

**Panama**



*Panama seen from Envisat ASAR 11 March 2007. The sea surface temperature observed onboard Vædderen in the Pacific Ocean while entering the Panama Canal is shown with orange 'balloons' (ca. 23°C).*

Vædderen sailed through the Panama Canal. In Panama Bay in the Pacific Ocean a tide of 1.5 m was experienced. It means a difference between high and low tide of 3 m. At the other side of the canal, in the Atlantic Ocean, there was hardly any tide but here the sea level is 0.25 m lower than the average sea level in the Pacific Ocean. These facts were well-known around 100 years ago when the Panama Canal was being planned. Therefore it was quickly understood that it would not be possible to construct a so-called level canal similar to the Suez Canal a few years earlier. The water currents in the canal would be far too large and furthermore much soil should have been moved.

The Panama Canal was constructed with locks. At Miraflores near the Pacific Ocean there are 4 locks and at Gatun near the Atlantic Ocean there are 3 locks. All locks have a length of 306 m and a width of 33 m. This leaves much space for Vædderen. When Vædderen had entered the first lock the doors were closed behind and in front of the ship and lake water was filled into the lock. Lake Gatun is 38 km long and located 26 m above sea level. Vædderen was in several steps moved up through the 4



locks to Lake Gatun. The use of water from the lake is very large, but Lake Gatun is not emptied because it rains much in the area. Panama is 50 km wide. The precipitation in the area is due to warm moist air pressed up over the mountains. It rains at approximately the same hour of the day each day. The net-evaporation is low for the entire Panama because the air is saturated by water vapor. The lake will not be emptied in the near-future even though ship traffic has increase much in recent years.

You can view video/web-cam animation of sailing though Panama Canal at:

<http://video.google.com/videoplay?docid=-9040875966564826702>

and read about the functions at:

<http://www.pancanal.com/eng/general/howitworks/index.html>

Finally, you can view in Google Earth an animation of the canal at:

<http://bbs.keyhole.com/ubb/download.php?Number=689429>

#### Technical information

The satellite image is observed with alternate polarization from ENVISAT ASAR. VH is shown in red, VV is shown in green and VH/VV is shown in blue channel. Green areas like waves at sea give mostly VV backscatter, whereas blue areas give very low backscatter. This is due to calm sea. Vegetation and cities give both high VV and VH and therefore appear in yellow (red+green). The image was acquired 11 March 2007 at 03.26 UTC.

Having installed Google Earth it is possible to view Panama from kmz file:

[http://galathea.oersted.dtu.dk/google/kmz/images/Radar/20070311\\_032625\\_ASAR-Panama\\_APP.kmz](http://galathea.oersted.dtu.dk/google/kmz/images/Radar/20070311_032625_ASAR-Panama_APP.kmz)

Envisat ASAR as geotiff is available at:

[http://galathea.oersted.dtu.dk/base/areas/Panama/20070311\\_032625\\_ASAR-Panama-APP-0326.tif](http://galathea.oersted.dtu.dk/base/areas/Panama/20070311_032625_ASAR-Panama-APP-0326.tif)

Further information on radar images is available at 'Radar eye on Galathea 3':

[http://galathea3.emu.dk/satelliteeye/projekter/radareye/index\\_uk.html](http://galathea3.emu.dk/satelliteeye/projekter/radareye/index_uk.html)

The image is processet at the Danish Space Centre, DTU.