

Sustained Coordinated Processing of Environmental Satellite Data for Climate Monitoring

SCOPE-CM

2nd Executive Panel Meeting (SEP-02)

Progress Report of the Pilot Projects

- DRAFT -

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BACKGROUND AND SCOPE

This first progress report SCOPE-CM Pilot Activities was compiled based on the input from the Pilot activities lead before the SEP-02 teleconference meeting on 9 July 2009, based on a proposed structure (template) of the SCOPE-CM Secretariat. The Executive Panel is invited to review the content but also the structure and level of detail of this status report.

1 AVHRR BASED CLOUD AND AEROSOL PROPERTIES

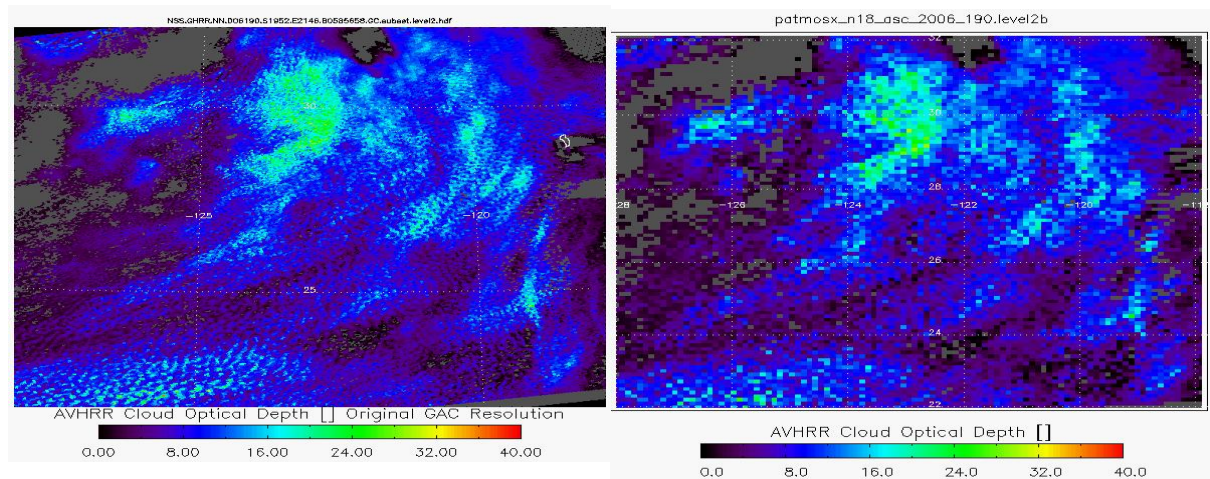
1.1 Meetings/interactions between the project partners

- NESDIS (Andrew Heidinger) and DWD (Rainer Hollmann) have begun a transfer of the AVHRR GAC Archive housed at the University of Wisconsin/CIMSS to EUMETSAT Climate Monitoring SAF
- Abhay Devasthale (SMHI) and Andrew Heidinger (NESDIS) have been communicating regularly in order to help the CM-SAF verify and implement the NESDIS AVHRR climate calibration methods.

1.2 Progress in the definition of potential SCOPE-CM data sets.

Generation of New Cloud Climate Data-sets.

- Our work in the GEWEX Cloud Climatology Assessment has convinced us that analysis of LEVEL-3 mean values is inappropriate for answering many cloud climate questions.
- PATMOS-x now generates 0.1o resolution LEVEL-2b output in addition the 0.5o LEVEL-3 output.
- LEVEL-2b output consists of sampled pixel-level results so that all pixel-level product correlations are preserved in the data.
- Images below show a LEVEL-2b (right) compared a LEVEL-2 (left) image of a cloud optical depth product generated from a NOAA-18 GAC data-set. A 30-yr record of global LEVEL-2 data is too large to store at this time.



1.3 Progress in FCDR generation/availability

Development of Inter-Satellite Consistent AVHRR Reflectance Calibration Tied to MODIS

- AVHRR reflectance calibration accuracy is a critical factor in many AVHRR CDRs.
- There is currently a significant level of disagreement among competing groups.
- PATMOS-x is using MODIS as the calibration reference.
- Using DOME-C, Desert Targets and Simultaneous Nadir Overpasses, a new calibration has been derived for all AVHRR/1, AVHRR/2 and AVHRR/3 sensors.
- Our analysis of the derived calibration slopes (examples on the left) indicate we have achieved agreement to within of 3-4% with MODIS and our methods have guaranteed a high-level of inter-satellite consistency.

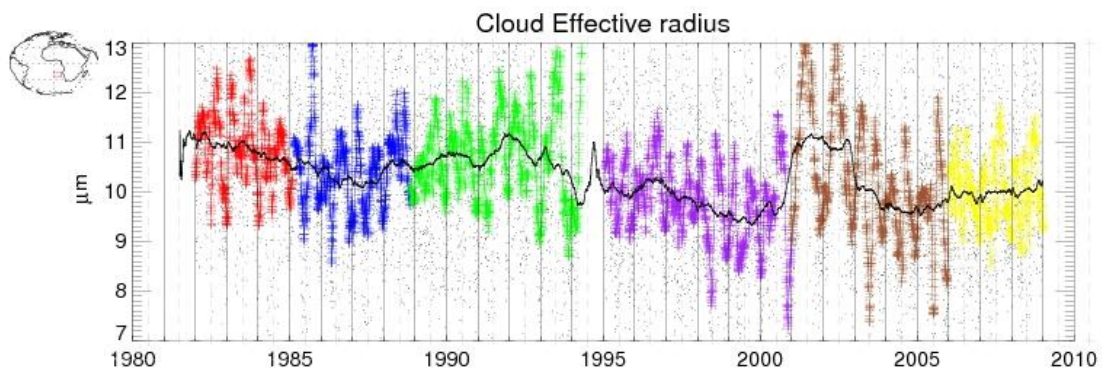
1.4 Progress in TCDR generation

Long Term Analysis of High Spatial Resolution Cloud Properties.

- To test the feasibility of making 30-yr high spatial resolution cloud TCDRs, we have begun generating 0.1o Level-2b data over specific regions.
- Coupled with our new calibration, we are beginning to analyze our climate records with more confidence. For example, we are studying the 30-year variability of the marine stratus regions due to their importance in the global

radiation budget and the significant variability in their predicted response to climate change.

- The image below shows a newly developed time series of cloud particle size from stratus region in the South Atlantic. PATMOS-x has recently adopted an algorithm developed under the GOES-R program which has been extensively characterized.
- We are conducting additional analysis of other climate data records to confirm and/or explain the variability we see.
- Geostationary data is also being processed through PATMOS-x algorithms to develop diurnal cycle adjustments.



1.5 Specific issues/problems identified

- Funding for the PATMOS-x (NESDIS AVHRR Cloud TCDRs) is in question.
 - Letter of intent to NOAA Climate Program Office for a proposal to generate 30-year global PATMOS-x level-2b data-set was rejected.
 - Proposal to NOAA Scientific Data Stewardship to generate MODIS consistent AVHRR cloud TCDRs still pending.
 - Funding for AVHRR calibration project will be exhausted in three months.

2 SSM/I TOTAL WATER VAPOUR, PRECIPITATION AND LIQUID WATER PATH

2.1 Meetings/interactions between the project partners

- NOAA attended NASA GPM Xcal working group meeting at Ann Arbor, Michigan and reported NOAA SSM/I cross calibration algorithm and discussed with Professor Chris Kummerow and his team on intercomparison CSU and NOAA xcal results.
- Also CM-SAF met Xcal head Tom Wilheit at the 8th GPM planning meeting in Paris and made contact to GPM calibration working group. Xcal wants a closer contact with GSICS and comparison of different intercalibration techniques envisaged.
- Meeting between CM-SAF and HOAPS people in Hamburg on the strategy to continue HOAPS with SSMIS
- Meeting with MPI staff to discuss extension of HOAPS precipitation over land

2.2 Progress in the definition of potential SCOPE-CM data sets.

- none, except that precipitation over land will come into focus at CM-SAF in CDOP-2 and that NOAA plans to work with NCDC on uses of its SSM/I HDF format.

2.3 Progress in FCDR generation/availability

- Beta version of SSM/I FCDR from 1992 to 2005 is available from NESDIS/STAR

2.4 Progress in TCDR generation

- NOAA generated TPW data record from 1992-2005
- CM-SAF still has TPW data record 1987 -2006
- comparison of both will be done in future

2.5 Validation activities/opportunities

- NOAA worked mainly on SSMIS TPW validation. SSMIS TPW algorithm is however different from SSM/I.
- CM-SAF issued contract to collocate DWD global marine archive buoy data to SSM/I radiance observations and products

2.6 Specific issues/problems identified

- It is still a tough problem to find a reference observation to assess stability of data sets, either in radiance or geophysical space

3 SURFACE ALBEDO/CLOUDS AND AEROSOLS FROM GEOSTATIONARY SATELLITES

3.1 Meetings/interactions between the project partners

- Yves Govaerts visited JMA in March 2009 to contribute to the verification of the product generated at JMA.
- Arata will visit EUMETSAT end of September (TBC) after the EUMETSAT User conference, but it is not approved yet

3.2 Progress in the definition of potential SCOPE-CM data sets

- The Level-3 product will be defined next year.

3.3 Progress in FCDR generation/availability

- The entire Meteosat archive has been processed. The GSA algorithm will be implemented in RMPEF to allow the processing of the XADC region.

3.4 Progress in TCDR generation

3.5 Validation activities/opportunities

- Is planned for next year when resource will become available.

3.6 Specific issues/problems identified

- No for the time being

4 ATMOSPHERIC MOTION VECTORS AND CLEAR SKY RADIANCE

Input from JMA as PowerPoint presentations.

5 UPPER TROPOSPHERIC HUMIDITY

No input so far