

Inter-continental cooperations and synergies on geospatial applications to support water resources management and water sustainability in Africa

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## Geospatial Applications

Geospatial applications enables continuous drought monitoring over a variety of spatial and temporal scales that can help to generate timely information on drought onset, progress, and areal extent.

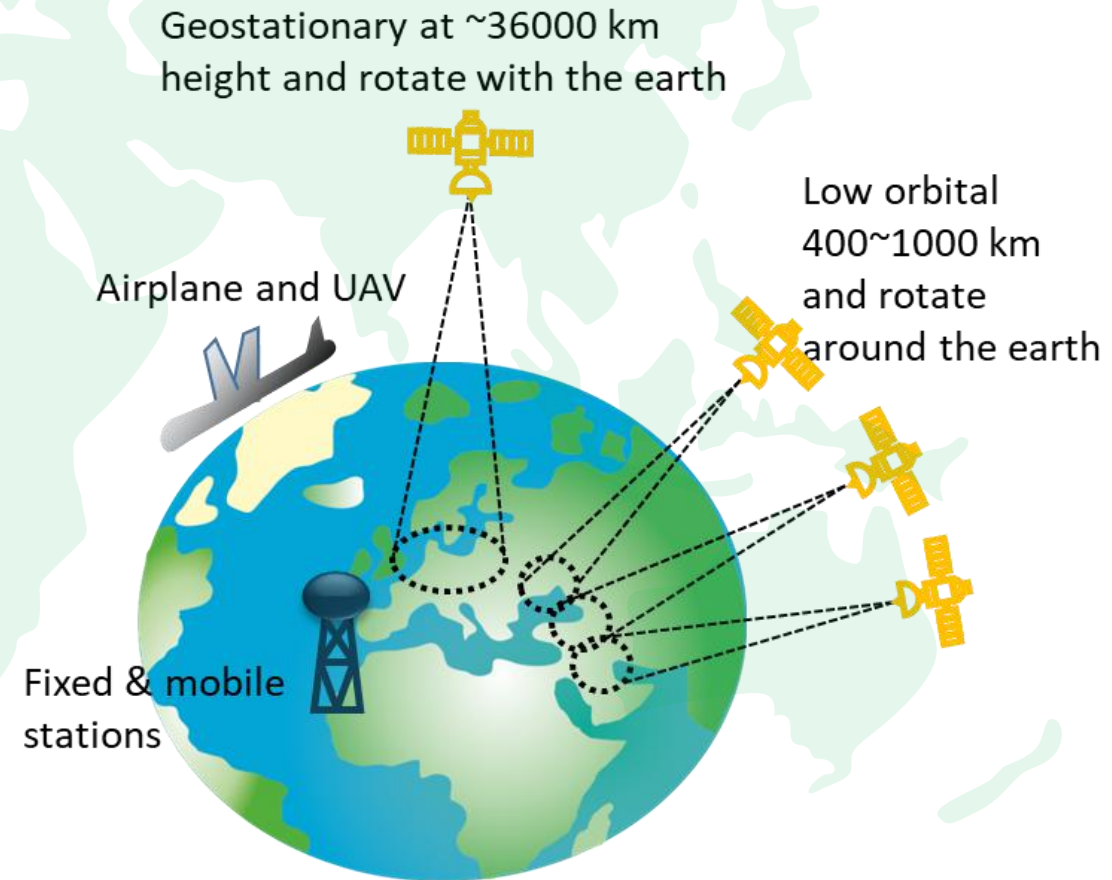
Remote sensors collect information on the target without physical touch

i.e. from a distance, on any platform:

hand held, mobile (phone) and/or fixed station

UAV and aircraft

Satellites: orbital or geostationary.



## Water Resources

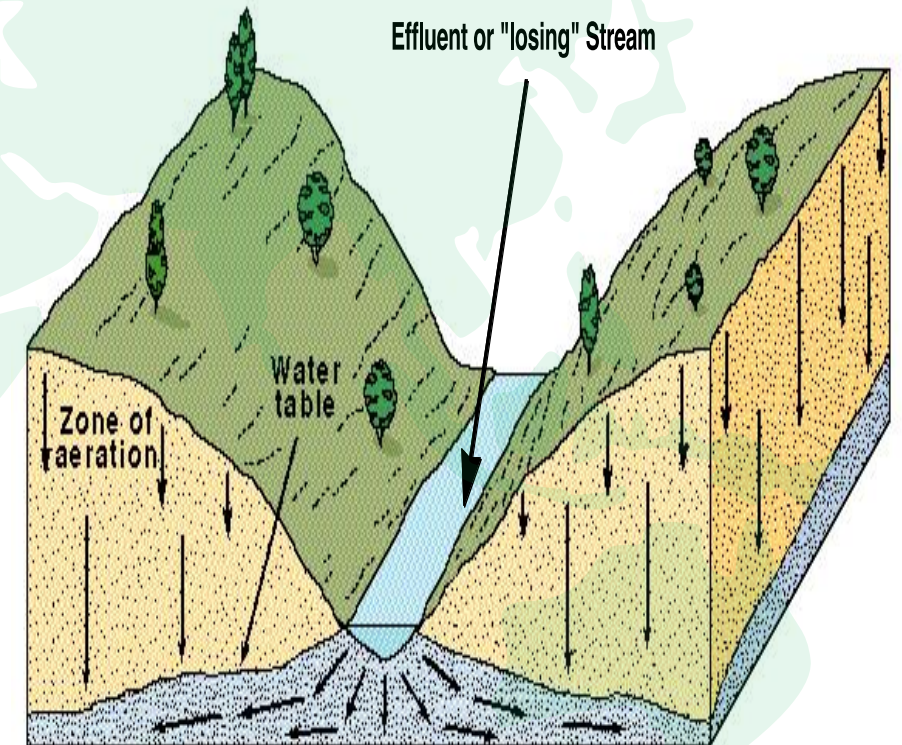
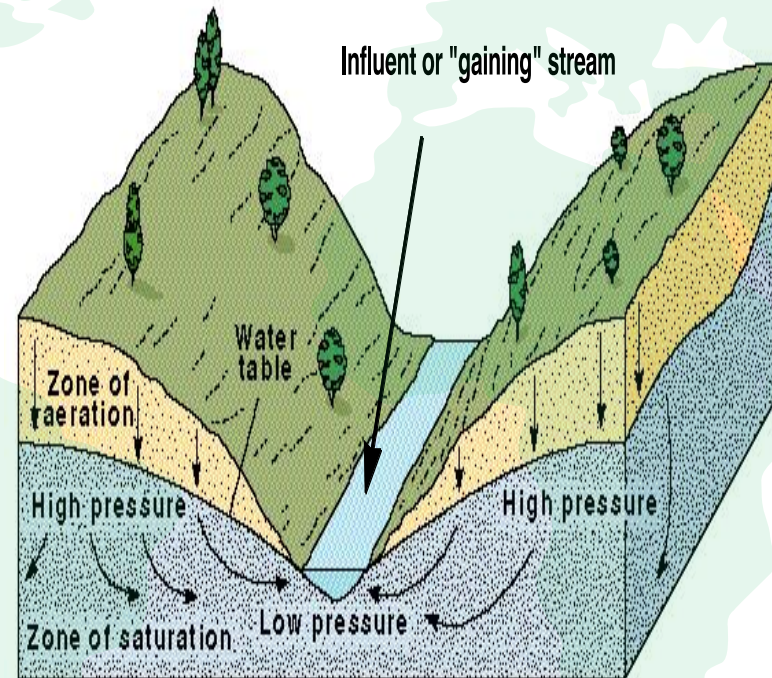
Groundwater ---> water stored in open spaces within underground rocks and sediments

In average 55% of the groundwater used in Africa is attributable to agricultural needs. New sources must be found; in many places and existing resources must be protected.

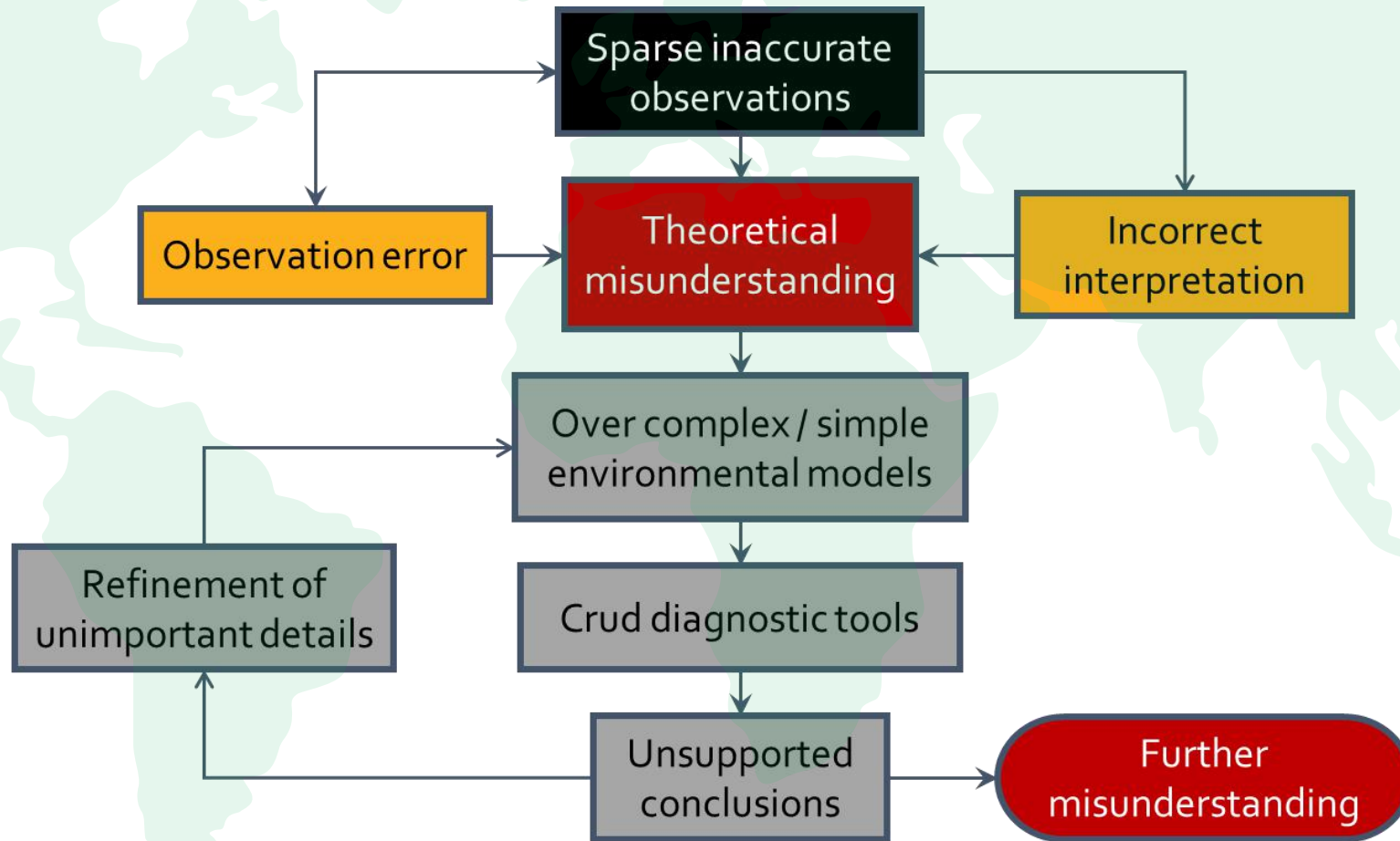
A non-renewable resource in most places are affected by erosion and deposition of silt, clay, and dissolved materials forms

- Flow velocity of groundwater is variable (very fast to very slow).
- Flows from high to low pressure areas.

- In some areas, streams act as recharge zones for unconfined aquifers, losing water from their channel to the material below.

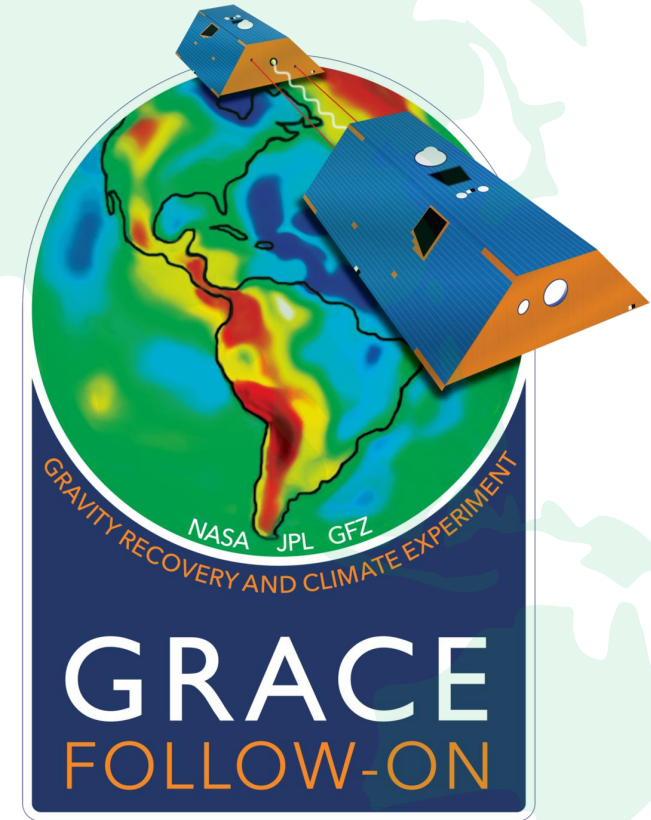


# Why International and Inter-continental Cooperations?

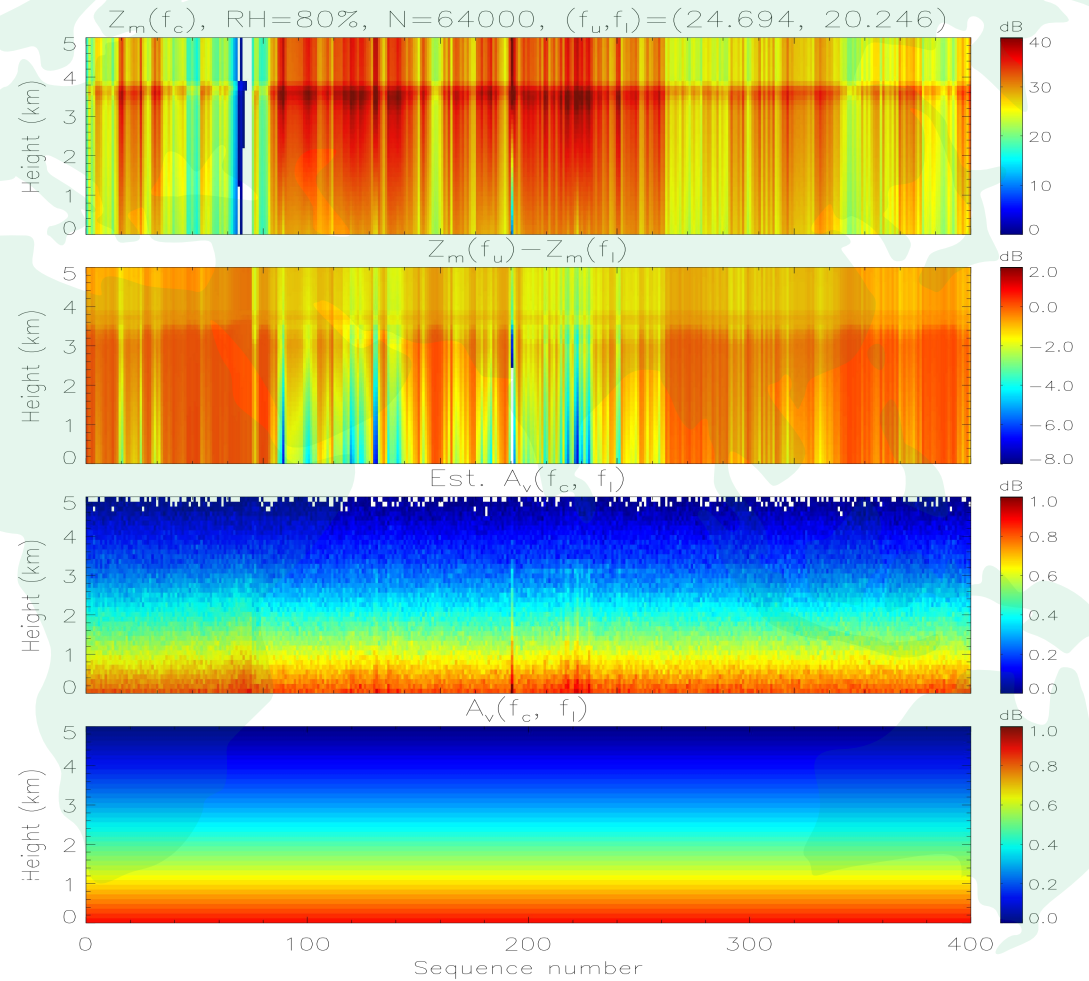
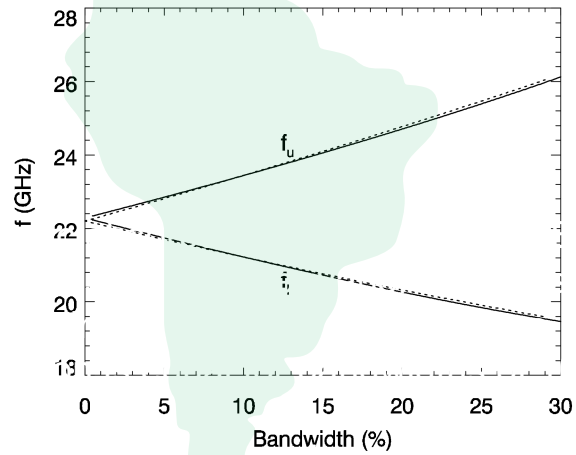
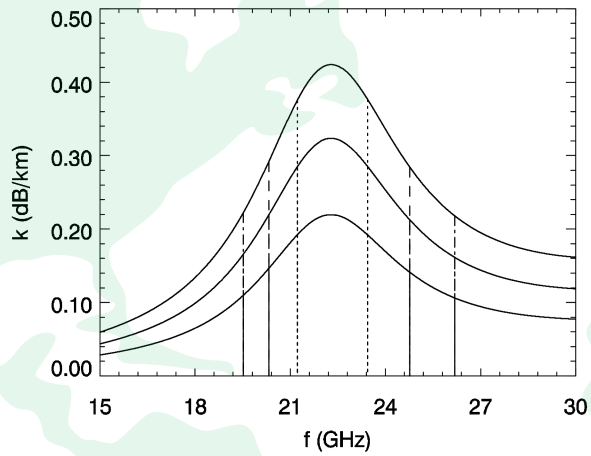


## Case Studies: GRACE and GRACE-FO

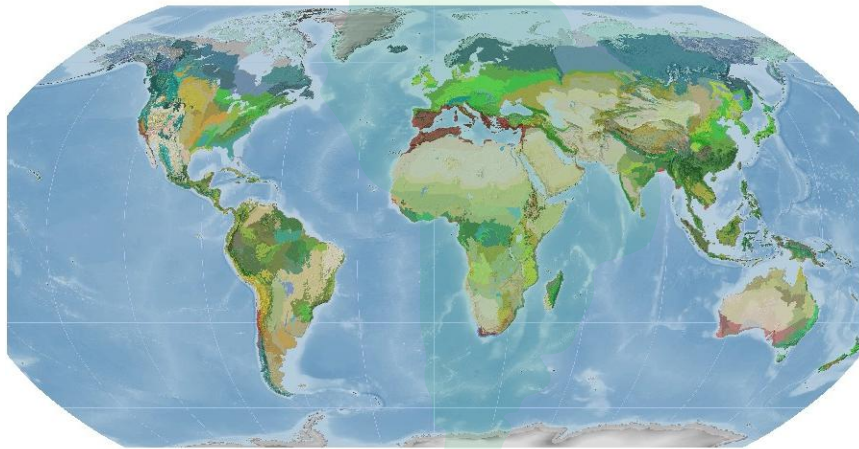
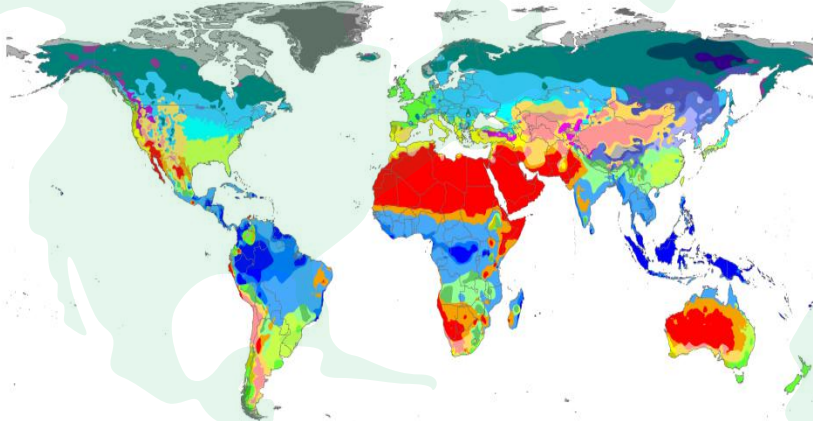
- Global mapping of Earth gravity field provides valuable information on climate change studies.
- GRACE and GRACE-Follow On missions have successfully demonstrated the power of high resolution global gravity maps.
- We proposed to explore a measurement architecture that can further improve Mass Change observations beyond GRACE-FO.
- We focused on a hybrid configuration of laser ranging interferometer (GRACE-FO) together with onboard quantum gravity gradiometer (QGG).



# Results



## Copernicus and GMES-Africa



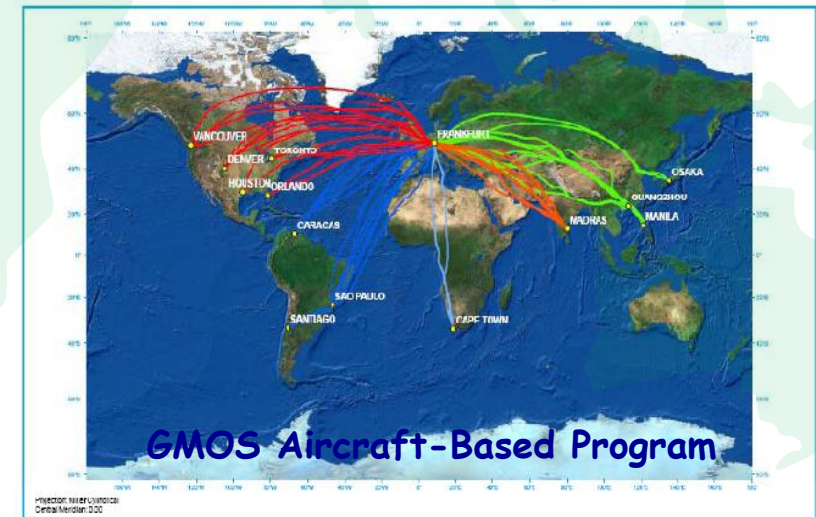
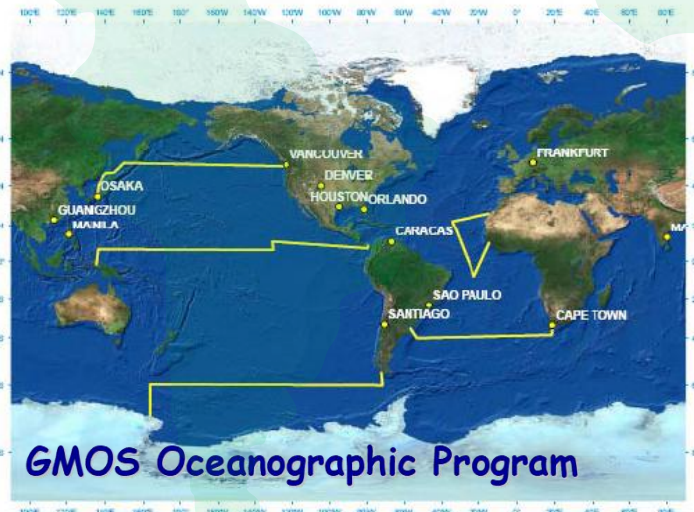
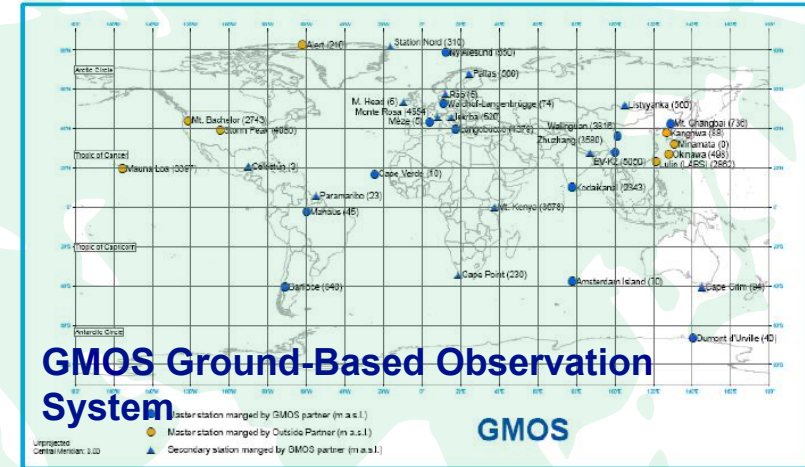
Added-value services to policy-makers and to other users on an operational sustained basis.

Global EO data sets are essential for the implementation of a number of global policies including environment, development, innovation, research and finally, space policy.

## GMOS: Global Observation System for Mercury

GEO Task He-09-02d "Global Observation System for Mercury"

Thematic Strategies on water resources management via GMES, GALILEO, INSPIRE, GEOSS, etc.



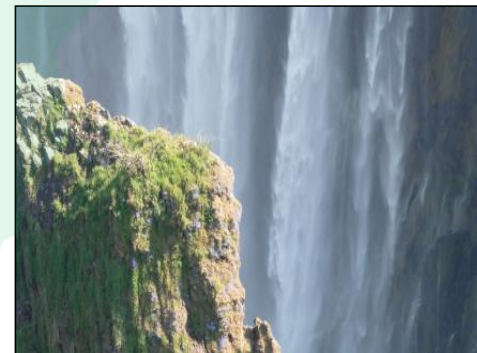
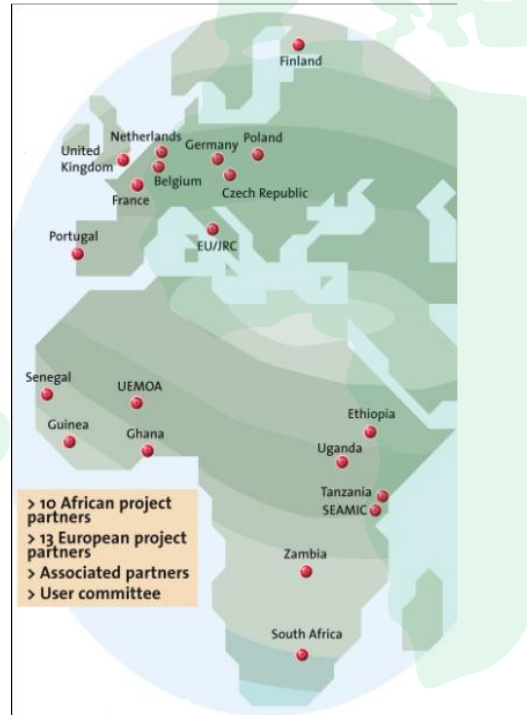




# AEGOS

AFRICAN-EUROPEAN GEORESOURCES OBSERVATION SYSTEM

- Enhance the capacity to plan and build multidisciplinary scenarios
- Integrate socio-economic development indicators
- Improve governance for managing non-renewable natural resources
- Market investment opportunities to support the economy
- Strengthen professional skills and capacities



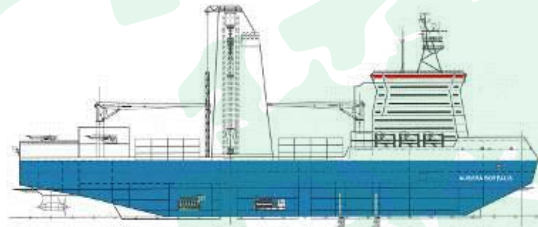
# Public-Private Partnership [PPP]

FP7 Capacity Program provide support to Research Infrastructures.

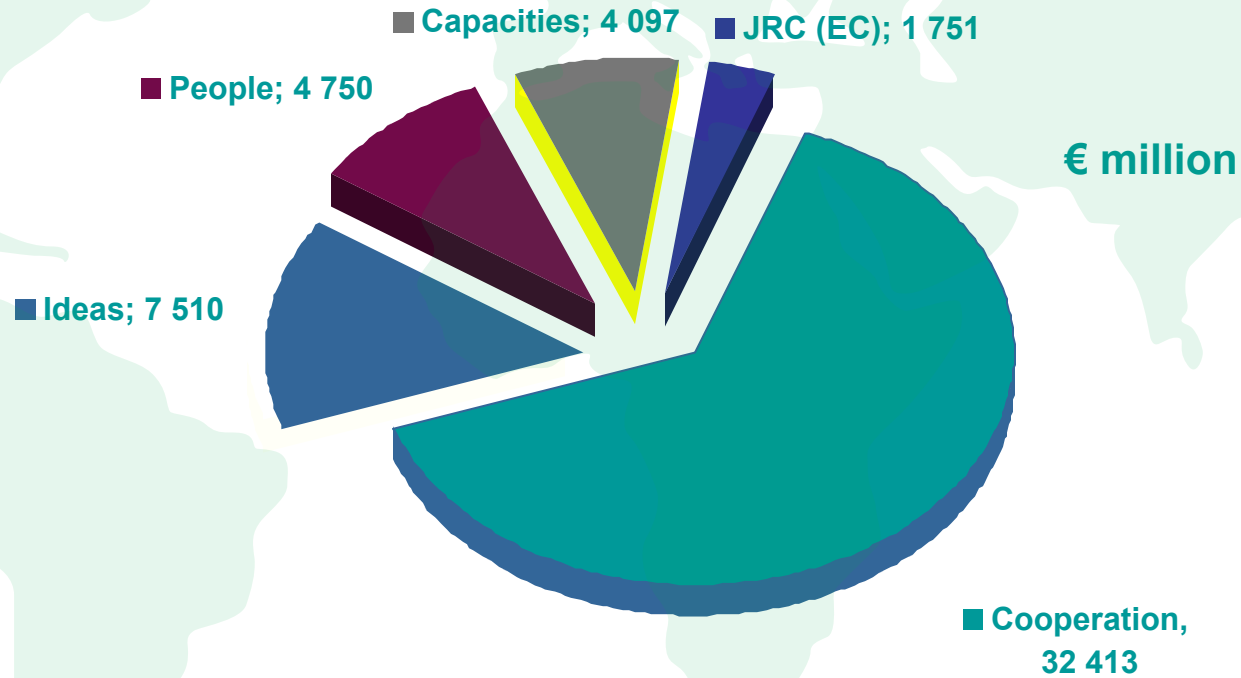
Collaboration with Research partners in Europe, China, Africa, US.

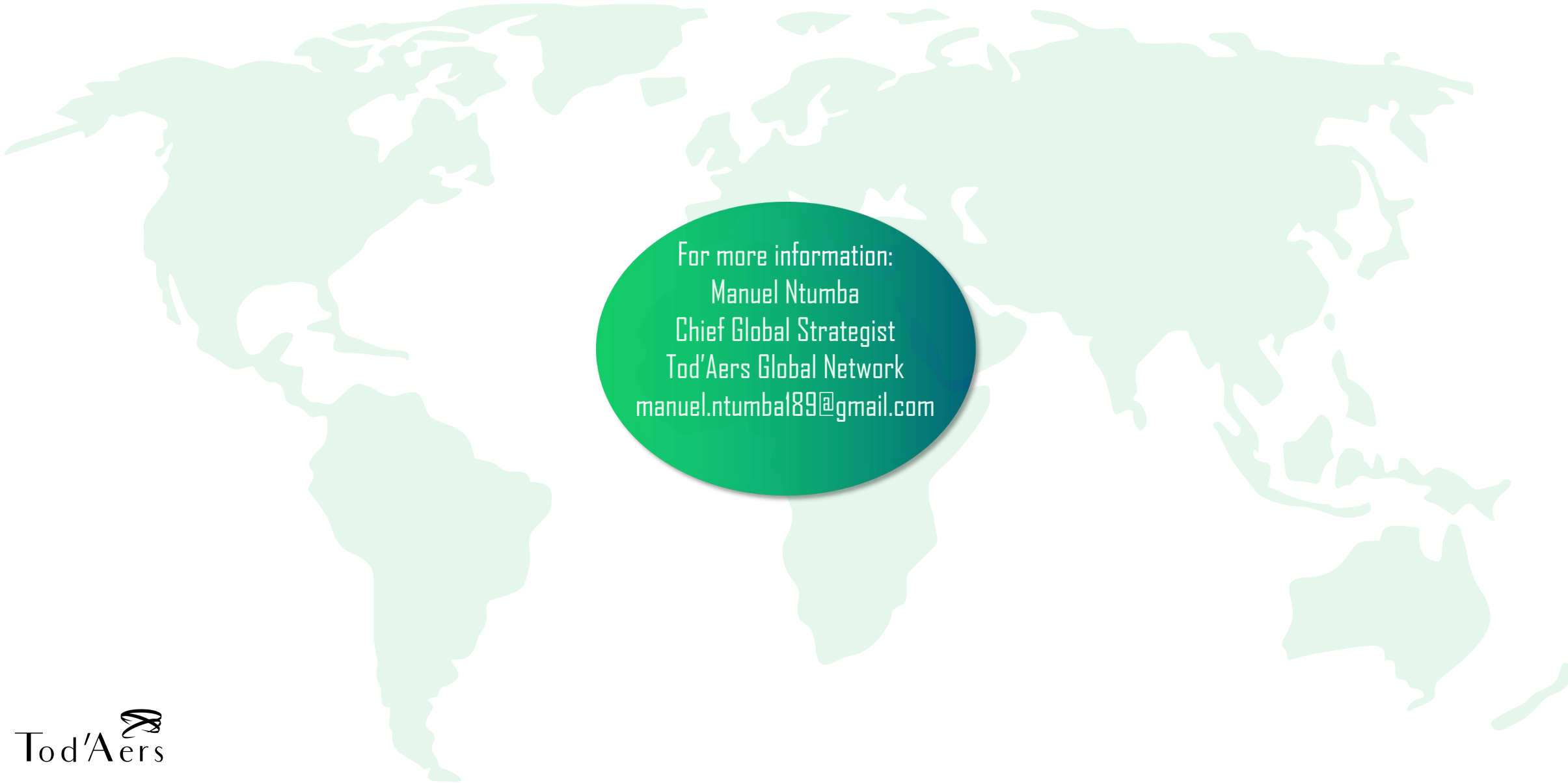
Optimise and share space infrastructure; and support Capacity Building in developing countries

The access to global sets of Earth observation data and resources is a necessity in many domains: climate prediction (e.g. Carbon Cycle), management of ocean resources, and water resources management.



# Estimated Budgets





For more information:  
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