SO&P

Simulations, Observations & Palaeoclimatic data: climate variability over the last 500 years

EVK2-CT-2002-00160 SOAP

Section 4: Technological Implementation Plan (TIP)

Co-ordinators:

Dr. Tim Osborn (t.osborn@uea.ac.uk)

Professor Keith Briffa (k.briffa@uea.ac.uk)

Climatic Research Unit, University of East Anglia, Norwich, NR4 7TJ, UK

SO&P website: http://www.cru.uea.ac.uk/cru/projects/soap/

TECHNOLOGICAL IMPLEMENTATION PLAN

Description of project

EC PROGRAMME:	**EESD**
PROJECT TITLE:	Simulations, observations and palaeoclimatic data: climate variability over the last 500 years
ACRONYM:	**SOAP**
PROGRAMME TYPE:	5th FWP (Fifth Framework Programme)
CONTRACT NUMBER:	EVK2-CT-2002-00160
PROJECT WEB SITE (if any):	http://www.cru.uea.ac.uk/cru/projects/soap/
START DATE:	01 Nov 2002
END DATE:	31 Oct 2005
COORDINATOR DETAILS:	**Name:** Keith Briffa and Timothy Osborn **Organisation:** University of East Anglia **Address:** Climatic Research Unit, University of East Anglia, NR4 7TJ Norwich, UK **Telephone:** +44 1603 592089 **E-mail:** t.osborn@uea.ac.uk

PARTNERS NAME:
UNIVERSITY OF EDINBURGH, Sandy Tudhope **FREIE UNIVERSITAET BERLIN,** Ulrich Cubasch **Met Office,** Simon Tett **UNIVERSITY OF BERN,** Heinz Wanner **UNIVERSITE DE DROIT D'ECONOMIE ET DES SCIENCES D'AIX-MARSEILLE III,** Joel Guiot **GKSS - FORSCHUNGSZENTRUM GEESTHACHT GMBH,** Hans von Storch **VRIJE UNIVERSITEIT AMSTERDAM,** Orson van de Plassche

Commission Officer Name:	Hans Brelen

Executive summary

Original research objectives

This project aims to provide a state-of-the-art quantitative description of the variability and causes of variability of Northern Hemisphere climate, over the last five centuries. It will investigate the behaviour of important regional systems as well as hemispherically-integrated changes, and quantify the changing influences of natural and anthropogenic climate forcings, using an integrated study of palaeoclimate proxies and carefully prescribed general circulation model (GCM) experiments. Another major objective is to establish the reliability of GCM simulations of natural climate variability, and hence gain additional insights into the uncertainty of model-based anthropogenic climate change detection studies. This will provide a more secure basis from which to assess the likelihood of future abrupt and unusual climate changes. We will also undertake this assessment. In reaching these overarching aims, the project will achieve many individual measurable objectives. The most important of these are: * The simulation of climate variations for the period AD 1500-2000 using two state-of-the-art GCM climate models, forced with very similar natural forcing histories (including volcanic aerosol loading, total solar irradiance changes and orbital changes) and separate simulations for the period AD 1750-2000 forced by combined natural and anthropogenic forcings (greenhouse gases, ozone and sulphate aerosols). * Detailed statistical intercomparison of the simulations with one another, and with already available millennial-length control simulations (with constant external forcings), to enable: ** the identification of robust climate responses to external forcing on global and regional scales; and ** the quantification of the relative importance of forced and internally-generated climate variability. * The production of an enhanced and integrated database of annually-resolved climate proxy records, by assembling many existing records (tree rings, ice cores, corals, etc.) and lower resolution records such as those from lake sediment, peat records and borehole temperature estimates. * The construction of homogeneous sets of climate data, representing seasonal temperature, precipitation and atmospheric circulation variability over the last 500 years, involving the amalgamation (via appropriate calibration) of instrumental observations, documentary climate archival data and existing and the newly amalgamated palaeoclimate proxy evidence, to allow: ** a detailed analysis (multiple variables for all seasons, or even at a monthly resolution) for the European region, possible because of the dense network of natural and documentary proxies available; ** the improved definition of the characteristics and magnitude of natural climate variability during the last five centuries across the full Northern Hemisphere; and ** the improved

reconstruction of past variations in important atmospheric and ocean-atmosphere modes of climate variability, including the North Atlantic Oscillation (NAO, and the related Arctic Oscillation) and the El Niño-Southern Oscillation (ENSO). * Evaluation of the simulated climate variability, and the simulated climate response to external forcing, by quantitative comparison with the extended observed/reconstructed climate data. * The use of the model simulations to aid in the interpretation of the real-world climate variability, specifically the use of signal detection techniques to test the extent to which the model response to external forcings is detectable in the observed/reconstructed climate data. * The generation of improved estimates of natural climate variability, through synthesis of the simulated and observed/reconstructed data. * The re-assessment of climate change prediction uncertainties and climate change signal detection uncertainty, in the light of these new estimates of natural variability. * Comparison of estimates of sea level variation generated from the climate model simulations with a synthesised history of North Atlantic sea level changes, based on a combination of long tide gauge records and evidence from a number of ongoing tidal marsh sampling studies.

Expected deliverables

D1: Dedicated project website (with private and public sections). D2: Assembly of climate proxy, documentary and long instrumental data, and existing palaeoclimate reconstructions completed, and distributed via the project website. D3: Simulated data in the project data base. D4: Methods for comparison of palaeo and model data developed and documented, and algorithms made available. D6: Improvement of European gridded temperature and precipitation/drought reconstructions. D7: Comparison, improvement and combination of Northern Hemisphere gridded temperature reconstructions. D8: Report on simulated response to external forcings. D9: Reconstruction of atmospheric circulation patterns and circulation indices and ENSO. D10: Spatio-temporal analysis of reconstructed climate variability over 1500-2000. D11: Report on difference between control and forced simulations. D12: Simulated sea-level from all GCM simulations in the project data base. D13: Regional estimates of observed sea level rise (from North Atlantic tide gauge and proxy records) in the project data base. D14: Report on the evaluation of simulated climate variability and climate response to forcing using the palaeo reconstructions. D15: Report on the interpretation of palaeodata using climate simulations. D16: Report estimating the natural and anthropogenic contributions to sea level variations over the past 500 years, and evaluating the simple climate/sea-level models. D17: Report on the comparison of simulated and observed sea levels and on relationships with climate forcing/variability. D18: Report on climate signal detection using the palaeo-based, model-based, and synthesis estimates of natural climate variability. D19: Final project report, draft TIP plan and dissemination of project results and data sets .

Project's actual outcome

All of the items listed under "Expected Deliverables" have been completed and are available directly or indirectly from the SOAP project website (http://www.cru.uea.ac.uk/cru/projects/soap/).

Broad dissemination and use intentions for the expected outputs

The new scientific knowledge obtained through the research undertaken for the SOAP project has been disseminated principally via the peer-reviewed scientific literature and by presentations and posters at scientific conferences. It is expected that more such output will follow in the next one-to-two years. A number of outputs are also in the form of new or improved data sets. Some of these are the output from simulations of the last 500 or 1000 years using climate models. Some of these are new collations of climate proxy data sets. And some of these are new or alternative reconstructions of past climate variations (temperature, precipitation, circulation) developed from climate proxy records. All of these data sets will support many further analyses of the detailed evolution of past climate changes and our ability to model it as a response to external forcings and internal variability. These data will continue to be used by the project partners, but many are also available for other scientific use (though mostly requiring initial agreement of the project coordinators and/or data set owners to avoid duplicating work planned by the SOAP partners).

Overview of all your main project results

No.	Self-descriptive title of the result	Category A, B or C*	Partner(s) owning the result(s) (referring in particular to specific patents, copyrights, etc.) & involved in their further use
1	Project website	A	UNIVERSITY OF EDINBURGH Met Office FREIE UNIVERSITAET BERLIN UNIVERSITY OF BERN UNIVERSITE DE DROIT D'ECONOMIE ET DES SCIENCES D'AIX-MARSEILLE III GKSS - FORSCHUNGSZENTRUM GEESTHACHT GMBH VRIJE UNIVERSITEIT AMSTERDAM University of East Anglia
2	A relational database of tree-ring records	A	UNIVERSITE DE DROIT D'ECONOMIE ET DES SCIENCES D'AIX-MARSEILLE III
3	Reconstructions of Northern Hemisphere temperature	A	University of East Anglia
4	Reconstruction from 1100-present of April-September temperatures averaged over western Europe	A	UNIVERSITE DE DROIT D'ECONOMIE ET DES SCIENCES D'AIX-MARSEILLE III
5	Reconstruction from 1500-present of seasonal precipitation for a grid covering Europe	A	UNIVERSITY OF BERN
6	Reconstruction from 1500-present of seasonal temperatures for a grid covering Europe	A	UNIVERSITY OF BERN
7	Simulations of the climate of the last 500 years with the HadCM3 climate model	A	Met Office University of East Anglia
8	Simulations of the climate of the last 1000 years with the ECHO-G climate model	A	GKSS - FORSCHUNGSZENTRUM GEESTHACHT GMBH FREIE UNIVERSITAET BERLIN University of East Anglia
9	Reconstruction of tropical SST from coral records	A	UNIVERSITY OF EDINBURGH
10	Sea-level changes over the last 500 years inferred from the HadCM3 simulations	A	Met Office

11	Reconstructions of past sea-level variations from salt marsh records	B	VRIJE UNIVERSITEIT AMSTERDAM

*A: results usable outside the consortium / B: results usable within the consortium / C: non usable results

Quantified Data on the dissemination and use of the project results

Items about the dissemination and use of the project results (consolidated numbers)	Currently achieved quantity	Estimated future* quantity
Product innovations	0	0
Process innovations	0	0
New services (commercial)	0	0
New services (public)	0	0
New methods	3	1
Scientific breakthrought	1	1
Technical standards to which this project has contributed	0	0
EU regulations/directives to which this project has contributed	0	0
International regulations to which this project has contributed	0	0
PhDs generated by the project	1	2
Grantees/trainees including transnational exchange of personnel	0	0

** "Future" means expectations within the next 3 years following the end of the project*

Comment on European Interest

Community added value and contribution to EU policies

European dimension of the problem

Climate variability and change incur great social and economic cost. The magnitude and patterns of future climate change depend upon the sensitivity of the climate system to changes in external forcings such as greenhouse gases and natural changes in solar output and volcanic aerosols. Optimal mitigation/adaptation strategies rely on improved knowledge of the climate system and of its sensitivity to these forcings, which can be gained by studying changes that have occurred in the past. The SOAP project has furthered our knowledge in these areas, with specific (though not exclusive) foci on the European region and on testing the ability of European climate models to simulate past changes in climate.

Contribution to developing S&T co-operation at international level. European added value

Increased knowledge about the climate system and its sensitivity to changes in natural and anthropogenic forcing holds the prospect of climate predictions that would offer benefits on a global-scale. Fifty-two publications funded fully or partially by the SOAP project have so far appeared in, been accepted for, or been submitted to, peer-reviewed journals or books. Of these, eleven have included authors from at least two (and in some cases three or four) different SOAP project partners. It is expected that more publications will follow, most involving multiple SOAP project partners. The collaborations and outputs achieved by the SOAP project help to sustain a critical mass of European climate scientific effort towards the goals of better understanding and modelling past climate change.

Contribution to policy design or implementation

The EU has played a major role in establishing the UN Framework Convention on Climate Change and the Kyoto Protocol, designed to stabilise greenhouse gas concentrations at a level that avoids dangerous climate change. Whilst domestic action, on a country-by-country basis is essential, so is Community action. The more that we know about the mechanisms and extent of climate change, the more effective the measures towards reduction, mitigation and adaptation can be. The SOAP project focus on past climatic variability and links with forcings, both natural and anthropogenic, will help in the assessment of the degree and measurable effects of climate change already evident and those predicted for the future. This information will help to guide future Community policy with respect to climate change.

Contribution to Community social objectives

Improving the quality of life in the Community:

The social, environmental and economic effects of climate changes can be very damaging. An ability to be able to more accurately predict possible future climate changes would have enormous benefits. The SOAP project has increased our understanding of the response to natural and anthropogenic forcings, in terms of global-scale climate changes, regional patterns of climate and sea-level rise. This knowledge contributes to society's gradually developing understanding of the climate system and its behaviour, which in total will support the EU in its efforts to preserve/enhance the quality of the environment and to reduce the negative effects on society of undesirable climate change.

Provision of appropriate incentives for monitoring and creating jobs in the Community (including use and development of skills):

The SOAP project has not directly increased employment in the EU. It has enhanced the skills of those working in climate research that have had connections with the project and thus strengthened the whole climate research sector. This, in turn, could lead to a better public understanding of the threats from climate change and an acceptance of the measures taken to minimise them. Thus,

some jobs may be created in the adaptation and mitigation sectors.

Supporting sustainable development, preserving and/or enhancing the environment (including use/conservation of resources):

The increased scientific understanding of the controlling factors on European and global climate, through projects like SOAP, should ultimately facilitate the production of improved future climate scenarios. Several of SOAP's outputs will, directly or indirectly, help present and future researchers make more robust conclusions about the causes of recent climate changes and the likely sensitivity of the climate system to external factors The improved scenarios will underpin tools used to inform policy makers and thus promote measures to make future development more sustainable and less demanding on the environment.

Expected project impact (to be filled in by the project coordinator)

EU Policy Goals	I SCALE OF EXPECTED IMPACT OVER THE NEXT 10 YEARS -1 0 1 2 3	II other	
		Not applicable to project	Project Impact too difficult to estimate
1. Improved sustainable economic development and growth, competitiveness	0	√	
2. Improved employment	0	√	
3. Improved quality of life and health and safety	0		√
4. Improved education	0		√
5. Improved preservation and enhancement of the environment	1		
6. Improved scientific and technological quality	2		
7. Regulatory and legislative environment	1		
8. Other	0	√	

1. Economic development and growth, competitiveness	Scale of Expected Impacts over the next 10 years (2)	
	By Project End -1 0 1 2 3	After Project End -1 0 1 2 3
a) Increased Turnover for project participants - national markets		
b) Increased Turnover for project participants - international markets		
c) Increased Productivity for project participants		
d) Reduced costs for project participants		
e) Improved output quality/high technology content		

2. Employment	Scale of Expected Impacts over the next 10 years (2)	
	By Project End -1 0 1 2 3	After Project End -1 0 1 2 3
a) Safeguarding of jobs		
b) Net employment growth in projects participants staff		
c) Net employment growth in customer and supply chains		
d) Net employment growth in the European economy at large		

3. Quality of Life and health and safety	Scale of Expected Impacts over the next 10 years (2)	
	By Project End -1 0 1 2 3	After Project End -1 0 1 2 3
a) Improved health care		
b) Improved food, nutrition		
c) Improved safety (incl. consumers and workers safety)		
d) Improved quality of life for the elderly and disabled		
e) Improved life expectancy		
f) Improved working conditions		
g) Improved child care		
h) Improved mobility of persons		

4. Improved education	Scale of Expected Impacts over the next 10 years (2)	
	By Project End	After Project End

	-1 0 1 2 3	-1 0 1 2 3
a) Improved learning processes including lifelong learning		
b) Development of new university curricula		

5. Preservation and enhancement of the environment	Scale of Expected Impacts over the next 10 years (2)	
	By Project End -1 0 1 2 3	After Project End -1 0 1 2 3
a) Improved prevention of emissions	0	1
b) Improved treatment of emissions	0	1
c) Improved preservation of natural resources and cultural heritage	0	0
d) Reduced energy consumption	0	1

6. S&T quality	Scale of Expected Impacts over the next 10 years (2)	
	By Project End -1 0 1 2 3	After Project End -1 0 1 2 3
a) Production of new knowledge	2	2
b) Safeguarding or development of expertise in a research area	2	2
c) Acceleration of RTD, transfer or uptake	1	1
d) Enhance skills of RTD staff	2	2
e) Transfer expertise/know-how/technology	2	2
f) Improved access to knowledge-based networks	2	1
g) Identifying appropriate partners and expertise	2	1
h) Develop international S&T co-operation	1	2
i) Increased gender equality	1	0

7. Regulatory and legislative environment	Scale of Expected Impacts over the next 10 years (2)	
	By Project End -1 0 1 2 3	After Project End -1 0 1 2 3
a) Contribution to EU policy formulation	0	1
Contribution to EU policy implementation	0	1

8. Other (please specify)	Scale of Expected Impacts over the next 10 years (2)	
	By Project End -1 0 1 2 3	After Project End -1 0 1 2 3

Description of Results

No.	Title:
1	Project website

CONTACT PERSON FOR THIS RESULT

Name	Timothy Osborn
Position	Academic Fellow
Organisation	University of East Anglia
Address	Climatic Research Unit, University of East Anglia NR4 7TJ, Norwich UK
Telephone	+44 1603 592089
Fax	+44 1603 507784
E-mail	t.osborn@uea.ac.uk
URL	http://www.cru.uea.ac.uk/
Specific Result URL	http://www.cru.uea.ac.uk/cru/projects/soap/

SUMMARY

The project website provides a comprehensive description of the project, including the objectives, methods, structure, partners, and many results including publications and data sets. The project will be maintained for as long as it still provides a useful function. Its main uses amongst the wider scientific community are (1) as a focus for continuing efforts in this field, (2) as a repository for accessing various climate reconstructions and climate model simulations, and (3) many standard visualisations of the data are provided for further analysis and interpretation (specifically for the climate model output).

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Website	http://www.cru.uea.ac.uk/cru/projects/soap/	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	KNOWLEDGE: Tick a box and give the corresponding details(reference numbers, etc) if appropriate					Pre-existing know-how Tick a box and give the corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	0	0
publications addressing general public (e.g. CD-ROMs, WEB sites)	1	0
publications addressing decision takers / public authorities / etc.	0	0

Visibility for the general public	YES

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:
2	A relational database of tree-ring records

CONTACT PERSON FOR THIS RESULT

Name	Joel Guiot
Position	Scientist
Organisation	UNIVERSITE DE DROIT D'ECONOMIE ET DES SCIENCES D'AIX-MARSEILLE III
Address	CEREGE - Europole de l'Arbois - BP 80 13545, AIX-EN-PROVENCE FR
Telephone	+33 4 42 97 15 32
Fax	+33 4 42 97 15 40
E-mail	guiot@cerege.fr
URL	
Specific Result URL	http://servpal.cerege.fr/webdbdendro/

SUMMARY

As part of the work funded by SOAP, partner CNRS/UDESAM at the CEREGE laboratory, Antoine Nicault, Simon Brewer and Joel Guiot have created a tree-ring data base, developed from earlier work on the FORMAT data base. This new data base, DENDRODB, has been filled with data from more than 600 tree-ring sites from Eurasia. 256 sites have tree-ring width chronologies of 300 years or longer, and 90 sites have tree-ring density chronologies of 300 years or longer. The main use of this product will be by those interested in locating, processing and using tree-ring measurement records for the purposes of reconstructing past variations in climate. It is intended to be complementary to the International Tree-Ring Data Bank. DENDRODB provides additional functionality in terms of relational searching and a number of data processing options.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Website	http://servpal.cerege.fr/webdbdendro/	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	KNOWLEDGE: Tick a box and give the corresponding details(reference	Pre-existing know-how Tick a box and give the

	numbers, etc) if appropriate					corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	0	0
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:

3	Reconstructions of Northern Hemisphere temperature

CONTACT PERSON FOR THIS RESULT

Name	Timothy Osborn
Position	Academic Fellow
Organisation	University of East Anglia
Address	Climatic Research Unit, University of East Anglia NR4 7TJ, Norwich UK
Telephone	+44 1603 592089
Fax	+44 1603 507784
E-mail	t.osborn@uea.ac.uk
URL	http://www.cru.uea.ac.uk/
Specific Result URL	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/deliv7.htm

SUMMARY

Existing NH temperature reconstructions have been collated for use within SOAP and recalibrated against a common target time series of instrumental temperatures. Some of these were published in the journal Science (Briffa and Osborn, 2002). For use within the wider scientific community, we provide three versions of these temperature reconstructions: (i) calibrated using traditional regression for annual temperatures; (ii) calibrated using traditional regression for warm-season temperatures; and (iii) calibrated by scaling to match the variance of annual temperatures. We also provide results from a combined large network of multiple proxy records, calibrated using the RegEM method to provide various reconstructions of NH temperature (Rutherford et al., 2005).

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	**Details (Title, ref. number, general description, language)**	**Status: PU=Public CO=Confidential**
Data and description	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/deliv7.htm	Public
Journal paper	Rutherford SD, Mann ME, Osborn TJ, Bradley RS, Briffa KR, Hughes MK and Jones PD (2005) Proxy-based Northern Hemisphere surface temperature reconstructions: sensitivity to method, predictor network, target season and target domain. Journal of Climate 18, 2308-2329.	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	**KNOWLEDGE:** **Tick a box and give the corresponding details(reference numbers, etc) if appropriate**					**Pre-existing know-how** **Tick a box and give the corresponding details(reference numbers, etc) if appropriate**	
	Current				**Foreseen**	**Tick**	**Details**
	Tick	**NoP[1)]**	**NoI[2)]**	**Details**	**Tick**		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	2	2
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	1
publications addressing decision takers / public authorities / etc.	0	1
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:
4	Reconstruction from 1100-present of April-September temperatures averaged over western Europe

CONTACT PERSON FOR THIS RESULT

Name	Joel Guiot
Position	Scientist
Organisation	UNIVERSITE DE DROIT D'ECONOMIE ET DES SCIENCES D'AIX-MARSEILLE III
Address	CEREGE - Europole de l'Arbois - BP 80 13545, AIX-EN-PROVENCE FR
Telephone	+33 4 42 97 15 32
Fax	+33 4 42 97 15 40
E-mail	guiot@cerege.fr
URL	
Specific Result URL	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/deliv6.htm

SUMMARY

A new reconstruction of mean temperature over western Europe has been developed, with values estimated as far back as AD 1100. This will prove useful to those researching the causes of European climate change, and for putting recent warming into a longer-term context.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Data and description	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/index.htm#guiot05	Public
Journal paper	Guiot J, Nicault A, Rathgeber C, Edouard JL, Guibal F, Pichard G and Till C (2005) Last-millennium summer-temperature variations in western Europe based on proxy data. The Holocene 15, 489-500.	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	KNOWLEDGE: Tick a box and give the corresponding details(reference numbers, etc) if appropriate					Pre-existing know-how Tick a box and give the corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	1	1
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	**Title:**
5	Reconstruction from 1500-present of seasonal precipitation for a grid covering Europe

CONTACT PERSON FOR THIS RESULT

Name	Heinz Wanner
Position	Head of Unit
Organisation	UNIVERSITY OF BERN
Address	Hallerstrasse 12 3012, BERN CH
Telephone	+41 3163 18545
Fax	+41 3163 18511
E-mail	wanner@giub.unibe.ch
URL	
Specific Result URL	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/deliv6.htm

SUMMARY

A new reconstruction has been developed with fine spatial resolution of seasonal-mean precipitation totals across Europe for the last 500 years (Pauling et al., 2006). This is based on a combination of long instrumental records, documentary records, and natural climate proxies. It will be useful for further investigations of past changes in European climate, including detection of unusual recent changes and the study of linkages between precipitation, atmospheric circulation, temperature and external forcings.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	**Details (Title, ref. number, general description, language)**	**Status: PU=Public CO=Confidential**
Data and description	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/index.htm#paul05	Public
Journal paper	Pauling A, Luterbacher J, Casty C and Wanner H (2006) Five hundred years of gridded high-resolution precipitation reconstructions over Europe and the connection to large-scale circulation. Climate Dynamics 26, 387-405.	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	**KNOWLEDGE:** **Tick a box and give the corresponding details(reference numbers, etc) if appropriate**	**Pre-existing know-how** **Tick a box and give the corresponding details(reference numbers, etc) if appropriate**

	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	3	2
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:
6	Reconstruction from 1500-present of seasonal temperatures for a grid covering Europe

CONTACT PERSON FOR THIS RESULT

Name	Heinz Wanner
Position	Head of Unit
Organisation	UNIVERSITY OF BERN
Address	Hallerstrasse 12 3012, BERN CH
Telephone	+41 3163 18545
Fax	+41 3163 18511
E-mail	wanner@giub.unibe.ch
URL	
Specific Result URL	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/deliv6.htm

SUMMARY

A new reconstruction has been developed with fine spatial resolution of seasonal-mean temperatures across Europe for the last 500 years (Luterbacher et al., 2004; Xoplaki et al., 2005). This is based on a combination of long instrumental records, documentary records, and natural climate proxies. It will be useful for further investigations of past changes in European climate, including detection of unusual recent changes and the study of linkages between precipitation, atmospheric circulation, temperature and external forcings.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Data and description	http://www.cru.uea.ac.uk/cru/projects/soap/data/recon/index.htm#luter04	Public
Journal paper	Luterbacher J, Dietrich D, Xoplaki E, Grosjean M and Wanner H (2004) European seasonal and annual temperature variability, trends and extremes since 1500. Science 303, 1499-1503.	Public
Journal paper	Xoplaki E, Luterbacher J, Paeth H, Dietrich D, Steiner N, Grosjean M and Wanner H (2005) European spring and autumn temperature variability and change of extremes over the last half millennium. Geophysical Research Letters 32 L15713 (doi: 10.1029/2005GL023424).	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	**KNOWLEDGE:** Tick a box and give the corresponding details(reference numbers, etc) if appropriate					**Pre-existing know-how** Tick a box and give the corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	3	1
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:
7	Simulations of the climate of the last 500 years with the HadCM3 climate model

CONTACT PERSON FOR THIS RESULT

Name	Timothy Osborn
Position	Academic Fellow
Organisation	University of East Anglia
Address	Climatic Research Unit, University of East Anglia NR4 7TJ, Norwich UK
Telephone	+44 1603 592089
Fax	+44 1603 507784
E-mail	t.osborn@uea.ac.uk
URL	http://www.cru.uea.ac.uk/
Specific Result URL	http://www.cru.uea.ac.uk/cru/projects/soap/data/model/hadcm3.htm

SUMMARY

One of the first sets of simulations of the climate of the last 500 years using comprehensive natural and anthropogenic forcings has been completed with a state-of-the-art coupled climate model. The HadCM3 results will be useful in a wide range of studies focussed on the changes in climate over this period and for comparison with observed and reconstructed evidence in many regions.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Data and description and visualisation	http://www.cru.uea.ac.uk/cru/projects/soap/data/model/hadcm3.htm	Public
Journal paper	Tett SFB, Betts R, Crowley TJ, Gregory J, Johns TC, Jones A, Osborn TJ, Ostrom E, Roberts DL and Woodage MJ (2006) The impact of natural and anthropogenic forcings on climate and hydrology since 1500. Climate Dynamics (in press).	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	KNOWLEDGE: Tick a box and give the corresponding details(reference numbers, etc) if appropriate					Pre-existing know-how Tick a box and give the corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	0	2
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0

publications addressing decision takers / public authorities / etc.	0	1
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:
8	Simulations of the climate of the last 1000 years with the ECHO-G climate model

CONTACT PERSON FOR THIS RESULT

Name	Timothy Osborn
Position	Academic Fellow
Organisation	University of East Anglia
Address	Climatic Research Unit, University of East Anglia NR4 7TJ, Norwich UK
Telephone	+44 1603 592089
Fax	+44 1603 507784
E-mail	t.osborn@uea.ac.uk
URL	http://www.cru.uea.ac.uk/
Specific Result URL	http://www.cru.uea.ac.uk/cru/projects/soap/data/model/echog.htm

SUMMARY

The first simulation, using a fully-coupled ocean-atmospheric general circulation climate model, of the climate of the last 1000 years has been completed, including separate simulations to distinguish between the influences of natural and anthropogenic forcings during recent centuries. These simulations with the ECHO-G model will be (and, indeed, already are) of widespread use to comparison with climate reconstructions and for studying the interactions of climate forcings and internal climate variability.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Data and description and visualisation	http://www.cru.uea.ac.uk/cru/projects/soap/data/model/echog.htm	Public
Journal paper	von Storch, H, Zorita E, Jones JM, Dmitriev Y, and Tett SFB (2004) Reconstructing past climate from noisy data. Science 304, 679-682.	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	KNOWLEDGE: Tick a box and give the corresponding details(reference numbers, etc) if appropriate					Pre-existing know-how Tick a box and give the corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	3	1
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:
9	Reconstruction of tropical SST from coral records

CONTACT PERSON FOR THIS RESULT

Name	Sandy Tudhope
Position	Scientist
Organisation	UNIVERSITY OF EDINBURGH
Address	School of Geosciences, John Murray Laboratories, The King's Buildings, West Mains Road EH9 3JW, EDINBURGH GB
Telephone	+44 1316 508508
Fax	+44 1316 683184
E-mail	sandy.tudhope@ed.ac.uk
URL	
Specific Result URL	

SUMMARY

A new reconstructions has been developed of tropic-wide averaged sea surface temperatures (Wilson et al., 2006). This is based on a combination of tropical coral records and spans the last few centuries (though with decreasing reliability before 1850, and especially before 1750). It will be useful for further investigations of past changes in tropical climate, including detection of unusual recent changes and the study of linkages with external forcings.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Journal paper	Wilson R, Tudhope A, Brohan P, Briffa K, Osborn T and Tett S (2005) 250-years of reconstructed and modeled tropical temperatures. Journal of Geophysical Research (in press).	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	KNOWLEDGE: Tick a box and give the corresponding details(reference numbers, etc) if appropriate					Pre-existing know-how Tick a box and give the corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development **Other:**

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	0	1
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	Title:
10	Sea-level changes over the last 500 years inferred from the HadCM3 simulations

CONTACT PERSON FOR THIS RESULT

Name	Timothy Osborn
Position	Academic Fellow
Organisation	University of East Anglia
Address	Climatic Research Unit, University of East Anglia NR4 7TJ, Norwich UK
Telephone	+44 1603 592089
Fax	+44 1603 507784
E-mail	t.osborn@uea.ac.uk
URL	http://www.cru.uea.ac.uk/
Specific Result URL	http://www.cru.uea.ac.uk/projects/soap/data/model/deliv12.htm

SUMMARY

Sea-level changes have been estimated from simulations of the climate over the last 500 years using the HadCM3 climate model, and forced by natural and anthropogenic forcings (or by only natural forcings). Estimates of the ocean thermal expansion/contraction component, and of the component arising from changes in mass of glaciers and small ice caps, have been estimated and summed. These will be of widespread use for studying past sea level change and for comparison with observed/reconstructed data.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	Details (Title, ref. number, general description, language)	Status: PU=Public CO=Confidential
Data and description and visualisation	http://www.cru.uea.ac.uk/projects/soap/data/model/deliv12.htm	Public
Journal paper	Gregory JM, Lowe JA and Tett SFB (2006) Simulated global-mean sea-level changes over the last half-millennium. Journal of Climate (in press).	Public

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	KNOWLEDGE: Tick a box and give the corresponding details(reference numbers, etc) if appropriate					Pre-existing know-how Tick a box and give the corresponding details(reference numbers, etc) if appropriate	
	Current				Foreseen	Tick	Details
	Tick	NoP[1)]	NoI[2)]	Details	Tick		
Patent applied for							
Patent granted							
Patent search carried out							
Registered design							
Trademark applications							
Copyrights							
Secret know-how							
Other - please specify:							

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	Actual current quantity	Estimated (or future) quantity
Time to application / market *(in months from the end of the research project)*	0	
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	0	2
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT

R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

No.	**Title:**
11	Reconstructions of past sea-level variations from salt marsh records

CONTACT PERSON FOR THIS RESULT

Name	Orson van de Plassche
Position	Scientist
Organisation	VRIJE UNIVERSITEIT AMSTERDAM
Address	De Boelelaan 1085 1081 HV, AMSTERDAM GB
Telephone	+31 2044 47380
Fax	+31 2064 62457
E-mail	plao@geo.vu.nl
URL	
Specific Result URL	

SUMMARY

A compilation of pre-instrumental records of past sea-level changes from around the North Atlantic has been made, and then screened against various criteria for indicating likely reliability/quality, and finally anaylsed and interpreted. These data are of use for comparison with changes in sea level diagnosed from climate model simulations of the last 1000 years. Some of these data have not yet been published, so they are not yet being made available outside the SOAP project consortium.

SUBJECT DESCRIPTORS CODES

174 EARTH SCIENCES FOR CLIMATE RESEARCH
269 GEOPHYSICS, PHYSICAL OCEANOGRAPHY, METEOROLOGY, GEOCHEMISTRY, TECTONICS
272 GLOBAL CHANGE: CLIMATE CHANGE

DOCUMENTATION AND INFORMATION ON THE RESULT

Documentation type	**Details (Title, ref. number, general description, language)**	**Status: PU=Public CO=Confidential**

INTELLECTUAL PROPERTY RIGHTS

Type of IPR	**KNOWLEDGE:** **Tick a box and give the corresponding details(reference numbers, etc) if appropriate**					**Pre-existing know-how** **Tick a box and give the corresponding details(reference numbers, etc) if appropriate**	
	Current				**Foreseen**	**Tick**	**Details**
	Tick	**NoP[1)]**	**NoI[2)]**	**Details**	**Tick**		
Patent applied for							
Patent granted							
Patent search carried out							

Registered design						
Trademark applications						
Copyrights						
Secret know-how						
Other - please specify:						

1) Number of **P**riority (national) applications/patents
2) Number of **I**nternationally extended applications/patents

MARKET APPLICATION SECTORS

Market application sectors
73 Research and development

CURRENT STAGE OF DEVELOPMENT

Current stage of development
Other:

QUANTIFIED DATA ABOUT THE RESULT

Items (about the results)	**Actual current quantity**	**Estimated (or future) quantity**
Time to application / market *(in months from the end of the research project)*		6
Number of (public or private) entities potentially involved in the implementation of the result:		
of which: number of SMEs:		
of which: number of entities in third countries (outside EU):		
Targeted user audience: of reachable people		
& publications (referenced publications only)	0	2
publications addressing general public (e.g. CD-ROMs, WEB sites)	0	0
publications addressing decision takers / public authorities / etc.	0	0
Visibility for the general public	YES	

FURTHER COLLABORATION, DISSEMINATION AND USE OF THE RESULT

COLLABORATIONS SOUGHT					
R&D	Further research or development		**FIN**	Financial support	
LIC	Licence agreement		**VC**	Venture capital/spin-off funding	
MAN	Manufacturing agreement		**PPP**	Private-public partnership	
MKT	Marketing agreement		**INFO**	Information exchange/training	
JV	Establish a joint enterprise or partnership		**CONS**	Available for consultancy	
Other	(please specify)				
Details:					

POTENTIAL OFFERED FOR FURTHER DISSEMINATION AND USE

PROFILE OF ADDITIONAL PARTNER(S) FOR FURTHER DISSEMINATION AND USE

I am the Co-ordinator of the above project, and confirm on behalf of the contracted Partners the information contained in this Technological Implementation Plan, and I authorise its public dissemination.

Signature: **Name:**

Date: **Organisation:**