

Report of the meeting of the CCI Expert Team on Climate Data Management Systems

19 – 21 October 2010, Exeter, UK

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Terms of Reference for the Expert Team on CDMS

At its 15th session held in Antalya, Turkey from 19 to 24 February 2010, the Commission for Climatology (CCI) established an Expert Team on Climate Database Management Systems within the Open Panel of CCI Experts on Climate Data Management (OPACE-1). The original Terms of Reference were considered at the first meeting of the Expert Team and they were revised as:

1. Assess and evaluate the current WMO Climate Database Management Systems (CDMS) and monitor changes and enhancements of these as well as the development of new systems;
2. Review and update the Guidelines on Climate Data Management;
3. Develop guidance and advice to the Members on the most practical, secure, reliable and affordable technologies for collecting observation data and metadata from source systems (including AWSs) and incorporation into a CDMS, in collaboration with CIMO, CBS and CHy.
4. Work in collaboration with the WMO WIS project office, CBS, CHy, JCOMM and CAgM and the space programme, the OGC and others on products and applications of climate data including standards and inter-operable systems to integrate and exchange NMHSs climate data and data from other sources such as remote sensing data, Geographic Information Systems, and data from applications sectors;
5. Assess the success of past and current capacity development activities in implementing and sustaining CDMSs operationally, and make recommendations for supporting activities, especially training in climatology in coordination with ETR;
6. Submit reports in accordance with timetables established by the OPACE co-chairs.

1.1 Climate Database Management Systems

1.1.1 CliDE

The new CDMS CliDE (Climate Database for the Environment) under development by the BoM uses Open Source software and will be released under the Ubuntu GPL OS license. CliDE is based on the ADAM (Australian Data Archive for Meteorology) data model. It's release, installation and training in countries in the Pacific are scheduled to take place early 2011. An Open Source Community will be established (Users and Developers) to support the system.

1.1.2 Climsoft Ver 3.

The new version (Version 3) of Climsoft has improved its data model by removing the auto numbering. All observation attributes are in one record. There is no more SQL reserved words and the new version gives the possibility to customize key-entry forms. Encoding of Table Driven Code Forms (TDCF) such as SYNOP, TEMP, and CLIMAT is also possible and the system can support the WIS Metadata and catalogue.

1.1.3 GDCLIM

The Moroccan CDMS (GDCLIM) system is easy to use and manage. It has a well designed Graphical User Interface (GUI) for adding new elements without altering the data model. GDCLIM has a very good security system. There are however some limitations in the system:

- The database model is : one table for all observation
- There is no possibility for automatic data ingestion.
- The creation of products is manual
- There is no Web access
- There is no possibility to manage satellite images, or gridded data.

1.1.4 Clidata

An update of the current installations of CLIDATA was presented which was confirmed by the CDMS survey conducted by WMO. Clidata is installed in the following countries:

- Czech Republic
- Caribbean Regional Project (7): Antigua and Barbuda, Barbados, Cuba, Dominican Republic, Guinea, Haiti, Jamaica, Trinidad and Tobago
- West Africa, (10 countries): Burkina Faso, Cape Verde, Chad, Gambia, Guinea-Bissau, Mali, Niger, Mauritania, Senegal, Benin
- VCP, (3 countries): Ghana, Macedonia, Cyprus
- Commercial sales, (4 countries): Bosnia, Estonia, Montenegro, Namibia
- Bbilateral cooperation, (5 countries): Dominican Republic, Ethiopia, Latvia, Lithuania, Serbia

1.1.5 Clisys

Clisys is currently installed in 7 countries: Egypt, Madagascar, Swaziland, Qatar, Indonesia, Libya, India. A case study of the Indian system was presented.

1.2 Analysis of the CDMS survey

The former Team Leader of the ET on CDMS made a preliminary analysis of the results of the survey on the use of CDMSs by WMO Members. 79 out of 190 countries (42 %) responded to the questionnaire. Only the results of Region I (Africa) were analysed.

The meeting recommended resending the survey to countries which did not responded. All members of the ET are requested to encourage Members to respond by individual contacts. The meeting also requested that WMO send a reminder letter (with questionnaire on the WMO ftp site) by end Feb 2011.

1.3 Training

The quick analysis of the questionnaires received showed that training is the bottleneck in the use of the CDMSs. In nearly all the regions, the lack of well trained staff jeopardize the use of the CDMSs. There is also a lack on training on "basic climatology" particularly in developing countries. The Team agreed that the development of fundable projects for training and capacity development in climatology, and on Climate Database Management in coordination with WMO ETR and DRA is a priority.

1.3 Interaction between Members CDMSs and open data exchange for integration and utilisation of climate data in interoperable systems

Develop the interaction between Members CDMSs and open data exchange for integration and utilisation of climate data in interoperable systems.

1.4 Workplan

The ET-CDMS developed a work plan which runs from October 2010 to February 2014. The key points of this work plan are the Capacity Development in particular for developing countries, the open data exchange for interoperable systems, the finalization of the Guidelines on Climate Data Management and the finalization of the CDMS survey. The outline of the work plan is as follow:

1.4.1 Continue the survey of Members CDMSs.

- a. Encourage Members to respond by individual contacts and reminder letter (with questionnaire on WMO ftp site) from WMO – by end Feb 2011
- b. Continue and develop the analysis of returns – by Congress May 2011 as Inf Doc.
- c. Record information from survey as a database, with inclusion in the WMO Country Profile database later

1.4.2 Develop the interaction between Members CDMSs and open data exchange for integration and utilisation of climate data in interoperable systems.

- a. Continued liaison with CBS WG on WIS (*led by Bruce Bannerman- ongoing*)
- b. Validate the Discovery Data Model (Validation to Feb 2012, finalised by Nov 2012)
- c. Promote consultation via the OGC MetOceans Domain Working Group – (*everyone, continuing*).
- d. Develop an open-standards based data exchange model that allows full data provenance to be distributed with the data, particularly stations data – (*everyone, continuing*).
- e. Encourage Members to participate in the consultation and development process (Continuing, but specific information in Congress May 2011 Inf Doc).
- f. To work with the OGC to conduct annual inter-operability tests based on the data exchange model.
- g. Take into account needs of developing countries in this process. (*Alpha Barry and Steve*).

1.4.3 Review and update the Guidelines on Climate Data Management (WCDMPNo60.pdf) by CCI XVI (Feb2014?)

- a. Review of the CDMS specification document
 - I. Classify items as Required / Recommended / Optional
 - II. Initial review and comments by all by end November 2010.
 - III. Subdivision for detailed rewriting by May 2011:
 1. System architecture, system facilities, cost and maintenance guidance – (*Bruce and Anyuan*)
 2. Data digitisation and metadata management – (*Denis, Radim and Alpha*)
 3. Data management and data products – (*Rachid & Lloyd*)
 4. Compliance and training – (*Steve*)
 - IV. Consolidation – (*Steve and Denis by end of 2011*)
- b. Incorporate information on Open Data Exchange etc in Guidelines document.

1.4.4 Capacity Development activities

- a. Develop fundable projects for training and capacity development in climatology, in coordination with WMO ETR and DRA.
- b. Watch and advise on other projects with related aims

2. Conclusions and other recommendations

- The Expert Team recommended the development of fundable projects for training and capacity development in climatology and Climate Database Management systems, in coordination with WMO ETR and DRA. The Team Leader will liaise with the WMO Secretariat for the development of such projects.

- In order to take advantage of developments in Open Spatial Standards to facilitate widespread integration, exchange and utilisation of climate data via interoperable systems, ET-CDMS intends to focus on the following:

- Work with the Open Geospatial Consortium via the MetOceans Domain Working group to establish technology independent data model(s) that will allow sharing and integration of climate data from a wide range of CDMS.

- This working group will need to ensure that the data model(s) developed will allow full data provenance to be distributed with data, particularly Station Metadata for observations data.

- ET-CDMS encourage all interested WMO related parties to contribute to this work to ensure that robust Open Spatial Standards based data models are developed that adequately meet climate science needs.

- ET-CDMS also encourage interested WMO parties to work with the OGC and other interested parties to conduct annual interoperability tests to assess the viability of each year's data model representations.