TELLUS South West

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Tellus South West is a regional environmental mapping project.

Its aims are ambitious and wide ranging.

Tellus South West will provide scientific data to benefit the economy and environment in South West England. It will expand our knowledge of geology, landscape and ecosystems, help us manage risks from natural hazards, and provide a census of the current state of the environment for measuring impacts of future change. It will identify new opportunities for sustainable use of natural resources, and assist with improving the quality of water and soil. It will help us make the right decisions about our environment for the benefit of future generations.

Tellus South West includes an **airborne survey** of the region, using modern scientific equipment mounted on a light aircraft flying low over the landscape. The airborne survey will be carried out in summer and autumn 2013.

Where does the name 'Tellus' come from?

Tellus is the Roman goddess of the Earth. Tellus measures the properties of three key elements of the Earth - soil, rock and water - and helps us understand how these elements are being changed by the activities of humans.

What will the airborne survey tell us?

The survey will give a comprehensive, three-dimensional picture of the underground environment in the region, to depths of many hundreds of metres, that will help us manage natural resources and the environment in the future. The data will be compiled into maps that will be made freely available online. This information will be of great use to policy makers, researchers, students and industry for many decades to come.

What kind of aircraft is being used in the survey?

The aircraft is a Reims Cessna F406 operated by the specialist survey company, Fugro Airborne Surveys of South Africa. The plane is white, with twin turboprop engines, and bears the registration number ZS-SSC.

Fugro operates a fleet of similarly equipped aircraft that carry out airborne surveys in many countries worldwide. The aircraft will be a familiar sight over the region for local residents and visitors over the summer and autumn 2013.

How high and fast will the survey aircraft fly?

The aircraft will fly at a safe height authorised by the Civil Aviation Authority. Over rural areas this will be 80m - about eight times the height of a two-storey house. Over urban areas the height will be 240m.

The survey will start at Land's End and progress steadily eastwards. Each area will be overflown only once. The survey flies at a low altitude to allow the sensitive instruments on board the plane to measure the properties of soil and rocks more accurately.

The speed of the aircraft is about 150 mph. The sound of the aircraft passing overhead is similar to that of a passing lorry.

What equipment is the survey plane carrying and what does it measure?

The aircraft will carry a range of instruments for navigation and for measuring geophysical properties of the ground.

NATURAL ENVIRONMENT RESEARCH COUNCIL

British Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

UNIVERSITY OF EXETER

CSM

The navigation instruments carried on the aircraft include:

- a satellite navigation system
- a radar altimeter for measuring altitude
- a video camera, which gives us a record of where the plane has flown. The video footage will not be used for any other purpose.

The geophysical instruments on board the plane are:

- a magnetometer which measures minute variations in the Earth's magnetic field
- a gamma ray detector which measures the very low levels of natural background radioactivity present in all soils and rocks

The only signals emitted from the aircraft will be for flight communications equipment common to all light aircraft. The geophysical instruments are passive detectors and emit no signals of any type.

Have similar airborne surveys been completed elsewhere?

Similar low altitude surveys have previously covered the whole of Northern Ireland in 2007 and extended into the Republic of Ireland in 2011. Others have covered the English East Midlands, Ayrshire, Anglesey and the Isle of Wight. Surveys of this type are routinely flown all over the world.

Is Tellus South West carrying out other surveys?

Yes. A ground-based survey of stream sediments and waters was carried out in 2012 and early summer 2013. This used teams of volunteers to collect samples, which are now being analysed for up to 55 chemical elements and compounds present in the environment. The results will be useful for assessing the health of the environment, agricultural nutrients and trace elements.

In July 2013, a higher altitude airborne survey was carried out using high precision laser range-finding technology to make highly accurate maps of ground elevation and topography, and the height of the tree canopy. These data help us make better maps of areas prone to floods, landslides and soil erosion, and to measure how much carbon is taken out of the atmosphere by growth of trees and vegetation.

A follow up ecological survey will analyse local stresses on natural habitats and ecosystems, and will investigate correlations with soil, landscape, geology and water data collected by the other surveys.

Who is paying for this project?

Tellus South West is financed by the Natural Environment Research Council (NERC), which funds world-leading environmental science in research centres and universities across the UK.

Who is doing the work?

The project is being managed and delivered by a partnership of the Natural Environment Research Council's research centres - the British Geological Survey, the British Antarctic Survey and the Centre for Ecology and Hydrology - working locally with the University of Exeter Camborne School of Mines. We hope the partnership will continue to grow as new data and results are released by the project.

What will the survey deliver?

The survey results will be processed and published online as maps and images, and made available for download for scientists and professionals to use. Provisional results and sample data will appear on our website **http://www.bgs.ac.uk/TellusSW** from early 2014 onwards.

The data will support environmental research in the region for many years to come and stimulate new scientific publications, grants and studentships at local universities and from the wider academic community.

If you have any questions or want to contact the **Tellus SW** Project please call our information line on:

01752 931009

(Standard network charges apply)

Website address:
www.bgs.ac.uk/TellusSW

Email address:
TellusSW@nerc.ac.uk

NATURAL ENVIRONMENT RESEARCH COUNCIL

British Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

UNIVERSITY OF EXETER