



SWOT Surface Water and Ocean Topography

A new satellite concept to study and monitor continental and ocean waters

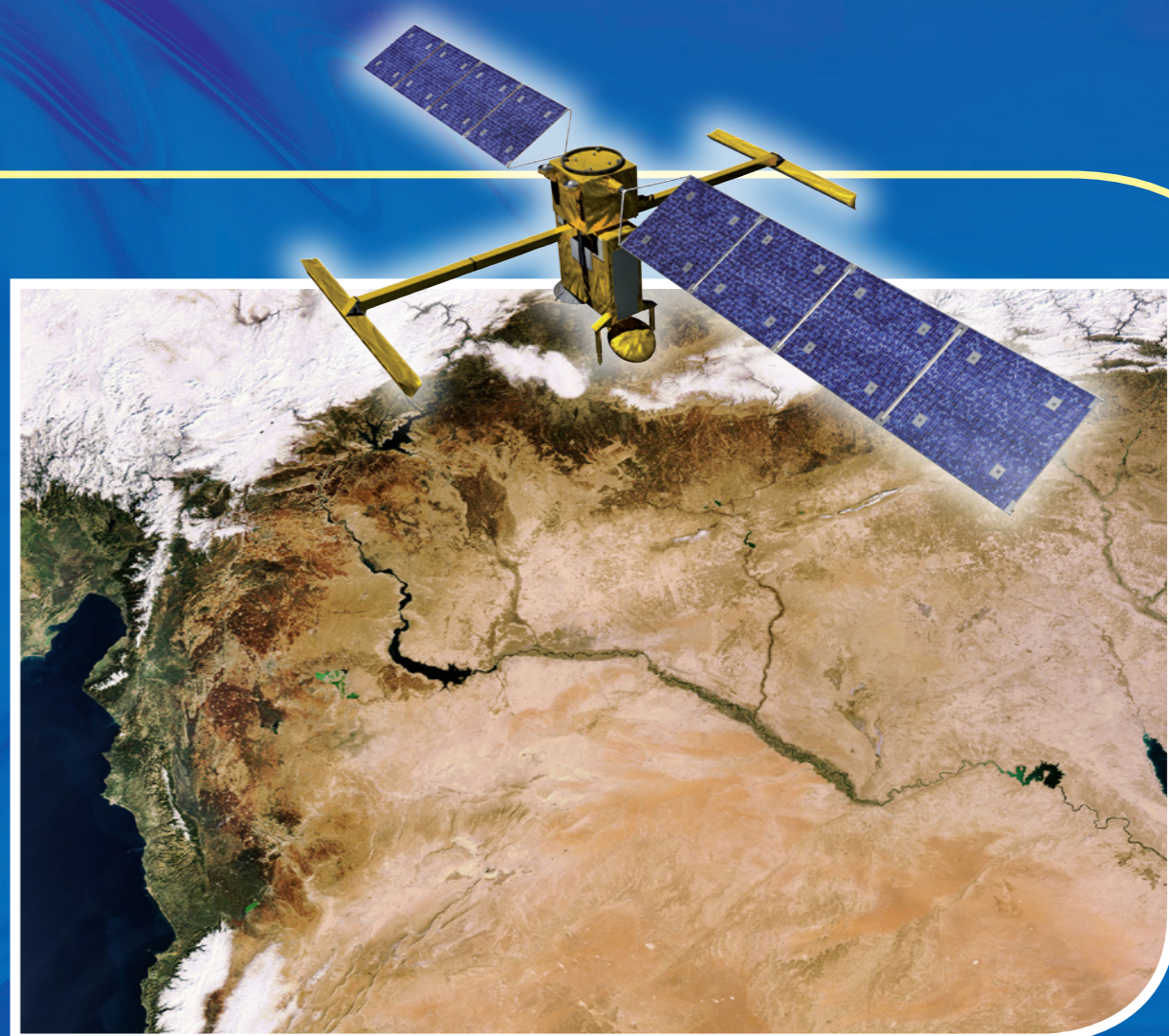
CNES, NASA and the Canadian Space Agency are proposing with a space mission using a new technical concept: wide-swath interferometric altimetry. This mission, SWOT, will enable the river, lake and flooded area height measurement, as well as the improvement of ocean observation. This partnership builds upon 25 years of cooperation between CNES and NASA in ocean altimetry with Topex/Poseidon and the Jason series. The SWOT mission inaugurate a new scientific series and create a brand new operational field.

Transboundary water management

The sharing of a river can be a cause of disagreement between neighbouring countries, in particular since control means are often missing. SWOT will enable to provide data at a worldwide scale, and will contribute to hydrographic basin monitoring systems.

40 % of the world population lives in hydrographic basins shared by at least two countries.

This Envisat image, acquired on 4 February 2008 by the MERIS instrument, features countries of the Middle East. The dark blue body of water peeping through the snow in the upper right hand corner is Lake Van, the largest body of water in Turkey. The Euphrates and the Tigris flowing from there are among the contentious rivers.



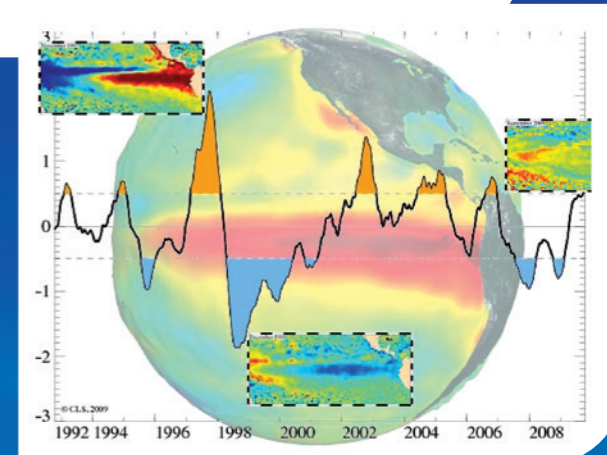
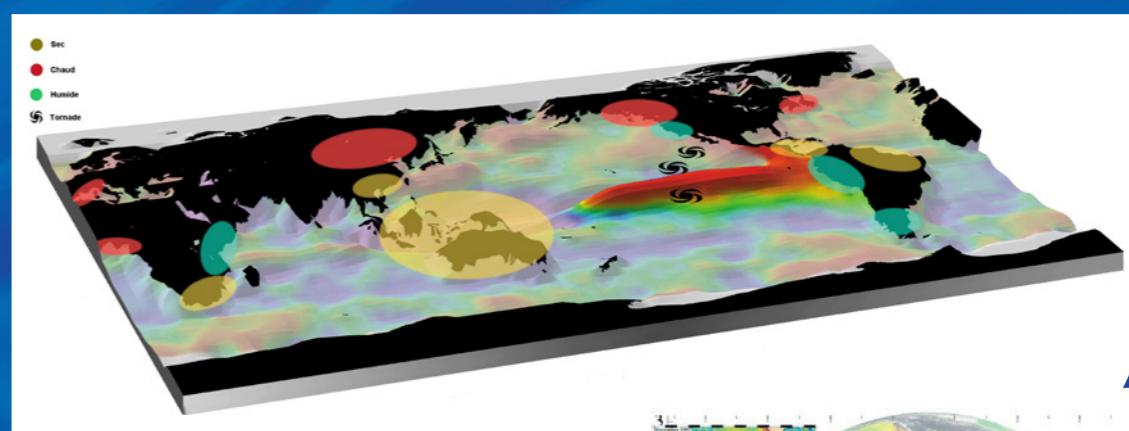
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More precise weather and climate forecasts

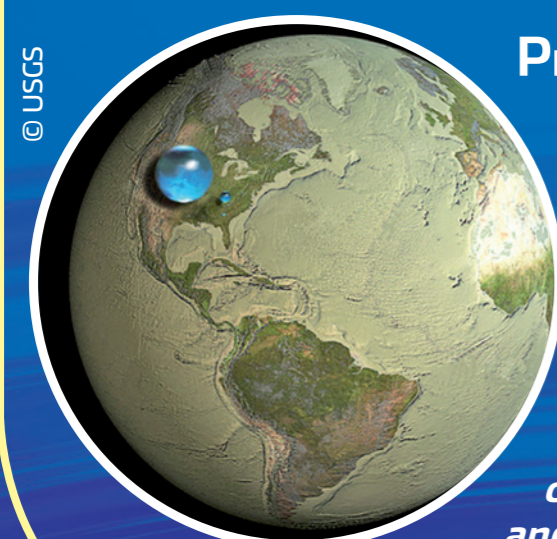
Thanks to SWOT, weather and climate forecasts, mostly seasonal ones, will be more precise. Quality of weather and climate forecasts depends in a large part on digital modeling, which use as initial or boundary conditions the surface state of the the ocean and the hydrologic monitoring of the catchment areas.

30 % of worldwide GDP - i.e. the equivalent of 18 000 billions US dollars in products and services - are weather-dependent

El Niño is one of the best-known disruptive climate events. The forecasting of such events are foremost in the objectives of SWOT. The human and economic consequences of an El Niño are enormous (in 1997/1998: 24000 casualties, 6 millions of climate refugees, 35 billions dollars of economic losses...)



Freshwater management of urban, industrial and agricultural use



Precise knowledge of available water sources is a key element in decision for organization dealing with water distribution for urban, industrial and agricultural use. SWOT data will contribute at a worldwide level to provide to water services and exploiting companies data over the major reservoirs, basins and rivers, thus enabling them to better anticipate water storage management.

All Earth's water. The biggest sphere shows all water, the smaller one the fresh liquid water, and the smallest the fresh-water lakes and rivers, i.e. the water available for most living organisms.

Water service segment develops a worldwide turnover of 125 billions euros.

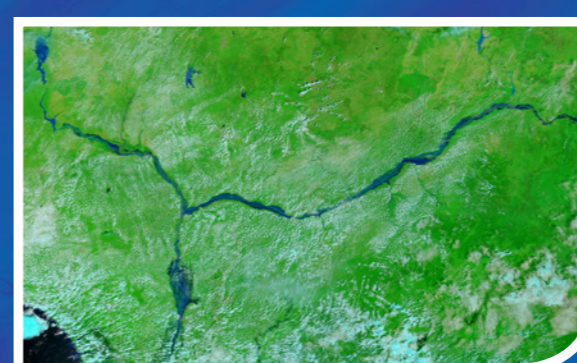
Better modeling of floods

Floods, in rivers as well as in coastal areas, are among the most disastrous natural phenomena. From the SWOT mission altimetry data, water levels reached during floods, and the land topography can be measured with a better accuracy.

51 % natural catastrophe victims between 1974 and 2003 are due to floods (36% to droughts), which represent more than 2.5 billions people.



Between July and October 2012, flooding in Nigeria pushed rivers over their banks and submerged hundreds of thousands of acres of farmland.



By mid-October, floods had forced 1.3 million people from their homes and claimed 431 lives, according to Nigeria's National Emergency Management Agency.

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Environmental risk reduction and public policymaking contribution

More generally, SWOT will participate to the improvement of our knowledge, reinforce the observation through long-term data collection and dissemination, and help taking into account past events. Water resources, natural risks (floods, climate variations, cyclone forecasts ...) biodiversity, health (epidemy propagation prevention), agricultural sector, energy (including electricity production management and help to offshore platforms), land occupation planning are among the major fields interested in this new space mission.

