

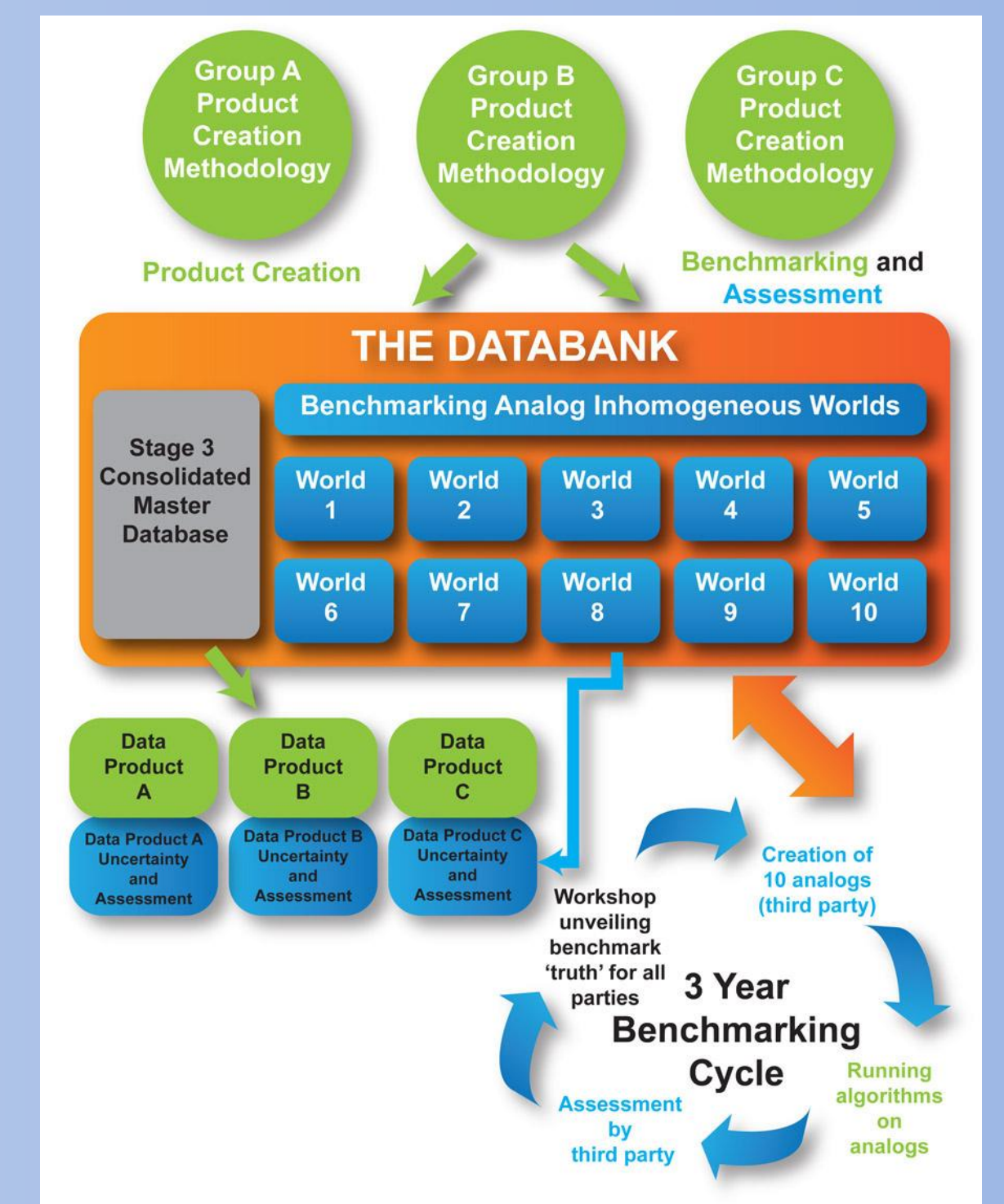
The International Surface Temperature Initiative

Peter Thorne, Kate Willett and the ISTI Steering Committee

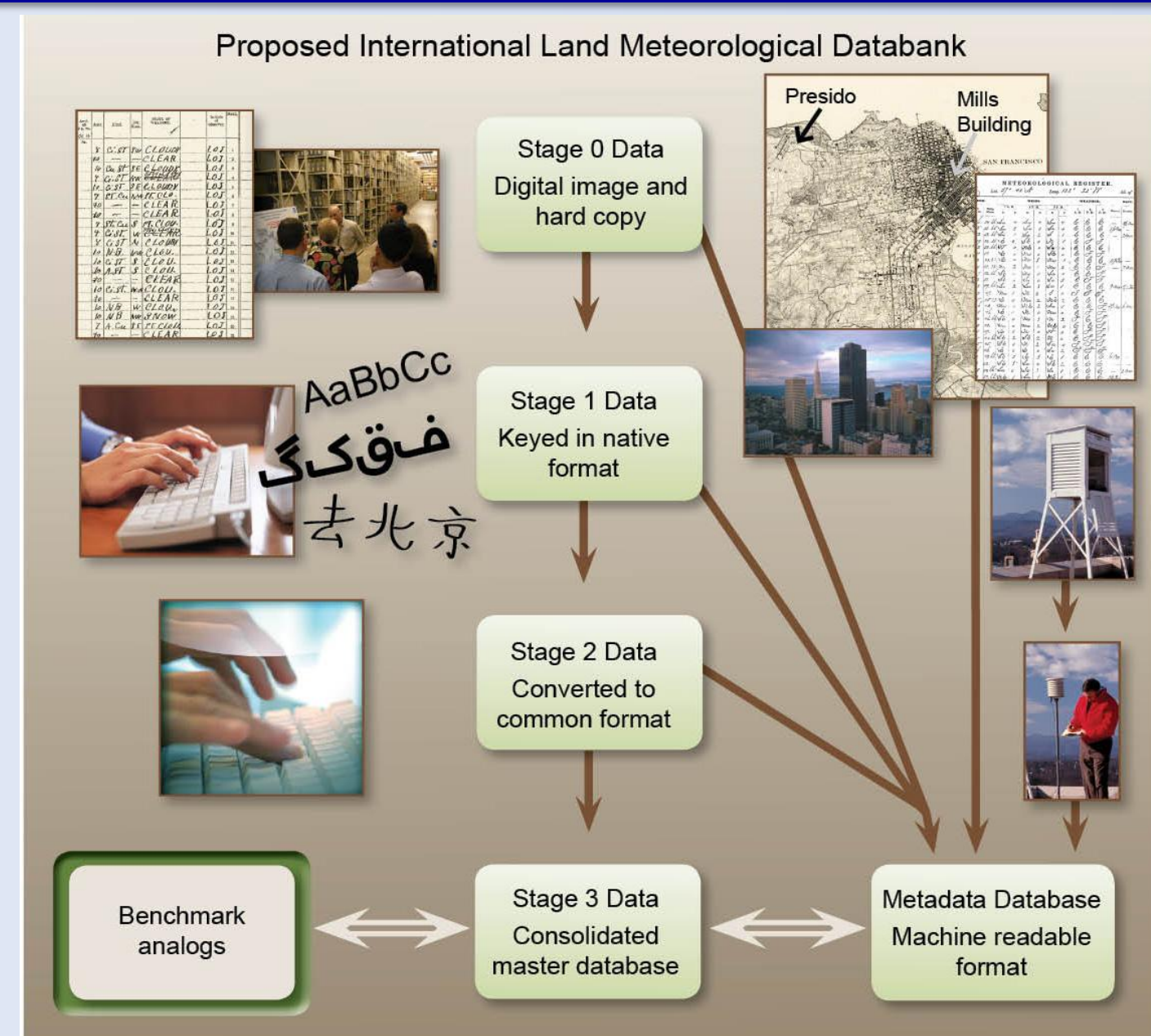
OVERVIEW
The International Surface Temperature Initiative was instigated in 2010. It provides an end-to-end process for accessibility of all land surface temperature data to the creation of a suite of open, transparent and verified surface temperature products to meet 21st Century requirements. The major identified work areas are a comprehensive land meteorological databank, benchmarking of homogenisation algorithms and provision of a data portal with user tools.

2. Creating multiple independent datasets

- Raw data undoubtedly contain artifacts from instrumental and system changes, and random error
- There is no definitive right way to go about adjusting for such effects, or averaging, or gridding, or interpolating etc.
- Only through undertaking multiple methodologically distinct and independent efforts can we gain a realistic estimate of these uncertainties
- Duplication of effort is scientifically valuable – cannot leave to just one group no matter how expert they are.



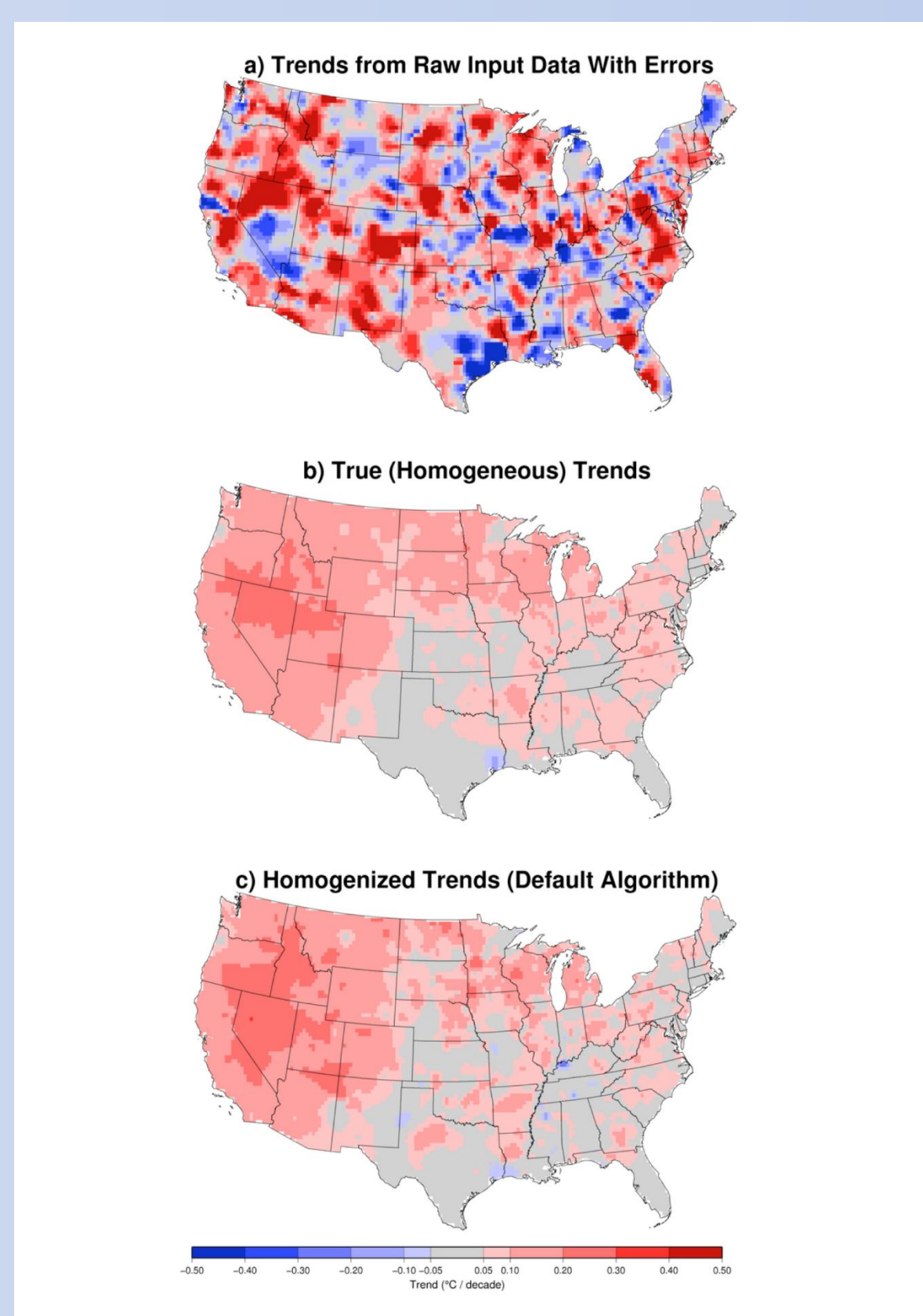
Benchmarking cycle schematic diagram



1. International land surface databank

The version 1 databank was released in June 2014 providing just over 32000 stations, a significant improvements in station availability (Rennie et al., 2014)

- Provenance is key – all source information and the full processing chain is available.
 - Stage 0 – hardcopy or image
 - Stage 1 – keyed in native format
 - Stage 2 – converted to common format
 - Stage 3 – merged to unique stations only
- Version control will be maintained allowing users to retrieve any prior version.
- Metadata is incorporated as far as possible
- Dedicated Databank, Data rescue and parallel station data working groups/task teams
- Version 1 of the databank is available at <ftp://ftp.ncdc.noaa.gov/pub/data/globaldatabank/>
- Data rescue requires strong partnering with existing efforts e.g., ACRE, IEDRO, MEDARE etc.



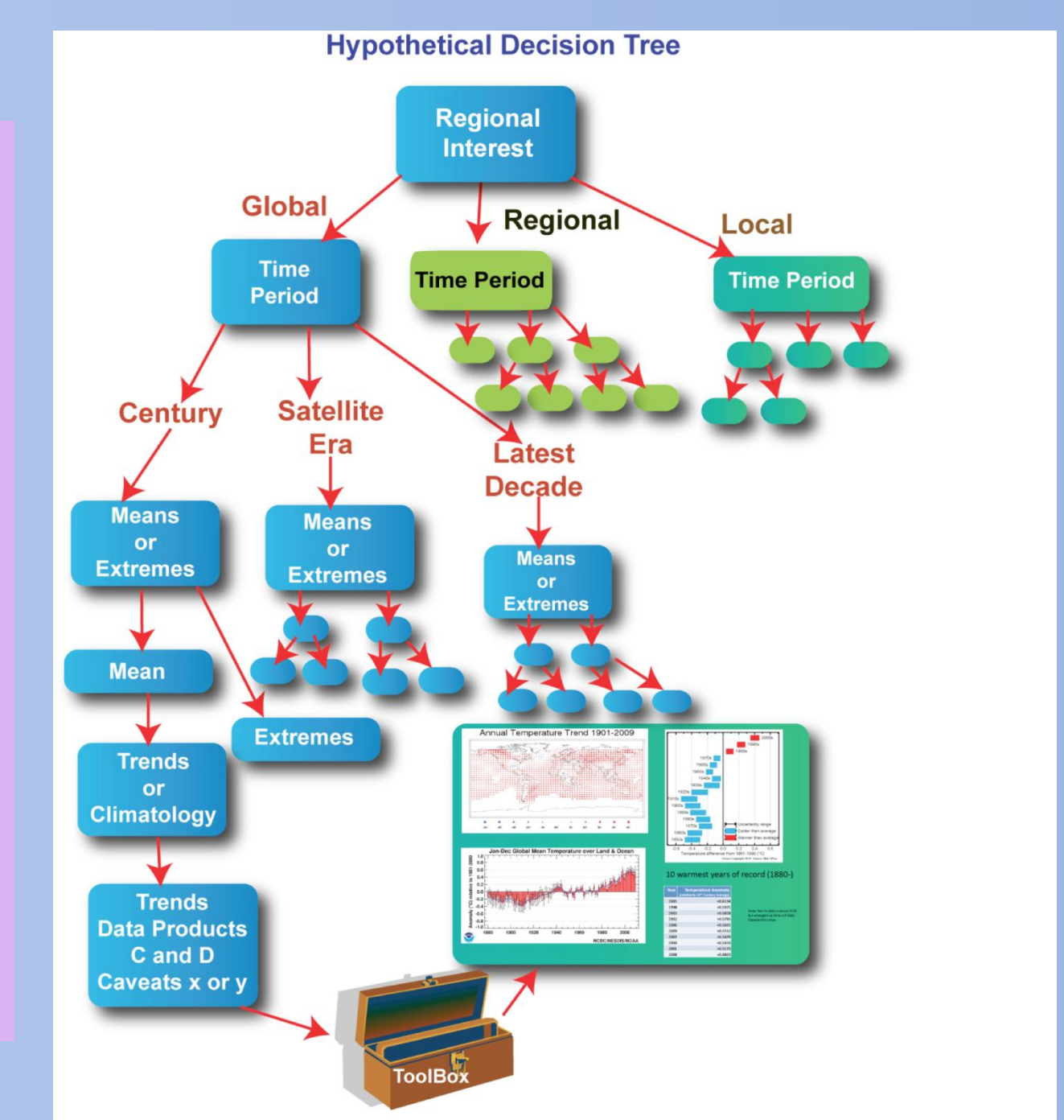
Example of results from a pre-existing benchmarking exercise for the USA (Williams et al., 2012)

3. Benchmarking homogenisation performance

- With real world data we do not have the luxury of knowing the truth – we cannot measure performance of a specific method or closeness to real world truth of any one data-product.
- Consistent synthetic test cases, simulating real world noise, variability and spatial correlations potentially enable us to do this
- Combine geo-spatial statistical tools, climate model data and real station climate characteristics to create clean synthetic station data (analog-clean-worlds)
- Add in a range of systematic errors to approximate the real world error structures which may exist (analog-error-worlds)
- Test blind and assess skill at detecting change-points and returning the synthetic error-worlds to their clean-world state
- A 3-year benchmarking cycle will allow up to date benchmarks, time to test the latest algorithms, assessment and review.
- This builds on previous work of Venema et al. (2012) and Williams et al. (2012) and is described in Willett et al. (2014)

4. Serving data products to end-users

- There are many and varied demands on the data for very many end users
- Need to provide easy use and user support based upon scientific findings
- Once precursor steps are sufficiently advanced we will start to serve products, tools and advice based upon Initiative outputs through a one-stop site

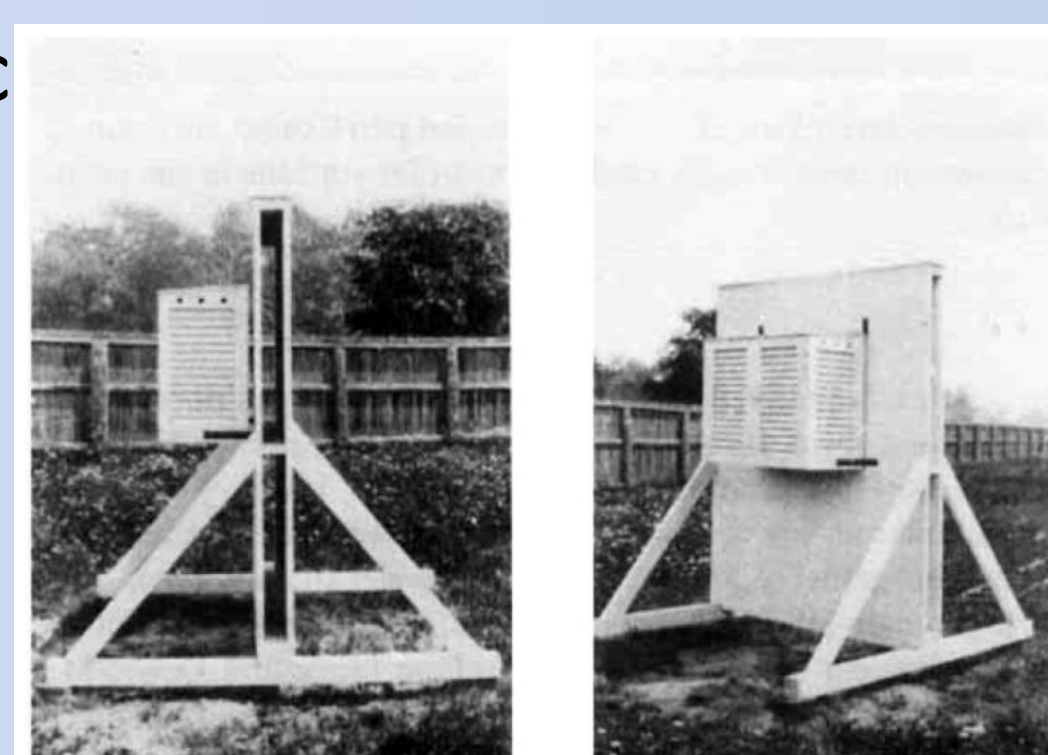


Schematic of envisaged user support and data and product provision tools

Parallel Observations Science Team (POST)

The POST is tasked with producing an open database of parallel observations for studying the characteristic inhomogeneity.

Tasks involve discovery and collation of such datasets which are often outside of existing national collections, and analysis of the effects of changes to the observing system including shelter changes, station moves, in changes etc.,



Examples of different instrument shelters.

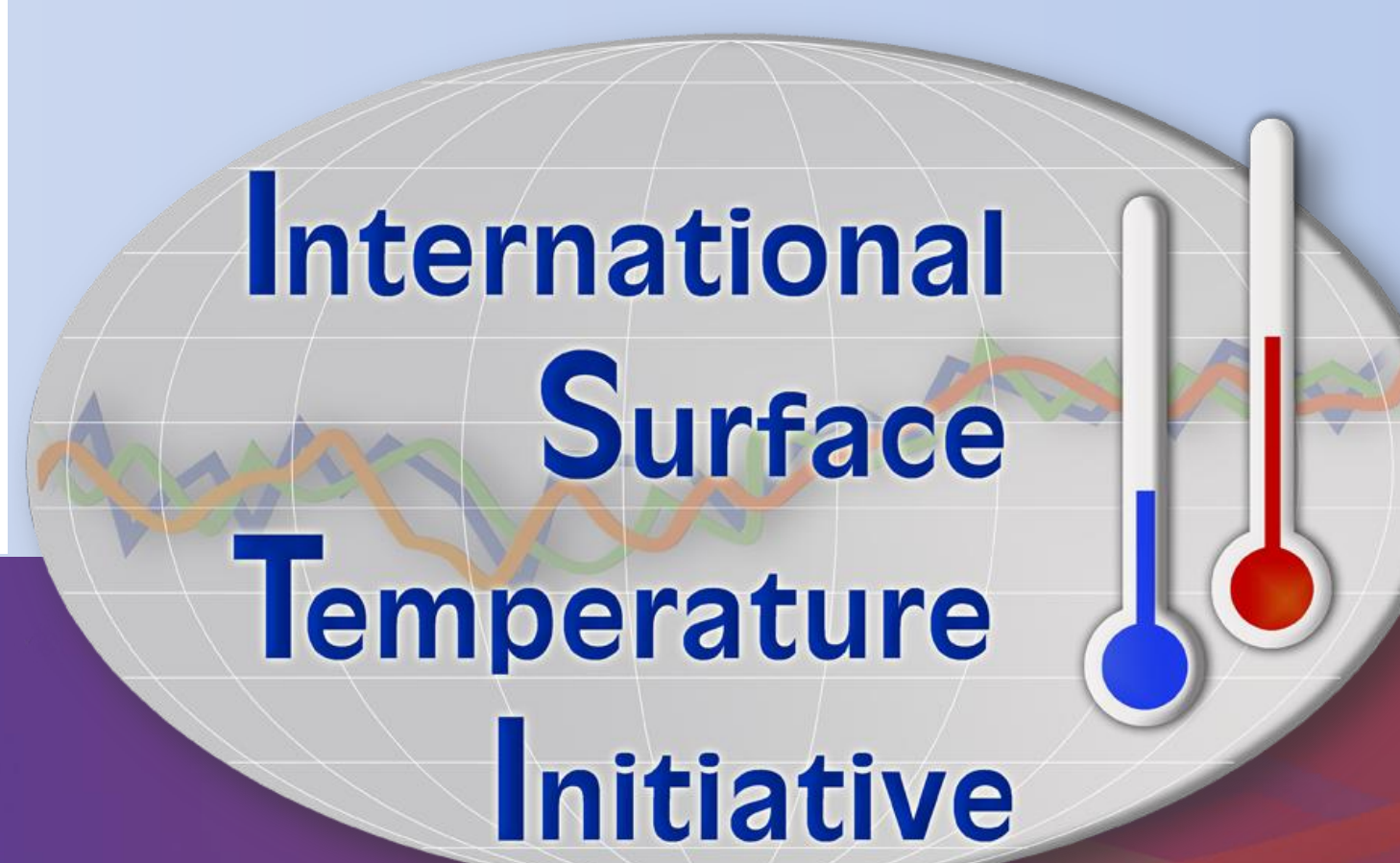


For more information:

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5. The Initiative and you

The International Surface Temperature Initiative will only work effectively if there is buy in from the science community. Not just climate scientists but in keeping with the instigation meeting also statisticians, metrologists, software engineers, and citizen scientists etc.. You can help in any of data rescue, databank management, creating new data products, benchmarking the efforts, or data product provision.



References

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