

## Creating surface temperature datasets to meet 21<sup>st</sup> Century challenges

Met Office Hadley Centre, Exeter, UK

**Confirmed sponsors: World Meteorological Office (CLPA and OBS); World Climate Research Program; Global Climate Observing System; Royal Meteorological Society; Met Office; University of Exeter; National Oceanic and Atmospheric Administration National Climatic Data Center, US Global Climate Observing System Office**

**7<sup>th</sup>-9<sup>th</sup> September 2010**

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International scientific organizing committee	Local organizing committee
Peter Thorne (Chair, CICS-NC (formerly Met Office)) Peter Stott (Met Office) Simon Gilbert (Met Office) Albert Klein Tank (CCI / KNMI) Liz Kent (WCRP WOAP / NOCS) Blair Trewin (BoM) Lianchun Song (CCI / CMA) Ian Jolliffe (Univ. Of Exeter) John Christy (UAH) Nigel Fox (NPL) Jay Lawrimore (NOAA NCDC) Adrian Simmons (GCOS / ECMWF)	Kate Willett (Chair) Peter Stott Simon Gilbert Julia Slingo John Kennedy Jo Mclellan Chris Gordon Vicky Pope

### Workshop aims

- To agree a well defined plan of how as an international community to go about undertaking necessary data rescue, analysis and verification to produce global surface temperature records at monthly, daily and sub-daily resolution that are fit for climate services. The focus is limited to land surface temperature records so as to allow a well defined remit but with the understanding that the concept should be taken forwards for other meteorological parameters if successful. It is also recognised that close collaboration with the SST community is essential to create truly global high quality assessments of surface temperatures.
- To agree how to ascertain the strengths and weaknesses in the resulting estimates of historical changes and quantify the inevitable uncertainties that result from not having made historical observations primarily for climate monitoring and these measures not being fundamentally traceable to standards.
- To engender broad input into the process design from expert communities outside of the traditional climate change community and key stakeholders including likely end-users.
- To ensure that the envisaged outputs will be usable by a broad range of stakeholders and accessible to everyone.

The workshop will start out from the Met Office proposal to the Commission for Climatology (reproduced at [www.surface temperatures.org](http://www.surface temperatures.org)) to produce an agreed plan with broad community sign on. The final meeting report which will be led by the international organising committee will appear either in BAMS or EOS as a public accessible summary and in more complete detail as a WMO Technical Document.

For those sessions that have an associated breakout scheduled selected individuals / groups will be solicited by the international organising committee to provide white papers (preferably 2, maximum 3 sides of text plus any necessary figures) to facilitate discussions and provide a starting point. Participants will be able to modify these positions in both breakout groups and plenary. These white papers will be posted in advance of the meeting and comments on these will be solicited through a moderated blog. *The white papers will provide the main input for the final meeting report.*

#### *Primer and nomenclature*

The final workplan will be developed and agreed by the meeting participants but here we outline some of the essential ingredients of that workplan. A single **primary databank** will be created to hold observations as originally recorded. The **databank** would contain observations at all available temporal resolutions: monthly, daily and sub-daily. The **databank** will have free and open access, contain all available metadata describing the observations and will have strong version control in place. The identification of **fundamental station records** or other primary observation sources is in some cases not a trivial task and research, data archaeology, digitisation, rescue, all with an agreed audit trail will be necessary.

This **databank** will be used to produce **derived datasets** by a broad range of traditional and non-traditional participants to meet particular requirements, but all derived **datasets** should be traceable to the **primary databank**. Such **datasets** might be for regional applications, incorporate data adjustments or homogenisation or be presented on regular grids. The derived **datasets** must be documented to agreed standards and therefore essentially reproduceable whilst recognising that exact reproducibility may not be possible for some approaches. Mechanisms should be in place to allow researchers to make the results of enhanced analysis such as improved quality assurance, data adjustments and homogenisation available to the wider community, perhaps as an adjunct to the **primary databank**.

Methods to ensure the accuracy of **derived datasets**, including the effectiveness of data homogenisation and the construction of gridded products, should be in place. For example, **dataset** development methodologies can be benchmarked for performance against a common set of realistic test-cases where synthetically produced data can provide a true solution against which results can be assessed.

Another important aspect is to ensure openness, transparency and outreach. To be successful the process must engage widely beyond the community of research scientists, including with funding bodies, the general public, policy makers and international organisations. Developing nations must be a priority for engagement, ensuring both that datasets are as globally complete as possible and that all nations contributing **station records** can benefit from the entire climate record. Finally, how this effort is to be governed and how it interacts with pre-existing efforts and related issues needs to be defined.

*Timing will be strictly adhered to – there will be a time keeper who will police talks.*

## **Tuesday 7<sup>th</sup> September**

**Chair: Prof. Adrian Simmons, European Centre for Medium-range Weather Forecasts, Chair Global Climate Observing System Steering Committee**

Registration 08.30-09.00

### **1. Welcome 09.00-10.00**

09.00-09.10 local logistics – Kate Willett, Chair, Local Organising Committee

09.10-09.35 Introductory remarks – Prof. Julia Slingo OBE, President Royal Meteorological Society, Met Office Chief Scientist

09.35-09.40 Opening remarks from Tom Peterson, President Commission for Climatology

09.40-09.45 Opening remarks from Ghassem Asrar, WMO Director of Research responsible for World Climate Research Program

09.45-09.50 Opening remarks from Adrian Simmons, Chair Global Climate Observing System Steering Committee

09.50-10.00 Overview of Workshop Objectives – Peter Thorne, Chair, International Organising Committee

### **2. Overview talks on data recovery, digitisation, management and data policy**

*Overview talks (this session and other overview sessions- 7 and 12) are to be a maximum of 25 minutes with 5 minutes for questions. The idea is that these talks are scene setters so it is imperative that they are focussed. Speakers are specifically requested to:*

- 1. focus upon the lessons learned that may be applicable to the task in hand*
- 2. avoid generalist overviews of their project*
- 3. reflect upon what worked, what didn't and what they would do differently if they were to start out again.*

*Please provide talks at least a week in advance of the workshop so that they can be reviewed by the IOC.*

- **ICOADS: A multinational data rescue, digitisation, archiving, and access success for the oceans**– Steve Worley, Scott woodruff, Eric Freeman

10:30-11.00 Coffee break

- **NCDC: A World Data Centre perspective on the data management issue** – Jay Lawrimore

- **Regional perspectives and potential contributions** - Albert Klein Tank

12.00-12.40 White paper presentations on data rescue efforts, updates and policy

### **3. Retrieval of historical data**

*White paper lead: Peter Thorne*

### **4. Near real-time updates**

*White paper lead: Jay Lawrimore*

**5. Data policy**

*White paper lead: Albert Klein Tank*

**6. Data provenance, version control, configuration management**

*White paper lead: John Christy*

12.40-13.40 Lunch

13.40-16.00 Breakout groups on data rescue, updates and policy

*Organisers will assign individuals to breakout groups prior to meeting commencement based upon participant expertise (TBD).*

16.00-16.30 Coffee break

16.30-18.00 Plenary discussion on output of breakout groups

**18.30-20.30 Icebreaker Exeter University**

**Wednesday 8<sup>th</sup> September**

**Chair: Prof. John Mitchell OBE FRS, Met Office Principal Fellow**

08.30-10.30

**7. Background talks on homogenisation and analysis**

- Lessons learnt from US Historical Climate Network and Global Historical Climate Network most recent homogenisation cycle – Matt Menne
- The COST HOME project – homogenisation across timescales and with input from multiple groups – Olivier Mestre
- Hadley Centre radiosonde project: what can be learnt from automation and systematic validation against plausible test-beds? – Peter Thorne
- SST homogenisation and analysis – what lessons can be learnt for land homogenisation and analysis? – John Kennedy

10.30-11.00 Coffee

11.00-11.40 White paper presentations on dataset creation and performance benchmarking

**8. Creation of quality controlled homogenised datasets from the databank**

*White paper lead: Blair Trewin*

**9. Benchmarking homogenisation algorithm performance against test cases**

*White paper lead: Kate Willett*

**10. Dataset algorithm performance assessment based upon all efforts**

*White paper lead: Peter Stott*

**11. Spatial and temporal interpolation**

*White paper lead: Liz Kent*

11.40-15.30

Breakout groups on dataset creation and assessment

**[Lunch 13.00-14.00]**

15.30-16.00 Coffee

16.00-18.00 Plenary

**19.30 Conference banquet Thistle Hotel**

**Thursday 9<sup>th</sup> September**

**Chair: Dr. Thomas Peterson, President Commission for Climatology, NOAA  
National Climatic Data Center Chief Scientist**

08.30-09.30

**12. Data management, outreach, education overview talks**

- Dataset History: The Microwave Sounding Unit Experience– John Christy
- Outreach, visualisation, user engagement, and education: lessons from google.org – Amy Luers

09.30-10.10 White papers on communication, outreach and governance

**13. Publication, collation of results, presentation of audit trails**

*White paper presenter: Kate Willett*

**14. Solicitation of input from the community at large including non-climate fields and discussion of web presence.**

*White paper presenter: Blair Trewin*

**15. Governance**

*White paper lead: Simon Gilbert*

**16. Interactions with other activities**

*White paper lead: Peter Thorne*

**10.10-13.00** Breakout groups on publication, outreach, education and project governance

**10.45-11.15** Coffee

**13.00-14.00** Lunch

**14.00-15.15** Plenary discussion of issues regarding management, outreach, education and project governance

15.15-15.45 Coffee

15.45-17.30

**16. Wrap up and agreement of broad brush challenge ToR**