

# ATLANTIC MERIDIONAL TRANSECT (AMT)



## Providing a unique novel research platform for UK and international scientists

AMT is an *in situ* observatory operating over extended time and spatial scales measuring a time series of core physical and biogeochemical variables. Biological, chemical and physical oceanographic research takes place during the annual AMT voyage between the UK and destinations in the South Atlantic, a distance of up to 13,500km. This transect crosses a range of ecosystems from sub-polar to tropical and from euphotic shelf seas and upwelling systems to oligotrophic mid-ocean gyres.

AMT is hosted by PML in collaboration with NOCS. Since its set up in 1995, AMT has involved a total of 20 research cruises, with over 200 scientists from 12 countries, POGO AMT fellowships for developing countries, over 200 refereed publications and at least 70 PhD theses.

### Services provided:

- AMT benefits from and contributes to the outputs of the UK NERC's funding for National Capability;
- A unique ability to acquire data on long transects of the Atlantic and to make observations on basin scales;
- The only programme based in the Atlantic Ocean that makes repeat measurements of core parameters and that is coordinated to allow the use of the ship as a sampling platform by other UK and international scientific teams;
- The longest time series of oceanographic data at basin scale.

### Research priorities:

- To quantify the nature and causes of ecological and biogeochemical variability in planktonic ecosystems, and to assess the effects of this variability on carbon and nutrient cycling, on biogenic export and on air-sea exchange of climate active gases;
- This open ocean *in situ* observing system will give warning of any fundamental change in Atlantic ecosystem function and thus will lead to improved forecasts of the ocean's future state and associated socio-economic impacts.

## Role in society

AMT provides information on the response of the Atlantic Ocean to environmental change and contributes to operational oceanography of the Atlantic Ocean through production of nowcasts, forecasts and hindcasts of oceanographic variables;

It aids the understanding of the fundamental links between biodiversity, ecosystem function, ecosystem services and human wellbeing;

AMT is contributing to Defra's Science and Innovation Strategy and previously to the Charting Progress report. Other contributions were made to the Marine Climate Change Impact Partnership (MCCIP), operational oceanography (real-time reporting - maritime security) and knowledge exchange;

It provides training for next generation scientists, an annual AMT fellowship in collaboration with the Partnership for Observation of the Global Oceans (POGO), on-line cruise blogs and supporting resources for schools.

## AMT for the UK and beyond



AMT is a collaboration between PML and NOCS in the delivery of NERC's National Capability;

UK collaborators and users include: the National Centre for Ocean Forecasting, the Met Office, the National Centre for Earth Observation (NCEO), the Natural History Museum and the Universities of East Anglia, Liverpool, Newcastle, Oxford, Plymouth and Southampton.



International partners and users include: NASA, the US National Science Foundation, EU funded projects such as Green seas, the Universities of Brest (France), Cape Town (South Africa), Dalhousie (Canada), Hawaii (USA), Newfoundland (Canada), Princeton (USA), Rutgers (USA), Vigo (Spain) and Washington (USA) and research institutes Bigelow (USA), Institute of Oceanography (Poland), Max Planck (Germany), MIT (USA) and the Scripps Institution of Oceanography (USA).

## Data access and management

· AMT work thus far has resulted in samples from over 100° latitude (including the South Atlantic Gyre), long-term *in situ* observations, inter-hemisphere differences, basin scale observations, progress towards a predictive capability, improved characterisation of oceanic provinces, validation of ocean colour algorithms, enhanced knowledge on the distributions of picoplankton, identification of regional sinks of  $p\text{CO}_2$  and informed on the spatio-temporal variability in rates of primary production and respiration;

· With the aim of making maximum use of this valuable data resource, all the data sets from cruises since 1995 onwards are available on request, with the CTD profiles and underway surface time series available online at: [www.bodc.ac.uk/projects/uk/amt](http://www.bodc.ac.uk/projects/uk/amt).

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