WORLD METEOROLOGICAL ORGANIZATION
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COMMISSION FOR ATMOSPHERIC SCIENCES

INTERNATIONAL CORE STEERING COMMITTEE FOR THORPEX

FIRST SESSION

FINAL REPORT

OSLO, NORWAY, 15 - 16 OCTOBER 2002

GENERAL SUMMARY OF THE WORK OF THE SESSION

THORPEX - A Global Atmospheric Research Programme

The Observing-system Research and Predictability Experiment (THORPEX) is a decade-long international research programme under the auspices of the Commission of the Atmospheric Sciences of the World Meteorological Organization (WMO), and its World Weather Research Programme. THORPEX aims at accelerating improvements in short-range (up to 3 days), medium-range (3 to 7 days) and extended-range (week two) weather predictions and the societal value of advanced forecasting products. THORPEX will examine predictability in the light of modern and flexible observation possibilities. The weather events to be considered include weather systems of mid-latitude, arctic or tropical origin; are primarily synoptic-scale; and often contain significant embedded mesoscale features.

1. The first session of the THORPEX ICSC was held in Oslo, Norway, on the 15th and 16th October 2002. Nominated representatives from Canada, China, Germany, India, Japan, Korea, Russian Federation, South Africa, United Kingdom and United States of America attended the session. The representatives of Australia and France were unable to attend. The Chairman of the International Science Steering Committee (ISSC) of the World Weather Research Programme (WWRP) and the Co-chairs of the International Science Steering Committee of THORPEX were also present, as well as a representative of the WMO Secretariat. The session was chaired by Anton Eliassen, President of the Commission of Atmospheric Sciences. The attendance list is given in Annex II.

2. The Permanent Representative of Norway with WMO welcomed the participants to the modest premises of the Norwegian Meteorological Institute.

3. The Chairman of the ISSC of the WWRP, Rit Carbone, outlined the role of THORPEX as a programme under the WWRP. He stressed the long-term goal of reliable and specific forecasts of high impact weather, and the importance of involving the research communities at the universities in the underpinning of THORPEX. He also informed the meeting that the first sponsor of THORPEX research had already been found, and suggested that sponsorship of THORPEX research should be pursued further.

4. The representative of the United States on the ICSC, David Rogers, gave some background for the establishment of the committee. The initiative was taken by the United States at the recent session of CAS in Oslo in February 2002. Dr Rogers underlined that for THORPEX to succeed, the operational weather forecasting communities and their research and development partners need to provide guidance to the THORPEX ISSC. He anticipated that the ICSC would provide this guidance. He also reminded the committee of the proposal to set up a THORPEX programme office.

5. The co-chairs of the ISSC for THORPEX, Melvyn A. Shapiro and Alan J. Thorpe, gave an overview of the present status of the plans for THORPEX. As a basis for this presentation they provided a comprehensive programme overview document from September 2002 as well as a status report. Both are annexed to this report.

6. Each of the attending members of the ICSC gave an overview of THORPEX-related activities carried out by institutions in their countries. All expressed a commitment to participate in THORPEX. The French member of ICSC, Philippe Bougeault, could not be present at the meeting but had sent an e-mail in which the support of Meteofrance to THORPEX was confirmed.

The member from the UK, Jim Caughey, also gave an overview of EUCOS, a European programme for a composite observing system (EUCOS is a core programme under the auspices of EUMETNET, a network of 18 European NMHSs organizing cooperative programmes. The responsible EUMETNET member for EUCOS is the Meteorological Office in the UK). All presentations given are available on a CD which is distributed to the participants.

7. In the ensuing discussion questions of scale and of scientific focus were raised.

The representative of India, S.V. Singh, was concerned that the focus of THORPEX seemed to be more on the mid-latitudes than on the tropics.

The representative of South Africa, Gerhard Schultze, stressed the sparsity of observations in the Southern hemisphere and the necessity to assess the meteorological value of existing observations at remote locations. These were resource-demanding to maintain.

Some of the national THORPEX-related activities were carried out on a finer scale than the scales highlighted in the Programme overview document. This difficulty was solved by coordinating the national activities in regional THORPEX Observing System Tests (TOSTs), see below. Naturally, this coordination will be voluntary.

The discussion on scientific focus revealed a general agreement on the importance of keeping THORPEX a focused programme. As far as possible, this is taken on board in the decisions given below.

8. Draft terms of reference for the THORPEX ICSC were presented by the US representative David Rogers. These were developed further by the Committee, see below.

9. Decisions:

The first session of the THORPEX ICSC:

9.1 Fully endorsed the rationale and basic ideas behind THORPEX. In particular the committee noted that forecasting errors often are due to initial condition errors in dynamically active data-sparse regions. It agreed that the new concept of “targeting” should be exploited to address this issue, as outlined in the Programme Overview. “Targeting” in this context, means the identification of those regions in which observation would maximally improve the skill of a weather forecast. The committee agreed that one basic strategy for THORPEX will be to develop “targeted” observing methods that incorporate dynamical information and properties of the data assimilation system, including the ad joint of data assimilation procedures and emsemble-based Kalman-filters.

9.2 Took note of the THORPEX Status Report by the co-chairs of the THORPEX ISSC.

9.3 Approved the Programme Overview of September 2002.

9.4 Asked the ISSC, on this basis, to complete a **Science Plan** for THORPEX. The science plan should contain objectives that can be attained within a time frame of 5 to 10 years. The science plan should address:

Observing systems: Potential for improvements of observing systems and demonstration of the capacity of a number of new platforms, especially space lidar, in situ aircraft observations, driftsondes, etc.)

Forecast system: Interaction between data-assimilation and observing strategies.

Predictability: Understanding its limitations and the most efficient ways to improve it in practice.

Societal and economic impact assessment: Quantification of the costs and effects of high impact weather, evaluation of the use of forecasts, development of verification measures.

These issues should be pursued, *inter alia*, by carrying out THORPEX Observing System Tests (TOSTs). The committee supported the plans for four TOSTs: A European North Atlantic Experiment, A North American Experiment, An Asian Experiment and A Tropical Experiment, as described in the programme overview. The committee also supported the plans for a global TOST, to emerge from the experience of the regional TOSTs.

Eventually the Science Plan should be supported by a detailed **Implementation Plan**, which identifies what is being done by whom, when, and for which resources within what organization.

9.5 Noted with gratitude that the Asian members of the ICSC (China, Japan, Korea, India and Russian Federation) agreed to plan an Asiatic TOST experiment together, thus extending the time and spatial scales of interest to include medium-range and regional/global.

9.6 Agreed that a close cooperation between EUCOS and THORPEX was essential in developing the European North Atlantic TOST.

9.7 Decided to set up a THORPEX **programme office** in Geneva, with the understanding that this office would have to be jointly financed by the THORPEX participants.

9.8 Decided to continue to seek sponsorship for THORPEX.

9.9 Invited India to name a representative to the ISSC.

9.10 Approved its terms of reference, given in Annex I.

9.11 Elected Dr Michel Béland, Canada, as its first chair.

9.12 Decided that the name of the programme be THORPEX - A Global Atmospheric Research Programme.

10. The ICSC thanked the president of CAS for chairing its first session, and the Permanent Representative of Norway for hosting the session.

ANNEX I

W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N
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COMMISSION FOR ATMOSPHERIC SCIENCES

INTERNATIONAL CORE STEERING COMMITTEE
FOR THORPEX: A GLOBAL ATMOSPHERIC RESEARCH PROGRAMME

Terms of Reference

PURPOSE

The International Core Steering Committee (ICSC) is responsible for the delivery of THORPEX to the Commission for Atmospheric Sciences (CAS). The ICSC will set THORPEX research priorities based upon recommendations from the International Scientific Steering Committee (ISSC), the CAS Science Steering Committee for the World Weather Research Programme (SSC/WWRP) and the CAS/JSC Working Group for Numerical Experimentation (WGNE). The ICSC shall report to the President of the CAS.

Specifically, the ICSC will

1. Provide the regional and national priorities with respect to the THORPEX subprograms, namely
   - ?? Observing System Development and Evaluation
   - ?? Data Assimilation and Observing Strategies
   - ?? Predictability and Dynamical/Physical Processes
   - ?? Social and Economic Impact Assessment
2. Provide guidance to the NMHSs on the timely transition of THORPEX research & development to operations;
3. Identify and mobilise national and international resources, financial, technical and human, to support THORPEX activities;
4. Coordinate THORPEX activities to provide the maximum benefit to all WMO members;
5. Approve the Science plan developed by the ISSC;
6. Approve the annual budget for THORPEX Trust Fund;
7. The ICSC shall meet at least once each year;
8. The ICSC shall be self-funding;

MEMBERSHIP

1. Membership shall be open to all WMO members contributing to THORPEX and under the authority of the CAS of the WMO.
2. The ICSC shall elect a chair, who shall serve for two (2) years.

EX-OFFICIO MEMBERS

1. Chair of the SSC/WWRP
2. Chair of the WGNE
3. Co-chairs of the ISSC
4. Chairs of Regional THORPEX Committees
5. Director of the WMO Atmospheric Research and Environment Programme (AREP)
6. Representative of the WMO Commission for Basic Systems (CBS)

ANNEX II

CAS INTERNATIONAL CORE STEERING COMMITTEE FOR THORPEX
FIRST SESSION

OSLO, NORWAY
15-16 October 2002

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