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Report for 1st Meeting of GCOS/CCI Task Team on the use of Weather radar for Climate Studies

FMI, Helsinki, Finland
30-31 August 2017

GCOS-212

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The first meeting of the AOPC task team on the use of weather radar for climate studies, was held at FMI, Helsinki, from August 30th to August 31st 2017. The meeting is hosted by Elena Saltikoff (FMI-Finland), chairperson of the Task Team. Bernard Urban (Météo-France-France) participates as radar expert, Rainer Hollman (DWD-Germany) as AOPC representative, Caterina Tassone for GCOS secretariat. Also present in the first part of the meeting are Aku Riihela and Terhikki Manninen from SCOPE-CM.

1. The following agenda is approved:

Wednesday 30th August 2017, 14:00-18:00

- Introduction
- Motivation of the task team, expected output
- Aku Riihelä: Experience of SCOPE CM
- Rainer Hollmann: Experience of CCI
- Elena Saltikoff: "Way forward" document
- Closer look at the Terms Of Reference
- Identification of stakeholders and contact points

Thursday 31st August 2017

- Document plan
- Milestones and timetable
- Share of work, identifying need for external contributors
- Interaction methods and frequency
- Progress reporting methods and needs
- AOB

2. The meeting starts with the presentation of Aku Riihelä on the experience and results from the Scope CM Project 2. The main concept of this work is to combine multiangular MODIS and AVHRR observations with a single surface albedo retrieval algorithm, thus providing a proof of concept study on multiangular data merging across different satellite imagers. It is noted that the Scope CM is not only for satellite and it could be tried to extend it to also cover radar studies. It is also interesting that the colleagues from U.S. have been motivated to work for the project and provide computing resources pro bono. Their motivation is likely based on acknowledged status of the project (helps in national funding proposals), possibility to share best practices and in co-authoring joint publications.

3. Rainer Hollman presents the work done within CCL Task Team on Use of Remote Sensing Data for Climate Monitoring. The relevant output of the CCI Task Team is the compilation of a list of available centers for radar climatology in Europe. This will be used as a starting point from this Task Team for D2. (ref. 1).

4. Elena Saltikoff presents the main output from the paper “the way forward” (ref 2). The paper had 5 authors, 2 commentators, so it represents the point of view of several experts in the field of radars. The team concludes that harmonization is important, data volumes are large, but these difficulties should not discourage this endeavor, given its importance and potential impact. It is especially important to emphasize its impact for future generations. Dataset from WMO normal term 1990-2020 may be patchy, but we are the people who can affect quality of the dataset from normal period 2020-2050.

5. The Terms of Reference (ToR) is revised and finalized. The updated version can be found in the Appendix.

6. The following Document Plan derived from the ToR is proposed:

D1. Climate monitoring requirements.

Input from:

- GCOS guidelines (GCOS Climate Monitoring Principles)
- Paper by Becker 2013 (ref 3)
- View of OPERA, IPET-OWR, Locarno meeting (see report, not available yet)
- Work done for the Climate data management manual by William Wright.

Main points to be covered:

- Start with GCOS principles, referring to radars.
- Define Key parameters (“level 1”)
- Acknowledge that even qualitative data can be valuable for monitoring severe weather
- Describe essential Metadata relevant for climate
- Describe quality control and its documentation
- Include relevance of keeping history of changes.

D2. Inventory of existing archives.

This includes:

- Plan an open survey: agree on what to document (content of survey + extract from WRD (in Turkey) database)
- Contact WRD and Dean Lockett
- Conduct an open survey and analysis (statistics + maps).

Information on existing archives should include: completeness, access, record length, coverage. In version 2, the inventory should include information on whether requirements defined in D1 are met. However this is beyond the scope of this team.

D3. Guidance how to facilitate user access and preservation of data.

Points to be considered:

- DCPC, user helpdesk, exchange of catalogs between centers (interoperability for catalogs)
- Bandwidth issues
- National, international, portal (pro/con).

D4. Recommendation: how to handle historical data

This includes:

- How to document the existing data
- Requirements for reprocessing with new algorithms

- Processing for extracting data from archives for quality control of the data
- Best practices from literature.

Historical data will be used mainly for:

- Case studies, seldom quantitative
- Severe weather statistics
- Obtain homogenous time series for radar at same location
- Fill the gaps in international datasets .

D5. Raise awareness and promote coordination of use of radar data for climate monitoring

Work to publish a report of the conclusion reached by this task team as a short paper in BAMS and in relevant WMO forums.

7. Tasks were assigned as following:

#		Lead	Others	When
D1	Climate Requirements	Elena Saltikoff, Andreas Becker	William Wright, OSCAR	*10 November for review * Draft November 2017 * Congress in May 2018
D2	Archive Inventory	Caterina Tassone	Bernard Urban and Elena Saltikoff for questions, WRD(Turkey), Dean Lockett, William Wright to review	Survey out 1 Jan. Analysis by March (presentation for GCOS)
D3	Guide to storage	Bernard Urban	Paul Joe, IPET-OWR	First draft end October
D4	Guide to handle historical data	Elena Saltikoff and Bernard Urban	TBD after D2	To be reconsidered after the D2
D5	Journal paper BAMS , WMO Bulletin	Elena, Rainer, Bernard, Andreas...	All of us, other experts and WRD (Turkey)	Summer 2018

8. Communication methods, tools, frequency

The following dates for Webex are agreed:

- 22 September 10-11 CET to discuss progress of D1, D2
- 8 November 14-15 CET to discuss D1 "final", D2, D3
- End February discuss analysis of D2, start D4, preparing for AOP C

Caterina will facilitate the teleconferences.

9. Other points identified during the discussion:

- Caterina Tassone to talk to Caroline Richter about how to provide visibility to the documents provided by the task team.
- Caterina Tassone to report regularly to CCI (Peer Hechler) about progress of the team.
- D5 article will be mostly done through email.
- Part of this work will be used to provide bullet points for Paul Joe, who is currently updating WIGOS guides to weather radar program, technology, procurement. Elena will get in contact with Paul. Caterina will talk to him.
- Caterina Tassone will meet with Omar Baddour (for CCI), Dean Lockett (for WIGOS) and Luis Felipe Nunes (for metadata) to present this report and ask suggestions on how WMO is going to include results from this TT in their work.
- Caterina Tassone to talk to Carolin Wittwer about including expert from European Flood Awareness System (EFAS).
- William Wright was contacted during the meeting, as his work is seen to be useful for the team. William is currently writing a manual on climate data management. However, the section relative to the radar is not complete. During this telephone call it is decided that in the future there will be information flow between this task team and William Wright: the task team will inform William Wright about their reports and ask him to review them, and William Wright will provide the task team with his report on climate data management to review.

10. The stakeholders and contact points identified are:

- IPET-OWR – Bernard Urban
- WIGOS – Dean Lockett, Louis Nunes (metadata issues)
- IPWG - Vincenzo Levizzani
- AOPC: Rainer Hollmann
- Radar expert(s): BU & ES
- CBS/CIMO/WIGOS: Caterina Tassone & Bernard Urban
- CCI: William Wright (Peer Hechler)
- GPCP Global Precipitation Climatology Center: Andreas Becker
- CHy: TBD - Backup EFAS (Talk to Carolin Wittwer)

11. In order to facilitate the inventory of the archives, contacts within the radar community in the different regions were also identified.

Region	Radar contact	Climate contact
RAI	Eric Becker, S. Africa	Fatima Driouech
RAII	Li Bai + Japan, Korea	Saviz Sehat
RAIII	Agusto Perreira (Br)	Matilde Rusticucci
RAIV	Mike Dixon	Brian Nelsen
RAV	Tom Keene	William Wright
RAVI	Bernard Urban, Elena Saltikoff	Andreas Becker

The meeting ends at 15:00.

12. List of Participants

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13. References:

- Ref 1: Use of Weather Radar for Climate Data Records in WMO Regions IV and VI. Luzia Keupp, Tanja Winterrath and Rainer Hollmann. http://www.wmo.int/pages/prog/wcp/ccl/opace/opace2/documents/TT-URSDCM_Use_Remote_Sensing_DataClimateMonitoringRAIV-VI.pdf
- Ref 2: Way forward in Using Radar Data for Climate monitoring, 28 February 2017, GCOS 207 bis
- Ref 3: Requirements for Weather Radar Data, Review of the climate requirements for Weather Radar Data. A. Becker.
https://www.wmo.int/pages/prog/www/OSY/Meetings/ET-SBO_Workshop_Radar_Data_Ex/SBO-WxR_Exchange_2.4_Climate_Require.pdf

Appendix : Terms of Reference of the Task Team

GCOS AOPC Task Team on the use of weather radar for climate studies.

Background:

AOPC-22 (Exeter, UK, March 2017) agreed on the creation of a dedicated task-team to work on a proposal on how best to proceed on the use of radar data for climate studies. The motivation for developing climate requirements for radar observations, stems from the need to monitor extreme convective precipitation with high spatial and temporal variations that can be seen only by radar. Extreme precipitation statistics for short durations events, important for hydrological applications, such as flood risk assessment and run-off projection, are currently based on rain gauge in-situ observations and require very long gauge records. Similar statistics could be obtained with shorter records of radar observations. In addition to hydrological applications, there are also regions where identification of dry zones is relevant, e.g. for agriculture and forest fires. Radar data can also be useful for ground-based validation of satellite-based radar data.

A short paper developed by members of the radar community was presented at the last AOPC meeting (Exeter, March 2017). This document identifies the challenges and proposes a way to move forward in the use of radar data for climate monitoring, and it will be used as the basis for the work of the Task Team.

Updated Terms of Reference:

1. Define weather radar data requirements for climate monitoring, define relevant metadata, and define best practices. Propose key parameters to be used for climate monitoring. Identify procedures for quality control of radar data specifically for climate applications.
2. Archives: Assess the status of existing international and national archives, including their accessibility, extent and quality.
3. Provide guidance on how to organize proper and standardized storage and user interface of local radar data and metadata for eventual reprocessing at a later stage to support climate monitoring.
4. Suggest procedures for handling historical data.,
5. Raise awareness and promote coordination of use of radar for climate monitoring.

Modus operandi:

1. The task team shall exist for a period of 1 year
2. The task team shall work primarily remotely, facilitated by GCOS secretariat. It is expected that an initial 'in person' meeting will be organized to discuss and agree the work-plan and deliverables, further meetings will be decided as required and subject to available resources..
3. Within 3 months of the initiation of the task team a detailed work plan and deliverable will be agreed.
4. Requirements for metadata standards shall be delivered by November 2017
5. The task team chair shall be expected to report on progress to AOPC by means of a brief written report.
6. The task team shall be expected to lead the production of a final report which may form the basis for a decision as to whether, and if so how, to proceed with recommendation for the use of radar data for climate studies.
7. The Task Team shall submit the report to relevant groups within WMO including CCL, WIGOS and CBS.

Members

Chairperson: Elena Saltikoff

AOPC: Rainer Hollmann

Expert(s): Bernard Urban, Katja Friedrich

CBS/CIMO/WIGOS:

CCI: Andreas Becker

GPCC Global Precipitation Climatology Center: TBD

CHy: TBD

GCOS secretariat: Caterina Tassone

Reference:

Way forward in Using Radar Data for Climate monitoring, 28 February 2017, GCOS 207 bis

Report by commission for Climatology Task team on the use of remote sensing data for climate monitoring
IPET-Sup-2/Doc.9.1

Requirements for weather radar data: Workshop on radar data exchange, Exeter, UK, 24-26 April 2013.
CBS/OPAG-IOS/WxR_EXCHANGE/2.4

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