

**ISTI#16/04/2018**

**ISTI Steering Committee Meeting**

16th April 2018 11am GMT/UTZ, 12pm British Summer Time,

**Joining:** Kate Willett (KM), Peter Thorne (PT), Victor Venema (VV), Blair Trewin (BT); Xiaolan Wang (XW) Michael de Podesta (MdeP), Andrea Merlone (AM) Akiyo Yatagai (AY)

**Not Joining:** Jay. my apologies will not be able to make it. Rob Allan, Richard Chandler

**No response (check whether they are still happy to be involved):** Peter Stott, Albert Mhanda, Matilde Rusticucci, Antonio Possolo, Gregory Strouse, Marian Scott (Ex-Officio), Tom Peterson (Ex-Officio), Chris Merchant (Affiliate)

**ACTIONS:**

**KW:** Check whether non-responding members want to be removed from the committee. Email sent Wednesday 18<sup>th</sup> April – no response by end of April and we'll assume 'retiring'.

Marina Scott - continuing

Matilde Rusticucci – continuing

Tom Peterson - retiring

**VV:** Some words to bring the POST and its data to the attention of ECMWF in regard to whether these data series could/should be hosted in the C3S Climate Data Store.

**PT/KW:** Chat with Dick Dee about the parallel observations and where/how to host them?

**VV/AM:** Think about potential avenues for assessment of instrumental factors using the parallel observations.

**PT:** Chase Richard Chandler about looking at the Benchmarking paper for Kate  
Done

**VV:** Follow up with Connor Murphy / Peter Thorne (Maynooth Uni) about potential Masters Student projects using the parallel data series - need project outlines by October 2018, starting January 2019

**AM:** Create a survey in early summer to get feedback from climate data users on what they would like from metrology. This can then be taken forward into project proposals.

**KW:** Organise a follow-on call for the existing Steering Committee in a few weeks to consolidate on plans and gather names of who to contact to refresh steering committee/other teams.  
Doodle poll sent around Monday 23<sup>rd</sup> April

**VV/KW:** Ongoing sub-teams (POST and BAWG) should make contact with existing members and establish status of members and work.

**JL/RA:** Sub-teams to be disbanded should make contact with their teams to let them know.

**KW:** Organise an all-hands call – should this be before or after sub-team disbanding, sub-team beginning and bringing in (hopefully) new people? I think before...

**KW:** Once minutes are agreed post these online for the record

---

## Agenda

### 1. Where are we now

- *ISTI overview by Peter Thorne*

PT: Its all gone rather quiet primarily because I've been otherwise distracted which, with CLA role in AR6, is going to get worse not better. If ISTI is to continue realistically it needs new leadership with resource availability to drive it. Until we get the benchmarks out its hard to see momentum building.

VV: I am quite confident we can do this this year.

PT: We also really need to have a meeting to reinvigorate the whole thing including new membership and a new statement of direction.

- *Databank status (ISTI, C3S 311a Lot 2, NOAA-NCEI) by Peter T and Jay Lawrimore*

PT: ISTI databank effort to all intents and purposes is superceded by the new NCEI / C3S activity which is trying to take us away from ECV and timeslice-specific holdings to integrated holdings. This is much more sustainable approach and builds upon much of the effort that was undertaken by the databank group. It may be that the databank group should consider its disbandment. Similarly, the data rescue group is superceded by the C3S activities and ACRE and there is little extra value likely added.

JL: I agree that because the Databank is being superceded by C3S that it would be appropriate to sunset the activity.

BT: Agree - work on databank largely mission accomplished. Our role is now more advisory.

VV: I like the multi-stage approach of ISTI which is different and valuable.

PT: C3S does include the stages excluding the homogenised and interpolated stages.

VV: Would different people contribute different QC methods and a benchmark approach be included?

PT: We welcome multiple QC approaches for each observation.

VV: Same for multiple homogenisation versions?

PT: Homogenised products are further up the chain so will likely be hosted in the C3S Climate Data Store but not part of this current project.

XW: What about the ongoing update of the databank?

PT: For now its carrying on because it makes up GHCNM4 but this will be superceded by the C3S activity eventually as this will/should have additional sources coming in whereas ISTI is now static in terms of sources and only updates existing series.

BT: WMO Commission for Climatology now adopting the daily CLIMAT messages - provided monthly along with the monthly CLIMATs.

- *POST overview by Victor Venema*

VV: Enric Aguilar organised a meeting on parallel data this winter. This has considerably extended our dataset for the transition from conventional observations to AWS. We plan to start writing a paper about this transition for temperature this summer.

VV: The dataset is now also large enough to benchmark daily correction methods. The parallel series are mostly so short that we can only correct one break and not multiple ones like we have to do in a practical example, but the advantage is that in this way the breaks are by definition realistic, which is hard to do statistically as we do not understand the statistical properties of breaks in daily data well yet.

VV: There is no activity on parallel data for relocations. Renate Auchmann has found another job and is no longer co-chairing ISTI-POST. Also in this group fresh blood is welcome.

PT: What are the long-term hosting options for this database? Is this something that we should be thinking about with the C3S / NCEI data holdings effort? Important to have a long-term archival consideration?

VV: Quite a few institutions are now doing PO activities. Need to look for hosts - NCEI, ECA&D/ICA&D?

KW: Could this be in the C3S database?

PT: **Something we can think about. We need some words from Victor that we can use to sensitize ECMWF.**

KW: The issue of hosting parallel observations is similar to the data rescued through the C3S Data Rescue Service (and all other data rescue efforts).

PT: **We should bring this to the attention of Dick Dee.**

AM: Is there room for including instrumental aspects of the parallel observations? We have found that there is a lot of work to do on this.

VV: Yes that is possible. Our analysis is mostly focussed on what is happening to the climate records but it would be good if the instrumental aspects could also be analysed.

KW: Can we expand the POST to include metrological experts and students?

VV and AM to think about it. (KW Note: **Instrument Uncertainty team verses integrating with other teams? I prefer having a focussed team for visibility that can then integrate with other teams as necessary.**)

AM: Also need to look at the metadata for these series. We have previously set up experimental sites (with Manola Brunet).

VV: At the workshop in Spain we made a standard format to report all metadata relevant for temperature measurements.

*- Benchmarking overview by Kate Willett*

KW: Clean world code appears to work but still need to publish methodology paper

KW: Victor has set up some code for the error world creation but this is not complete

VV: I think we are at least half way with coding (and would need to write things up). When I started coding again for a talk on the benchmark at EMS I noticed that the structure of the code is really quite good and well documented. Thus everyone can easily help finish the code, which is a project on the ISTI GitHub account.

KW: We have discussed plans for validation and will likely follow the work of Rachel Warren for daily benchmarks

KW: I think it would be good to revisit the benchmarks, refresh the team and attempt to complete the job. They can be used for assessing homogenisation skill in addition to other issues (quality control, missing data, possibly interpolation) which in some cases may require additional work on the benchmarks to make them fit for purpose (e.g. random error for QC testing).

PT: **I will chase Richard Chandler?**

PT: We have Masters students at Maynooth.

KW: could we have one look at the parallel datasets?

VV: We have already done this and its worked well.

VV: Better to look at homogenised data and whether its a random walk or noise pattern?

KW: **Can you follow this up Victor? Master student projects at Maynooth exploring parallel datasets**

PT: **January and July so could try for 2019 - need projects by October 2018 - liaise with Connor Murphy.**

#### **SUMMARY:**

**ISTI has stalled. Largely, ISTI has achieved its aim given that the databank was produced and is now superseded by work at NCEI and C3S. The data rescue efforts through ISTI were with the view to feeding the databank. These are ongoing outside of ISTI and have additional effort from C3S. The**

*Parallel Observations Science Team and Benchmarking Working Group have made progress but still have plenty of work to do and so are ongoing with active (semi) members).*

## 2. What should happen to ISTI now?

- *carry on as before*

PT: Given that we have stalled this isn't really an option. Also, realistically the databank issues have been superseded. Where we can bring value now is the benchmarks and the parallel measurements in my view. But there are also opportunities to go in new directions.

PT: Value in the brand and so we should keep and build on that

BT: ISTI has provided an overall framework for other projects (Benchmarks, POST) and this could be expanded. ISTI is very valuable to be an overarching framework.

MdP: In general its good to have Metrologists in these conversations is valuable. We have MeteoMet and extensions of that project. Cannot state exactly what we should do but ISTI is a valuable body.

AM: ISTI is a way to demonstrate impact to our community. WMO CIMO have a new proposal for more tests of thermometers and shields. Recognition of metrological standards for observing record values. Lots of metrological work going on around temperature (air): EURAMET new project on air temperature measurements & calibration. ISTI is a means for us to report and receive input from a different (and users) perspective on recorded data (originated from measurements). Temperature is a key quantity and both BIPM CCT and EURAMET TC-T have initiatives and working groups which interact with the climate community. NMIs like NPL (UK), INRiM (IT), CEM (ES) and few other have practical activities on T.

KW: I like the idea of a team on instrumental issues.

VV: Other variables likely to have more problems than temperature - should we open up to more variables?

BT: If what we're doing is providing a framework then this may open the door to others being involved. Most other variables are definitely less well-explored than temperature.

VV: It could bring others in.

KW: Much of what we have done is transferable to other variables in the broad sense. I like the idea but would we need to change the name?

VV: ISDI - International Station Data Initiative

PT: Lets not spread ourselves too thin or compete with others? What are the unique things that we can do over the next few years? Benchmarking, interpolation, parallel obs, instrumental analysis

VV: I don't see us competing with other groups from going into other elements but temperature is most easily funded, PT aligned to Paris agreements,

MdP: What about the paper on climate references networks? Can we be a group that supports the implementation of that.

PT: GCOS is taking this for now so we shouldn't spend too much time on it.

XW: What is our relationship to WMO or WCRP?

PT: Historically we have reported to them annually (and BIPM, ISI-TIES?) but this has been ignored. Its never become a WMO activity.

AM: The action of this group falls a bit out of the BIPM scope. However, support for near surface values was included in the BIPM CCT road map. So there is room for support for ISTI. WMO CCI new expert teams include Data development and stewardship (1.3) and on Data rescue and management (1.4). Members are being nominated (today?) and a formal interaction is possible, also with the existing personal links...

KW: Could we have a four team approach to addressing quality and uncertainty in climate data?

POST, Benchmarks, Interpolation, Instrumental Aspects? If it is appropriate to include other variables this can be assessed on a case by case basis - where its straightforward and useful, why not?

- refocus? benchmarking and uncertainty (interpolation? processing methods, instrumental and structural uncertainty), image archiving?

PT: Kevin Cowtan had expressed interest in interpolation / averaging aspects. He could be invited on and given a thought as to instigating an activity on this under ISTI

VV: Do we see a way to also fairly benchmark the interpolation? Are climate model fields realistic enough or reanalysis fields?

PT: Unclear but I know that Kevin is interested in various aspects around the interpolation issues and this has been a recent focus. We could invite Kevin on with a view to considering this.

VV: There seems to be a move to multi-element databases. This is good. So we could consider to also open ISTI to all station data. Compared to "just" a database with station data I think our open science concepts (provenance, data processing stages, inviting everyone to contribute processing methods and benchmarking them) still have a lot of value and would be transferable to other climatic elements. More elements would be more work, but could maybe also attract additional interest.

PT: This multi-element database is what the C3S / NCEI activity discussed above is doing.

VV: The database group could work on becoming more international. Have servers/mirrors on all continents, where also data can be inserted into the database.

PT: Again, the C3S / NCEI activity does this and we are always willing to take on new in-kind. We are working on instigating several options for push and pull submissions presently.

VV: When the main thing that has value is our open science, "provenance, data processing stages, inviting everyone to contribute processing methods and benchmarking them", did we ever try to get funding from funders especially interested in Open Science? That may be easier as normal science as our normal science is not that new; the planet warms.

PT: Yes, we got 2.2 million from C3S to try to do this. Always room for more funding and if C3S continues in next EU budget cycle I expect the activity to continue to be funded.

KW: Sounds like an ISO standard for governing climate records or something like that. I like the idea of ISTI becoming more focussed on quality and uncertainty which would include the provenance side of things.

PT: With C3S the whole metadata and data management is becoming ISO-compliant in terms of formats etc. Also conversant with the WMDS.

#### **SUMMARY:**

*ISTI is still a valuable and recognised entity albeit with no funding or actual engagement from WMO, BIPM or TIES despite original formal recognition. ISTI has provided a useful framework for data stewardship (international interdisciplinary and comprehensive approach, collation, structure, management, dissemination) and provenance (merging, traceability, parallel observations, benchmarking). It has also provided a forum for reporting to and receiving scientific insight from which helps facilitate research especially from disciplines with a broader scope than just climate (i.e., metrology). The general feeling is that ISTI should continue in some context but without the databank efforts which are now superseded. ISTI could refocus on quality and uncertainty with four teams: Parallel observations collation and assessment; Benchmarking homogenisation algorithms, Benchmarking interpolation algorithms, assessment of Instrumental Factors. ISTI could also aim to be a guiding body on all things relating to temperature observations for climate. WMO CCI new expert teams include Data development and stewardship (1.3) and on Data rescue and management (1.4). Formal ISTI interaction is possible. ISTI outputs can be expanded to other variables as desired – in many cases what has been done for temperature is transferable and valuable. Temperature should remain the primary focus for now. A member refresh (steering committee and sub-teams) is essential. We also really need a face-to-face meeting/workshop to scope out the future/undertake work/gain enthusiasm – this requires funding!*

### **3. Steering Committee refresh?**

PT: Yes, I need to be rotated off as chair and we need to get new blood in.

PT: But we also need to rethink and potentially refresh the underlying groups.

VV: I would be willing to chair the initiative if this would be funded somehow. Doing it on the side is too much work for a project scientist.

KW: I would also be happy to chair/co-chair. Co-chairing actually sounds quite appealing as opposed to lone-chairing. I have the ability to squeeze this into my existing work a little so could take this on with a view to trying to source funding which may then enable Victor to take it on in a more major way.

BT: happy to stay on Steering Committee but I also have an IPCC role (albeit a less big one than Peter), so being a chair or co-chair is probably too much of a stretch

XW: also happy to stay on the steering committee but I am committed to writing a book on data homogenization and quality control (to be published by Cambridge University Press; new info on this regard are more than welcome) and have also shifted my focus onto precipitation.

VV: Open Science Foundations? There are various bodies that might offer funding which is aligned with our approach to things.

MdP: Happy to stay on and good to see an instrumental string which I would be happy to lead.

KW: Great!

VV: Could call the homogenisation benchmarking group, interpolation benchmarking group, instrumental analysis group

BT: Starting a precip project later this year so also support expanding to other variables to some extent.

AM: Difficult to directly bring money to this but we can get feedback from climate data users on what they would like from metrology. This can then be taken forward into project proposals. **I will circulate a survey in early summer on "your wishlist"**. Keeping 'Temperature' in the name is an advantage but doesn't mean we can't consider other variables where appropriate. "Temperature and near surface observations"

#### **SUMMARY:**

*We didn't really conclude. It appears that Kate is the only person able to take on chairing ISTI at present until some funding might be found. Kate is happy to do this and would love to co-chair if anyone is volunteering. Kate feels a bit odd taking on the chairing role without being given an official thumbs up and is very open to anyone else stepping forward to volunteer as chair.*

#### **4. Short term plans?**

PT: Try to instigate a meeting which may serve as a reboot of the entire thing. If Maynooth were to host I may be able to garner some financial support given sufficient lead time but not enough to cover everyone. But, it may be better hosted by new Chair(s).

PT: Key challenge remains funding. The databank efforts are now funded. We need to work on similarly gaining funding support for other activities.

PT: ISSI? COST? <http://www.birs.ca/> ? <https://www.mfo.de/> ? All these would provide a mechanism to engender some meetings at least.

PT: Need to next engage existing groups of ISTI via an all-hands call were we to continue to outline what the proposed changes are and get their input on it.

BT: A face to face meeting would be useful. Agree it is a good idea but think I may struggle to get there myself.

PT: Have another telecon in a few weeks before anything else? Invite all ISTI participants.

VV: Sounds good. Will think about potential funding avenues.

#### **SUMMARY:**

*We should have a follow-on call for the existing Steering Committee in a few weeks to consolidate on plans and gather names of who to contact to refresh steering committee/other teams. **Ongoing sub-***

teams (POST and BAWG) should make contact with existing members and establish status of members and work. We should then have an all-hands call – should this be before or after bringing in (hopefully) new people? I think before...

## 5. Any other business?

Report from WMO CCI

Manola Brunet elected new President

New expert team defined and created.

List at resolution 6/1 [http://meetings.wmo.int/CCI-17/\\_layouts/15/WopiFrame.aspx?sourcedoc=/CCI-](http://meetings.wmo.int/CCI-17/_layouts/15/WopiFrame.aspx?sourcedoc=/CCI-17/English/1.%20DRAFTS%20FOR%20DISCUSSION/CCI-17-d06-WORK-PLAN-AND-STRUCTURE-CCL-2018-2022-draft1_en.docx&action=default)

[17/English/1.%20DRAFTS%20FOR%20DISCUSSION/CCI-17-d06-WORK-PLAN-AND-STRUCTURE-CCL-2018-2022-draft1\\_en.docx&action=default](http://meetings.wmo.int/CCI-17/English/1.%20DRAFTS%20FOR%20DISCUSSION/CCI-17-d06-WORK-PLAN-AND-STRUCTURE-CCL-2018-2022-draft1_en.docx&action=default)

See documents at [http://meetings.wmo.int/CCI-17/SitePages/Documents%20\(in%20English\).aspx](http://meetings.wmo.int/CCI-17/SitePages/Documents%20(in%20English).aspx)

Thank you

AY: Thanks. Sorry just for listening and silence. I have been too busy for APHRODITE-2. If ISTI starts precipitation someday, I am happy to share my experiences. ^ ^ We also handle temperature and snow, but its very little...

KW: Thanks Akiyo - looks like a few people are moving to precipitation so that is worth keeping in mind.

PT: Meeting notes should be posted online once agreed for the record

KW: Meeting concluded because the gotomeeting closed with Kate's power outage.

---

## NOTES:

### Potential funding streams: Meetings only? Students? Actual Research?

#### Meetings Only:

##### Maynooth University:

**COST** [http://www.cost.eu/COST\\_Actions](http://www.cost.eu/COST_Actions): Open calls periodically, 8 month decision making, begin within 3 months of decision. Next call 27<sup>th</sup> April 2018 so too late really. This requires 7 partners who are from COST Member States ([http://www.cost.eu/about\\_cost/cost\\_member\\_states](http://www.cost.eu/about_cost/cost_member_states)). It does not fund research but does fund networking tools, such as meetings, workshops, conferences, training schools, short-term scientific missions (STSMs) and dissemination activities and can include near neighbour countries ([http://www.cost.eu/about\\_cost/strategy/international\\_cooperation/nnc](http://www.cost.eu/about_cost/strategy/international_cooperation/nnc)) and International Partner Countries

([http://www.cost.eu/about\\_cost/strategy/international\\_cooperation/ipc](http://www.cost.eu/about_cost/strategy/international_cooperation/ipc)). COST Actions typically last for 4 years. It stipulates an interdisciplinary project that empowers young researchers and innovators.

**ISSI** <http://www.issibern.ch>: This appears to be mostly space focused although it does mention ground-based observations and I have been encouraged to apply before but with a link to satellite temperature.

**Banff International Research Station** <http://www.birs.ca/>: Hands on workshops 5 days to 2 weeks fully funded. I couldn't find anything about how to apply. It suggested you might have to be North American?

**Oberwolfach Research Institute for Mathematics** <https://www.mfo.de/>: 5 day workshops for 45-48 participants. 3-5 pages of title, proposed organisers, abstract, mathematics subject classification, aim, list of participants. 2-4 organisers with at least one from outside of Germany. Submission at end of July for a workshop in 2 years time.



**Turing Gateway to Mathematics** <https://www.turing-gateway.cam.ac.uk/>: May host a one-day meeting but not entirely clear how or whether some funding would need to be brought in. Very small chance this is something the Met Office could do but there is no recent precedence of it.

**Students:**

**Maynooth University Masters students:** Project proposals needed by October 2018 for commencement Jan-July 2019.

**Actual Research:**

EPSRC (UK)?

NERC (UK)?

**Potential ISTI Teams:**

Parallel Observations Science Team (POST)

- This team can explore inhomogeneity, random error/QC and instrumental factors
- Think about an end result of quantifying uncertainty in a meaningful (degrees C) way.

Homogenisation Benchmarking Science Team (HBST)

- This team explores the ability of homogenisation algorithms to detect and adjust for inhomogeneities and quantifies the uncertainty in homogenisation both in terms of missed and incorrectly adjusted changepoints.
- Continue with monthly surface temperature benchmarks.
- Bring Rachel's daily work in house with ability to rerun for different regions and worlds?
- Think about an end result of quantifying uncertainty in a meaningful (degrees C) way.

Instrumental Factors Science Team (IFST)

- This team manages the metrological aspects of uncertainty in surface temperature and feeds into work in other teams.
- Need members from a metrological background and also those who work with temperature data, probably both from an operational (NMS) perspective and also a climate perspective.
- Think about an end result of quantifying uncertainty in a meaningful (degrees C) way.

Interpolation Benchmarking Science Team (IBST)

- This team explores the ability of different interpolation methods to cope with unevenly sampled data, sporadically and systematically missing data in space and time, data containing biases and errors
- Think about an end result of quantifying uncertainty in a meaningful (degrees C) way.

Quality Control Benchmarking Science Team (QBST)

- Think about an end result of quantifying uncertainty in a meaningful (degrees C) way.

**Meetings to attend:**

CIMO TECO October 2018 Amsterdam - <https://www.wmocimo.net/topics/>