

**Planetary Wonderings**  
**July Focus: Ocean Topography Missions**  
**By Mary-Frances Bartels, NASA Solar System Ambassador**

Most of the topics covered in this column involve looking up --- studying phenomenon and objects in outer space. Sometimes NASA missions look down, down on our own Earth to collect data that cannot be obtained by ground-based instruments. OSTM/Jason-2 is the latest in a line of missions to study ocean topography. All three missions mentioned below are a collaboration of NASA and the French Space Agency Centre National d'Etudes Spatiales (CNES).

What is and why study ocean surface topography? Simplified, ocean topography measures sea surface height, more commonly known as mean sea level. Sea level varies greatly over the world's oceans and changes over time. Scientists want to learn more about how its fluctuations are related to ocean circulation, climate change, marine weather, flooding, drought, hurricane intensity and coastline erosion. The more scientists learn about ocean surface topography, the better they can apply that knowledge to answer more mysteries of the oceans.

The first ocean topography mission was TOPEX (ocean TOPography EXperiment)/Poseidon launched in 1992. TOPEX/Poseidon observed oceanic circulation, tides, El Niño and La Niña, as well as sea surface height and floor topography. Though still in orbit, TOPEX/Poseidon has not been operational for two years.

Jason-1 is the first follow-on to the highly successful TOPEX/Poseidon mission. Launched in 2001, its five-year mission has been extended. It has been able to measure sea level with an accuracy of about one inch. Data it collects is being used to increase our understanding of ocean circulation, improve climate forecasting, measure global sea-level changes, and improve coastal tide models.

Along comes the Ocean Surface Topography Mission —OSTM/Jason-2 —which was successfully launched June 20. Like its predecessors it will measure sea height and circulation, continuing the longitudinal study began by TOPEX/Poseidon. In addition to NASA and the French Space Agency, the National Oceanic and Atmospheric Administration (NOAA), and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT, NOAA's European counterpart) also collaborated for this mission.

For its first assignment, OSTM/Jason-2 will fly with Jason-1, first just ahead of it, then beside it, and the two spacecraft will make measurements in tandem, providing twice the data about the same stretches of ocean.

How will OSTM/Jason-2's results be used? Its data will be used in applications as diverse as, for example, routing ships, improving the safety and efficiency of offshore industry operations, managing fisheries, forecasting hurricanes and monitoring river and lake levels.

What does the future hold for sea level study? EUMETSAT, NOAA and the French Space Agency have already expressed an interest in Jason-3, scheduled to launch around 2013.

**Resource of the Month:** <http://www.usm.maine.edu/planet/> Click on "This Month's Schedule" on this website for the Southworth Planetarium located at the University of Southern Maine.

While their planetarium shows are listed on this fairly busy calendar, significant astronomical events and anniversaries are also noted. Some dates include eye-catching astrophotographs.

**Activity of the Month:** June 30 was the 100<sup>th</sup> anniversary of the Tunguska Event. Investigate this yourself. Where did it occur? What are the major theories/explanations as to what happened? What do you think was the cause, and why? When was it first investigated? Who is having special celebrations to commemorate this mystery?

Suggestions, questions, and comments about “Planetary Wonderings” are welcomed and may be directed to stargazer @ keeplookingup.net (remove spaces). Past columns may be found at [www.keeplookingup.net](http://www.keeplookingup.net) (all past columns, click on “Planetary Wonderings” on the right side of opening screen) and at <http://www.freelists.org/archives/astronomyed/> (columns from Jan. 2007 to the present).

**Remember to *keep looking up!***

Sources (not mentioned in article): [http://www.nasa.gov/mission\\_pages/ostm/overview/index.html](http://www.nasa.gov/mission_pages/ostm/overview/index.html)  
NASA JPL e-mails  
<http://sealevel.jpl.nasa.gov/mission/mission.html>  
<http://www.aviso.oceanobs.com/en/missions/>