Atlantic Meridional Transect

The Atlantic Meridional Transect (AMT) programme is a multidisciplinary research venture which undertakes biological, chemical and physical oceanographic research during an annual voyage of a NERC-UK research vessel to the Southern Ocean. AMT is heralded as one of NASA SeaWiFS 10 greatest highlights since it provides an ocean observing platform to provide vital calibration and validation data to support ocean colour satellite missions. The transect covers a vast range of environments from the productive coastal and eutrophic regions to the desert-like gyres in the centre of the ocean and the Southern Ocean, which are rarely accessed by research ships.

On 20 September 2016, scientists from Plymouth Marine Laboratory, the University of Southampton and IFREMER, France collectively embarked on a 7000 mile transect from the UK to the Southern Ocean on board the RRS James Clark Ross as part of the Atlantic Meridional Transect (AMT) programme to ensure the accuracy of the recently launched Copernicus Sentinel satellites.

Partners

The AMT4SentinelFRM consortium is led by Plymouth Marine Laboratory and includes two partners as subcontractors: the University of Southampton and the Institut Français de Recherche pour l'Exploitation de la Mer, Plouzane, France (IFREMER). The European Commission Joint Research Centre (JRC) is involved as an external party on Copernicus validation activities.

Satellite images courtesy of ESA, RRS James Clark Ross images by C. Gilbert and P. Bucktrout, British Antartic Survey.

Fiducial Reference Measurements

The measurements taken during the cruise will provide the range and diversity of parameters required to independently validate the suite of Sentinel sensors. The measurements are of sufficient quality and accuracy to be classified as Fiducial Reference Measurements (FRMs) as they follow satellite validation protocols and procedures, have documented SI traceability and maintain an associated uncertainty budget over the duration of the satellite mission.

Following the cruise, all of the sensors used will be re-calibrated to SI standards which will be used to calculate the uncertainty in each ship-board sensor deployed. With this uncertainty budget, the scientists will be able to accurately determine the error in each of the Sentinel satellites so that we can more accurately define the uncertainty in the satellite data.

Trios Ramses profiling radiometer

Contact

AMT4SentinelFRM Project Office
Plymouth Marine Laboratory
Prospect Place
Plymouth, PL1 3DH, UK
www.amt4sentinelfrm.org
email: comms.amt4sfrm@pml.ac.uk
tel: +44 (0)1752 633100

amt4sentinelfrm

Validating Copernicus Sentinel data using Fiducial Reference Measurements

Scientists from the Plymouth Marine Laboratory, University of Southampton and IFREMER have embarked on an exciting new project funded by the European Space Agency, ESA, to ensure the accuracy of the recently launched Copernicus Sentinel satellites.

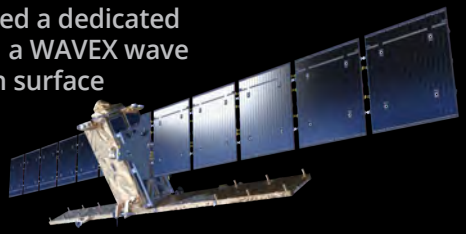
An extensive array of reference measurements to validate Copernicus Sentinel data

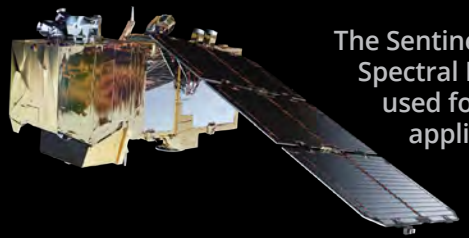
The new Sentinel satellites, developed by the European Space Agency, form the heart of the European Commission's Copernicus programme – the largest global environmental monitoring initiative ever conceived.

The Copernicus programme is unique because of the continuity of coverage over seas and oceans of global maps of phytoplankton chlorophyll, the green pigment found in plants, temperature and other sea surface properties that contribute to the air-sea flux of carbon dioxide and other climate relevant gases.

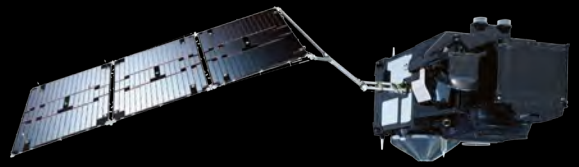
The Sentinels carry a vast range of state-of-the-art instruments to deliver a stream of complementary imagery and data for monitoring our land, ice, oceans and atmosphere at unprecedented and synoptic spatial and temporal resolutions.

Sentinel-1 deployed a dedicated C-band radar and a WAVEX wave radar to ascertain surface ocean dynamic properties.





The Sentinel-2 Multi-Spectral Instrument was used for ocean colour applications.



Sentinel-3 Operational Colour (OLCI) and Sea Surface Temperature (SLSTR) instruments collected a suite of sea surface temperature, optics, biogeochemistry and radar data.