



North American THORPEX Update - Summer 2006

Note the upcoming THORPEX science meetings and/or scientific sessions of national interest with submission deadlines (see the THORPEX North American (<http://www.ucar.edu/na-thorpex>) and International web sites for information on these and other upcoming meetings):

- The 2nd THORPEX International Science Symposium will be held in Landshut, Germany (4-8 December 2006). The deadline for submission is 14 July 2006.
- THORPEX sessions are planned at the 13th Cyclone Workshop (22-27 October 2006; Monterey, CA). The deadline for submission is 1 August 2006.
- We will convene a THORPEX session on processes over the tropical western Pacific and Indian Oceans and their impact on downstream weather and global circulations during the Annual Meeting of the American Meteorological Society (AMS). The submission date is 1 August. Please see: <http://www.ametsoc.org/meet/ann/callforpapers.html#annual> and scroll down to the 2007 Annual Meeting and look for the AMS Forum: Climate Variations and Change Manifested by Changes in Weather. The THORPEX Special Session is listed as item 5 under the Forums' Call for Papers.

THORPEX is moving ahead with plans on TIGGE (the THORPEX Interactive Grand Global Ensemble) and North America has made progress with NAEFS (North American Ensemble Forecast System).

- At the most basic level, the goal of TIGGE is to provide access by the research community to all the ensemble members of the forecasts produced by the world's operational forecast centers. Forecast centers are also encouraged to provide their deterministic forecast along with the ensemble members. One very appealing aspect of TIGGE is that the data sets will include some derived-diagnostic fields (PV, CAPE, etc.) in addition to the routinely saved parameters. These data sets will be useful for a range of research activities from designing future ensemble approaches to basic research on predictability and societal impacts.

- The National Center for Atmospheric Research has agreed to be a data archive, access and meta data center for TIGGE. Data transfers and access of the full ensemble data sets from two centers have already been established. The other proposed archive centers are the European Centre for Medium- Range Weather Forecasts and the Chinese Meteorological Administration. Plans are moving forward to secure the participation of the major global numerical prediction centers including those in North America as data providers. Further information on the design and status of TIGGE can be found at <http://tigge.ecmwf.int/>
- An operational “parallel” TIGGE that has already begun to produce experimental forecast products based on a multi-model, multi-national ensemble forecast system is the North American Ensemble Forecast System (NAEFS). This ensemble system is run jointly by the Meteorological Service of Canada and the U.S. National Weather Service’s National Centers for Environmental Prediction. NAEFS combines the global ensemble forecast systems of the two nations and will provide numerical weather prediction products out to week 2 for the weather services of Canada, Mexico and the US. The intention is for NAEFS to officially begin forecasts this fall and to make the data available to the research community. Further information on NAEFS can be found at <http://www.emc.ncep.noaa.gov/gmb/ens/NAEFS.html>.

The THORPEX Pacific Asian Regional Campaign (T-PARC) is a major international research campaign proposed for May through December 2008. The overarching goal of this campaign is to improve understanding and predictions of: i) high-impact weather affecting East Asia and the western Pacific, particularly typhoons and heavy rainfall events; ii) those high-impact weather events over North America and other “downstream” locations that have their dynamical roots and/or forecast errors in events over the East Asian-Western Pacific region.

- A preliminary science plan, experimental design document and brief statements of research interest from participants in Asia, North American, and Europe can be found at <http://www.ucar.edu/na-thorpex/PARC.html> . These documents were used in the process to apply for observational facilities sponsored by the National Science Foundation in the US. These facilities include the instrumented HIAPER and P-3 aircraft plus driftsonde. These documents will also be used as the basis for a final T-PARC Science and Experimental Design document. There will be a PARC Planning Workshop later this fall.
- Some aspects of this international campaign are already funded; other aspects are in various stages of the proposal process. Investigators in North America that would like to learn more information on T-PARC should contact David Parsons (US – parsons@ucar.edu), Pierre Gauthier (Canada -- Pierre.gauthier@ec.gc.ca) and Ricardo Prieto González (Mexico -- rprieto@tlaloc.imta.mx). In particular, US investigators from the academic research community should be aware that there is likely to be a deadline this summer on T-PARC related proposals.

Within the THORPEX program, considerable interest has been focused on how THORPEX should collaborate with the climate community on topics of mutual interest. One potential research area is on topics related to tropical convection, the Madden-Julian Oscillation and the influence of tropical convection on middle latitude processes. Developments include:

- THORPEX and the World Climate Research Program collaborated on an international workshop on Organization and Maintenance of Tropical Convection and the Madden Julian Oscillation. This workshop took place in Trieste, Italy on the 13-17 March 2006 and was hosted by the International Center for Theoretical Physics. A meeting report was produced by Julia Slingo, Franco Molteni, Mitch Moncrieff and Melvyn Shapiro and contains specific recommendations on setting future priorities. The report is posted at <http://www.ucar.edu/na-thorpex>.
- A small focused retreat on the related subject of tropical convection and two-way scale interaction is planned to take place during the 10-14th of July 2006 at NCAR. This retreat is intended to begin the process of defining a contribution to this research area by the US academic community and the role played by NCAR and its strategic partners.

The 3rd meeting of the North American THORPEX Regional Committee was held in Montreal on the 23rd and 24th of May 2006. It was hosted by the Atmospheric Science and Technology Research Branch of the Meteorological Service of Canada. The goal of the meeting was to exchange information on the international program and national priorities with the intent of developing a regional plan as requested by the International Core Steering Committee. The nations represented were Canada, Mexico and the United States. The presentations, meeting summary and action items are located on the web site of the North American Regional Committee at <http://www.ucar.edu/na-thorpex>.

- Proposed potential areas for North American collaboration are: i) Pacific predictability, including the proposed T-PARC experiment in 2008; ii) Tropical convection and tropical-extratropical interaction; iii) General effort on prediction including: Collaboration between the operational and research communities; use of TIGGE and NAEFS by the academic research community; access of academic community to satellite data sets; iv) Societal and Economics Research and Applications activities including capacity building among the nations of the region; v) Canada will also likely have a major funded effort under the THORPEX cluster for the International Polar Year, which will include some US collaboration.
- The current make-up of the committee is four to five members from each of the three participating nations and two co-chairs. The regional committee will work to expand to secure the participation of other nations within the Caribbean and Central American regions. This may require a change in the committee structure.
- Timelines were established to produce or refine national THORPEX plans that feed into a new North American Regional Plan as follows: The North American Regional Plan will: i) highlight major efforts and focus areas of the nations of the region, ii) areas for collaboration between the nations of the region, and iii) describe the links with the international program. The agreed upon time-lines are: i) Completed national plans by 1 September prior to the completion of the regional plans so that national priorities can “lead” the regional process; ii) Polished 1st draft of regional science and implementation plans by 1 October by working on areas of regional collaboration in parallel with the national planning effort; iii) Vetting of the regional plans at the 2nd Science Symposium in December through a presentation at the 2nd Science Symposium and an open meeting of available North American participants; iv) Completion of the final regional plan by 1 February 2007 to be submitted for approval at the March 2007 meeting of THORPEX management. For input to the regional planning process or for more information contact David Parsons (Regional Co-chair from the US – parsons@ucar.edu), Pierre Gauthier (Regional Co-chair from Canada -- Pierre.gauthier@ec.gc.ca) and Ricardo Prieto González (Mexico National Coordinator-- rprieto@tlaloc.imta.mx). Further information on the national planning process is discussed in the next section.

Mexico recently joined the THORPEX effort and is now represented on the regional committee. National committees are being established for Canada, Mexico and the United States. These committees are working to establish national priorities for their participation within the framework of the international program and will be producing science plans over the summer. For further details see the national presentations at the regional meeting (<http://www.ucar.edu/na-thorpex>) or contact the following national co-ordinators or designated co-chairs: Canada – Pierre Gauthier, Pierre.Gauthier@ec.gc.ca; Mexico — Ricardo Prieto González, rprieto@tlaloc.imta.mx; US – Jim Hansen, jhansen@mit.edu.

- Mexico has established a National THORPEX Science Committee consisting of Dr. Valentina Davydova Belitskaya (Mexican Weather Service), Tte. Juan M. Caballero González (Mexican Navy), Lic. Jorge Luis Vázquez Aguirre (Agroasemex) and Dr. René Lobato Sánchez, M. Sc. Fernando Oropeze Rosales, Dr. Martín Montero Martínez, and Dr. Ricardo Prieto González (National Coordinator) all of the Mexican Institute for the Technology of Water. In terms of THORPEX priorities, high-impact weather of Mexico includes tropical cyclones and waves, heat waves and droughts, cold northerly fronts, the North American monsoon and air pollution.
- Within the US, the primary agencies that support weather research have formed a US THORPEX Executive Committee. Among its activities, this committee seeks to co-ordinate federally funded THORPEX activities in the US, has final approval of any national THORPEX Science and Implementation plan and oversees the activities of the US Science Committees and the US Project Office. The committee is chaired by Rick Rosen (National Oceanic and Atmospheric Administration) with the following committee members: Ramesh Kakar (National Aeronautics and Space Administration), Pamela Stephens (National Science Foundation), Steve Tracton (Office of Naval Research), and Louis Uccellini (National Oceanic and Atmospheric Administration). The committee has met twice and will meet quarterly. Their early actions include the establishment of a US Project Office (David Parsons and Pamela Johnson at NCAR) and a Science Steering Committee (discussed below).
- A US THORPEX Science Steering Committee (USTSSC) has been formed. The members are Jim Hansen (Co-chair and currently at Mass Institute of Technology), Lance Bosart (Co-chair, State University of NY at Albany), Walt Dabberdt (Vaisala Group), Jenni Evans (Penn. State University), Eve Grunfest (U Colorado at Colorado Springs), William Lau (NASA Goddard), Carolyn Reynolds (Naval Research Lab.), Chris Snyder (National Center for Atmospheric Research), Zoltan Toth (NOAA/National Centers for Environmental Prediction), and Xiaolei Zou (Florida State University). Preliminary thoughts on Science are: i) Clear support for the science outlined in the International Science Plan (MJO, tropical convection, Rossby waves, TCs, ET, regimes, predictability, observability, etc.) and for T-PARC (THORPEX Pacific Asian Regional Campaign); ii) The USTSSC will actively work to define a tight US science focus, iii) Societal and Economic Research and Applications will be a strength; iv) Strongly leverage graduate student education. Jim Hansen is working to convene a meeting of the US committee and leading the effort to produce the next draft of a US THORPEX Plan.
- Canada is in the process of reconstituting its national science committee. Canada was represented at the North American Regional THORPEX Committee by Gilbert Brunet, Pierre Gauthier, Peter Houtenkamer, and Ayrton Zadra (all of the Meteorological Service of Canada) and Brian Mills, Member, Adaptation and Impacts Research Division of Environment Canada. The high impact weather in Canada includes: i) Snow storms and freezing rain in winter; ii) Strong winds in coastal

areas and in association with extra-tropical transitions on the East Coast of Canada; iii) Heavy rainfall, mudslides, flash floods and graupel; iv) Drought in the Prairies. The focal areas to date have included assessing the impact of adaptive observations, predictability and ensemble forecasting research, and numerical modeling of the MJO and tropical convection. Canada plans participation in T-PARC and the preparation phase, studies on the impact of surface fluxes on cyclogenesis forecasting and the International Polar Year with the THORPEX Arctic Weather and Environmental Prediction Initiative (TAWPEI).

THORPEX in many ways represents the first major effort to improve global numerical weather prediction since the landmark GARP (Global Atmospheric Research Program) took place in the late 1960s and 1970s. Much like THORPEX, the start of GARP took several years to move from the conception of the ideas to the start of major research efforts. One major accomplishment has been the bringing together of the research and operational communities and agreement to have 5-6 core research objectives. Still THORPEX is reaching some important early milestones, in addition to previously discussed, including:

- The research on the data sets produced by the Atlantic THORPEX Regional Campaign (A-TReC) are beginning to appear in print showing the promise and limitations of the current strategies of utilizing adaptive measurements. For example, watch for an upcoming paper on Issues in Targeted Observing by Rolf Langland in the Quart. J. Roy Meteor. Soc. Other research on this campaign is still ongoing; such as very promising forecast improvements realized from the assimilation of A-TReC Doppler lidar observations by Carla Cardinali (ECMWF) and Martin Weissmann (DLR)
- While TIGGE, and its operational “relative” NAEFS, are moving ahead on providing ensemble data sets to the academic research community, THORPEX funded researchers have been focusing on various aspects of ensemble data assimilation. Examples of research from the US and Canadian investigators were presented at the NOAA THORPEX PI Workshop in January 2006 and can be found at <http://www.emc.ncep.noaa.gov/gmb/ens/THORPEX/PI-shop-2006.html>
- Driftsonde will be demonstrated during the 2006 hurricane season during the AMMA (African Multidisciplinary Monsoon Array) campaign with eight French stratospheric balloons from the French Space Agency (CNES -- Centre National d'Etudes Spatiales) being launched from Niger carrying gondolas designed by NCAR. Each gondola will hold 40 dropsondes capable of being launched on command. Based on trajectories from previous years, the balloons will cross Africa and then the tropical Atlantic in about 10-15 days. This unique data set will be used to investigate hurricane genesis, the model vs. observed evolution of Saharan air mass, interactions between easterly waves and convection, and the forecast impacts of additional data.
- The THORPEX organization (Science Advisory Boards, Working Groups, Executive Boards) has been populated with a group of talented individuals from the operational and research community around the world (see http://www.wmo.int/thorpex/implementation_phase.html) In particular, we are very fortunate to have David Burridge (former Director of ECMWF) serving as the Director of the International Project Office (IPO) with the assistance of Jim Caughey (the former lead of the EUCOS effort). During the early stages of the Project Office, they were assisted by Xueghu Feng, who has just returned to a position in the Chinese Academy of Meteorology. David Burridge, the IPO staff and members of the WMO (especially Elena Manaenkova, Former Director of the WMO Atmospheric Research and Environmental Program) has helped to form productive links to major efforts such as Global Earth Observing System of Systems and the World Climate Research Program.
- Finally, we invite you to explore the web sites of the International Program

(<http://www.wmo.int/thorpex>) and the North American Regional (<http://www.ucar.edu/na-thorpex>) to find more information on the program. Presentations from many of the meetings, most relevant to the meetings, are on the North American web site. In addition, the Predictability and Dynamical Processes Working Group under the leadership of the co-chairs (Istvan Szunyogh, U of Maryland and Heini Wernli – U of Maine) has set up emailing lists for discussion groups. These discussions are in the process of being archived on the North American web site. You will need to join the mailing lists and then access the archives of the exchanges.