



Canberra Space Centre

# FACT SHEET

www.cdsc.nasa.gov

# Earth Explorers

Keeping an 'eye' on our planet

While many spacecraft are out exploring the various planets, moons, asteroids, and comets that are dotted across our solar system, a fleet of satellites are also busy exploring our own planet - the Earth.

Through the 'eyes' of these satellites, we learn more about our planet's atmosphere, its oceans, and varied land forms.

Many satellites watch our weather, warning us about hurricanes and severe storms. Others check for pollution, or the damage we are causing to our forests and waterways.

Some spacecraft study the way in which the Sun interacts with the Earth, how solar flares can create aurorae in our skies, change the shape of our magnetic field, or disrupt TV, radio and satellite communications.

The knowledge provided by dozens of spacecraft orbiting the Earth, helps us to discover ways to protect our fragile world.

Here are just a few examples:

**Jason-1** is the first follow-on to the highly successful **TOPEX/Poseidon** mission that measured ocean surface topography to an accuracy of 4.2 cm, enabling scientists to forecast El Niño events, and improve our understanding of ocean circulation and its effect on global climate.

In the same way that winds blow around the highs and lows of atmospheric pressure, ocean currents flow around highs and lows of oceanic pressure that can be determined from the height of sea surface, called ocean surface topography.

Jason-1's data is part of a suite of data provided by other Jet Propulsion Laboratory managed missions - **GRACE** uses two satellites to accurately measure Earth's mass distribution, and the **QuikSCAT** scatterometer mission measures ocean-surface winds.

The Earth's ocean, the land with its plant and animal life, the ice covered regions (cryosphere) and all levels of the atmosphere (troposphere, stratosphere and mesosphere) are all parts of an interconnected system - the Earth system. A change in any one part affects what happens elsewhere in the system.

**Envisat** carries instruments to collect information that will help scientists to understand each part of the Earth system and to predict how changes in one part will affect others.

Many of Envisat's instruments are a development of those that have flown on earlier Earth-observing missions such as **ERS-1** & **-2**.



Envisat images of land, sea, and atmospheric events have improved life here on Earth.



A Landsat image of a meteor crater in Australia showing many diverse landforms & environments.

The **Landsat** program is the longest-running enterprise for acquisition of moderate resolution imagery of the Earth from space.

Landsat-1 was launched in 1972; and the most recent, Landsat-7, was launched in 1999.

The instruments on the Landsat satellites have acquired millions of images. These images form a unique resource for applications in agriculture, geology, forestry, regional planning, education, mapping, and global change research.

## More information on the Internet

### Jason 1

<http://topex-www.jpl.nasa.gov/mission/jason-1.html>

### Envisat

<http://envisat.esa.int/>

### Landsat

<http://landsat7.usgs.gov/index.php>