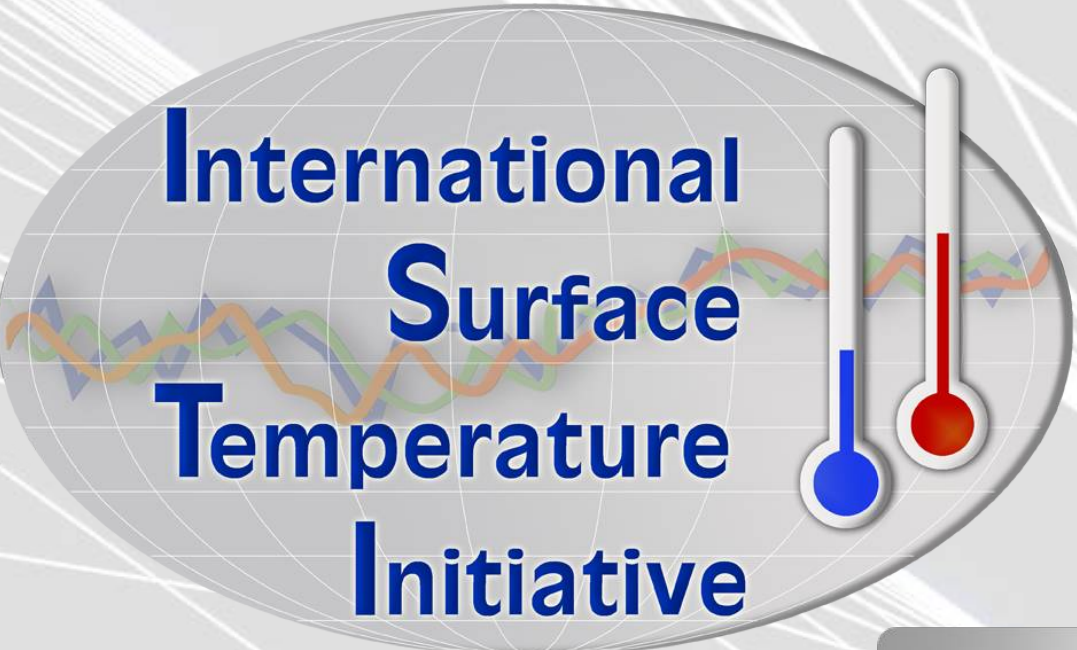


# Progress Report for the International Surface Temperature Initiative



International  
Surface  
Temperature  
Initiative

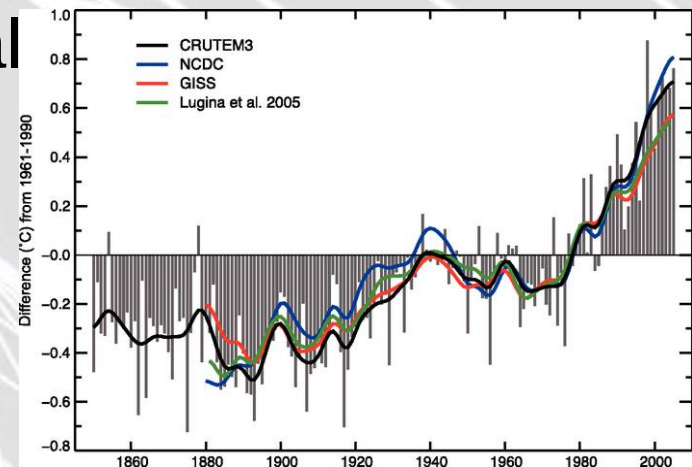
**GCOS SC, September, 2011**

**Dr Kate Willett, Met Office Hadley  
Centre, UK**

# The Big Question

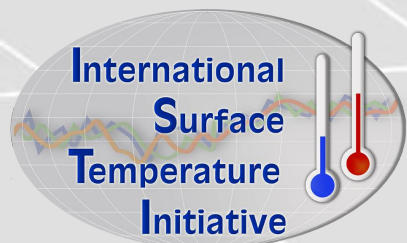
- Can we facilitate creation of independent verified estimates of land surface temperatures to answer scientific questions and societal demands of the 21<sup>st</sup> Century?
  - Open and transparent
  - Better understanding of fundamental instrument performance and measurement properties
  - Consistent 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](http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch3s3-2-2.html).



# In the beginning...

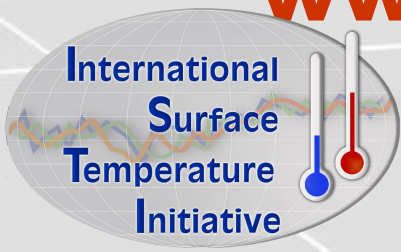
- 2010 UK Met Office submission to WMO CCI
  - Call for creation of a new suite of products to meet 21<sup>st</sup> Century demands / expectations
- September 2010 kick-off workshop, UK Met Office, Exeter
  - 80 international experts (climate scientists, metrologists, statisticians, software engineers)
  - 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

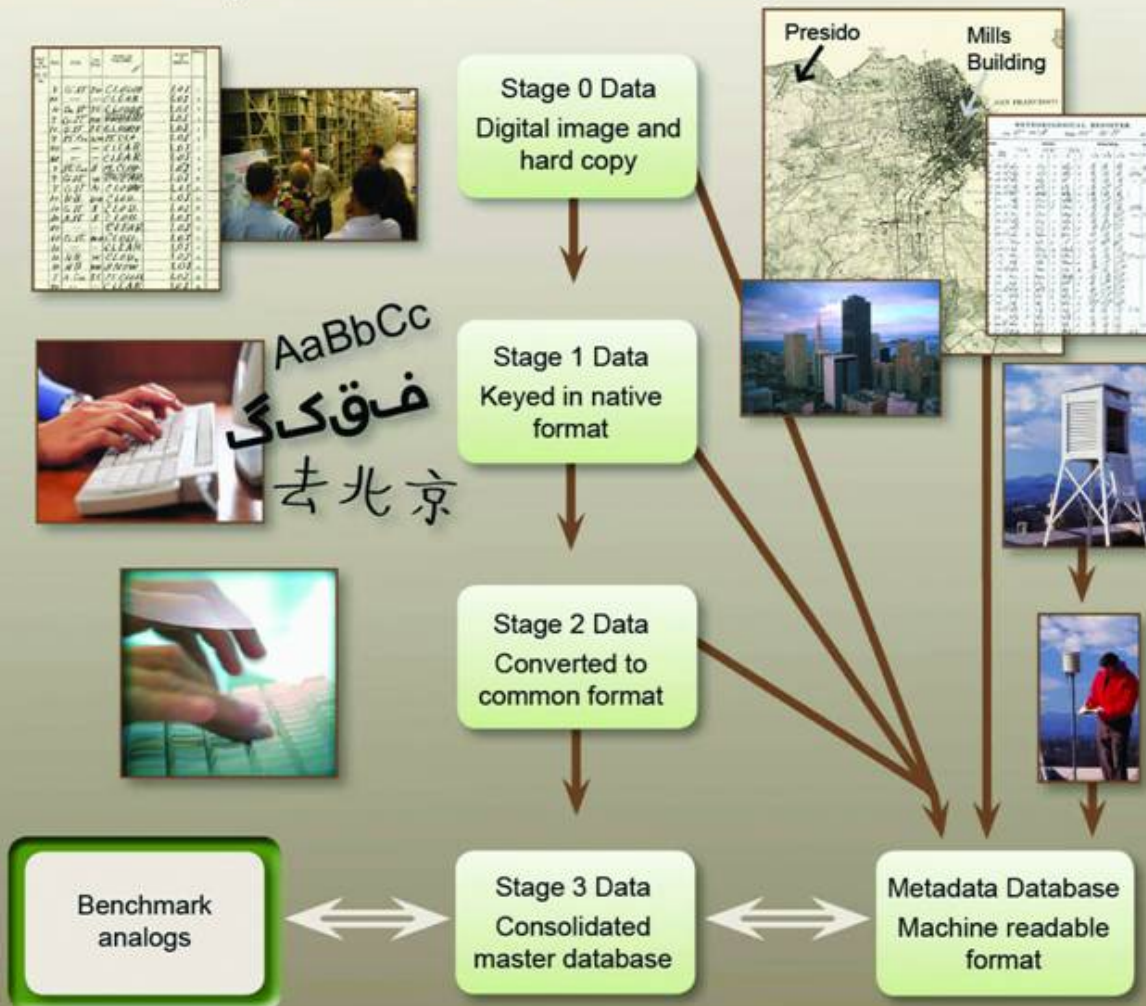
- Steering Committee ([www.surface temperatures.org/steering-committee](http://www.surface temperatures.org/steering-committee))
  - Terms of Reference
  - Endorsed by World Meteorological Organization (WMO) and The International Environmetrics Society (TIES) - International Bureau of Weights and Measures (BIPM) pending
- Working groups on databank and benchmarking  
([www.surface temperatures.org/databank](http://www.surface temperatures.org/databank))  
([www.surface temperatures.org/benchmarking-and-assessment-working-group](http://www.surface temperatures.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.surface temperatures.org](http://www.surface temperatures.org)



# Data Acquisition and Provision

## Proposed International Land Meteorological Databank



- 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](http://www.gosic.org/GLOBAL_SURFACE_DATA_BANK/GBD.html)
- First version release and accompanying documentation / paper submitted spring 2012

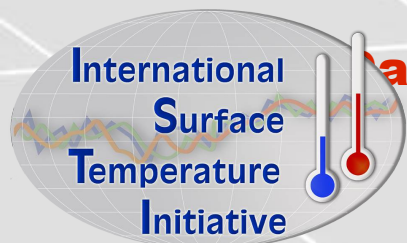
# Partnerships are Essential

- Bring together existing efforts, augment and ensure pull through. e.g. ACRE project (<http://www.met-acre.org/>), IEDRO ([www.iedro.org](http://www.iedro.org)) and other national / international programs.
- Pursue innovative approaches (crowdsourcing building upon success of oldweather.org, [www.data-rescue-at-home.org](http://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.surface temperatures.org/databank](http://www.surface temperatures.org/databank)**

**[Data.submission@surface temperatures.org](mailto:Data.submission@surface temperatures.org)**

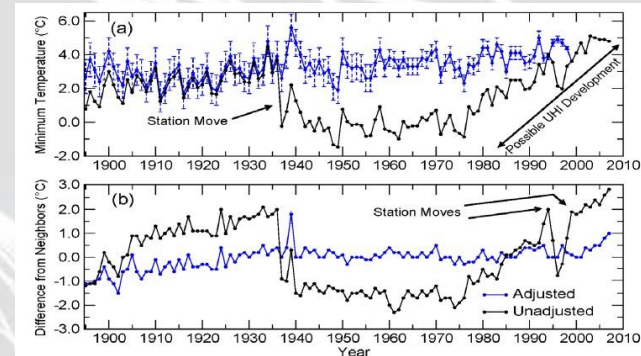
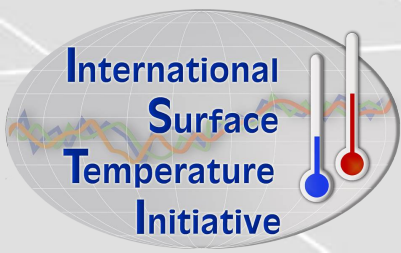
**[http://www.surface temperatures.org/databank/  
DataSubmission-Stage1-Guidance.pdf?attredirects=0](http://www.surface temperatures.org/databank/DataSubmission-Stage1-Guidance.pdf?attredirects=0)**



# Benchmarking and Assessment

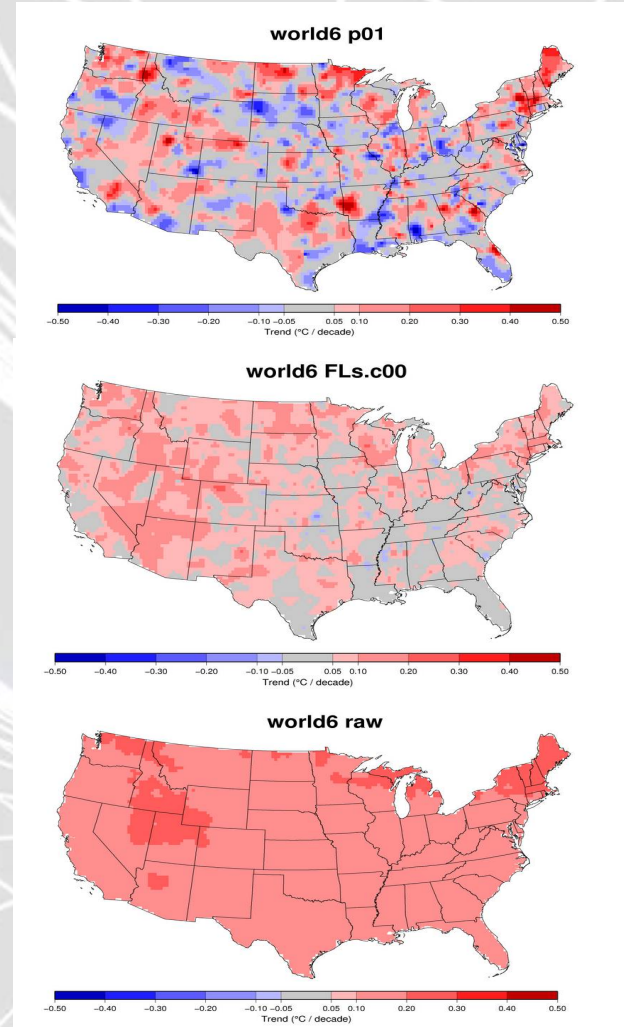
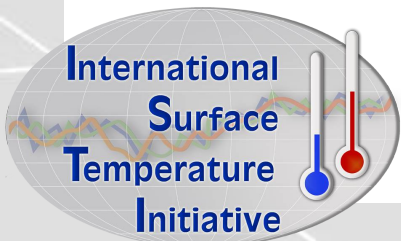
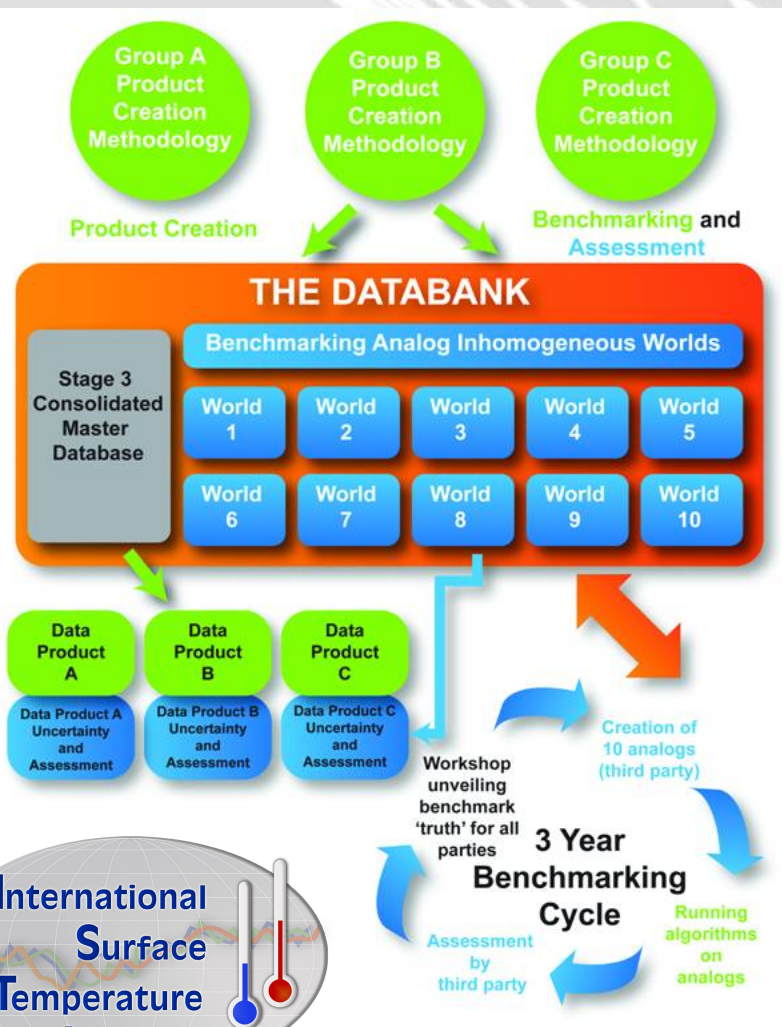
- With real world data we do not have the luxury of knowing the truth – we CANNOT measure closeness to real world truth of any one data-product.
- We CAN focus on performance of underlying algorithms
- Consistent synthetic test cases, simulating real world noise, variability and spatial correlations potentially enable us to do this

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



(Matt Menne, NOAA National Climatic Data Center)

# Benchmarking Cycle

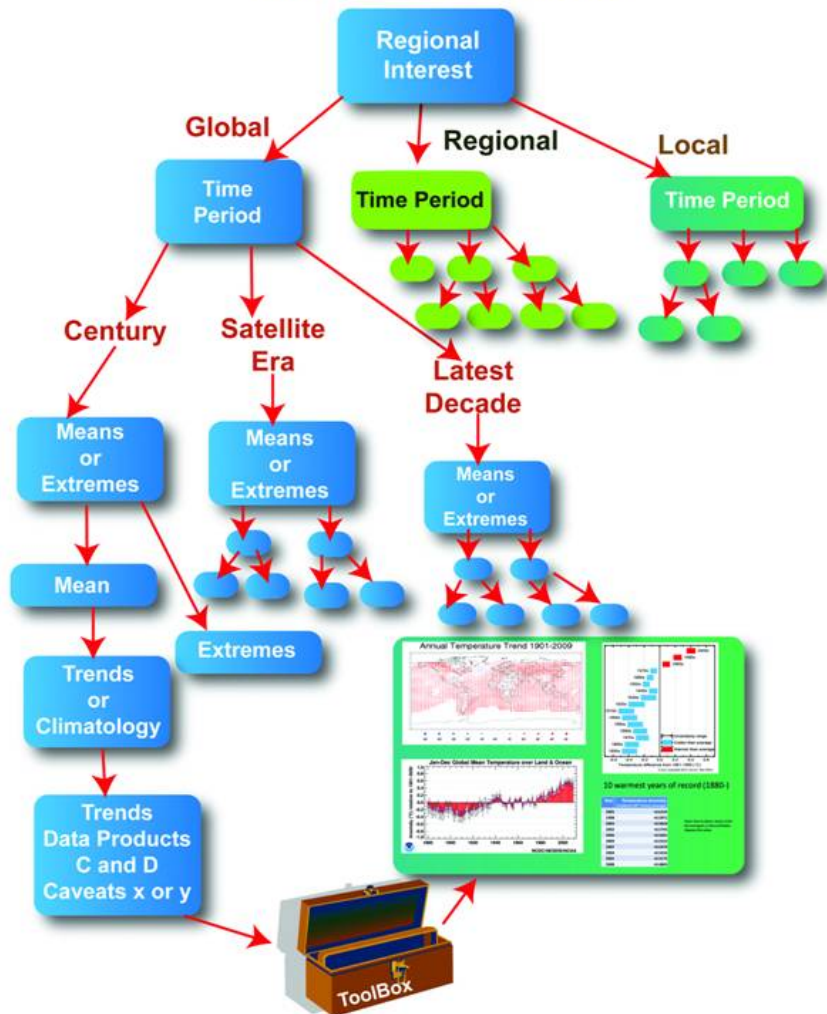


Example use of benchmark data for USHCN



# Serving Products and Aiding Users

Hypothetical Decision Tree



- 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](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

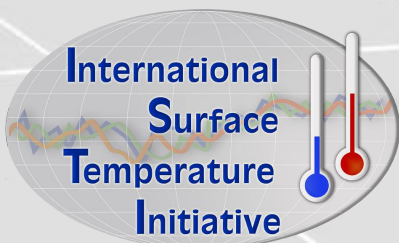
## **Benefits to ISTI:**

**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**



# Recommendations to GCOS: The Initiative

- 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

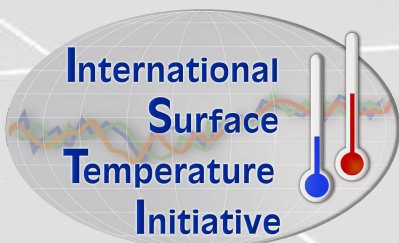
## **Benefits to ISTI:**

**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**

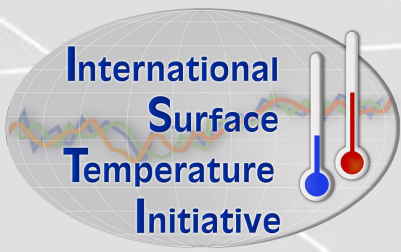


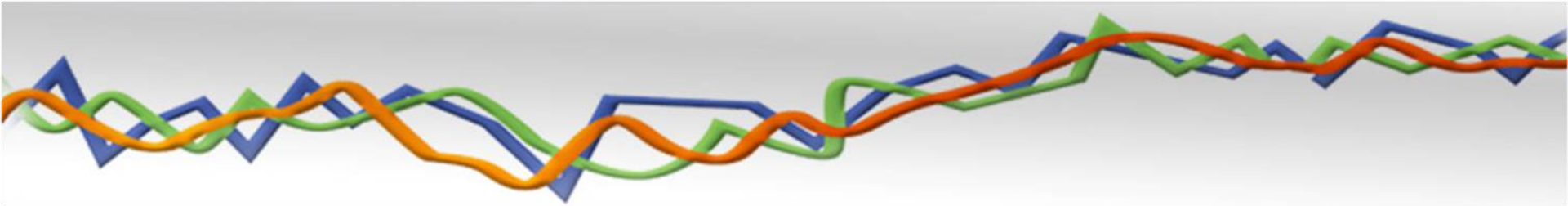
# Recommendations to GCOS: Possible Global Surface Reference Network

- 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.surface temperatures.org](http://www.surface temperatures.org)**

**[General.enquiries@surface temperatures.org](mailto:General.enquiries@surface temperatures.org)**

**[Data.submission@surface temperatures.org](mailto:Data.submission@surface temperatures.org)**