

# International Surface Temperature Initiative

## Parallel Observations Science Team (POST)

### Terms of Reference

Version: Jan 2015

#### *1. Background*

- 1.1. The International Surface Temperature Initiative, endorsed by the WMO Commission for Climatology at its 15<sup>th</sup> session, was launched at a meeting at the UK Met Office, Exeter in September 2010. To meet the requirements placed on climate science in the 21<sup>st</sup> Century, it is necessary to create a suite of high quality and high resolution data-products, with openness, transparency, verification, and user tools. Such a range of estimates, and common framework, would aid decision making at national and international scales and inform adaptation strategies. Crucially, this Initiative is envisaged to be international and interdisciplinary - involving climate scientists, statisticians, metrologists and software engineers from around the world.
- 1.2. The Initiative should encompass: data rescue and digitisation; an open, transparent and comprehensive databank with versioning and provenance tracking; a data-portal for multiple products estimating local, regional and global scale changes; a common benchmarking and assessment process; and platforms for data download, intercomparison and visualization.
- 1.3. The most direct way to study the influence of non-climatic changes on the measured distribution and to understand the reasons for these biases is the analysis of parallel (co-located) measurements representing the old and new situation (in terms of e.g. instruments, location) over a period of time preferably exceeding 2 years.
- 1.4. Inhomogeneities are especially important for studies on changes in extremes and weather variability using daily data. Our abilities to statistically homogenise daily data are very limited, while at least for temperature the non-climatic changes in the tails of the distribution are expected oftentimes to be stronger than the changes in the mean state.
- 1.5. Current studies of non-climatic changes using parallel data are limited to local and regional case studies. However, the effect of specific transitions depends on the local climate and the most interesting questions are about the systematic large-scale biases produced by transitions that occurred in many regions. Thus a large global parallel dataset is highly desirable as it allows for the study of systematic biases in the global record.

- 1.6. The information from parallel measurements is also necessary to produce realistic validation datasets for homogenization methods by the benchmarking working group of the ISTI and thus to be able to estimate the contribution of non-climatic changes to the uncertainty budget. Furthermore, a large dataset is needed to use parallel data to validate homogenization adjustments directly. The WMO has called on all members to assist in gathering parallel datasets for an international dataset. The Task Team on Homogenization (TT-HOM) of the WMO Commission for Climate (CCI) supports the building of a database with parallel measurements. The Science Team shall report to the Databank Working Group.

## 2. *POST purpose*

- 2.1 The POST exists to promote research using parallel measurements in general and specifically to facilitate and stimulate the analysis of parallel data to study non-climatic changes in the instrumental climate record. All Essential Climate Variables are of interest at all relevant temporal scales. Emphasis will be on daily temperature observations.
- 2.2 The POST is responsible for the design of the database and its data processing. Following the philosophy of the main ISTI database, the software will be written in an open language and published with an open license. Because of being widely used to study moderate extremes we will compute the indices of the Science Team on Climate Change Detection and Indices or if this is not possible similar indices. In case the (sub-)daily data cannot be shared, we would hope to be able to obtain and publish these indices from parallel measurements.
- 2.3 The POST will coordinate and stimulate the collection of parallel measurements. In accordance with the ISTI main database, parallel data should be submitted in their native format (to avoid undetectable conversion errors we will convert it to a standard format ourselves). The POST is interested in data from all climate variables at all time scales; from annual to sub-daily. High-resolution data is important for understanding the physical causes for the differences between the parallel measurements. This is an important application. Also for a better understanding of the differences we are interested in other climate variables measured at the same station. For example, in case of parallel temperature measurements, the influencing factors are expected to be at a minimum insolation, wind and clouds cover. The minimum length of the overlapping period is one season but at least two annual cycles are highly preferred to elucidate any seasonality of effects robustly. In actively looking for data we will prioritize daily data from the early instrumental period because they are rare and larger differences are expected.
- 2.4 To understand the reasons for any differences also metadata that describe the parallel measurements is as important as the data itself and the POST aims to

collect and standardize comprehensive metadata about the parallel measurements. For example, the types of the instruments, their siting, height, maintenance, etc.

- 2.5 The POST will stimulate research using the database and its publication in reputable peer reviewed journals with a preference for Open Access journals. It is planned that after publication also the data will be published with an open license.
- 2.6 The team will act as advocates of parallel data collection and its scientific application. This can be achieved through personal contact and through presentations at conferences and workshops. All presentations and posters to which the conference hosts stipulate no restrictions are to be made available through our website
- 2.7 The team has ultimate responsibility for the parallel data webpage on the Surface Temperature Initiative website. There will be a mailing list for interested scientists and existing blogs will be used for communication as well.
- 2.8 The team will do its best to achieve all targets set, but given the voluntary nature of this group there may be times when deadlines have to be changed. A table of planned work, with dates for completion, is maintained on the website.
- 2.9 The team will work in partnership with other working groups and teams of the ISTI to support the overall objectives of this program.

### *3. Reporting*

- 3.1 The team shall contribute to the annual report of the Databank Working Group (DBWG). This contribution shall be submitted to the Working Group in October-November of the previous year. This report shall:
  - Highlight progress in the prior year.
  - Detail issues that delayed progress.
  - Provide a detailed plan for the coming year and indicative plans thereafter.
- 3.2 The reporting should be succinct yet comprehensible to a lay audience and highlighting all salient issues.
  - The report will be published without restriction on the web at time of submission to sponsors and moderated public comments solicited through a blog or similar forum.
- 3.3 The team will be expected to respond in a timely manner to additional reasonable reporting requests from the Steering Committee raised on an *ad hoc* basis.

- 3.4 Defined outputs from the Implementation Plan will be reported to the Steering Committee and posted on the web upon completion.

#### *4. Coordination with Initiative activities*

- 4.1 The team is part of the Databank Working Group (DBWG) which will answer to the Steering Committee.
- 4.2 The chair of the DBWG and the Steering Committee will have ex-officio membership on the team. The chair of the team will be a member of the Steering Committee.
- 4.3 The chair of the team will give verbal reports to DBWG and Steering Committee at each meeting or designate the task if they are unable to attend in person.
- 4.4 The team chair will report annually by end of November for consideration and incorporation into the main overarching report to sponsors.
  - These reports will be published on the web in a timely manner.

#### *5. Mode of operation*

- 5.1 The team will communicate primarily through regular teleconferences occurring as deemed necessary by its members. Online document discussions, ad-hoc meetings and workshops (where funding becomes available) may also be used.
  - Approved minutes from these events will be posted as soon as possible thereafter and at a minimum within four weeks through the ISTI webpage or another web based portal without restriction.
- 5.2 Where a number of POST members are in attendance at a scientific meeting, holding a side-meeting is encouraged, which will, however, not replace a teleconference of the group as a whole.
  - A brief summary from any such meeting should be reported to the group as a whole at its next meeting.

#### *6. Membership*

- 6.1 We will strive to achieve a diverse team with members from various cultural, climatic, organizational and scientific backgrounds.

- 6.2 Additional members are considered at the discretion of the team or under the advisement of the DBWG and the Steering Committee.
- 6.3 People who are actively working on or with the parallel databank are invited to become a member of the team. Examples of such work could be significant improvements of the data processing or authoring an article building on the parallel database in a peer reviewed publication in a reputable scientific journal.
- 6.4 One senior representative from each Initiative sponsor is welcome to sit in on teleconferences on an *ad hoc* basis.
- 6.5 If resources allow it, interested scientists that are not members of the team are also welcome to participate in any teleconference or meeting.
- 6.6 We strive for decisions based on a large majority. If voting is necessary, voting will be performed in a secret ballot.
- 6.7 The team has a chair and may have co-chairs. The current chair can be replaced by a majority vote for a new chair.
- 6.8 Membership will be reconsidered on a bi-annual basis or at the request of individual members.
- 6.9 Members are expected to make all reasonable efforts to attend teleconferences and provide relevant input by email/blogpost in advance in the event of non-attendance.
- 6.10 The POST is an entirely voluntary commitment so there are no explicit workload requirements, beyond reasonable expectations of discharging the activities detailed in these terms of reference or efforts volunteered and minuted in agreed meeting notes.
- 6.11 Members may resign from the team at any time by informing the chair in writing of their intention to do so. They are encouraged to suggest replacement members.
- 6.12 In addition to full members, interested scientists can also become associated members. In this way they can express their support for this line of work. Associated members will be informed about major developments and are invited to give feedback.
- 6.13 Current membership is detailed on the ISTI Webpage

## 7. *Terms of reference revision*

- 7.1 Terms of reference and membership will be revised at the beginning of every ISTI benchmarking cycle.

- Revision can also be requested by a group comprising of at least three members or by any single Initiative sponsor.