

ITWG Climate Working Group

Recommendations and actions from ITSC-17

Compiled by Jörg Schulz and Peter Thorne

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Topics for ITSC-17

- New satellite programs / missions still in planning stage - do they meet climate requirements? If not, what specific recommendations do we have and how can we influence them?
- Ensuring the data record - metadata, reprocessing, data archival - is everything as rosy as it should be?
- Cal/val activities - GSICS, GRUAN, CLARREO - are they looking like meeting our needs? How can we most effectively influence / support them?
- Consideration of work programmes for climate already in operation / advanced planning - are there things they should be doing that they are not? Best practices being learnt?
- Gap analysis - are there data that as a global community that we should be looking at but are not? What should the priorities be and why?

Current programs and mission planning

Conically scanning microwave imagers/sounders

- **Recommendation Climate 1:** There is a critical need for a follow on microwave imager on DMSP for climate purposes because although they weren't initially intended for climate they have been hugely useful. We would still look to DMSP to provide such measures because of the need for LECT continuity for climate record continuity purposes. A similar sounder on a post-EPS orbit would also be immensely valuable and EUMETSAT are encouraged to continue planning in this regard. Suitable representation from climate community in the planning phase to ensure the continuity of the record is requested.
- **Action Climate 2:** TBD in international group

Current programs and mission planning

Spectral response function change management and mitigation

Recommendation climate 2. Satellite agencies that are considering changing the frequency or viewing geometry / resolution of heritage measures need to consider the impact on climate monitoring and particularly trend characterisation. This can be easily achieved through the use of radiance simulators and climate model output that is freely available through the CMIP portal.

Action climate 1: ITWG co-chairs to communicate to CGMS.

Current programs and mission planning

Orbital slots

Recommendation climate 3: Recognising that climate change may have a diurnal cycle component we recommend to CGMS to explicitly consider the coordinated international phasing of satellites to ensure adequate sampling of diurnal cycle.

Action climate 1: ITWG co-chairs to communicate to CGMS.

Current programs and mission planning

Temporal instrument overlap requirements

Recommendation climate 4: Consider a session at next ITWG specifically on analyses of overlap requirements for continuity across changes in platform or technology (e.g. HIRS2/3/4, TOVS to ATOVS, AIRS to IASA, SSMI to SSMIS). With a view to promoting the appearance of such studies in the peer reviewed literature and making robustly quantified recommendations on overlaps required when the satellite technology changes and quantifying GCOS climate monitoring principles.

Action climate 3: ITWG co-chairs to consider the viability of this recommendation.

Current programs and mission planning

Temporal instrument overlap requirements (cont.)

Recommendation climate 5: EUMETSAT to pro-actively consider the multiple platform issue with consultation with NOAA who have considerable experience in this regard. Discussions need to recognise the import to climate of the longest term record and that the non-operational platform need not be available in real-time to be useful for climate.

Action climate 4: Jörg Schulz to communicate recommendation climate 5 to EUMETSAT.

Current programs and mission planning

The opportunity for global SNO assessments with METOP A/B

Recommendation climate 6: EUMETSAT and GSICS are urged to look pro-actively at the METOP A/B global SNO measurements opportunity that will be afforded to ascertain the likely validity of the global application of high latitude only derived SNOs for other platforms through systematic experimentation and to write this up in the peer reviewed literature.

Action climate 5: Jörg Schulz to communicate recommendation climate 6 to GSICS and EUMETSAT.

Metadata, reprocessing, archival

Use of radiances in reanalyses

Recommendation climate 7: Advise reanalyses centres that future reanalyses should use suitable FCDRs that have had substantial work applied as their radiance datasets for ingest. Furthermore, to consider whether it is more applicable to anchor the reanalyses to these globally complete and consistently processed data than their current approaches.

Action climate 6: Peter Thorne to communicate recommendation climate 7 through the joint GCOS / WCRP Working group on observations for reanalyses.

Metadata, reprocessing, archival

Improved access and documentation of observational data sets for the CMIP5 and the next Intergovernmental Panel on Climate Change (IPCC) report

Recommendation climate 8: Identify potential observational data sets that seem suitable for comparison to the CMIP5 fields for the next IPCC report. Datasets should be converted to standard grids (where possible), and to standard CF compliant NetCDF to be hosted on the Earth System Grid , and be documented.

Action climate 7: John Bates to communicate climate recommendation 8 to the SCOPE-CM executive panel. Jörg Schulz to communicate climate recommendation 8 to the EUMETSAT SAF network.

Cal / Val activities

Metrology input

Recommendation climate 9: Space agencies to recognise the importance of traceability in characterisation of the fundamental measurement and to actively engage the metrologist community throughout the process but particularly in pre-launch characterisation. Building upon the recent BIPM-WMO meeting.

Action climate 1: ITWG co-chairs to communicate to CGMS.

Action climate 8: Bill Bell to distribute report and presentations from the recent BIPM-WMO meeting to this working group and the ITWG co-chairs for their consideration.

Cal / Val activities

GPS-RO as fundamentally more than a record in its own right

Recommendation climate 10: ITWG climate working group notes that GPS-RO in and of itself constitutes a valuable climate record. But perhaps of greater value is the cal/val it affords to the operational satellites. It is imperative that a long term capability be retained.

Action climate 1: ITWG co-chairs to communicate to CGMS.

Cal / Val activities

CLARREO type missions

Recommendation climate 11: Absolute calibration missions (such as CLARREO) should be planned to continue after CLARREO's expected lifetime and include other spectral regions including microwave radiances which is recognised to be hugely challenging.

Action climate 1: ITWG co-chairs to communicate to CGMS.

Cal / Val activities

GRUAN

Recommendation climate 12: To agencies to provide and sustain high quality in-situ observations through programs such as GRUAN to improve radiative transfer models co-located in space and time. Furthermore, to advertise the existence of such data to their users.

Action climate 1: ITWG co-chairs to communicate to CGMS.

Action climate 9: Peter Thorne to distribute report from latest GRUAN meeting to the Working Group so that they are up to date.

Cal / Val activities

GSICS and SCOPE-CM

- **Recommendation climate 13:** GSICS should continue actively reaching out to user community and capture evolving requirements.
- **Action climate 10:** Mitch Goldberg to communicate recommendation climate 13 to GSICS.
- **Recommendation climate 14:** SCOPE-CM Exec panel to formulate their requirements to GSICS.
- **Action climate 11:** John Bates to communicate recommendation climate 14 to SCOPE-CM.

Cal / Val activities

Renewal of automatic weather station at DOME-C

- **Recommendation climate 15:** To put up an alternate AWS at DOME-C as back up for AWS8989 that has proven invaluable for satellite cal/val.
- **Action climate 12:** ITWG co-chairs to communicate this to CGMS with the recommendation to encourage the Italian Space Agency to resume the station at DOME-C.

Planned and ongoing analysis

ESA Climate Change Initiative

- **Action climate 13:** Roger Saunders to provide ESA CCI documentation to the working group members for feedback.
- **Recommendation climate 16:** To ESA to strongly consider clear and unambiguous guidance on data openness and transparency from the outset to the CCI initiative ensure that datasets created are verifiable and exhibit best practices.
- **Action climate 14:** Roger Saunders to feedback recommendation climate 16 to ESA CCI.

Planned and ongoing analysis

Need for multiple analyses and characterisation of uncertainty

- **Recommendation climate 17:** To CGMS to support multiple analyses of FCDRs and TCDRs recognising that there are many methodologically uncertain choices required.
- **Action climate 1:** ITWG co-chairs to communicate to CGMS.

Planned and ongoing analysis

Further work on the IASI / HIRS comparison on METOP-A

- **Recommendation climate 18:** To EUMETSAT to write up the IASI / HIRS intercomparison presented at ITWG in the peer reviewed literature including an analysis as to why the channels vary in their response to the extent where such analysis is possible.
- **Action climate 15:** Dieter Klaes to communicate recommendation climate 18 to EUMETSAT.

Planned and ongoing analysis

Understanding diurnal drift impacts more unambiguously

- **Recommendation climate 19:** To reanalyses centres to provide their diurnal climatologies at hourly resolution for a suite of geophysical and radiance parameters including surface characteristics in support of satellite dataset construction efforts.
- **Action climate 16:** Peter Thorne to communicate this through GCOS / WCRP Working Group on Observations for reanalyses.

Gap analysis

- We could conceivably infer a lot about cloud properties from hyperspectral. Bearing in mind that clouds and cloud processes are a key constraint on our ability to infer climate feedbacks and therefore sensitivity efforts in this area would be useful.
- Radio frequency interference was recognised as an important issue for climate. There are two important aspects: issues of sub-detectable interference; and deletion of affected data. Both will almost undoubtedly be non-stationary in space and time. Both impact the ability to infer the true global and regional scale changes. The possibility to undertake “what if” type analyses was very briefly touched upon.
- There is likely value to an intercomparison of methods and not just final results for various CDRs. We are starting to undertake this work for MSU/AMSU.

Gap analysis

CEOS response to the 2010 update of GCOS-IP

Action climate 17: Mitch Goldberg to distribute CEOS draft response to the 2010 update of the GCOS Implementation Plan for comment when ready.

NWP and climate requirements approach for Post-EPS

- **Recommendation climate 20:** To CGMS to consider the potential benefits of the NWP and climate requirements approach adopted by EUMETSAT as part of the post-EPS mission planning.
- **Action climate 18:** Jörg Schulz to send details on the tables to NOAA for JPSS planning.