SUMMARY OF ACTIONS AND RECOMMENDATIONS TOVS/ATOVS IN CLIMATE

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2 UK MetOffice
3 NOAA
4 LMD
Introduction

- There have been 16 recommendations and 10 specific actions from the ITSC-15
- Recommendations (10-12) concerned with NPOESS de- and re-manifestation will be covered on Friday in an extra talk
- Recommendations and actions (5, 6) related to in situ networks are covered in Peter’s talk on GRUAN.
- Reanalysis recommendations have been passed to WCRP/AOPC working group on observations for reanalysis (WOAP)
- This talk focuses on:
  - development of WG web site
  - New sensors – monitoring of CH4, CO, CO2
  - development of GSICS and R/SSC-CM
Remaining Action Summary

• **Action Climate-1**: Set up WG web site – done.

• **Action Climate-2**: Addition of links to GEWEX assessments – links established, can be put on site.

• **Action Climate-3**: John Bates to make available information relating to the status of the NPOESS project as and when publicly available - link to the NPOESS project is added.

• **Action Climate-4**: available information on future plans of satellite agencies and/or past actions helping in the interpretation of data streams - regular updates needed - WG Web site has links to several current and future satellites and activities. However, the links will need updates by the group.
• **Action Climate-7**: updated knowledge on instrument characteristics Web links on the WG Web sites - The ITWG RT WG provided web links on satellite instrument characteristics for NOAA POES ATOVS and AVHRR, GOES, Meteosat, MetOp IASI, EOS MODIS and AIRS, and GMS-5. A link to MetOp ATOVS and AVHRR SRFs is still yet to be provided.

• **Action Climate-8**: ITWG Climate Group to post any information on satellite data reprocessing and sensor metadata updates on the ITWG Web site. - Some satellite data reprocessing and sensor information has been posted to the WG Web site – more to come.

• **Action Climate-10**: ITWG members to circulate NRT planned IASI processing activities for climate (e.g., M. McCarthy for Met Office plans) - UK Met Office has started the Had-IR project to archive IASI data using 1 out of 4 pixels but maintaining full spectral resolution. Plan will be posted to the WG web site.
About the working group

Since the first International TOVS Study Conference (ITSC) held in Austria (1983), the ITSCs significantly evolved and formed numerous working groups and subgroups. The Climate Working Sub-Group (CWSG) now has access to data records in excess of 22 years. Accordingly, the objective of this working sub-group is continuing to improve the management, integrity, quantity, quality and collaboration of climate products as more centers fall in support Climate Data Record (CDR) production in operation across the world.

The ability to access and share both historical, current and planned climate products and data (both raw and meta-data) has become an essential requirement that empowers leaders to make informed, confident decisions based upon solid and credible recommendations from subject matter experts.

Working group activities

Climate Data Record (CDR) Measurement Maturity Index

As the data records from satellites have become longer and the science of applying these data to climate problems has evolved, best practices for compiling CDRs have emerged. The objective is compiling these best practices into an assessment model that has been in order to:

1. Reduce difficulty and confusion in the community about what attributes are important in climate data records;
2. Produce an easily understood way of identifying maturity of data products and science data stewardship approaches, and
3. Help identify areas needing improvement.

In an effort to capture these best practices and assess the maturity of various CDRs, three dimensions for assessing the maturity of a CDR have initially been proposed: scientific maturity, preservation maturity, and societal benefits. The particular maturity level is assessed by defining the set of key process areas and the level of best practices that characterize each area. The result is a score ranging from 1 (very low) to 5 (very high) that can be used to provide a sense of the total maturity of a specific climate data record. Essential Climate Variables (ECVs), Societal Impact, and ECV IPCC Impact Indicators in HTML format are anticipated to be available for review, consideration and input from subject matter experts in the near future.

ITSC working group reports

At every ITSC the group meets to discuss developments and issues arising in the areas of interest to the working group, listed above. PDF copies of the resulting reports will be provided here.

Reanalysis and Satellite Sensor Information:

The Japan Meteorological Agency (JMA) is currently working on action. Climate-3 and ITSC-15. JMA will post any information on reanalysis and satellite-sensor to include metadata updates on the CWSG web site. Dr. Masami Sakamoto has completed work on geomatic error limits and associated documentation to include compilation of TRB quality lists. An Error List Production in accordance with (IAW) the following recommendations in ITSC-15 will be completed:

- Recommendation Climate-4: Reanalysis groups should seek to work with the operational satellite climate centres on the optimal calibration and processing of archived data sets. Additionally, the Reanalysis Groups should send back to the relative operational centre any meta-data obtained during or after the reanalysis.
- Recommendation Climate-7: Reprocessing and Reanalysis Centres to
## ECV Societal Benefit Matrix

GEO Work Plan 2007-2009 tasks and societal related Essential Climate Variables (ECV’s) are as follows:

### Impact Legend
- **S** = Strong (2.5-3.0)
- **M** = Medium (1.5-2.4)
- **W** = Weak (0.5-1.4)

### Domain Legend
- **Atmosphere**
- **Ocean/Ice**
- **Terrestrial**

### ECVs:
- Essential Climate Variables
- ECV Domain

<table>
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<tr>
<th>ID</th>
<th>ECV Description</th>
<th>Agriculture</th>
<th>Biodiversity</th>
<th>Climate</th>
<th>Disaster</th>
<th>Energy</th>
<th>Societal Totals</th>
<th>Societal Averages</th>
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<td>1</td>
<td>Ozone Concentration [O3]</td>
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<td>N/A</td>
<td>S</td>
<td>N/A</td>
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<td>N/A</td>
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<td>N/A</td>
<td>N/A</td>
<td>S</td>
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<td>N/A</td>
<td>S</td>
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<td>Earth Radiation Budget (including solar irr...</td>
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<td>M</td>
<td>N/A</td>
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<td>M</td>
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<td>8.0</td>
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New sensors – monitoring of CH4, CO, CO2

• PostEPS planning at User Application Group level considered requirements on chemistry monitoring beyond 2020.
• Variables considered were O3, H2O, CH4, CO2, CO and NO2 profiles.
• Highest impact would have high resolution infrared (IRS) and SWIR (UVNS) sounding.
• In the current mission ranking for PostEPS gives very high priority for IRS (IASI follow on) and medium priority for UVNS.
• Planning of PostEPS is connected to ESA plans for GMES sentinels 4 and 5, i.e., funding may comes from EU rather than EUMETSAT member states.
GSICS

- Current contributors: CMA, CNES, EUMETSAT, JMA, KMA, NASA, NIST, NOAA
- Routine LEO to LEO intercalibration, results in “science pages”:
  - www.star.nesdis.noaa.gov/smcd/spb/calibration/icvs/GSICS/
- GEO-LEO intercalibration should be operational in 2008 using METOP/IASI as reference through common tools and procedures
- Data management issues being addressed
- Open question about need to have identical calibration algorithms
The R/SSC-CM (Regional/Specialised Satellite Center-Climate Monitoring) Network will be:

Based on activities of existing initiatives (GOS, GCOS and GSICS)
Build upon existing operational infrastructures
Serve users and other organisations (e.g. WMO Regional Climate Centres RCC, National Weather Services)

Overall objective: Continuous and sustained provision of high-quality Essential Climate Variables satellite products on a global scale (includes reprocessing)
R/SSC Initial Candidates
(highest maturity & long time period)

• Cloud properties + aerosols
  – NOAA (proposal coordinator) + EUMETSAT (CM-SAF)
    • (may include Polar Winds and surface properties)
• SSM/I: total column water vapour, precipitation, liquid water path
  – NOAA + **EUMETSAT** (CM-SAF) (proposal coordinator) + CMA (precipitation)
    • (may include snow and sea ice)
• Surface albedo, clouds + aerosols from geostationary satellites
  – JMA + **EUMETSAT** (CF + CM SAF) (proposal coordinator) + NOAA + CMA
• Atmospheric Motion Vectors (AMV) + clear sky radiance
  – JMA + **EUMETSAT** (CF) (proposal coordinator) + NOAA + CMA
• Upper tropospheric humidity
  – JMA + EUMETSAT (CF + CM SAF) + **NOAA** (proposal coordinator) + CMA
Suggested Topics for WG meeting

- Review recent advances in (A)TOVS climate datasets including errors in (A)TOVS climate datasets
- Current and future work on intercalibration of HIRS and MSU/AMSU sensors including MSU/AMSU temperature, HIRS water vapor, HIRS ozone, AMSU-B 183GHz
- Plans for hyperspectral instruments, including archiving and products as well as climate studies
- Plans for SSM/T2 and SSMIS
- Need of long term calibration standards – GRUAN/CLARREO for climate
- Stratospheric climate change
- Clouds including status of assessment and future activities
- Carbon Dioxide and Dust (LMD)
- GSICS and R/SSC-CM: A future framework for transition of research products into sustainable production of climate data records?