Congressional Research Service

MEMORANDUM December 1, 2009

To: Senate Committee on Environment and Public Works
Attention: Tom Hassenboehler

From: Jane A. Leggett, Specialist in Environmental and Energy Policy (7-9525)

Subject: **The Climate Research Unit at the University of East Anglia**

This memorandum provides information on the Climate Research Unit (CRU) at the United Kingdom's (UK) University of East Anglia, in response to your request. The memorandum covers what the CRU does, and the role it plays in developing and disseminating important climate change data and analysis.

If I can be of further assistance, please contact me at 7-9525.

The Climate Research Unit (CRU) is among the renowned research centers in the world on some aspects of climate change, both natural and anthropogenic.[1] It is part of the School of Environmental Sciences at the University of East Anglia in the United Kingdom. (CRU is a separate entity from the UK Meteorological Office's Hadley Centre, although the two cooperate on a number of topics and share data and analysis.[2]) The staff includes about 30 research scientists and students.[3] Professor Phil Jones has been the Director,[4] and the Deputy Director is Professor Keith Briffa.[5] According to the CRU's website, "the aim of CRU is to improve scientific understanding in:

- past climate history and its impact on humanity;
- the course and causes of climate change during the present century; and
- prospects for the future."[6]

[1] Human-related.

[2] The leaked release of thousands of emails and computer code from the CRU has been the subject of recent media attention. Apparently, some bloggers have inaccurately identified the information security breach with the Met Office's Hadley Centre, an institution of the Government of the UK. This inaccuracy has spread through the Internet.

[3] Well-known principal research scientsts include: Maureen Agnew, Keith Briffa, Simon Busby, Clare Goodess, Dimitrios Efthymiadis, Ian (Harry) Harris, Mike Hulme, Phil Jones, Alexey Karpechko, Mick Kelly, David Lister, Colin Marpham, Douglas Maraun, Tim Osborn, Sarah Raper, Mike Salmon, Mike Thorne, Tom Wigley, and Clive Wilkinson.

[4] The University of East Anglia announced on December 1, 2009 that Professor Jones is standing aside as Director of CRU until completion of an independent university review "resulting from allegation following the hacking and publication of emails from the [CRU]." http://www.uea.ac.uk/mac/comm/media/press/2009/nov/homepagenews/CRUupdate

[5] Biographic information from CRU's website for Jones and Briffa are attached to this memorandum.

[6] http://www.cru.uea.ac.uk/.

Funding of the CRU is by external contract and grants from a wide variety of sources, including British government agencies, the European Commission, the UK's Engineering and Physical Sciences Research Council, and other public and private sources. As of December 1, 2009, the CRU operates under multi-year research grants totaling approximately £993,452 (US$1,651,899).[7]

Work of the CRU has contributed to the scientific assessments of climate change conducted by the Intergovernmental Panel on Climate Change (IPCC). For example, CRU's CRUTEM3 dataset of surface temperatures is one of five used by the IPCC in the Fourth Assessment Report (AR4).[8] CRU Director Phil Jones was one of the Coordinating Lead Authors of the IPCC science working group's chapter on "Observations: Surface and Atmospheric Climate Change."[9] Deputy Director Keith Briffa was a Lead Author on paleoclimatology in the IPCC AR4. The CRU also produced the IPCC AR4's "high resolution climatologies," constructed datasets representing average climate conditions in grid squares covering most of the globe, historically and as projected by a range of climate models for 16 different scenarios to 2100, used to analyze the impacts of uncertainty in future climate projections for specific locations. The CRU work on paleoclimatology is widely cited, including by the IPCC, and has contributed to analysis of the factors contributing to climate variability over past centuries. Briffa and Jones contributed to four of the 10 reconstructions of Northern Hemispheric temperatures since the year 1000 that have often been characterized as the "hockey stick"; some of these reconstructions were included in the AR4 as one line of evidence that the Earth's temperature is presently warmer than previous centuries (including the Northern Hemisphere's "Medieval Warm Period").

CRU is engaged in developing and producing output datasets from climate change scenarios for the UK and other locations, primarily in specialty activities, such as "weather generation" and "downscaling" results from larger grid cells down to detailed locales, and characterizing uncertainties apparent in ranges of results across different climate models and "ensemble"[10] runs. Increasingly, CRU conducts research and analysis on both physical and socio-economic impacts of climate change. Much of their data and projections are available on the CRU's website (http://www.cru.uea.ac.uk/cru/data/), as well as the IPCC Data Distribution Centre (http://www.ipcc-data.org/).

Researchers from CRU have cooperated with U.S. researchers on a variety of projects. These have included methods for reconstructing climate observational and proxy data sets and inter-comparison of datasets, and preparing data sets for evaluating the performance of global climate models.

[7] Grant funding only is available at http://www.cru.uea.ac.uk/cru/research/grants.htm.

[8] Three of the five global surface temperature datasets come from the United States: the National Oceanic and Atmospheric Administration's National Climate Data Center dataset; the National Aeronautics and Space Administration's Goddard Institute for Space Studies dataset; and the Department of Energy's Oak Ridge National Laboratory Carbon Dioxide Information Analysis Center. The fifth dataset, for sea surface temperatures, is from the UK Met Office's Hadley Centre. Surface temperature data were supplemented by, and compared with, satellite data from 1979, when satellite measurements began.

[9] The CRU says, despite contrary allegations, that "over 95% of the raw station data has been accessible through the Global Historical Climatology Network for several years.... The University will make all the data accessible as soon as they are released from a range of non-publication agreements. Publication will be carried out in collaboration with the Met Office Hadley Centre." http://www.uea.ac.uk/mac/comm/media/press/2009/nov/homepagenews/CRUupdate.

[10] "Ensembles" are multiple runs with one climate model for given input information. Ensembles reflect the uncertainties and natural variabilities in climate and weather systems. Model projections frequently are presented as the mean of such ensemble runs, averaging out the multiple variabilities to show more likely results, but not representing the ranges of possible outcomes for a given input.

Appendix A. Biographic Information on the CRU Director and Deputy Director[11]

Professor Phil Jones

I am the Director of the Climatic Research Unit (CRU) and a Professor in the School of Environmental Sciences at the University of East Anglia in Norwich. I was born in Surrey in 1952 and completed a B.A. in Environmental Sciences at the University of Lancaster in 1973 and an M.Sc. (1974) and Ph.D. (1977) at the Department of Civil Engineering at the University of Newcastle-upon-Tyne. My Ph.D. was titled "A spatially distributed catchment model for flood forecasting and river regulation with particular reference to the River Tyne."

My research interests are in instrumental climate change, palæoclimatology, detection of climate change and the extension of riverflow records in the UK using long rainfall records. I am principally known for the time series of hemispheric and global surface temperatures, which I update on a monthly basis. I have numerous research papers over the last 20 years and these are available in the CRU Publications List.

I have coedited four books: "Climate Since A.D. 1500" (with Ray Bradley) published by Routledge in 1992 and in paperback in 1995; "Climatic Variations and Forcing Mechanisms of the Last 2000 Years" (with Ray Bradley and Jean Jouzel) published by Springer-Verlag in 1996; "History and Climate: Memories of the Future" (with Astrid Ogilvie, Trevor Davies and Keith Briffa) published by Kluwer in 2001 and "Improved Understanding of Past Climatic Variability from Early European Instrumental Sources (with Dario Camuffo) published by Kluwer in 2002.

I have been a fellow of the Royal Meteorological Society since 1992 and was on the Editorial Committee of the International Journal of Climatology until 1995. I am currently on the editorial board of Climatic Change. I am an elected member of Academia Europaea since 1998 and a member of the American Meteorological Society since 2001.

I was jointly awarded the Hugh Robert Mill Medal in 1995 by the Royal Meteorological Society for work on UK Rainfall Variability, and in 1997 the Outstanding Scientific Paper Award by the Environmental Research Laboratories / NOAA for being a coauthor on the paper "A search for Human Influences on the Thermal Structure of the Atmosphere," by Ben Santer et al. in Nature, 382, 39-46 (1996). More recently I was awarded the first Hans Oesschger Medal from the European Geophysical Society (now the European Geosciences Union) in 2002 and the International Journal of Climatology prize of the Royal Meteoological Society for papers published in the last five years, also in 2002.

Last updated: August 2004

Professor Keith Briffa

Keith Briffa is a Reader at the Climatic Research Unit, University of East Anglia, Norwich, U.K., where he as worked since 1977. He was born in 1952. His primary research interests are in late Holocene

[11] This biographic information is copied from the CRU website: http://www.cru.uea.ac.uk/cru/people/, extracted December 1, 2009.

climate change with a geographical emphasis on northern Eurasia. His specialism is dendroclimatology, a field in which he has produced a number of widely cited reconstructions of past climate variability (in western North America, northern North America, Western Europe, Fennoscandia and western Siberia). He is presently the coordinator of ADVANCE-10K a European Community funded project (involving 15 institutions in 9 countries) using various forms of tree-ring data (ring widths, ring densities and carbon and oxygen isotopes) to reconstruct high-resolution northern European climate change over the last 10,000 years. Beside this principal commitment, Briffa is currently engaged in collaborative tree-ring projects with colleagues in N. America, Russia, S. America (Chile and Argentina) and New Zealand.

Besides tree-ring research, Briffa's interests encompass evidence of recent climate change based on instrumental records, and the theory and general application of various palaeoclimate data for describing 'natural' climate variability, its relationships with possible forcing factors and the relevance for anthropogenic climate change detection. Briffa is an Associate Editor of the journals The Holocene (of which he was a founding member) and Dendrochronologia.

Last updated: March 2009