



Pléiades Days

April 1-3, 2014

Toulouse, France

Hydrology Session Introduction

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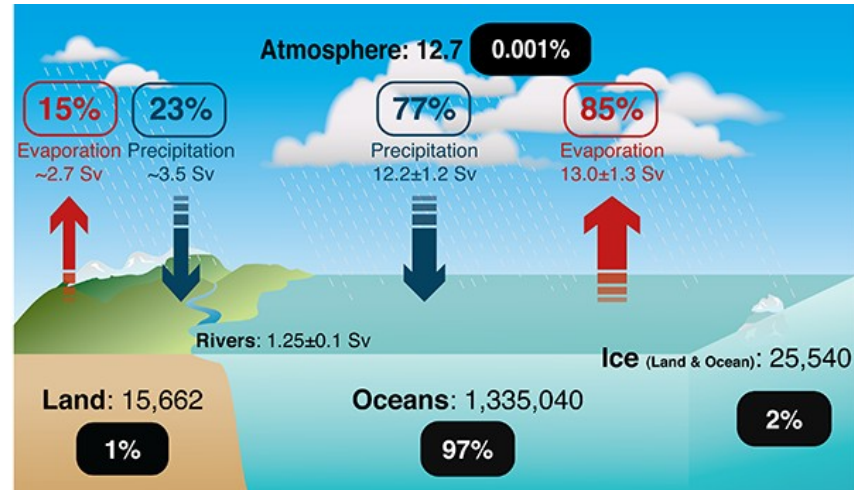
Thematic Domain



Hydrology: **water cycle** science and issues

but also

- Hydroecology
- Related biogeochemical cycles
- Hydric erosion & Geomorphology
- Epidemiology (waterborne diseases)



Durack et al. (2012)

Fresh water issues:

- Inland water resources monitoring (quantity & quality)
- Aquatic habitats monitoring
- Hydrological risks prevention

Actions:

- Science: Processes understanding, modelling and simulation
- Public policies (Water managers, engineering):
 - EU Nitrates Directive - 1991
 - EU Water Framework – 2000
 - EU Floods Directive - 2007



Remote sensing use

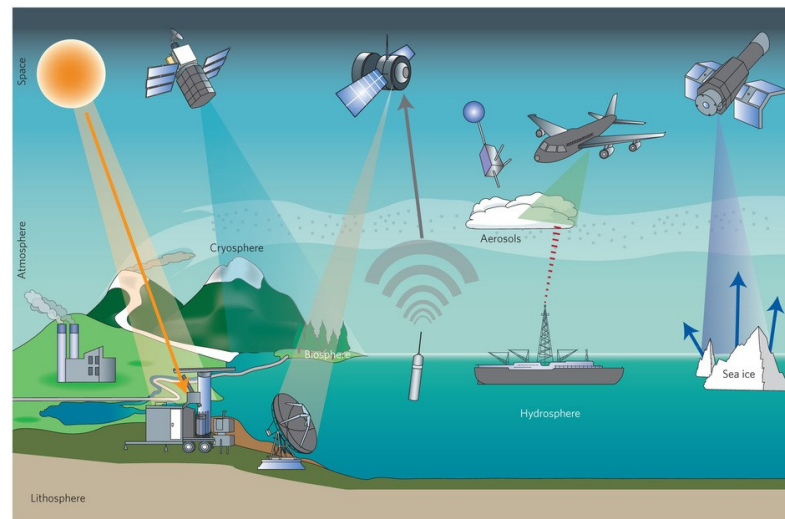


Historical remote sensing for hydrology :

- DEM (waterpaths and catchment delineation)
- Soil-Vegetation-ATmosphere models parametrization (ETP, etc)
- Land surface characteristics (land-use)

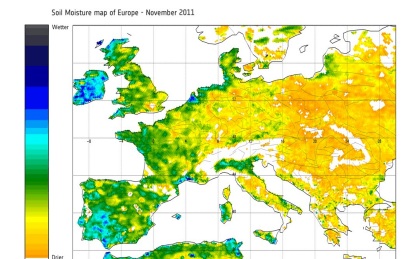
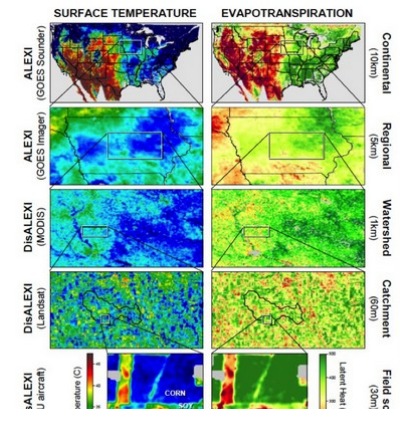
Dedicated sensors for global water cycle monitoring:

- AQUA – Evaporation - Precipitation
- Soil moisture
- Ice
- Limnigraphy
- River discharge
- ...etc

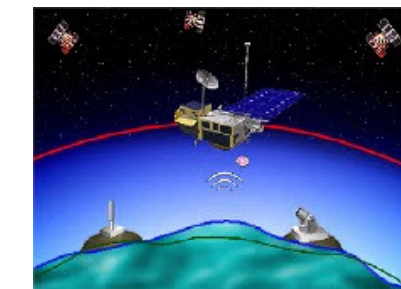


Yang et al. (2013)

But few dedicated sensors at mesoscale (management scale)

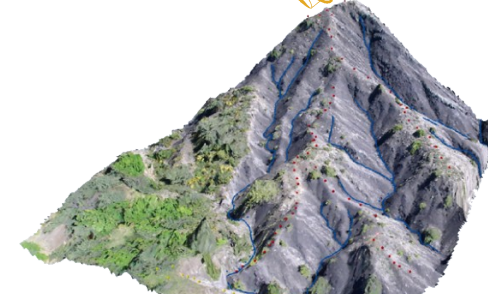


SMOS



SWOT

Pléiades expectations



Spatially highly resolved optical multi-spectral data for land surface hydrology:

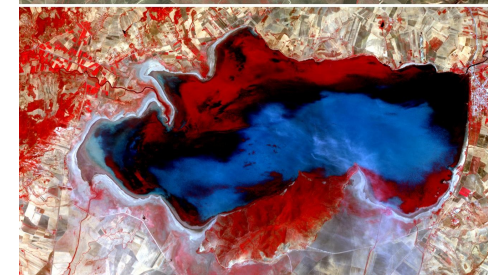
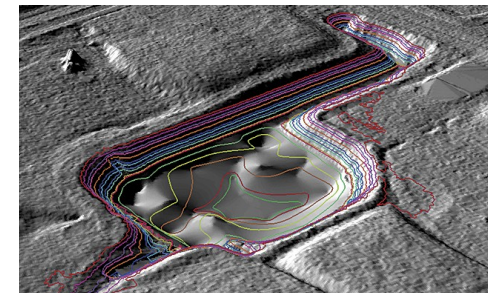
An imagery and DEM space-time downscaling opportunity

For hydrological scientists:

- Erosion and geomorphic processes observation (diachronic)
 - Catchment land surface erosion
 - Changes in braided and gravel-bed rivers
 - ...
- Hydrological objects mapping for model feeding
 - Waterbodies delineation
 - Catchment characteristics (drainage system, ...)

For water management and public policies

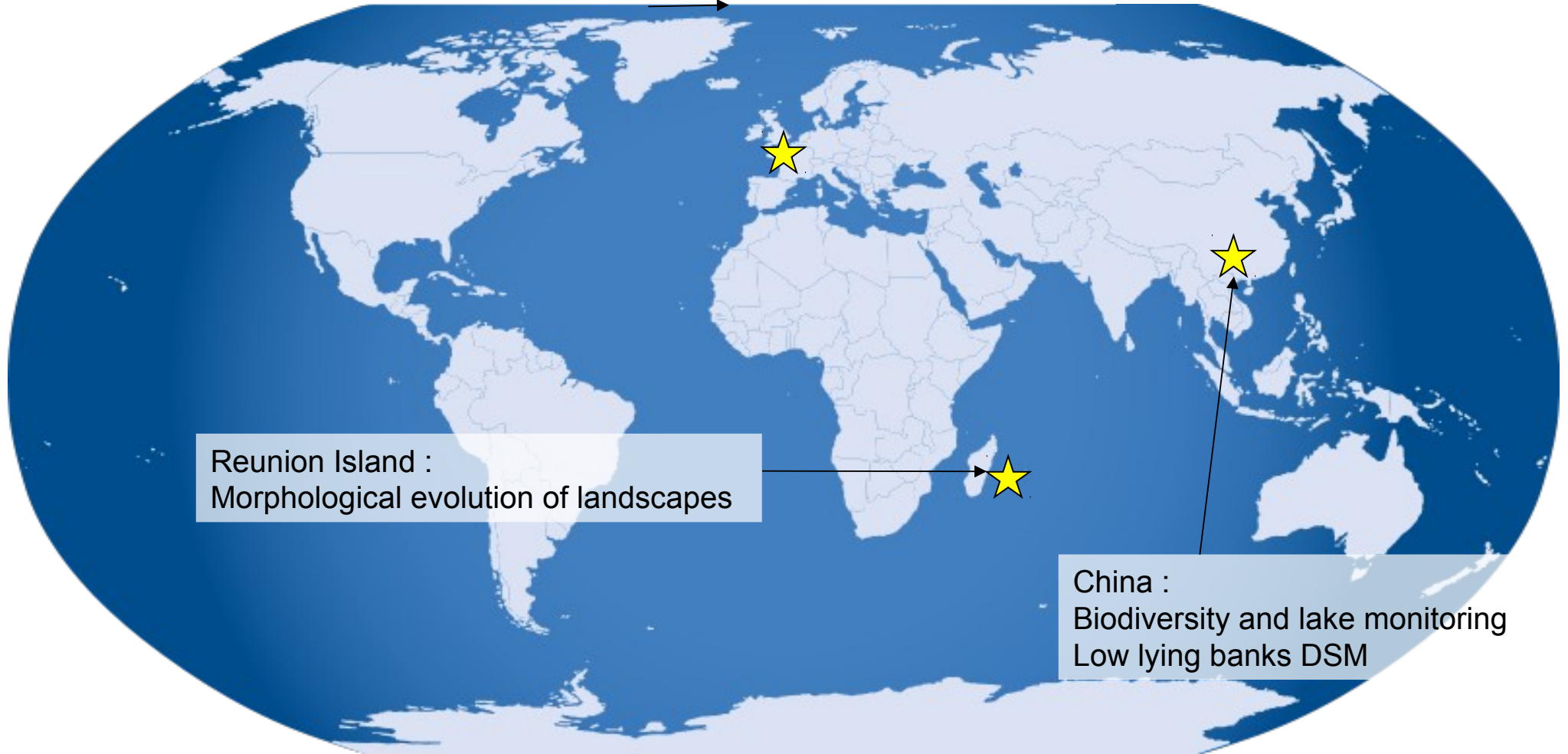
- Aquatic habitat monitoring using imagery derived indicators
- Water resources monitoring: water quality, water storage



7 Hydrology Studies within Pléiades Users Thematic Commissioning



France :
Terrace walls detection
Diachronic analysis of river and lake dynamics
Drainage in catchment areas of drinking water supply



Reunion Island :
Morphological evolution of landscapes

China :
Biodiversity and lake monitoring
Low lying banks DSM

Partners of the studies



Pléiades Days – Hydrology Session Agenda - Poster Communications



- HP1 Terrace walls detection from a Pléiades Digital Elevation Model - [J.S. Bailly \(LISAH\)](#)
- HP2 Potentialities of Pléiades images to monitor the water level fluctuation of French reservoirs: comparison and complementarity with high spatial and temporal radar images - [T. Tormos \(IRSTEA\)](#)
- HP3 Synergy of VHR optical and VHR SAR data for generation of high resolution DSM's over large flat areas. The case of Pleiades and TerraSAR-X exploitation over the low lying banks of Yangtze River (PR China)
- [H. Yésou \(SERTIT\)](#)