Progress Report for the International Surface Temperature Initiative

GCOS SC, September, 2011

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The Big Question

• Can we facilitate creation of independent verified estimates of land surface temperatures to answer scientific questions and societal demands of the 21st Century?
  – Open and transparent
  – Better understanding of fundamental instrument performance and measurement properties
  – Consistent performance evaluation
  – Daily, sub-daily, regional and local
  – User tools

IPCC AR4 (2007), Fig. 3.1 Annual anomalies of global land-surface air temperature (°C), 1850 to 2005, relative to the 1961 to 1990 mean for CRUTEM3 updated from Brohan et al. (2006). The smooth curves show decadal variations … The black curve from CRUTEM3 is compared with those from NCDC (Smith and Reynolds, 2005; blue), GISS (Hansen et al., 2001; red) and Lugina et al. (2005; green). See http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch3s3-2-2.html.
In the beginning...

• 2010 UK Met Office submission to WMO CCI
  - Call for creation of a new suite of products to meet 21\textsuperscript{st} Century demands / expectations
• September 2010 kick-off workshop, UK Met Office, Exeter
  - 80 international experts (climate scientists, metrologists, statisticians, software engineers)
  - White papers posted online and public comments solicited
  - Agreed project outline and governance structure
  - Agreed outcomes: BAMS. doi: 10.1175/2011BAMS3124.1
  - Steering Committee
  - Databank Working Group
  - Benchmarking and Assessment Working Group
Progress Summary

• Steering Committee (www.surfacetemperatures.org/steering-committee)
  – Terms of Reference
  – Endorsed by World Meteorological Organization (WMO) and The International Environmetrics Society (TIES) - International Bureau of Weights and Measures (BIPM) pending

• Working groups on databank and benchmarking (www.surfacetemperatures.org/databank) (www.surfacetemperatures.org/benchmarking-and-assessment-working-group)
  -- Databank prototype made public and data sources coming in

• Implementation Plan published

• Progress documented on Initiative website at www.surfacetemperatures.org
Data Acquisition and Provision

- Working Group instigated
  - Data rescue task team
  - Provenance and version control task team
- Pilot databank hosted: http://www.gosic.org/GLOBAL_SURFACE_DATA_BANK/GBD.html
- First version release and accompanying documentation / paper submitted spring 2012
Partnerships are Essential

- Bring together existing efforts, augment and ensure pull through. e.g. ACRE project (http://www.met-acre.org/), IEDRO (www.iedro.org) and other national / international programs.
- Pursue innovative approaches (crowdsourcing building upon success of oldweather.org, www.data-rescue-at-home.org etc.)
- Build on ICOADS model for sea surface temperatures (http://icoads.noaa.gov/) – easy submission and access to data
- Recognize key partners and contributions
- Engage ...

www.surfacetemperatures.org/databank

Data.submission@surfacetemperatures.org

http://www.surfacetemperatures.org/databank/
dataSubmission-Stage1-Guidance.pdf?attredirects=0
Benchmarking and Assessment

• With real world data we do not have the luxury of knowing the truth – we CANNOT measure closeness to real world truth of any one data-product.

• We CAN focus on performance of underlying algorithms

• Consistent synthetic test cases, simulating real world noise, variability and spatial correlations potentially enable us to do this

**Inhomogeneities:**
annual mean min temp at Reno, Nevada, USA

(Matt Menne, NOAA National Climatic Data Center)
Benchmarking Cycle

Example use of benchmark data for USHCN
Serving Products and Aiding Users

- Data formats – netCDF, ASCII?
- Degree of user interaction – data-subsets?
- Ability to create graphical and tabular output on the fly - tools
- Limited progress to date
  - Largely a reflection that this data provision is some way down the road?
  - Ideas and suggestions welcome …
Recommendations to GCOS: The ISTI Databank

1) Review the prototype databank archive and provide feedback on adequacy for GCOS purposes:
http://www.gosic.org/GLOBAL_SURFACE_DATABANK/GBD.html

2) Recognise the ISTI databank as a GCOS data archive for land surface temperatures and other data
- links between data sources and databank curators

Benefits to ISTI:
Data acquisition - rescue and new sharing agreements
Communication and publication of the work of ISTI
Support from NMHSs, the research community and national Governments

Benefits to GCOS:
A comprehensive repository for open, traceable land surface data
3) Feedback on any aspects (esp. Implementation Plan and timelines) of ISTI to the ISTI Steering Committee
   - guidance on GCOS standards and principles that ISTI should subscribe to
4) Consider appropriate ongoing reporting mechanisms to GCOS, if desired, recognising that the Initiative is a voluntary effort

**Benefits to ISTI:**
Strong alignment with user’s needs
Transparency of ISTI through reporting to international bodies

**Benefits to GCOS:**
Provision of a globally useful tool to facilitate sign-up to key climate observation principles
Recommendations to GCOS:
Possible Global Surface Reference Network

5) Viability of a Global Surface Reference Network: The Exeter workshop included a recommendation to GCOS to consider instigation of a global surface reference network, modelled upon USCRN and GRUAN.

- Assure the future record at a representative sample (~200) of sites through traceable and redundant measurements tied to metrological standards at well characterised sites free of artificial contaminant effects.

Benefits to ISTI and GCOS:
A set of known standards for data verification going forward
Questions and Answers

www.surfacetemperatures.org

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