

Independent Review Team – UEA/CRU

Formal Record

Notes of an Interview with Prof. Phil Jones and Prof. Keith Briffa of the University of East Anglia (UEA) Climate Research Unit (CRU)

Interviewers Sir Muir Russell & Prof. Jim Norton

Interview carried out at UEA on 27th January 2010

Introduction

1. Sir Muir set the scene by reiterating the objectives of the Independent Review and detailing the members of the Review Team. He explained the purpose of the meeting as exploratory. He envisaged that there would be a subsequent formal process of seeking written evidence in response to questions from the Review Team, and a general opportunity for written evidence to be submitted on matters within the Review's terms of reference. He emphasised that it was not the Review's role to range across the whole of climate science. The Review would focus on the scientific rigour with which data had been collected, processed and presented in the context of the scientific norms relevant at the time. The Review would also address the extent and effectiveness of the "Peer Review" process. Both Prof. Jones and Prof Briffa would be given ample time to provide considered written responses to the questions posed.

Background (drawn from separate interviews with Central and CRU IT Staff)

2. Researchers within the CRU work individually or in small groups. There is no master index of resources, be these data, algorithms or software. No systematic approach to the creation of metadata exists. There is no central database of underlying climate data; rather individual researchers assemble "ensembles" of data drawn from different primary sources outside the CRU (for example the Met. Office Hadley Centre for Climate Change). This might arrive by network (Janet & Dante), or on portable hard disks. A typical "ensemble" might be 10GBytes of data. The data might be stored locally (cheaper), on the University Storage Area Network (SAN) or split between the two.

Secretary's note: Subsequent written responses by Prof Jones and Prof Briffa on March 1 and April 20 and interviews on April 9 supercede the summary points 3-6 below.

3. It was confirmed that a single common set of data, drawn from around 7000 weather stations around the globe, provides the base data for climate research both at CRU and other research centres. The CRU does not take responsibility for calibration or accuracy assessments of this base data. That was stated to be the responsibility of the primary providers such as the Met. Office and its equivalents. There were stated to be two other primary teams (beyond CRU) drawing on this data, using different algorithms, different selections of stations and different approaches to interpolation. Both CRU Professors were adamant that, apart from drawing on the same base data – though they made different selections from it - these teams were genuinely independent. All had reached

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similar conclusions regarding the overall ‘warming trend’ (graph provided scanned and attached). We indicated that Prof Peter Clarke from the Review Team would be likely to wish to explore these data aspects in more detail. It was noted that more base data was due to be released into the public domain by 29th January, following agreements reached with the various primary sources. [Note to Team colleagues we haven’t yet bottomed out the issue of whether data was being withheld **only** because of the rules imposed by Met offices etc, or whether there were **other** withholdings – as the e-mails have been claimed to imply. This will be for the questions being developed by Geoffrey to explore]. (15.6.10 Note – this line of question was in fact not pursued.)

Secretary’s note: Subsequent written responses have clarified the Review team’s understanding that there is in fact no common or a master set that the three groups draw from. The three groups have produced their own selections of raw data albeit from many of the same sources – the raw data source of 7000+ stations. The groups access sources such as the Global Historical Climatology Network (GHCN), World Weather Records (WWR) and data made available by National Meteorological Services (NMSs).

Rigour and Quality Assurance

4. It was noted that individual CRU researchers develop their own algorithms and their own software to encode those algorithms. No systematic approach could be evidenced to either peer review of algorithms or software either within or outside the CRU. Retrieval of data sets, meta-data and documentation from departing researchers appeared to be at best haphazard. When pressed on the quality issues Prof. Jones noted that “one developed a feel for the data and instinctively knew what was right”. There seemed to be little awareness that development and testing of software has different characteristics to that for physical systems. In physical systems, reasonable inferences can be made as to correct operation by testing at specific points and interpolating between them. That is not the case for software systems. A strong impression was given that pressure on resources led to a very low priority being given to data indexing and archiving plus software development and testing.

Secretary’s note: Subsequently it was understood by the Review team that the key algorithms (at least for global temperature calculation) were not large pieces of software, but were in fact less than 100 lines of code. This software was also shown to agree exactly with that independently developed by the Met Office Hadley Centre (using software in perl as opposed to Fortran used by CRU). The testing of the software was also partly assured by the similarity of the results from the two US groups (see the attached figure). Data archiving was addressed more extensively in the CRU submissions on March 1.

Peer Review

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5. Both Professors were questioned as to how effective Peer Review could be carried out on papers when there appeared to be no effective standards for the development and manipulation of the base data sets and no independent verification of processing integrity. There was a general recognition that work needed to be done to create a more effective structure for Peer Review.

Secretary's note: Subsequently, Profs. Briffa and Jones outlined that effective peer review of the papers published by CRU is carried out by the journals that publish the papers CRU personnel write. This is in common with all scientists working in climate science and all other fields. There are also internal informal review mechanisms within CRU, where staff read and critique each others' papers prior to submission.

General

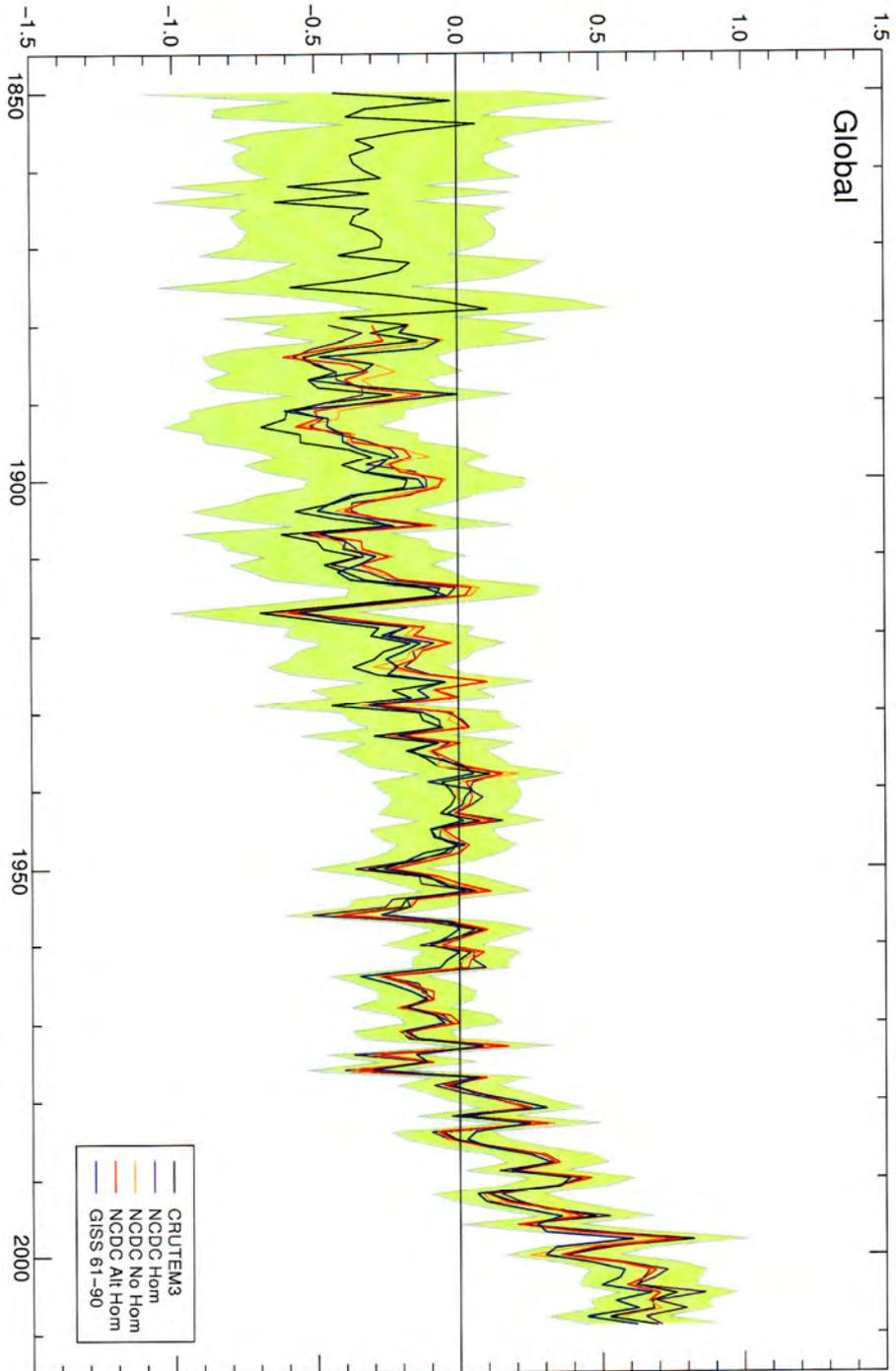
6. Both Professors stressed that the critics of their work followed a very wide agenda, going well beyond the issues raised in the e-mails, and expressed concern that the Review Team might seek to cover all that ground. They were at pains to emphasise that they felt that these critics were unfair in generally failing to acknowledge the caveats, margins of error etc that were explained in the work. It was clear that they had come to regard it as impossible to take the time to respond to each and every criticism. They mentioned that the Review might wish to hear from colleagues whose names cropped up in the e-mails: Ian Harris ("Harry read me"), also Tim Osborn.

Secretary's note: Subsequently, CRU did provide responses to some critics (e.g. over Yamal on the CRU web site). However they have outlined that in common with most working in climate science, they focus their response to comments that come via the peer-review literature and not to every criticism that appears on web sites.

Jim Norton & Muir Russell - 29th January 2009 updated 15th June 2009

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Black line is the global average from all CRUTEM3 (Land only) sites. The green range covers the 2.5 and 97.5% estimate of the errors – due to reduced coverage, homogeneity assessment and urbanization effects (see Brohan *et al.*, 2006). The other 4 curves are 3 different versions of one of the two US datasets and the 4th is the other US dataset.