

THORPEX: A WORLD WEATHER RESEARCH PROGRAMME

In response to CGMS Action 34.24

WMO WP-09 informs CGMS Members of activities and plans for THORPEX, with particular focus on major science activities related to remote sensing, activities of the THORPEX Observing Systems Working Group and the Data Assimilation and Observing Strategies Working Groups. It also underlines that THORPEX has become an official programme within the WMO AREP's Open Programme Area Group World Weather Research Programme (OPAG WWRP) and as a result its International Core Steering Committee has been restructured.

CGMS Members are invited:

- To note the report and comment as appropriate;
- To actively participate in THORPEX field programmes and become engaged in the planning and execution of those programmes;
- To participate in and support the 4th WMO Workshop on "The impact of various observing systems on numerical weather prediction", scheduled for March 2008;
- To confirm their agencies representatives for satellite issues to THORPEX (see table 1 of Annex 2) in order to ensure their active participation in THORPEX activities.

THORPEX: A WORLD WEATHER RESEARCH PROGRAMME

1. BACKGROUND

THORPEX was established in May 2003 by the Fourteenth World Meteorological Congress (Resolution 12) as a ten-year international global atmospheric research and development programme.

At CGMS-XXXII, CGMS Members were informed about the status and activities of the THORPEX and sought CGMS involvement in THORPEX. CGMS Members requested representation in observer status on the THORPEX ICSC. CGMS Members further agreed to contribute to development of the THORPEX Implementation plan in coordination with WMO Space Programme.

At CGMS-XXXIII, CGMS nominated Dr James Purdom as CGMS Rapporteur to THORPEX.

At CGMS-XXXIV, CGMS Members identified focal points within their agencies for THORPEX related satellite issues, CGMS was informed about the organizational structure within WMO and the programmes relationship to the Commission for Atmospheric Sciences (CAS) which leads the development and implementation of the programme in coordination with the WMO Commission for Basic Systems. CGMS was also informed of plans for the various THORPEX Regional Experiments and of THORPEX partnerships; it was reminded of the importance of THORPEX to satellite related activities and the need to assure their participation in THORPEX planning for future Regional Plans campaigns and experiments. CGMS-XXXIV decided Action 34.24: *“The CGMS THORPEX Rapporteur will contact CGMS Member focal points with regards to their becoming involved in THORPEX Regional Planning activities. Deadline: CGMS-35.”* (See Annex 1)

2. THORPEX ACTIVITY SINCE CGMS XXXIV

2.1. Second THORPEX International Science Symposium (STISS)

STISS took place from 4 to 8 December 2006 in Landshut, Germany. STISS focused on current advances on all fields of research aiming at the general goals of THORPEX: accelerating improvements in the accuracy of one-day to two-week high-impact weather forecasts for the benefit of society, the economy and the environment'. With contributions from the academic research community, research laboratories, operational weather prediction centres and end users of meteorological forecasts.

The five sessions of STISS were along the themes of the THORPEX working groups: 1) Predictability and Dynamic Processes (PDP); 2) Observing System (OS); 3) Data Assimilation and Observing Strategies (DAOS); 4) Societal and Economic Research and Applications (SERA); and, 5) THORPEX Interactive Grand Global Ensemble (TIGGE).

2.2 International Core Steering Committee Meeting (ICSC-6)

ICSC-6 took place in Geneva from 25 April to 27 April, 2007. THORPEX is now a fully integrated part of the World Weather Research Programme (WWRP), which is an Open Programme Area Group (OPAG) within AREP. The Societal and Economic Research and Applications (SERA) group now has a WWRP-wide role.

The THORPEX ICSC was reorganized with the removal of the current Executive Board (EB), Science Advisory Board and Technical Advisory Board whose roles subsumed in a reconstituted ICSC (see Annex 3). It was expected that the WGs would meet once a year, alternating between two modes: a) one year in association with the ICSC, which also includes the regional co-chairs, representatives from the THORPEX donor nations, and synergistic programmes (e.g. EUMETNET); and b) in alternate years with the THORPEX International Science Symposium. The TIPO will be an integral part of the WMO AREP department and managed by the Chief, WWRP.

ICSC-6 reviewed the African, Asian, European, North American and Southern Hemisphere Regional Development plans; received status reports from the THORPEX Science and Technical Advisory Boards, TIGGE, MEDEX and CGMS. It then reviewed cooperation with other programmes including WCRP, GEOSS and IPY. The reports were comprehensive and may be read in full in the report from ICSC-6 which is published as WMO/TD-No.1389, WWRP/THORPEX No. 8 and may be accessed over Internet at <http://www.wmo.int/pages/prog/arep/thorpex/documents/ICSC-6.pdf> . An abridged copy of the CGMS Rapporteur's report to ICSC-6 is included as Annex 2.

2.3 THORPEX-Pacific Regional Campaign (T-PARC)

As the THORPEX-Pacific Regional Campaign (T-PARC) is scheduled for next year it is important that CGMS Members become involved. The information below on the T-PARC was extracted directly from WMO/TD-No. 1389, referenced above. "THORPEX Pacific Asian Regional Campaign (T-PARC) is an international project among Asian, European and North American countries, aiming to answer fundamental scientific issues on i) predictability of high-impact weather events over the eastern Asian and north western Pacific region and the relationship of these events to the subsequent generation of high impact weather; ii) feasibility studies of targeting strategies and adaptive use of satellite observations; iii) data assimilation tests and impact studies of different observational platforms, including in-situ and remote sensing data; and iv) disaster mitigation strategies and evaluation of prediction performance for the societal/economical value. These scientific issues are fully covered in the THORPEX Science Plan."

T-PARC has received the approval of the WMO-ICSU Joint Committee for the International Polar Year. The WMO 15th Congress strongly supported the AREP resolution for T-PARC, noting with great satisfaction the progress of the planning for the THORPEX Pacific Asian Regional Campaign (T-PARC) and likelihood that T-PARC will make significant and unique advancements to the core goals of the THORPEX programme.

2.4 Observing Systems Working Group Meeting (OSWG-2)

The second meeting of the THORPEX Observing Systems Working Group (OSWG) took place in Louisville, Colorado, from 2 to 4 May 2007. Similar to ICSC-6, OSWG-2 reviewed the various Regional Plans and was pleased to see that they were addressing the major THORPEX science issues. OSWG-2 also received a report from the Chair of the Data Assimilation and Observing Strategy working group and noted the synergy between their activities. Among the activities of interest from the DAOS Chair report that are relevant to CGMS were:

- **Impact of observations**
 - Guidance for observation campaigns and the configuration of the Global Observing system
 - Assessment of the value of targeted observations
 - Evaluation of observation impact with different systems (A-TReC)
 - Proposed intercomparison experiment in the context of T-PARC

- **Improving the use of satellite data**
 - Observation error statistics (including correlations)
 - Use of sensitivity information to do adaptive data selection
 - Extend our use of satellite data (density, cloudy/rainy, over land)

A review of the status and plans of space agencies, both operational and R&D that are contributing to the WMO Space Programme was presented to the OSWG. Discussion of those that were relevant to THORPEX ensued. The importance of interaction between the Regional Campaigns and CGMS was discussed, and the importance of the contact points for space agencies (main points of contact to avoid confusion) that had been confirmed at CGMS 2006 was repeated.

The terms of reference for the OSWG were reviewed with some slight modifications. Among the important goals of the OSWG are: Ensure that the space-based and terrestrial (surface and airborne) observing components evolve to form an optimized integrated overall system - to their maximum potential - for THORPEX purposes, and that associated data and products are available to modelling activities, including real-time applications such as data from:

- Both research and operational satellite systems;
- Experimental airborne and in-situ systems;
- Other remote sensing systems (terrestrial).

3. SUMMARY

This report summarizes activities within the THORPEX programme and reaffirms the importance of CGMS satellite operators' active participation in both the planning and execution of that programme. This includes having active THORPEX focal points.

CGMS Members should particularly recognize the importance of THORPEX Observing Systems Working Group and continue to support its activity. Activity within the THORPEX Data Assimilation and Observing Strategy activity is particularly important to CGMS. CGMS Members should participate in and support the 4th WMO



Workshop on “The impact of various observing systems on numerical weather prediction” in Geneva, from 3 to 5 March 2008.

ANNEX 1**Email to CGMS Focal Points for THORPEX**

-----Original Message-----

From: Purdom, Jim
Sent: Monday, August 27, 2007 2:39 PM
To: tim.schmit@ssec.wisc.edu; Albert Fischer; Evangelina.Oriol-Pibernat@esa.int; Johannes Schmetz; 'Yoshishigo Shirakawa'; 'Anna Khoklova'; 'Jim Yoe'; 'Ken Holmlund'; 'Kiran Kumar'; 'Ramesh Kakar'; 'Remash Bhatia'; 'Tsuguhiko Katagi'; 'Xiaoxiang Zhu'
Cc: 'walter.dabberdt@vaisala.com'; 'Dave Parsons'
Subject: FW: [Fwd: T-PARC Planning Meeting]

Dear Colleague,

Attached is the first announcement of an up coming THORPEX planning meeting for the T-PARC experiment that is scheduled for next year. This is an important meeting in that it will be used to help in the planning of special observing strategies from various observing systems including satellite rapid scan support for T-PARC.

The planning meeting is in December in Hawaii, almost a month after CGMS meets in Florida. I would urge you to give serious consideration to attending the T-PARC meeting if your agency plans to provide special satellite support for T-PARC. I also request that you make sure your agency is in a position to report on THORPEX related activity at CGMS, including but not limited to T-PARC.

I understand that a few of you have changed responsibilities recently, and request that if you are no longer your agencies satellite issues representative to THORPEX that you forward this message to the new person that has taken over that responsibility and also that you copy me.

Thank you,

Jim Purdom

ANNEX 2

Abridged Report of the CGMS Rapporteur to INTERNATIONAL CORE STEERING COMMITTEE FOR THORPEX Sixth Session (Submitted by James F.W. Purdom)

1. CGMS-34

CGMS Members were informed of the status and activities of THORPEX. They were reminded that of particular interest to CGMS Members was that under the auspices of THORPEX, regional and global projects and experiments will be carried out to: 1) target satellite and in situ observations to design the strategy for interactive forecasting and observation, thus contributing to the evolution of the WMO Global Observing System (GOS); 2) create and evaluate systems for the assimilation of targeted observations from satellites and in situ measurements; and, 3) demonstrate societal and economic benefits of improved forecasts, by improving decision-support tools, which utilize advanced forecasting products to benefit directly social and economic sectors.

Of interest was THORPEX planning for future Regional Plans campaigns and experiments in which all satellite operators should become involved. To that end, CGMS Members identified focal points within their agencies for THORPEX related satellite issues, Table 1.

Table 1: CGMS THORPEX Focal Points and Contacts

AFFILIATION	NAME	EMAIL
CGMS Rapporteur to THORPEX ICSC	James Purdom	purdom@cira.colostate.edu
CMA/NSMC	Mr. Xiaoxiang Zhu	zhuxx@nsmc.cma.gov.cn
ESA/ESRIN	Dr. Evangelina Oriol-Pibernat	Evangelina.Oriol-Pibernat@esa.int
EUMETSAT	Dr. Johannes Schmetz Dr. Ken Holmlund	Johannes.Schmetz@eumetsat.int Kenneth.Holmlund@eumetsat.int
IMD	Dr. Remash Bhatia	rcbhatia1912@yahoo.com
IOC	Dr. Albert Fischer	a.fischer@unesco.org
ISRO	Mr. A.S. Kiran Kumar	kiran@sac.ernet.in
JAXA	Dr. Tsuguhiko Katagi	Awaiting update
JMA	Mr. Naotaka Uekiyo	uekiyo@met.kishou.go.jp
NASA	Dr. Ramesh Kakar	Ramesh.Kakar@hq.nasa.gov
NESDIS:	Dr. Jim Yoe Dr. Tim Schmit	James.G.Yoe@noaa.gov tim.schmit@ssec.wisc.edu
Russian Fed.	Ms. Anna Khoklova	anna_x@meteo.ru
WMO Space Programme	Dr. Donald Hinsman Mr. Jerome Lafeuille	DHinsman@wmo.int JLafeuille@wmo.int
KMA	To be designated	

2. Plans of CGMS Members to support THORPEX Field Campaigns

ETRec2007

EUMETSAT plans were presented.

TPARC

JMA and NESDIS plans were presented.

OTHER activity with METOP

Special activity with respect to METOP Cal/Val activities was presented

3. Satellites available to support THORPEX and related experiments

(Provided as an attachment)

4. Further information on current satellite related plans and activities

Satellite Operators – Details on satellite operator current operations and future plans may be obtained from the WMO web site by accessing the WMO Space Programme. They may also be obtained from individual satellite operator web sites.

WMO ET-Space Newsletter: An informal newsletter is normally issued twice a year for the attention of the CBS OPAG-IOE Expert Team on Satellite Systems and Expert Team on Satellite Utilization and Products. To subscribe to the news letter, contact the WMO Space Programme (Table 1). The news letter contains information on current activity within the WMOSP, as well as information on satellite launch activity,

5. Future activities of the CGMS Rapporteur to THORPEX

The CGMS THORPEX Rapporteur will contact the focal points with regards to their becoming involved in THORPEX Regional Planning activities pending results from the THORPEX ICSC-6 Meeting (April 25-27, 2007), the Second Meeting of the THORPEX Observing Systems Working Group (May 2-4, 2007) and WMO CG-XV (May 6-25, 2007).

ANNEX 3

CAS International Core Steering Committee for THORPEX (ICSC)

(as agreed at the Sixth Session of the ICSC)

1. There shall be five ICSC Executive Committee members comprising the Chair, an Independent Scientist (to act as ex-officio member of WWRP/JSC), an Independent Technical expert, a Trust Fund advisor, and the Chief of the WWRP (C/WWRP). The current members of the Executive Committee are:

Dr David Burridge (c/o WMO), Chair

Dr Huw Davies, (ETH Zurich), Science expert (Ex-Officio Member of the WWRP/JSC)

Dr Walter Zwiefelhofer, (ECMWF), Technical expert

Dr Richard D. Rosen (USA/NOAA), Trust Fund Advisor

TBD (WMO), C/WWRP

2. Members include representatives of Nations (France, Korea, Russia, South Africa, Morocco, Japan, Australia, UK, USA, Germany, India, Norway, China)

Representatives of International Organizations

Dr Lars Prahm, EUMETSAT

Dr Jochen Dibbern, EUMETNET

Dr Philippe Bougeault, ECMWF

Dr Gilbert Brunet, Chair of the WWRP/JSC

Dr Martin Miller, Chair of the WGNE

Dr Jim Purdom, CGMS

Professor Geerd Hoffmann, CBS

Professor Jagadish Shukla, WCRP/JSC

Independent senior scientists and technical experts

Dr John Eyre, UKMO

TBD

TBD

One Representative from each of the THORPEX Working Groups

Co-Chairs of the THORPEX Regional Committees

The Director of AREP