1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

The thirteenth International TOVS Study Conference, ITSC-XIII, was held in Sainte Adèle, Québec, Canada from 29 October - 4 November 2003 and marked the milestone of 25 years of TOVS data starting with the launch of TIROS-N in October 1978. Around one hundred and thirty participants attended the Conference and provided scientific contributions. Twenty countries, and two international organizations were represented: Australia, Austria, Canada, China, Denmark, France, Germany, Hungary, India, Italy, Japan, Mexico, New Zealand, Norway, Poland, Russia, Sweden, Taiwan, the United Kingdom, the United States of America, ECMWF and EUMETSAT. This was the largest conference to date in terms of number of presentations and posters.

Most of the meeting was occupied with scientific presentations on a range of issues which included:

- Operational use of ATOVS
- New applications for NWP
- Instrument studies
- Radiative transfer and surface modelling
- Retrieval of atmospheric, surface and cloud parameters
- Use of ATOVS for climate studies
- Future systems and processing

There were 90 oral and 58 poster presentations during the conference. The programme for ITSC-XIII can be found starting on page 53.

Working Groups were formed to consider six key areas for the International TOVS Working Group (ITWG): Radiative Transfer and Surface Property Modelling; Use of TOVS and ATOVS in Numerical Weather Prediction; Use of TOVS and ATOVS for Climate Studies; Advanced Sounders; International Issues and Future Systems; and Satellite Sounder Science and Products. The Working Groups reviewed recent progress in these areas, made recommendations on key areas of concern and identified items for action. Working Group reviews and recommendations comprise Section 2 of this report but the key points arising from the conference are listed below.

During the Conference, a session on Status Reports considered summaries of activities that had taken place since ITSC-XII. It also reviewed progress on the Action Items identified by the ITSC-XII Working Groups. Many of these items formed the basis for further discussion by Working Groups at ITSC-XIII. Several technical sub-groups met during ITSC-XIII to discuss frequency protection and developments and plans concerning specific software packages, shared and in common use at TOVS, ATOVS and Advanced Sounder processing centres. Brief reports on these sub-group meetings are recorded in Section 3. The conference also recognised the achievements of one of the pioneers of satellite sounder science, Dave Wark, who died on 30 July 2002 and was a long term supporter of these conferences.

1.2 SUMMARY OF MAJOR CONCLUSIONS

Overall, the meeting documented significant gains in many areas and noted areas for future activity. In particular, it noted that:

1. Recent observing system experiments have shown that the impact on medium range weather forecasts from using ATOVS data in NWP now exceeds that from the radiosonde network. The AMSU data contribute most of the impact.

2. The impact of 3 ATOVS platforms with different equator crossing times was shown to improve on

the current baseline 2 polar orbiter system. As a result ITWG reaffirms the requirement for both the 0530LT and 1330LT NPOESS platforms to include both CrIS and ATMS measurements.

3. In a recent review for the ITWG it was noted that many NWP centres are now using level 1b ATOVS radiances in their variational assimilation systems but a significant number of centres still use the level 2 retrievals.

4. NWP centres have agreed to increase their co-ordination in exchanging their ATOVS monitoring results in order to identify instrument anomalies as quickly as possible.

5. The timeliness requirements for global ATOVS datasets needs to be reviewed as NWP models are now reducing their data cut-off times to well below three hours. It was suggested that the WMO re-examine the timeliness criteria for NWP in light of NWP centres changing their data timeliness requirements. Satellite agencies should also continue to strive to reduce the time delays of the global data.

6. The EUMETSAT ATOVS Retransmission Services (EARS) now covers a significant part of the Northern Hemisphere and provides ATOVS level 1c radiances within 30 minutes of measurement time. Plans are well advanced to use these data for both regional and global NWP. Satellite agencies should consider this option for future polar orbiters particularly if delays are likely to be greater than 60 minutes for the global datasets.

7. NWP centres are now beginning to see beneficial impacts in the assimilation of ATOVS data in local area models, although it is still in the early stages and significant development is necessary to increase the impacts.

8. More centres are now assimilating the microwave humidity sounding data from AMSU-B with positive impacts particularly on the moisture fields and precipitation.

9. Since ITSC-XII a high spectral resolution sounder workshop was held at the University of Wisconsin-Madison in May 2003 to allow a more detailed presentation of scientific issues related to advanced sounders. These workshops can educate and train young scientists entering the field. It is planned to hold another workshop before ITSC-XIV.

10. There is now a significant effort to demonstrate the impact of advanced infrared sounder data in NWP using the AIRS near real-time datasets available from NESDIS. One centre is already using the data operationally.

11. Only a small fraction of the full AIRS dataset is currently being assimilated in NWP model experiments and research is underway to exploit more of the data both spectrally, spatially, over land and cloud to increase the impacts in NWP models.

12. The community software packages for processing locally received ATOVS data continue to be developed. In particular preparations for processing the new datasets to be received from NOAA-N (i.e., HIRS-4 and MHS) are underway. The free distribution of ATOVS processing software has been essential in the use of ATOVS data by the meteorological community.

13. Community software for processing Aqua AIRS, AMSU-A, HSB and MODIS locally received data is now available. AMSR-E processing capability will be added soon. Equivalent software needs to be developed for the NPOESS direct readout data.

14. The AIRS advanced sounder data have proven to be stable and accurately calibrated and so is an excellent dataset for validating radiative transfer model simulations.

15. The intercomparison of radiative transfer calculations continues to be coordinated by the group and an effort to compare radiative transfer models for AIRS is underway.

16. Several presentations demonstrated the feasibility of including the effects of both cloud and precipitation in radiative transfer models, preparing the way for assimilation of cloud and rain affected radiances.

17. The retrieval of land surface infrared emissivity for advanced sounder channels is an area where research has expanded and is showing promise.

18. The retrieval of mid-tropospheric CO_2 over the tropics using both HIRS and AIRS data has been demonstrated and validated with aircraft data.

19. There was an increased involvement of the climate monitoring community in this conference with presentations on the HIRS-12 water vapour and MSU temperature records. The group was informed of the NOAA White Paper which proposes to co-ordinate a reprocessing of satellite data including the TOVS 25 year dataset. The group broadly supported this initiative.

20. Plans were presented to provide a continuous monitoring of operational polar orbiting satellites and radiosondes through a carefully defined network of radiosonde reference stations with balloon launches coincident with satellite overpass times. Additionally a sensor for satellite inter-calibration in a medium earth orbit was proposed. Such transfer standards need to be established to reduce the uncertainties in the satellite data for climate monitoring applications.

21. The ITWG were informed of the discrepancies between the various MSU climate records and invited to help resolve the differences.

22. The ITWG will support the satellite frequency co-ordination group meeting, SFCG-24, in September 2004 in Lannion, France.

23. The ITWG noted the use of the 23.6-24.0 GHz band for atmospheric sounding is under threat by proposed automobile collision avoidance radars.

24. The ITWG will gather information on education and training activities of its members, including the satellite operators and NWP centres, and provide this information on its Web site. It will also seek to connect members to the WMO co-ordinated efforts in education and training to utilise resources globally.

25. The ITWG reaffirmed the need to maintain a robust system in both AM and PM orbits optimally spaced to maximise the coverage both for NWP and climate monitoring applications.

26. Access to documents describing NPOESS/NPP ground processing and raw data and sensor data records (content and format) needs to be established to allow review by members of the group.

1.3 FUTURE PLANS

ITWG will continue its ongoing activities of informing the ATOVS community of new developments through its Web site maintained by the University of Wisconsin and the email list server maintained by WMO. In particular more information suitable for training will be incorporated on to the Web site. A workshop on high spectral resolution sounders is planned to take place in Europe during 2004. The AIRS radiative transfer model intercomparison sponsored by ITWG will be completed in 2004. The links with international bodies such as WMO and CGMS will be maintained and a report of this meeting will be made to CGMS by our rapporteur, Paul Menzel.

In addition to this report a proceedings for ITSC-XIII from the papers submitted will be provided to attendees on CD-ROM. The oral and poster presentations from ITSC-XIII are already available as pdf files which can be downloaded from the ITWG Web site. The next meeting of the ITWG is planned for Spring 2005. Topics of interest may include further exploitation of advanced IR sounder data, plans for use of METOP data and status of climate datasets derived from (A)TOVS.

ACTIONS AND RECOMMENDATIONS

WORKING GROUP ON RADIATIVE TRANSFER AND SURFACE PROPERTY MODELING

2.1.1 Atmospheric profile datasets for Radiative Transfer

Action

Roger Saunders to post profile interpolation code on ITWG-RTWG Web page.

Action

Roger Saunders to put trace gas profiles on ITWG-RTWG Web site.

2.1.2 Instrument characteristics required for RT modeling

Action

Tom Kleespies to inform ITWG before NOAA-N launch.

Action

Tom Kleespies to provide SSMIS channel characteristics.

Action

Tom Kleespies to obtain and provide WINDSAT measured channel responses.

2.1.3 Line by Line (LbL) model status

Recommendation

Infrared line by line models can now be validated using AIRS data with collocated profiles for a wide range of atmospheric situations. Model developers should be encouraged to update their models and/or spectroscopic databases in the light of this new dataset.

2.1.4 Assessment of spectroscopic databases

Action

Nicole Jacquinet-Husson to send Roger Saunders copy of ‘road map’ document for distribution to the group.

Action

All members of the group to send information on validation datasets to RTWG Co-Chairs for posting on the ITWG-RTWG Web site on a new validation page.

2.1.5 Fast RT models

Action

Tom Kleespies and Roger Saunders to collect notes on this topic and post a summary on the ITWG-RTWG Web site.

2.1.6 AIRS RT model comparison

Recommendation

All AIRS RT modellers should be encouraged to participate in the AIRS RT model comparison to assist in the estimation of forward model error covariances.

Action

Roger Saunders to obtain profiles and AIRS data from Larrabee Strow and provide to modellers.

2.1.8 Review of group Web page

Action

Co-Chairs to update Web pages and ITWG-RTWG to propose additions and improvements.

WORKING GROUP ON TOVS/ATOVS DATA IN CLIMATE

2.2.1 Introduction

Recommendation

We recommend that ITWG broadly supports the white paper.

Action

The NOAA NESDIS white paper is available on the ITWG Web site. All members of the Climate Working Group (and other interested parties) should provide feedback and comments on the white paper to Mitch Goldberg and John Bates.

Action

Mitch Goldberg and John Bates to provide summary of responses and report back via the ITWG email list.

2.2.3 Issues related to long-term homogeneity

Action

Tony Reale to pursue SUAN funding and agreement through relevant bodies (NOAA, NASA, WMO, GCOS etc.). This needs to be effectively targeted which will require research and further collaboration with interested parties before being presented.

Recommendation

ITWG encourages an inter-calibration sensor to be considered for the first medium earth orbit evaluation payload.

Recommendation

ITWG should promote the GCOS observing principles to satellite agencies.

Recommendation

When changing instrumentation satellite agencies should try and ensure that the new sensor has backward compatibility to ensure long-term climate monitoring can continue.

Recommendation

ITWG members should help to resolve the observed MSU dataset trend discrepancy for the climate community by providing their expertise and guidance gleaned from other applications of MSU.

Action

Evan Fishbein and Carl Mears to assess the optimal choice of equator crossing times for climate applications and report back to ITWG.

2.2.4 Reanalysis datasets

Recommendation

ITWG to ask ECMWF to try rerunning a 2-year segment from early 1986 to remove the early NOAA-9 platform warm bias and allow potential analysis of true NOAA-9 platform bias in MSU2.

Recommendation

ITWG should reaffirm to funding bodies the potential benefits of new high quality reanalysis products.

2.2.5 Relations to international climate programs and other bodies

Action

ITWG climate group to form a sub-group to discuss this issue and report back.

Recommendation
ITWG to promote using standardised sensors on non-NOAA platforms as a way to increase spatial and temporal coverage for climate records.

WORKING GROUP ON THE USE OF TOVS/ATOVS IN DATA ASSIMILATION/NUMERICAL WEATHER PREDICTION (DA/NWP)

2.3.2 Evaluation and use of TOVS/ATOVS in Data Assimilation/NWP

Recommendation (to DA/NWP Centres)
The Working Group recommends the continued exchange of monitoring results and encourages each centre to develop their own Web page to post their results. A master document linking all Web pages has been developed and linked on the NWP SAF site and a similar link will be set on the ITWG Web site to enable easy examination and comparison of results between groups. Centres are encouraged to share pre-submitted papers and any valuable material on the following topics:

1. Bias correction procedures for regional and global systems
2. Scan-dependent biases
3. Thinning procedures for regional and global systems
4. Background error correlation and variance studies
5. Mesoscale verifications

Action
C. Chouinard will coordinate the development of the NWP Web page until June 2004 after which S. English will take responsibility.

Recommendation (to DA/NWP Centres)
That an e-mail list be set up and used to quickly alert each other of potential problems and their severity so actions can be taken in a timely manner. (Action: J. Derber to setup the e-mail list) Note: this e-mail list is intended as an informal exchange between NWP centres not a formal communication with data providers. The original list is made up of NWP WG members but will likely be extended to others.

Recommendation (to DA/NWP Centres)
The Group recognizes the difficulty in implementing and validating radiance/retrieval data in a DA/NWP system and recommends that those that have prepared so-called single observation experiments in the development of their assimilation system post them on their Web page with sufficient details on the Web site for another to replicate these independently.

Recommendation (to DA/NWP Centres)
Encourage the production of Observing System Experiments at various NWP centres to be presented at the next meeting and most importantly post these results on the ITWG Web site.

Recommendation (to ITSC)
The Group recommends that the McNally survey summary grid be continued and posted on the ITWG Web site. When changes are made at various NWP centres on the use of data, that McNally be advised, the grid updated accordingly, and the changes be logged on the ITWG Web site. The WG noted that the table and survey should be expanded and include more information on how the data are prepared and used at various centres. This would be reflected by a more complete summary with additional columns and/or notes. (Action: T. McNally to coordinate)

Recommendation (to NOAA/NESDIS and EUMETSAT)
The Group recommends that the data providers should continue to improve the quality assurance of all data, including level 1b and level 1d. The quality of the data (e.g., including navigation) should be

monitored at all stages including the final stage, which may have been reformatted. The provider should attempt to identify and flag questionable or poor quality data. Data providers, e.g., EUMETSAT and NOAA/NESDIS, are encouraged to use NWP monitoring results to help them in diagnosing data problems. The Group recognizes that it is easy to identify gross errors, while subtle errors are more difficult to detect. (Action: NESDIS, EUMETSAT)

Recommendation
To document, evaluate and improve the current procedures to convert antenna temperatures to brightness temperatures. (NESDIS and DoD)

Action
To collect documentation of the current status of antenna correction procedures for current microwave instruments from DoD, NESDIS, EUMETSAT and NASA and present at next ITSC meeting. (G. Deblonde)

2.3.3 Forward modelling

Recommendation
We encourage the developers of new instruments to either expand or enhance current RT models, or develop general codes applicable to all instruments and make them available.

2.3.4 Observing systems and real-time access to data

Recommendation
That satellite agencies and the WMO GOS WG consider 3xAMSU or equivalent in orthogonal orbits as minimum requirement to maximize global coverage for operational NWP.

Recommendation
That satellite agencies support the use of the WMO standard and produce data in a common format (e.g., BUFR). Also, the agencies should collaborate early and often on definitions and provisions of test data sets.

Recommendation
That EARS be continued and where possible, extended to include more of NH and possibly SH.

Recommendation
The data providers should continue to strive to speed up delivery of data and eliminate blind orbits. (Action EUMETSAT, NESDIS)

Recommendation
Real-time access to the observations by NWP centres should be considered for all satellite observation programs which may be useful for NWP. (All satellite agencies)

Recommendation
Both operational and research programs should develop collaborative efforts with NWP centres to evaluate the new data and allow the earliest possible access to the data for the NWP centres.

Recommendation (to NOAA, EUMETSAT)
Specification for future instruments at least matches or improves upon the capabilities of current instruments.

WORKING GROUP ON ADVANCED SOUNDERS

2.4.2 Status of plans for advanced sounding instruments

Action

J. Eyre to update IR and MW sounder tables on ITWG Web site before ITSC-XIV.

Action

A. Huang to implement a Web page for the Advanced Sounders Working Group on the ITWG Web site.

2.4.3 New initiatives for geostationary sounding

Recommendation (to Space Agencies)

The ITWG recommends that system design simulations and other studies be completed for the purpose of identifying optimized performance/cost/risk/benefit approaches for candidate geostationary and MEO microwave sensors. This microwave system would supply data for temperature and moisture soundings and time-resolved precipitation mapping.

2.4.4 The use of the NPOESS requirements change process

Recommendation to ITWG

Any recommendation concerning NPP and NPOESS advanced sounding instruments' requirements change should use this process by presenting the relevant study results to the JARG through Mitch Goldberg.

2.4.5 Implementation of advanced sounders

Recommendation (to NPOESS Joint Agency Requirements Group (JARG))

ITWG recommends that the entire interferogram be sampled and transmitted to the ground for all three spectral bands of the NPOESS CrIS instrument. This will allow full spectral resolution to be achieved for the midwave and shortwave N_2O/CO_2 bands as well as for the longwave bands. Full spectral resolution in all three bands is important for improving boundary layer temperature and upper tropospheric water vapor sounding as well as for extraction of trace gas profiles for climate data records. In addition the longwave extent of the shortwave band of the CrIS should be extended to include the 4.7 μm band of CO lines. Measurement of tropospheric CO is important for monitoring and forecasting air quality and for associated impacts to atmospheric chemistry climate.

Recommendation (to NPOESS Joint Agency Requirements Group (JARG))

ITWG recommends that the 0530LT and 1330LT NPOESS platforms retain full CrIS and ATMS measurement capability. These two satellites together with the 0930 METOP satellite will be able to provide 4-hour frequency high resolution soundings that are important for improved global weather predictions (see recommendation in 2.3.4 related to this).

Recommendation (to NASA)

ITWG recommends that the orbit of the NPP satellite be changed from 1030 to a time that better complements the 0930 orbit of the METOP satellite. This is important to improve the global sampling of high vertical resolution soundings for global weather prediction.

Recommendation (to NPOESS Joint Agency Requirements Group (JARG))

The Field-of-View size for CrIS should be redefined so as to optimize sounding performance under partly cloudy sky conditions.

2.4.6 Data processing, inversion and assimilation

Action (Hal Bloom)

ITWG requests that the user communities be provided with, and invited to review, the draft specifications (content and format) for the raw data records (RDRs) and sensor data records (SDRs) for NPOESS/NPP instruments.

Recommendation (to IPO and NPOESS Joint Agency Requirements Group (JARG))
ITWG recommends that the user communities be invited to assess and comment on the performance of NPOESS/NPP sensors and processing algorithms, especially calibration data and algorithms, in a timely fashion to enable suitable preparation for processing and interpretation of data from the flight mission.

Action (Allen Larar / Chair of SOAT)
Interact with the NPOESS IPO to facilitate a mechanism for ITWG members to obtain NPOESS ground processing and field terminal design parameters, including draft input data file formats, draft processing design documents, draft interface control documents and draft hardware specification documents through collaborations with the NPOESS SOAT.

Recommendation (to CGMS)
ITWG recommends that responsible agencies establish focal points to ensure that ingest and pre-processing code for future advanced sounders (and their complementary imagers) is provided, in a form suitable for use with locally-received direct read-out data, and yielding output consistent with globally processed data. Furthermore, activities are to be undertaken to integrate this code into processing packages available for international distribution in a timely manner.

Recommendation (to IPO and NASA)
ITWG recommends that ingest code for NPP instruments (CrIS, ATMS and VIIRS) be made available by IPO to the external scientific community, and that such algorithms should be integrated into a processing package for locally received data available for international distribution.

2.4.7 Characterization of spatial response

Recommendation (to Space Agencies)
ITWG recommends that the spatial responses of advanced sounders should be characterized to a level at which the associated error does not cause the total noise budget of the instrument to be exceeded, and, where achievable at reasonable cost, to a level at which the associated error is a negligible contribution to the total system noise.

2.4.8 Validation of data and products

Recommendation (to NOAA and NASA)
The Advanced Sounder working group strongly supports the Satellite Upper Air Network (SUAN) initiative proposed by the Satellite Sounder Science and Products working group (see action in 2.6.11).

2.4.9 Workshop for Soundings from High Spectral Resolution Sounders

Recommendation (to ITWG)
The Advanced Sounders working group recommends that ITWG organize periodic Advanced Sounding workshops to be held independently of the main ITSC meetings and plans should be made to hold a workshop in Europe before ITSC-XIV.

WORKING GROUP ON INTERNATIONAL ISSUES AND FUTURE SYSTEMS

2.5.3 Timeliness of satellite data

Recommendation (to WMO/CGMS)
It was recommended that WMO review the requirement for timeliness of satellite data for global NWP in the light of NWP centres changing requirements.

2.5.4 Software and documentation

Recommendation (to space agencies)
The Working Group recommended that the satellite operators continue their excellent efforts to provide

documentation and software to support optimal use of environmental satellite data with the view to have complete compatibility between global and local geophysical parameters (at least to level 1b).

2.5.5 Equator crossing time

Action (D. Hinsman)

Provide link to CGMS table to ITWG Webmaster.

2.5.6 Frequency protection

Recommendation (to National Radiofrequency Agencies)

Given the current levels of uncertainty in the studies for potential interference to EESS applications within the 23.6-24.0 GHz band by proposed automobile collision avoidance radars it was recommended that:

1) automobile radar manufacturers make efforts to develop systems that operate outside this band

2) any interference study of the impact of automobile radars on EESS applications using this band incorporate margins of at least 13 dB (20x) below the necessary EESS sensitivity levels to account for the uncertainties.

2.5.7 Education, training and promotion

Action (to ITWG)

All members of ITWG to consider contributing to ITWG training Web page.

WORKING GROUP ON SATELLITE SOUNDER SCIENCE AND PRODUCTS

2.6.2 Working group interaction and scientific contributions

Action (all WG members)

The WG Co-Chairs and individual members will promote the synergy between SSSP and other ITWG Working Groups, continue to seek scientific contributions from members and from the international community, and enhance the SSSP and ITWG Web site to meet these goals. The group will also seek to identify sources of information on the use of sounding data through questionnaires.

2.6.3 Access to global data from current polar satellites

Recommendation (to Satellite Agencies)

All satellite operators providing global polar satellite observations are encouraged to make their data routinely available to the international user community. In each case, procedures (and necessary protocols) for users to gain routine access to global, operational and research data sets should be identified and made available to users via links on the SSSP Web site. This will include complete listings of the data available (measurements and products), data formats, metadata and software for reading data files.

Action (to SSSP Co-Chairs)

The Co-Chairs will request information from space agencies through ITWG members (AK Sharma, Devendra Singh, Dong Chaohua, Alexander Uspensky) and provide links to the information on Web site).

2.6.4 Access to HRPT data and software from current polar satellites

Action (to SSSP Co-Chairs)

The Co-Chairs will request information from space agencies and provide links on the Web site. WG members will collect needed information on operational and research satellites and instruments for which direct broadcast (HRPT) data and associated software processing packages are available (and not currently included on the SSSP Web site). Appropriate data links will be provided to the Webmaster for inclusion in the HRPT area of the site.

Recommendation (to Satellite Agencies and HRPT Reception Stations)
It is recommended that satellite data providers and HRPT reception stations consider programs for expanded HRPT and associated imager data coverage similar to EARS, but with more complete global coverage.

2.6.5 Instrument health and future instrument status

Action (to SSSP Co-Chairs)
The Co-Chairs will request information on instrument health from satellite providers through ITWG members (Dieter Klaes, Devendra Singh, Dong Chaohua, Alexander Uspensky, Paul Menzel, Hal Bloom) to identify sources of information (e.g., Web sites) covering the health of current instruments and the status of future satellites and instruments. This information shall be provided to the SSSP Webmaster to include on the Web site.

2.6.6 Access to information on data plans for future satellites

Action (to SSSP Co-Chairs)
The Co-Chairs will request information on future satellite systems from satellite providers through ITWG members (A.K. Sharma, Dieter Klaes, Devendra Singh, Dong Chaohua, Alexander Uspensky, Hal Bloom). Information shall be provided to the SSSP Webmaster to include on the ITWG site.

2.6.7 Scientific algorithm information from global satellite providers

Action (to SSSP Co-Chairs)
The Co-Chairs will request information from satellite providers through ITWG members (Dieter Klaes, Peter Schlüssel, Thierry Phulpin, Devendra Singh, Dong Chaohua, Alexander Uspensky, Tony Reale, Walter Wolf, Tom Kleespies). They will identify sources of information (e.g., Web sites) describing the scientific methods for processing polar satellite data, beginning with measurement calibration (i.e., instrument filter functions, etc.) and including derived product algorithms. This information will be provided to the ITWG Webmaster for inclusion on the SSSP Web page.

2.6.8 Information on useful datasets for satellite data processing and simulation

Action (Lydie Lavanant)
A list of parameters and associated data atlas volumes available within the international community from operational and research satellites will be identified, and links to scientific documentation, formats and data will be established within the SSSP Web site to facilitate their access by users.

2.6.9 Global HRPT directory

Action (Lydie Lavanant, Elizabeth Sylvestre, Tom Kleespies)
WG members should seek information concerning actively working HRPT sites. Available government licensing and/or other listings will be sought to aid in creating a directory. Once established, the SSSP Co-Chairs shall contact these facilities and solicit inputs to SSSP and, where appropriate, encourage ITWG participation.

2.6.10 Collocated radiosonde and satellite observation dataset

Action (Tony Reale, Lydie Lavanant, Hank Revercomb, Mitch Goldberg, Graeme Kelly)
Efforts to compile real-time and historical datasets of collocated radiosonde (GTS and special experimental observations) and operational polar satellite (Global and HRPT) data are encouraged. The SSSP Web site will be expanded to identify groups compiling such data, and facilitate better awareness of and access to special experimental radiosondes (and other in situ ground truth observations) which are not routinely available.

2.6.11 Satellite Upper Air Network (SUAN)

Action (Tony Reale, with Guy Rochard, Don Hinsman, Peter Thorne, Mitch Goldberg, John Bates, Dave Steenbergen, Dieter Klaes)
A proposal describing the Satellite Upper Air Network will be developed and provided to the WMO for

international discussion and recommendation. This proposal would identify candidate site selection, expected benefits, network protocols (i.e., launch schedules) and resource requirements.

2.6.12 Identification of key research topics

Action (Tony Reale, Lydie Lavanant, Tony McNally, Thierry Phulpin)

SSSP WG members will establish a list of key scientific topics in conjunction with ongoing user needs. ITWG members are requested to provide inputs to the SSSP WG Co-Chairs, who will review and forward this information to the Webmaster for inclusion on the SSSP site.