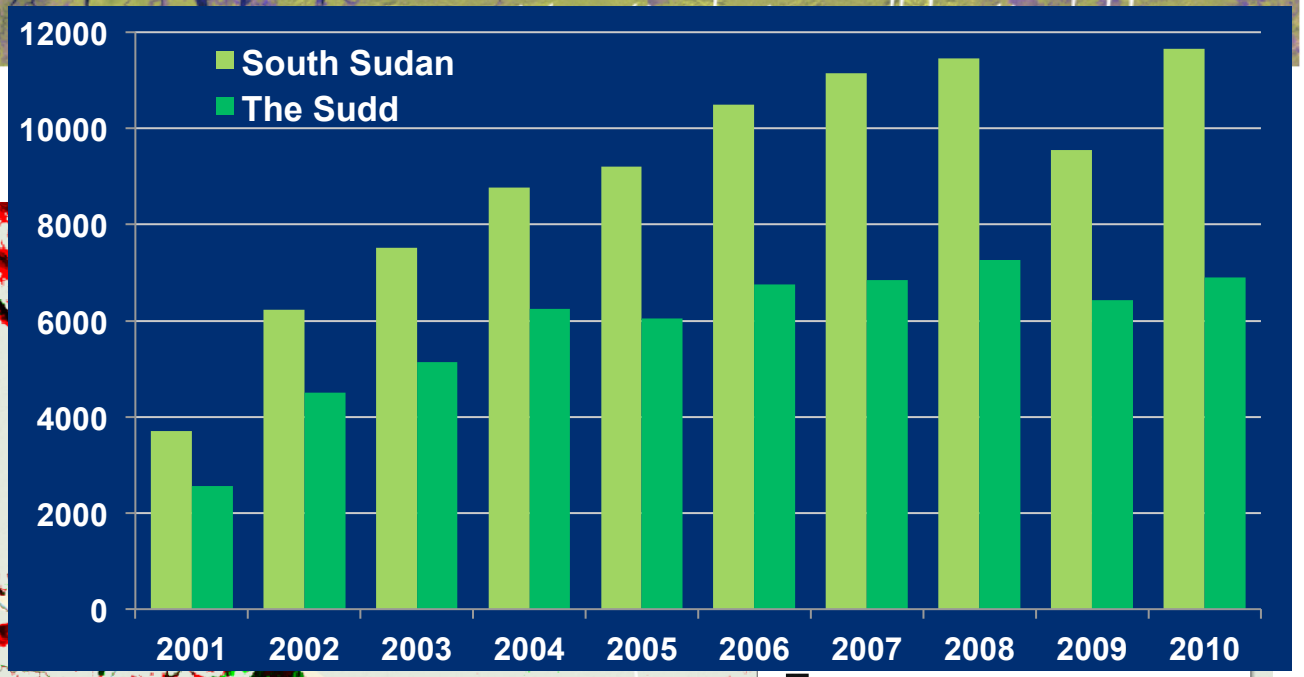
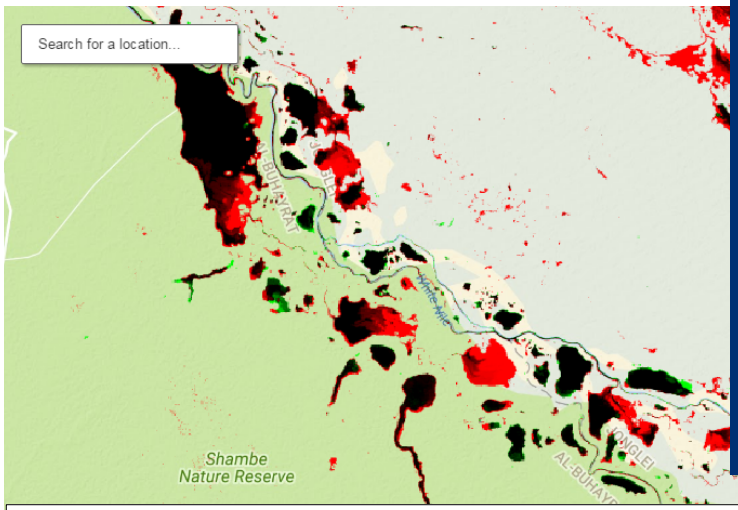
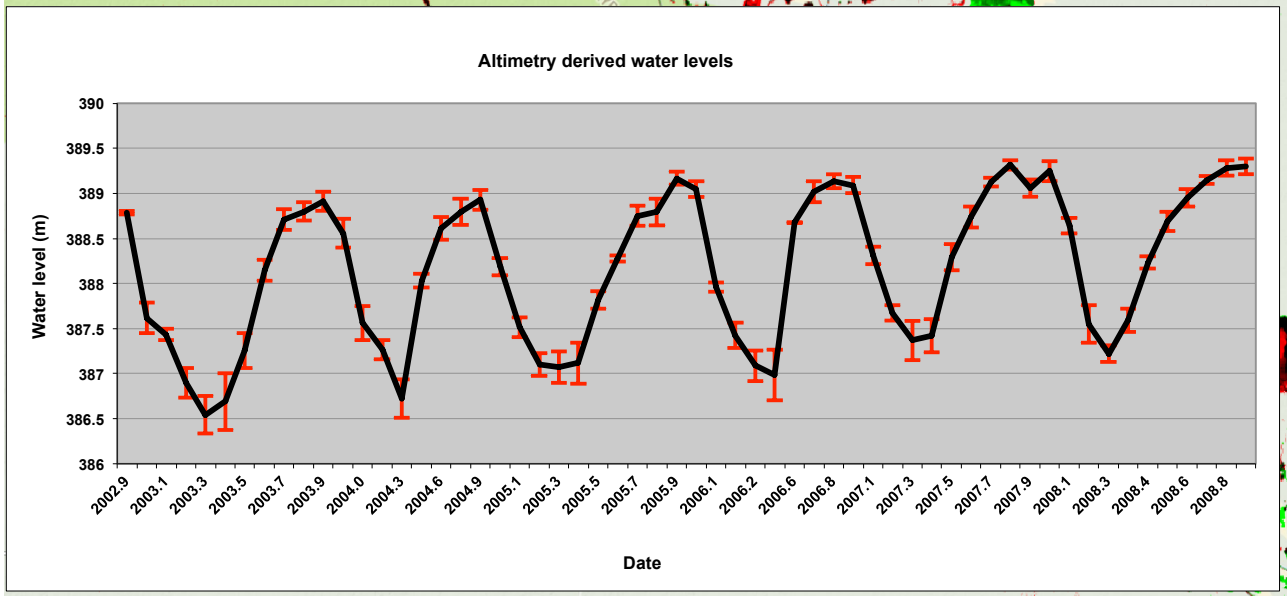
100%
Water Transitions
(First Year to Last Year)
ON
Permanent
New Permanent
Lost Permanent
Seasonal
New Seasonal
Lost Seasonal
Seasonal to Permanent
Permanent to Seasonal
Ephemeral Permanent
Ephemeral Seasonal
Maximum Water Extent (1984-2015)
OFF
Background Layers
Google Earth Engine

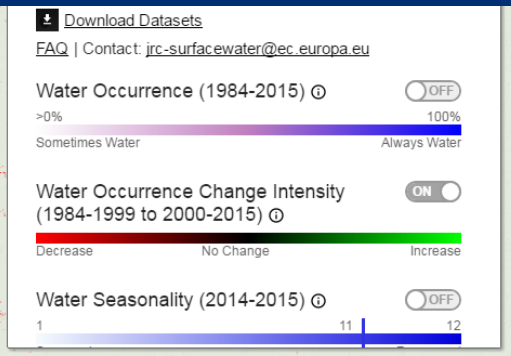
ALOS

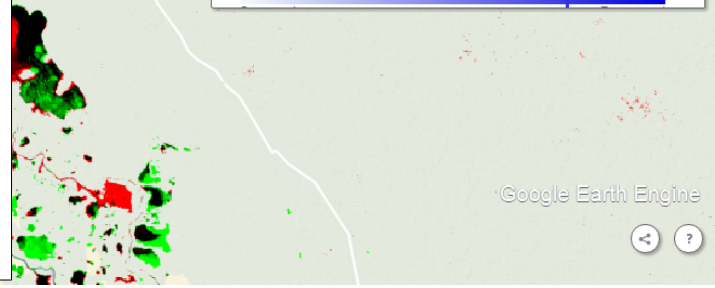
K&C Initiative







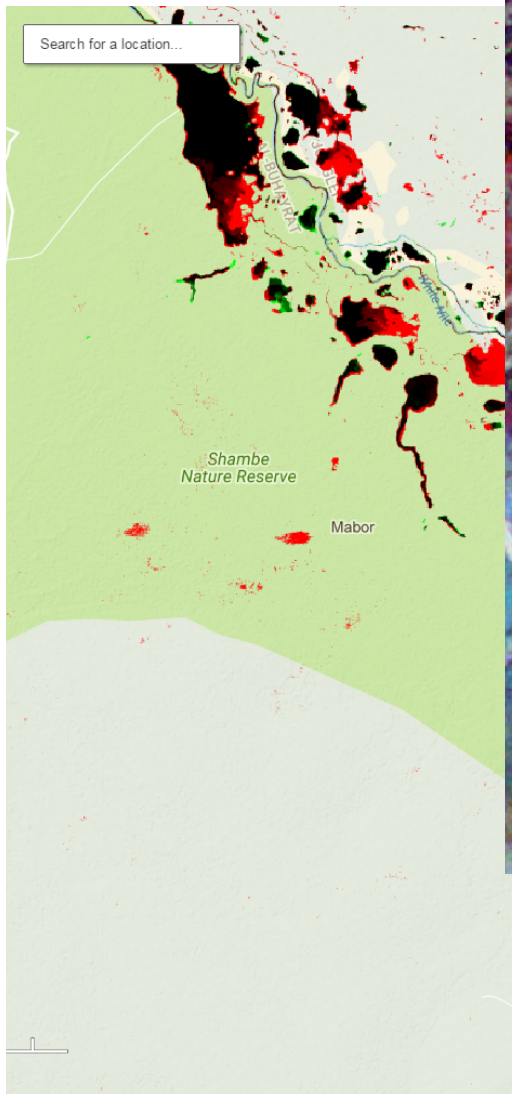


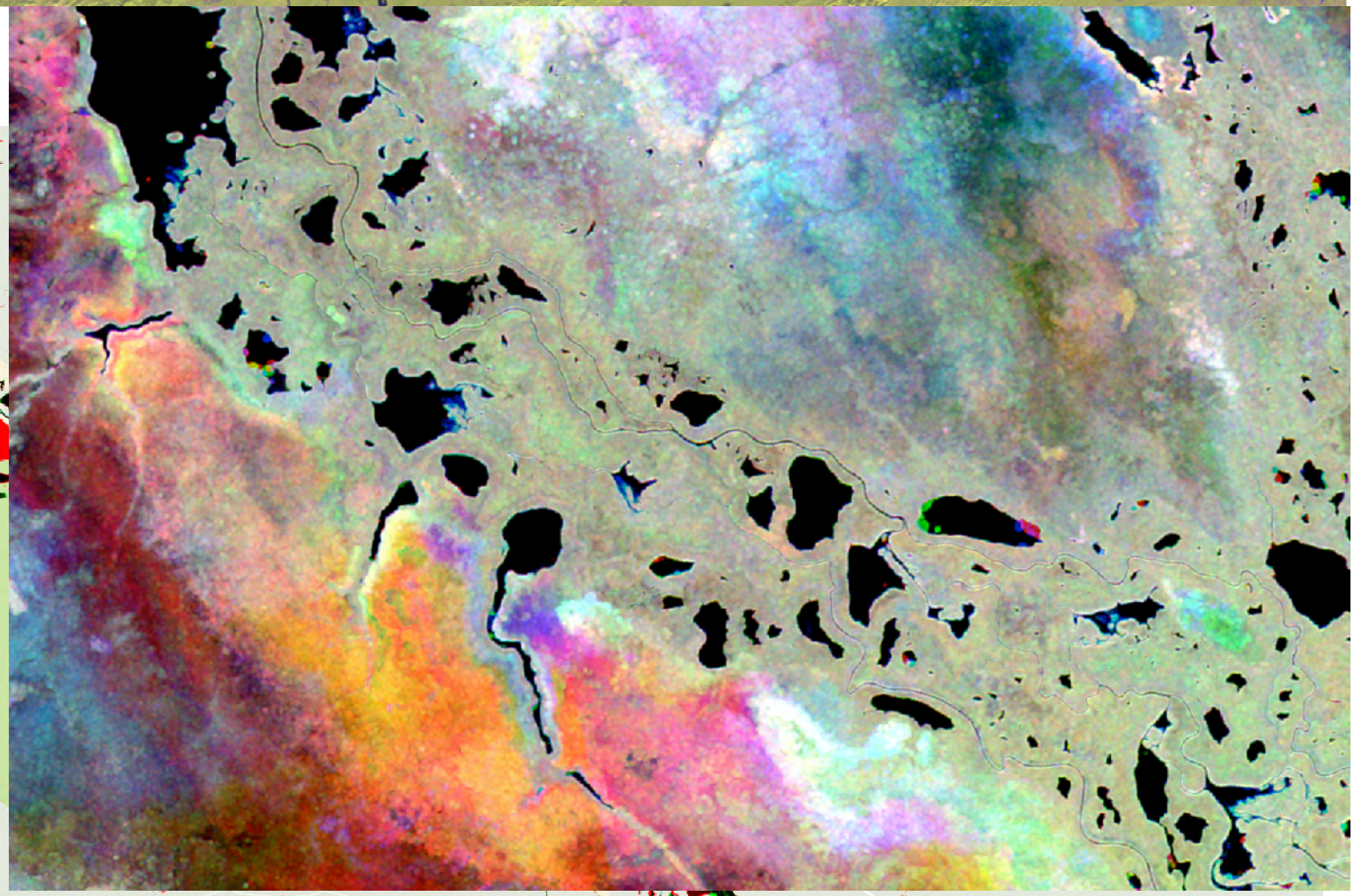


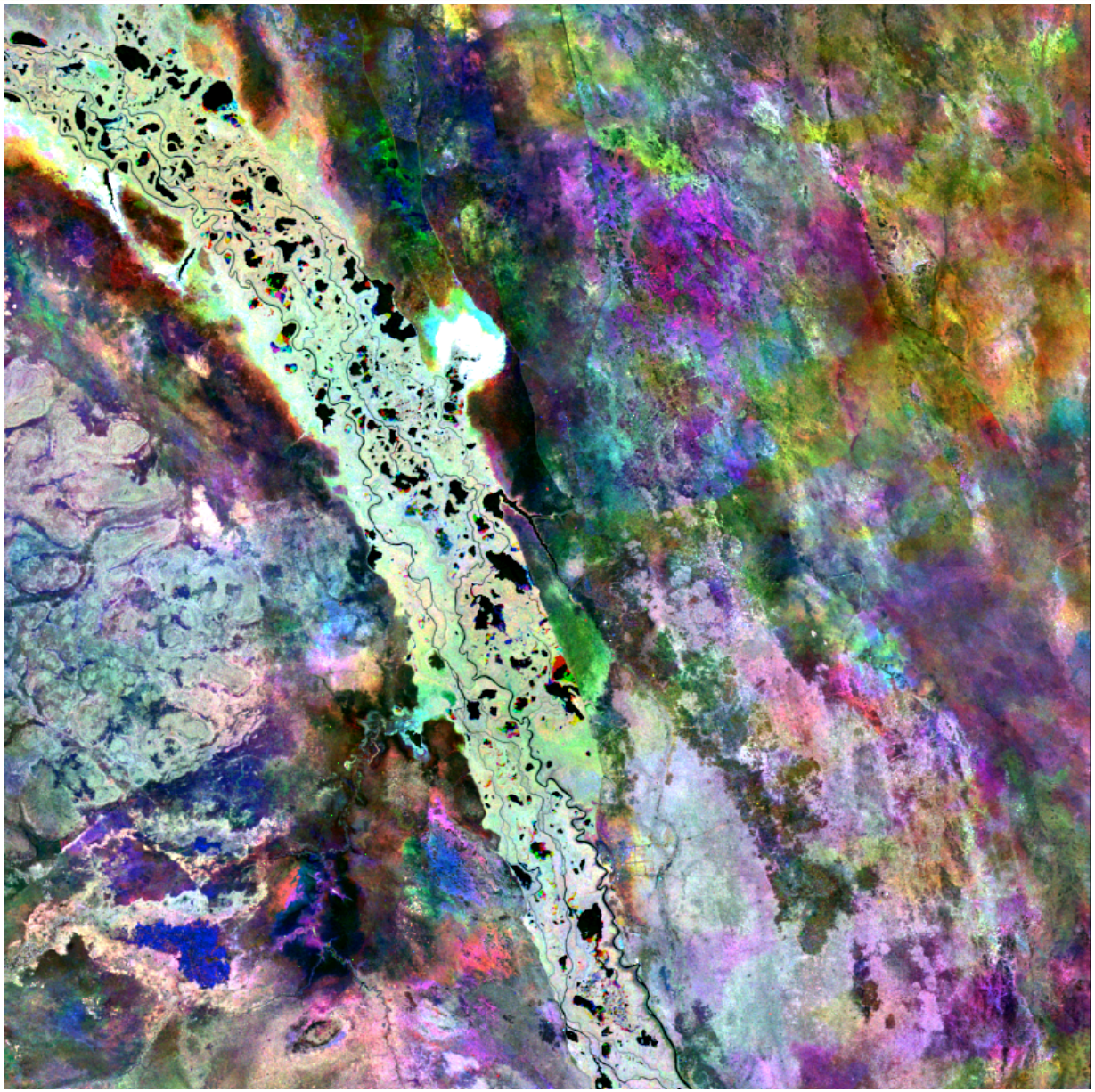
ALOS

K&C Initiative

An international science collaboration led by JAXA







JERS – 1994, 1995, 1996

PALSAR – 2007, 2008, 2009

ALOS 2 – 2014, 2015, 2016…

A 20 year record of the wetland.

PALSAR/PALSAR-2 data access

Please list the PALSAR/PALSAR-2 data you have (1) requested and (2) obtained:

- ALOS-2 PALSAR-2 Fine Beam (HH+HV) mosaic products (2014+)
- ALOS-2 PALSAR-2 ScanSAR (HH+HV) mosaic products (every cycle, non-gap filled - *Foreseen over selected forest and wetlands regions up to 9 times/year 2014*+)
- ALOS PALSAR FBD (HH+HV) mosaic products (2007, 2008, 2009, 2010)
- ALOS PALSAR ScanSAR (HH) mosaic products (every cycle, non-gap filled 2007-2010)
- JERS-1 SAR (HH) mosaic products (mid 1990's)

THANK YOU!