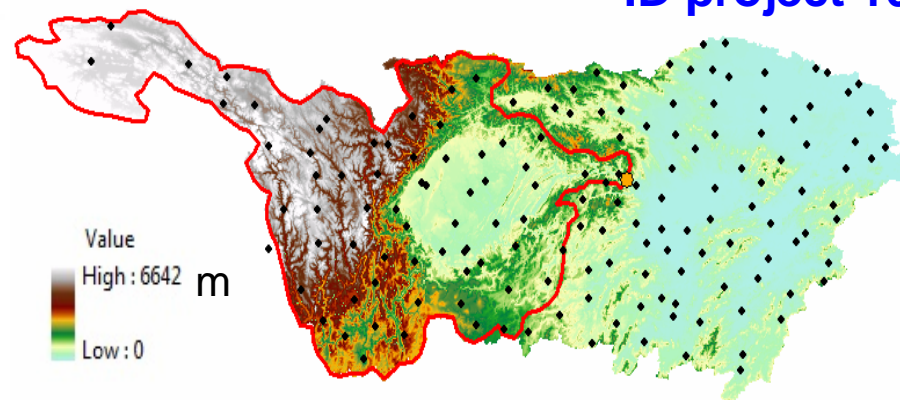
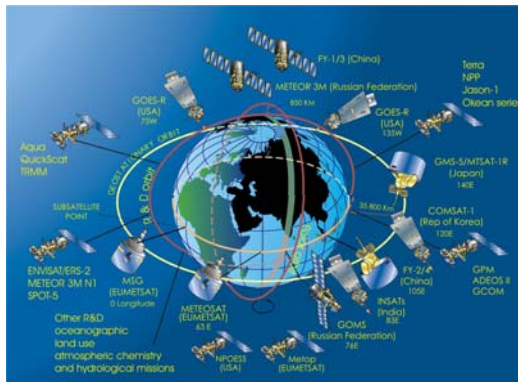


Satellite data and hydrological model to assess water quantity and quality in the Yangtze River basin

ID project 10664



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WP1 /WP2: Data base of European and Chinese remotely sensed products at different temporal and spatial resolution; **ground data** including meteorological and hydrological ground data and channel river geometry

WP3.1 / WP3.2 : Calibration/validation of hydrological water balance models for water resources assessing using satellite data of land surface temperature and river discharge; **Soil moisture monitoring**

WP4.1/ WP4.2: Implementation of an erosion distributed model for the whole catchment closed at the 3 Gorges Dam ; Detection of suspended solid sediment, turbidity, surface water temperature and other **water quality parameters** in the 3 Gorges dam reservoir from satellite and **eventually ground data**

WP5: Small cases study: water resources analysis for **Danqing river basin** (Sub-basin of Yangtze river) or upper basin of the **Huaihe River** and **Tibetan plateau**

WP6: collaboration and **interaction with other Dragon 3 project** focused on water resources, such as hydrology, CEOP-TPE, water quality, landslides.

WP1: Satellite database

WP2: Ground database

WP3: Water quantity

WP4: Water quality

WP3.2: Soil moisture monitoring

WP3.1: Hydrological modelling: calibration / validation

WP3.31: Erosion model: calibration / validation

WP4.2: Reservoir water quality from satellite

WP7: Deliverables

WP7.1: Evapotranspiration

WP7.2: Discharge/Flow duration curve

WP7.3: Soil moisture

WP7.5: Water quality

WP7.6: Erosion maps

WP6:

Link with other Dragon3 projects on water resources

WP5: Small cases study

WP5.1: Daning river basin

WP5.2: Tibetan plateau

WP5.3: Huaihe river basin

- **GIS database** of satellite and ground data;
- **Flow duration curves** for different river cross sections for hydropower and agricultural use;
- **Maps of daily and monthly evapotranspiration** from hydrological modeling and satellite data;
- **Maps of soil moisture** from hydrological modeling and satellite data;
- **Maps of soil erosion** from hydrological modeling and satellite data;
- **Maps of water quality parameters**: suspended solid sediments, chlorophyll and turbidity and surface water temperature.

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		2012		2013				2014				2015				2016	
		Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
	WP0: Coordination																
	WP1: Satellite database																
	WP2: Ground database																
WP3: Water quantity	WP3.1: Hydrological modelling: calibration / validation																
	WP3.2: Soil moisture monitoring																
WP4: Water quality	WP4.1: Erosion distributed model: calibration / validation																
	WP4.2: Reservoir water quality from satellite																
	WP5: Small cases study																
	WP6: Link with other Dragon3 projects																
	WP7: Deliverables																

Objective: **Data base of European and Chinese remotely sensed products** at different temporal and spatial resolution

Results:

- multi-temporal series of vegetation parameters, of land surface temperature and of snow coverage
- GIS system for all the used data

Satellite data:

- Digital elevation Model (DEM): **ASTER, SRTM**
- Vegetation information: **BEIJING-1, MERIS, CBERS, MODIS, SENTINEL 2, HJ1-A&B, BJ-1**
- Land Surface Temperature: **CBERS, AATSR, SENTINEL 3, HJ1-A&B, BJ-1, MODIS**
- Snow maps: **MERIS, MODIS, BJ1-A&B, BJ-1**
- Soil moisture: **ALOS/PALSAR, ASAR, ERS-1/2 / AMI (SAR), HJ 1-C, SMOS, ASCAT, AMSR-E, SENTINEL 1**
- Maps of flooded area: **ERS-1/2, SENTINEL 1, HJ1-A&B, BJ-1**
- altimetry: **ERS-1/2 / ALTIMETRY**
- suspended solid sediment, chlorophyll, turbidity: **MERIS, HY-1B, MODIS, SENTINEL 2, HJ1-A&B, BJ-1**

Objective: **Data Base of a ground data** including meteorological and hydrological ground data and channel river geometry

Results:

- analysis of ground data that are necessary as input to hydrological models or for models validation
- GIS system for all the used data

Ground data:

- Discharge measurements (hourly-daily)
- Precipitation (hourly-daily)
- Air temperature (hourly-daily, maximum, mean, minimum)
- Air humidity (hourly-daily)
- Wind velocity (hourly-daily)
- Incoming short wave radiation (hourly-daily)
- Soil maps: soil lithology
- River network geometry: river network derived from DEM and reservoirs main geometry
- Water quality parameters

WP3.1 Hydrological modelling: calibration/validation

Objective: Calibration/validation of hydrological water balance models for water resources assessing using satellite data of land surface temperature and river discharge

Results:

- Calibrated and validated hydrological model based on water and energy balance with satellite land surface temperature
- Comparison between conceptual and physically based hydrological models (**FEST-EWB** and **Xinanjiang**) according to remote sensing data input
- Integration of hydrological model with module for hydraulic routing in channel network and definition of flooded area with satellite data

Satellite data:

- Input to the model: vegetation variables (LAI, NDVI), land use/cover, DEM
- Calibration of the model: land surface temperature, snow coverage, soil moisture
- Maps of flooded area from SAR data

WP3.2 Soil moisture monitoring

Objective: **Soil moisture monitoring** through remote sensing data and hydrological model

Results:

- Soil moisture maps from satellite thermal infrared data and distributed hydrological models
- Soil moisture maps from microwave remote sensing data

Satellite data:

- Soil Moisture: ALOS/PALSAR, ENVISAT/ASAR, ERS-1/2 / AMI (SAR), HJ 1-C / synthetic aperture radar, SMOS, ASCAT, AMSR-E, SENTINEL 1

WP4.1 Erosion distributed modelling: calibration/validation

Objective: to parameterize **an erosion distributed model** for the whole catchment closed at the 3 Gorges Dam

Results:

Calibrated and validated erosion model with satellite and ground data

Satellite data:

Land use/ land cover map: MERIS

WP4.2 Reservoir water quality from satellite

Objective: Detection of suspended solid sediment, turbidity, surface water temperature and other **water quality parameters** in the 3 Gorges dam reservoir from satellite and eventually ground data

Results:

Time series of water quality parameters

Satellite data:

- suspended solid sediment, chlorophyll, turbidity: MERIS, MODIS, SENTINEL 2, HY-1B, HJ1-A&B, BJ-1
- Water surface temperature: CBERS, AATSR, MODIS, SENTINEL 3, HJ1-A&B, BJ-1

Objective: Small cases study: water resources analysis for **Danqing river basin** (Sub-basin of Yangtze river) or upper basin of the **Huaihe River** and **Tibetan plateau**

Results:

Calibrated hydrological models for the smaller test area at higher spatial resolution

Snow dynamic analysis

WP6: Links with other Dragon3 projects

Objective: collaboration and interaction with other Dragon 3 project focused on water resources, such as hydrology, CEOP-TPE, water quality, landslides.

Results:

exchange of information, database and scientific knowledge between European and Chinese groups