CGMS-XXXII
WMO WP-14
Prepared by WMO
Agenda item II/4

INTERNATIONAL PRECIPITATION WORKING GROUP

(Submitted by WMO)

Summary and purpose of document

To inform CGMS Members on the status of activity related to International Precipitation Working Group (IPWG).

ACTION PROPOSED

(1) CGMS Members to note the status of activity related to the International Precipitation Working Group (IPWG);

(2) CGMS Members to continue to provide and update the inventory of routinely produced precipitation estimates, either operational or experimental/research, to the IPWG co-chairs;

(3) CGMS Members to note and support the upcoming IPWG science meeting.

Appendix: Terms of Reference for the International Precipitation Working Group (IPWG)

DISCUSSION

Background

1. CGMS-XXVIII initiated the establishment of a Working Group on Precipitation, with co-sponsorship by WMO and CGMS.

2. CGMS-XXIX noted the successful organizational session of the International Precipitation Working Group (IPWG) and approved the terms of reference for the IPWG: provided in the Appendix of this document for completeness.

3. CGMS-XXX received with enthusiasm the report of the First International Precipitation Working Group (IPWG) Workshop that was held at the EUMETSAT Nowcasting Satellite Applications Facility (SAF) in Madrid, Spain, 23-27 September 2002. The workshop had very successfully promoted the exchange of scientific and operational information between the producers of precipitation measurements, the research community, and the user community, and developed pathways forward for a variety of activities within the IPWG. An important goal of the workshop was to compile an inventory of routinely produced precipitation estimates; either operational or experimental/research. Three working groups were established: Operational Applications, Research Activities, and Validation Activities. Each working group developed plans for future activities with short term, intermediate and long term goals.

4. CGMS-XXX supported the recommendations of the IPWG.

5. CGMS-XXXI was updated on algorithm activities and plans for the next IPWG science meeting, and developed Action item 31.29.

Response to CGMS-XXXI Action Item 31.29: (1) CGMS Members to note and support upcoming IPWG science meeting. (2) CGMS members to provide and update the inventory of routinely produced precipitation estimates, either operational or experimental/research, along with training information to the IPWG co-chairs via the IPWG web page. (3) CGMS Members to provide information to the IPWG Rapporteur on areas for future consideration by the IPWG.

6. Upcoming IPWG science meeting:

   (a) Invitations and call for presentations have gone forth for the October meeting to be held in Monterey, California;
   (b) As of 4/27/04 positive indications of monetary support for various functions have been received from EUMETSAT, NOAA/NESDIS and WMO.

7. Algorithms and training:

   (a) The current IPWG algorithm site (as of April 27, 2004) contains infrared (IR)-based algorithms, multiple precipitation estimations blend, microwave (MW)-based algorithms, and blended MW-IR algorithms;
   (b) Some CGMS members need to address the portion of the template "including available web and ftp sites for imagery and data download";
   (c) For some algorithms, links to training are contained within the algorithm name from the algorithm inventory table. However, under “Training” on the IPWG web site none are currently (4/27/04) listed.

   This item to be addressed in working groups at CGMS-XXXII.

Status and plans for major theme areas

8. Activity continues in major theme areas: 1) Algorithms; 2) Research, and 3) Future Sensors. The major accomplishment in each area is presented in summary, followed by a more detail is subsequent paragraphs.

(1) Algorithms:

(a) A central data and document database was is available on the IPWG World Wide Web (WWW) site, which is maintained by Dr. Vincenzo Levizzani of CNR and IPWG Co-Chair:

http://www.isac.cnr.it/~ipwg (main IPWG site)
http://www.isac.cnr.it/~ipwg/algorithms/algorithms-invent.html (algorithm site)

(b) The current IPWG algorithm site (as of April 27, 2004) contains infrared (IR)-based algorithms, multiple precipitation estimations blend, microwave (MW)-based algorithms, and blended MW-IR algorithms. The algorithm name, responsible institution and contact person are presented below.

IPWG
International Precipitation Working Group
IPWG INVENTORY OF EXISTING OPERATIONAL ALGORITHMS

IMPORTANT
The following algorithms were listed as a result of a first IPWG inventory worldwide.
The list does not pretend to be exhaustive at the moment and the inventory will be a continuous process.
Therefore the list is under a constant revision process as new algorithms are identified.
Each algorithm is briefly described following a standard form issued by the IPWG.

You are encouraged to SUBMIT to IPWG the description of your algorithm using the following FORM

IR-based algorithms

Algorithm name	Institution	Developer/contact person
CMA	China Meteorological Agency (CMA), People Rep. of China	L. Naimeng
Convective-Stratiform Technique (CST)	NASA /GSFC, USA	A. J. Negri
EURAINSAT/A 1.0	EURAINSAT project, EU	F. J. Tapiador
High resolution Precipitation Index (HPI)	EUMETSAT, EU	T. Heinemann
JMAMSC	Japan Meteorological Agency, Japan	N. Ohkawara

Multiple precipitation estimations blend

Algorithm name	Institution	Developer/contact person

GOES Multispectral Rainfall Algorithm (GMSRA)	NOAA/NESDIS, USA	M.Ba and A. Gruber
GPCP 1 Degree Daily	NASA/GSFC, USA	G. J. Huffman
GPCP Satellite-Gauge Combination	NASA/GSFC, USA	G. J. Huffman
Hydro-Estimator for short term (1-6 hr) Extreme Precipitation	NOAA/NESDIS, USA	R. Scofield
TRMM var (3B41RT)	NASA/GSFC, USA	G. J. Huffman
UOB Advection 1.0	Univ. of Birmingham, UK	C. Kidd
UOB NET 1.0	Univ. of Birmingham, UK	F. J. Tapiador

MW-based algorithms

Algorithm name	Institution	Developer/contact person
AMSU operational global rain rates	NOAA/NESDIS, USA	R. R. Ferraro
AMSU global monthly and pentad rainfall	NOAA/NESDIS, USA	R. R. Ferraro
SSM/I operational global rain rates	NOAA/NESDIS, USA	R. R. Ferraro
SSM/I global pentad and monthly rainfall	NOAA/NESDIS, USA	R. R. Ferraro
TRMM HQ (3B40RT)	NASA/GSFC, USA	G. J. Huffman

Blended MW-IR algorithms

Algorithm name	Institution	Developer/contact person
CPC Morhping technique (CMORPH)	NOAA, USA	R. Joyce
EURAINSAT/B 1.0	EURAINSAT project, EU	C. Kidd
NRL Blended Satellite Technique	Naval Research Laboratory, USA	F. J. Turk
Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks (PERSIANN)	Univ. of California Irvine, USA	K.-L. Hsu
TRMM HQ/VAR (3B42RT)	NASA/GSFC, USA	G. J. Huffman

(c) Items that need to be updated:

(i) Some algorithm descriptions need to be updated on the IPWG website to document current and in-use algorithms;

(ii) If any validation has been performed that information should be provided;

(iii) Training materials with respect to the algorithms or techniques need to be posted on the IPWG web site under “Training”;
For some algorithms, links to training are contained within the algorithm name from the algorithm inventory table.

Under "Training" none are currently (4/27/04) listed.

(2) Research

(d) Case study data set for algorithm testing and comparison.
(i) At the Madrid meeting, the group suggested creating "case study" satellite datasets to be available through the IPWG website. Due to the manner in which most techniques operate, little advantage is expected from making such a database available. Some data sets for specific satellite case studies are available from individual institutions via ftp. This item will be discussed further at the October 2004 IPWG meeting.

(e) Blended algorithms and techniques
(i) At the October 2004 IPWG meeting Joe Turk will report to the group with a "status report" regarding the current state of the various blended-type algorithms and techniques.

(f) Climate applications
(i) At the October 2004 IPWG, Bob Adler and Phil Arkin will report on the status of the new GPCP 1-degree daily products.

Reports Available on IPWG Web Site

(g) Frequency related issues
(i) A report related to spectrum protection for remote sensing in the microwave/sub-millimetre wavelength region is available.

(h) Climate applications
(i) A report that addresses applications related to seasonal to interannual climate assessment using satellite data is available.

Plans for the Second International Precipitation Working Group (IPWG) Workshop

9. CGMS Members are requested to take note that the second International Precipitation Working Group Science meeting and workshop is to be held in Monterey, California, from October 24-28, 2004. Invitations and a request for presentations have been issued.

10. Invitations were issued to previous IPWG meeting participants as well as some other scientists. If CGMS Members have additional people that they wish to have attend the meeting, they should contact the IPWG CGMS Rapporteur at the email address (Purdom@cira.colostate.edu)

11. CGMS Members are requested to provide information to the IPWG Rapporteur on areas for future consideration by the IPWG and to provide guidance on novel research in this area and questions that might be addressed at IPWG II:
12.

(a) Recalling the terms of reference for the IPWG: 1) Development of better measurements, and improvement of their utilization; 2) improvement of scientific understanding; and, 3) development of international partnerships;

(b) Areas might include THORPEX and similar experiments, information of Member activities in IPWG focus areas, guidance on studies related to uses of precipitation estimations in data assimilation and NWP on scales ranging from nowcasting to climate, reprocessing activities, and planned experiments such as the Global Precipitation Mission.

TERMS OF REFERENCE FOR THE INTERNATIONAL PRECIPITATION WORKING GROUP (IPWG)

Background

It was proposed at the first session of the IPWG (20-22 June 2001) to establish the International Precipitation Working Group (IPWG) as a permanent Working Group of the Coordination Group for Meteorological Satellites (CGMS). The IPWG will focus the scientific community on operational and research satellite based quantitative precipitation measurement issues and challenges. It will provide a forum for operational and research users of satellite precipitation measurements to exchange information on methods for measuring precipitation and the impact of space borne precipitation measurements in numerical weather and hydrometeorological prediction and climate studies.

Purpose

In the area of quantitative precipitation estimation, the IPWG intends to build upon the expertise of scientists who are currently involved in precipitation measurements from satellites with emphasis on derivation of products. The IPWG is established to foster the:

- Development of better measurements, and improvement of their utilization;
- Improvement of scientific understanding;
- Development of international partnerships.

Objectives

The objectives of the IPWG are:

(a) to promote standard operational procedures and common software for deriving precipitation measurements from satellites;

(b) to establish standards for validation and independent verification of precipitation measurements derived from satellite data; including:

- reference standards for the validation of precipitation for weather, hydrometeorological and climate applications;

- standard analysis techniques that quantify the uncertainty of ground-based measurements over relevant time and space scales needed by satellite products;

(c) to devise and implement regular procedures for the exchange of data on inter-comparisons of operational precipitation measurements from satellites;

(d) to stimulate increased international scientific research and development in this field and to establish routine means of exchanging scientific results and verification results;

(e) to make recommendations to national and international agencies regarding the utilization of current and future satellite instruments on both polar and geostationary platforms; and

(f) to encourage regular education and training activities with the goal of improving global utilization of remote sensing data for precipitation measurements.

Membership

The Working Group shall be comprised of representatives nominated by the satellite operators of the CGMS, other members of CGMS and relevant research satellite operators. The CGMS or the IPWG may invite other experts from the community to participate in the activities of the group.

Working Arrangements

The Working Group will be chaired by two Co-Chairmen appointed by the plenary of the CGMS. The Co-Chairmen shall compile a report on relevant activities for the scheduled plenary meetings of the CGMS. The interactive connection with satellite operators will be performed through the use of a Rapporteur who will attend and report to the CGMS meetings.

Under the lead of the two Co-Chairmen, the IPWG will organize Workshops, co-sponsored by CGMS and WMO, approximately every two years. The Workshops will promote the exchange of scientific and operational information between the producers of precipitation measurements, the research community, and the user community.