

SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (SCAR) – NATIONAL REPORT 2012-2013
MEMBER COUNTRY: UNITED KINGDOM

Activity	Contact Name	Address	Telephone	Fax	Email	Web site
NATIONAL SCAR COMMITTEE						
UK National Committee for Antarctic Research (UKNCAR)	Dr. Kathryn Rose Secretary	Formerly: British Antarctic Survey Bristol Glaciology Centre University of Bristol Bristol, BS8 1SS	+44 1223 221	+44 1223 350456	k.c.rose@bristol.ac.uk	www.antarctica.ac.uk/UKNCAR
UK National Committee for Antarctic Research (UKNCAR)	Prof. Jane Francis Chair	School of Earth and Environment, University of Leeds, Leeds, LS2 9JT	+44 113 3436761	+44 113 3435259	j.francis@see.leeds.ac.uk	www.see.leeds.ac.uk
SCAR DELEGATES						
1) Delegate Director of BAS	Prof. Alan Rodger Interim Director	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221551	+44 1223 350456	asro@bas.ac.uk	www.antarctica.ac.uk
2) Alternate Delegate	Prof. Jane Francis Chair	School of Earth and Environment, University of Leeds, Leeds, LS2 9JT	+44 113 3436761	+44 113 3435259	j.francis@see.leeds.ac.uk	www.see.leeds.ac.uk
STANDING SCIENTIFIC GROUPS						
Life Sciences						
1)	Dr. Pete Convey (Voting Rights)	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221588	+44 1223 362616	pcon@bas.ac.uk	www.antarctica.ac.uk
2)	Dr Anne Hicks	Medical Director BASMU Emergency Dept. Derriford Hospital Plymouth PL6 8DH	+44 1752 315220	+44 1752 315219	annehicks1@nhs.net	
Geosciences						
1)	Prof. Jane Francis (Voting Rights)	School of Earth & Environment University of Leeds Leeds, LS2 9JT	+44 113 3436761	+44 113 3435259	jane@see.leeds.ac.uk	www.see.leeds.ac.uk

STANDING SCIENTIFIC GROUPS cont/d						
Geosciences						
2)	Prof. Mike Hambrey	Centre for Glaciology Institute of Geography & Earth Sciences Aberystwyth University Aberystwyth Ceredigion SY23 3DB	+44 1970 621860	+44 1970 622659	mjh@aber.ac.uk	www.aber.ac.uk/glaciology
Physical Sciences						
1)	Prof. John Turner (Voting Rights)	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221485	+44 1223 362616	jtu@bas.ac.uk	www.antarctica.ac.uk
2)	Prof. Rob Mulvaney	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221436	+44 1223 362616	rmu@bas.ac.uk	www.antarctica.ac.uk
3)	Dr. Steve Colwell (SSG Secretary)	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221483	+44 1223 362616	src@bas.ac.uk	www.antarctica.ac.uk
SCIENTIFIC RESEARCH PROGRAMMES						
AAA						
1) Steering Committee	Dr. Philip Anderson	SAMS, Scottish Marine Institute, Oban, Argyll, PA37 1QA	+44 1631 559438	+44 1631 559001	Philip.Anderson@sams.ac.uk	www.sams.ac.uk
EBA						
1) Steering Committee	Prof. Pete Convey Co-Chair	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221588	+44 1223 362616	pcon@bas.ac.uk	www.antarctica.ac.uk
2) Steering Committee	Dr. Jose Xavier Co-Secretary	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221400	+44 1223 362616	jccx@cantab.ne	www.antarctica.ac.uk

SCIENTIFIC RESEARCH PROGRAMMES cont/d						
EBA Cont/d						
3) Steering Committee	Dr. Dominic Hodgson (Work Package 1)	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221635	+44 1223 362616	daho@bas.ac.uk	www.antarctica.ac.uk
3) Steering Committee	Dr. Katrin Linse (Work Package 1)	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221240	+44 1223 362616	kl@bas.ac.uk	www.antarctica.ac.uk
SRPs In Proposal Stage						
PAIS						
1) Steering Committee	Dr. Rob Larter	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221573	+44 1223 362616	rdla@bas.ac.uk	www.antarctica.ac.uk
2) Steering Committee	Dr. Mike Bentley	Durham University Department of Geography Science Laboratories, South Road, Durham, DH1 3LE	+44 191 3341859	+44 191 3341801	m.j.bentley@durham.ac.uk	www.dur.ac.uk/geography/
AntEco						
1) Proposal Contributors	Dr. David Barnes	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221613	+44 1223 362616	dkab@bas.ac.uk	www.antarctica.ac.uk
2) Proposal Contributors	Dr. Dominic Hodgson	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221635	+44 1223 362616	daho@bas.ac.uk	www.antarctica.ac.uk
3) Proposal Contributors	Dr. Huw Griffiths	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221417	+44 1223 362616	hig@bas.ac.uk	www.antarctica.ac.uk
4) Proposal Contributors	Prof. Pete Convey	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221588	+44 1223 362616	pcon@bas.ac.uk	www.antarctica.ac.uk

SRPs In Proposal Stage cont/d						
Ant-ERA						
1) Proposal Contributors	Dr. Tom Bracegirdle	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221571	+44 1223 362616	tjbra@bas.ac.uk	www.antarctica.ac.uk
2) Proposal Contributors	Prof. Lloyd Peck	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221603	+44 1223 362616	lspe@bas.ac.uk	www.antarctica.ac.uk
AntClim²¹						
1) Proposal Contributors	Dr. Tom Bracegirdle	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221571	+44 1223 362616	tjbra@bas.ac.uk	www.antarctica.ac.uk
2) Proposal Contributors	Prof. John Turner (Voting Rights)	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221485	+44 1223 362616	jtu@bas.ac.uk	www.antarctica.ac.uk
SERCE						
1) Lead Investigator	Dr. Pippa Whitehouse	Durham University Department of Geography Science Laboratories, South Road, Durham, DH1 3LE	+44 191 3341877	+44 191 3341801	pippa.whitehouse@durham.ac.uk	www.dur.ac.uk/geography/ uk
ACTION GROUPS						
1) PAntOS	Dr. Jon Shanklin	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221482	+44 1223 362616	jdsh@bas.ac.uk	www.antarctica.ac.uk
2) Biological Monitoring	Mr. Rod Downie	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221248	+44 1223 362616	rhd@bas.ac.uk	www.antarctica.ac.uk
3) CAML	Prof. Paul Rodhouse	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221612	+44 1223 362616	pgkr@bas.ac.uk	www.antarctica.ac.uk

ACTION GROUPS cont/d						
3) CAML	Prof. Colin Summerhayes	Scott Polar Research Institute University of Cambridge Lensfield Road Cambridge CB2 1ER	+44 1223 336540	+44 1223 336549	cps32@cam.ac.uk	www.spri.cam.ac.uk
4) Antarctic Fuel Spills	Dr. Mike Meredith	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221586	+44 1223 362616	mmm@bas.ac.uk	www.antarctica.ac.uk
5) PCPBEA	Prof. John Turner	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221485	+44 1223 362616	jtu@bas.ac.uk	www.antarctica.ac.uk
5) PCPBEA	Prof. Pete Convey	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221588	+44 1223 362616	pcon@bas.ac.uk	www.antarctica.ac.uk
5) PCPBEA	Dr. Tom Bracegirdle	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221571	+44 1223 362616	tjbra@bas.ac.uk	www.antarctica.ac.uk
6) KGI – King George Island Science Coordination Group	Prof. John Smellie	Department of Geology University of Leicester University Road Leicester, LE1 7RH	+44 116 252 3933	+44 116 252 3918	jls55@leicester.ac.uk	www2.le.ac.uk
7) IASC	Prof. Alan Rodger	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221551	+44 1223 350456	asro@bas.ac.uk	www.antarctica.ac.uk
8) AGAFS	Dr. Mike Meredith	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221586	+44 1223 362616	mmm@bas.ac.uk	www.antarctica.ac.uk
9) MarBin	Prof. Andy Clarke	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221400	+44 1223 362616	accl@bas.ac.uk	www.antarctica.ac.uk
9) MarBin	Dr. Huw Griffiths (BAS representative)	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221417	+44 1223 362616	hjpg@bas.ac.uk	www.antarctica.ac.uk
9) MarBin	Dr. Katrin Linse (BAS representative)	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221631	+44 1223 362616	kl@bas.ac.uk	www.antarctica.ac.uk

ACTION GROUPS cont/d						
9) MarBin	Mr. Chester Sands (BAS representative)	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221582	+44 1223 362616	cjsan@bas.ac.uk	www.antarctica.ac.uk
10) ACCE	Prof. John Turner (Chair)	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221485	+44 1223 362616	jtu@bas.ac.uk	www.antarctica.ac.uk
10) ACCE	Prof. Colin Summerhayes	Scott Polar Research Institute University of Cambridge Lensfield Road Cambridge CB2 1ER	+44 1223 336540	+44 1223 336549	cps32@cam.ac.uk	www.spri.cam.ac.uk
10) ACCE	Prof. Pete Convey	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221588	+44 1223 362616	pcon@bas.ac.uk	www.antarctica.ac.uk
10) ACCE	Dr. Dominic Hodgson	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221635	+44 1223 362616	daho@bas.ac.uk	www.antarctica.ac.uk
10) ACCE	Dr. Tom Bracegirdle	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221571	+44 1223 362616	tjbra@bas.ac.uk	www.antarctica.ac.uk
11) VIA	Dr Paul Berkman	Scott Polar Research Institute University of Cambridge Lensfield Road Cambridge, CB2 1ER	+44 1223 336540	+44 1223 336549		www.spri.cam.ac.uk
11) Acoustics	Prof. Colin Summerhayes	Scott Polar Research Institute University of Cambridge Lensfield Road Cambridge, CB2 1ER	+44 1223 336540	+44 1223 336549	cps32@cam.ac.uk	www.spri.cam.ac.uk
11) Acoustics	Mr. Mark Tasker	Joint Nature Conservation Committee Monkstone House, City Road, Peterborough, PE1 1JY	+44 1224 266551	+44 1733 555948	mark.tasker@jncc.gov.uk	jncc.defra.gov.uk
11) Acoustics	Prof. David Walton	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221400	+44 1223 362616	dwhw@bas.ac.uk	www.antarctica.ac.uk

EXPERT GROUPS						
1) Human Biology & Medicine	Dr. Kevin Fong	Anaesthetics Department University College Hospital 235 Euston Road London, NW1 2BU	+44 2076 915827		k.fong@ucl.ac.uk	www.ucl.ac.uk/anaesthesia
2) BAMB - Birds and Marine Mammals	Dr. Richard Philips	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221610	+44 1223 362616	raphil@bas.ac.uk	www.antarctica.ac.uk
3) CPR - Continuous Plankton Recorder Research	Dr. Peter Ward	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221 564	+44 1223 362616	pwar@bas.ac.uk	www.antarctica.ac.uk
3) CPR - Continuous Plankton Recorder Research	Prof. Peter Burkill	SAHOS, The CPR Survey, The Laboratory, Citadel Hill, Plymouth, PL1 2PB	+44 1752 633281	+44 1752 600015	phb@sahfos.ac.uk	www.sahfos.ac.uk/index.asp
4) ICED – Integrating Climate and Ecosystem Dynamics	Prof. Eugene Murphy Chair	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221614	+44 1223 362616	ejmu@bas.ac.uk	www.iced.ac.uk/index.htm
5) SCOR	Dr. Mike Meredith	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221586	+44 1223 362616	mmm@bas.ac.uk	www.antarctica.ac.uk
6) ITASE	Prof. Rob Mulvaney	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221436	+44 1223 362616	rmu@bas.ac.uk	www.antarctica.ac.uk
7) ISMASS	Prof. David Vaughan	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221643	+44 1223 362616	dgv@bas.ac.uk	www.antarctica.ac.uk
7) ISMASS	Dr. Richard Hindmarsh	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221495	+44 1223 362616	rcah@bas.ac.uk	www.antarctica.ac.uk

EXPERT GROUPS cont/d						
8) IPICS	Dr. Eric Wolff Co-Chair	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221491	+44 1223 362616	ewwo@bas.ac.uk	www.antarctica.ac.uk
8) IPICS	Prof. Rob Mulvaney	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221436	+44 1223 362616	rmu@bas.ac.uk	www.antarctica.ac.uk
9) OpMet - Operational Meteorology	Dr. Jon Shanklin Chair	British Antarctic Survey High Cross Madingley Road Cambridge , CB3 0ET	+44 1223 221482	+44 1223 362616	jdsh@bas.ac.uk	www.antarctica.ac.uk
10) Oceanography	Dr. Mike Meredith	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221586	+44 1223 362616	mmm@bas.ac.uk	www.antarctica.ac.uk
11) IBCSO	Mrs. Gwen Buys	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221400	+44 1223 362616	gnew@bas.ac.uk	www.antarctica.ac.uk
11) IBCSO	Dr. Rob Larter	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221573	+44 1223 362616	rdla@bas.ac.uk	www.antarctica.ac.uk
11) IBCSO	Dr. Adrian Fox	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221415	+44 1223 362616	ajfo@bas.ac.uk	www.antarctica.ac.uk
12) ADMAP	Dr. Fausto Ferraccioli	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221577	+44 1223 362616	ffe@bas.ac.uk	www.antarctica.ac.uk
12) ADMAP	Dr. Ash Johnston	Geosoft Europe Ltd, 20/21 Market Place, Wallingford, Oxfordshire, OX10 0AD	+44 1491 835231	+44 1491 835281	ash.johnson@geosofteurope.co.uk	www.geosoft.com
13) Geospatial Information	Dr. Adrian Fox	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221415	+44 1223 362616	ajfo@bas.ac.uk	www.antarctica.ac.uk

STANDING COMMITTEES						
1) Antarctic Geographic Information (SC-AGI)	Dr. Adrian Fox	British Antarctic Survey High Cross Madingley Road Cambridge, CB3 0ET	+44 1223 221415	+44 1223 362616	ajfo@bas.ac.uk	www.antarctica.ac.uk
3) Antarctic Treaty System (SC-ATS)	Dr. Kevin Hughes Deputy Chief Officer	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221616	+44 1223 362616	kehu@bas.ac.uk	www.antarctica.ac.uk
5) Antarctic Data Management (SC-ADM)	Mr Alex Tate	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221439	+44 1223 362616	ajtate@bas.ac.uk	www.antarctica.ac.uk
NATIONAL ANTARCTIC DATA CENTRE / POLAR DATA CENTRE						
Antarctic Environmental Data Centre (AEDC) Polar Data Centre	Mr Alex Tate AEDC Manager	British Antarctic Survey High Cross Madingley Road Cambridge CB3 0ET	+44 1223 221439	+44 1223 362616	ajtate@bas.ac.uk	www.antarctica.ac.uk
SCAR DATABASE						
Reference Antarctic Data for Environmental Research (READER) Antarctic Digital Database (ADD) Antarctic Bedrock Mapping (BEDMAP) Tide Gauge Data (Permanent Service for Mean Sea Level)			Mr Steven Colwell (BAS); Dr. Mike Meredith (BAS); Prof. John Turner (BAS) Mr Paul Cooper (BAS) SC-AGI; Dr. Adrian Fox (BAS) Prof. David Vaughan (BAS) Prof. Philip L. Woodworth (Proudman Oceanographic Laboratory)			

A BRIEF SUMMARY OF SCIENTIFIC HIGHLIGHTS

Glaciation of the NE Antarctic Peninsula on Centennial to Millennial Timescales

This NERC-funded project, led by Professor Neil Glasser at Aberystwyth University, has endeavoured to understand the interaction between glaciers, ice shelves and climate since the Last Glacial Maximum of around 20,000 years ago. The team comprising Neil Glasser, Dr. Bethan Davies (Aberystwyth), Michael Hambrey (Aberystwyth), Jonathan Carrivick (Leeds) and John Smellie (Leicester) have used extensive remote sensing, cosmogenic nuclide dating and geomorphological mapping over three field seasons to James Ross Island and Alexander Island to resolve rates of ice-sheet thinning following the Last Glacial Maximum, ice-stream initiation and recession in Prince Gustav Channel, mid- and Late Holocene glacier fluctuations, and twentieth century ice-shelf collapse and glacier recession.

GENTOO: Gliders: Excellent New Tools for Observing the Ocean

The Gentoo project seeks to use ocean glider to continuously monitor remote but influential regions of the ocean. It is a collaborative project, was led by the University of East Anglia but incorporating expertise from BAS, University of Cambridge and NOC Southampton. Gentoo successfully deployed three Seagliders (autonomous underwater vehicles) into the Weddell Sea to the east of the Antarctic Peninsula in January-March 2012. It is hoped that the data collected by these gliders will present a new view on the variability and inter-dependence of ocean physics, chemistry biology at the boundary between the Antarctic margins and the global ocean.

Halley VI

At the start of 2013, Britain's new state-of-the-art research station, Halley VI, became fully operational. The new research station, which replaces the 20-year old Halley V facility, is the sixth to be built on the floating Brunt Ice Shelf. The first station, occupied in 1957 for a Royal Society expedition during the International Geophysical Year, established the region as an important natural laboratory for studying the Earth's magnetic field and the near-space atmosphere. It was data from Halley that led to the 1985 BAS discovery of the ozone hole. Construction was carried out during four Antarctic summers – each build season lasting just nine weeks. Construction teams worked round the clock in freezing conditions to complete this extreme challenge. This new station is set to continue the long-term research investigations carried out at Halley since the 1950s that have led to deeper understanding of our world.

Modelling Ice Sheet Retreat

A UK team led by Durham University has found that Ice-sheet retreat can halt temporarily during long phases of climate warming. This project presents the first simulation of past ice-sheet retreat and collapse over a ten thousand year period in Antarctica, demonstrating that the geometry of channels beneath the ice can be a strong control on ice behaviour, temporarily hiding the signals of retreat. This work sheds new light on what makes ice stable or unstable and will help refine predictions of future ice extent and global sea-level rise, the researchers say.

First evidence of ocean acidification affecting live marine creatures in the Southern Ocean

Researchers from BAS and the University of East Anglia (UEA), in collaboration with colleagues from the US, discovered severe dissolution of the shells of living pteropods in Southern Ocean waters. These tiny marine snails are a valuable food source for fish and birds and play an important role in the oceanic carbon cycle. A number of laboratory experiments have demonstrated the potential effect of ocean acidification on marine organisms. However, to date, there has been little evidence of such impacts occurring to live specimens in their natural environment. The new findings from this project support predictions that the impact of ocean acidification on marine ecosystems and food webs may be significant.

Warm ocean currents cause the majority of ice loss from Antarctica

An international team of scientists led by BAS has established that warm ocean currents are the dominant cause of recent ice loss from Antarctica. NASA's ICESat satellite was used to map the changing thickness of almost all the floating ice shelves around Antarctica, revealing the pattern of ice-shelf melt across the continent. New techniques were then used to differentiate, for the first time, between the two known causes of melting ice shelves — warm ocean currents attacking the underside, and warm air melting from above. This finding brings scientists a step closer to providing reliable projections of future sea-level rise.

Hidden Rift Valley in West Antarctica

Scientists from the University of Aberdeen and BAS discovered a one mile deep hidden rift valley below Ferrigno Ice Stream in West Antarctica. The ice-filled ancient rift basin is connected to the warming ocean which impacts upon contemporary ice flow and loss. This rift is therefore contributing to ice loss from this region of the continent. The West Antarctic Ice Sheet is of great scientific interest and societal importance as it is losing ice faster than any other part of Antarctica with some glaciers shrinking by more than one metre per year. Thus, understanding the processes that influence ice loss from West Antarctica is important to improve predictions of its future behaviour in a warming world.

A BRIEF SUMMARY OF SCIENTIFIC HIGHLIGHTS cont/d**New Climate History from the Antarctic Peninsula**

Scientists from Britain, Australia and France provide the first comprehensive reconstruction of a 15,000 year climate history from an ice core collected from James Ross Island in the Antarctic Peninsula region. The Antarctic Peninsula is one of the fastest warming places on Earth and this work adds a new dimension to our understanding of Antarctic Peninsula climate change and the likely causes of the break-up of its ice shelves. The data reveal that the rapid warming of this region over the last 100 years has been unusual and came on top of a slower natural climate warming that began around 600 years ago. These centuries of continual warming meant that by the time the unusual recent warming began, the Antarctic Peninsula ice shelves were already poised for the dramatic break-ups observed from the 1990's onwards. These new data will help scientists to determine how much of the Earth's recently observed warming is due to natural climate variation and how much can be attributed to human activity since the industrial revolution.

/ /2012