

## Minutes Convection Working Group Meeting

08 September 2008, EUM Headquarters

As most members of the Convection Working Group (CWG) were present at the 2008 EUMETSAT conference, a short CWG meeting was organised for the afternoon of 08 September.

The meeting was chaired by Volker Gärtner (EUMETSAT) and Nikolai Dotzek (ESSL). The participants are listed in Annex I to this document.

After having formally opened the workshop, Volker Gärtner asked the participants for a quick tour de table, as some participants were new to the workshop.

The list of recommendations from the 2007 Krakow workshop was then discussed in order to document the progress of the work and pending actions:

### **Recommendation 01/07:**

*The generation area of the EUMETSAT MPEF RII which is currently over South Africa should be moved somewhat to the east to better cover South Africa mainland.*

Status: The RII area was moved accordingly.

**There is not much to add to this: SAWS has their own local GII installation, and all additional work and validation work done at saws was based on this own installation. It is questionable whether a EUMETSAT central RII over South Africa is of any additional benefit**

### **Recommendation 02/07:**

*The air mass analysis products from Meteosat should be compared with IASI level 2 retrievals. Also the ATOVS soundings should be used for comparisons*

Status: The project is currently being pursued by EUMETSAT (point of contact here is Marianne König), but also by other CWG members (e.g. by Paolo Antonelli CIMSS). The outcome of first studies will be shown at the next CWG meeting in 2009.

**Summary of work: IASI L2 products from the NOAA L2 product server is of sufficiently good quality, the EUMETSAT L2 product, however, is not good enough for this purpose. M. König can show examples.**

**Recommendation 03/07:**

*The quality of the IASI level 2 data should be demonstrated by comparison to radiosondes.*

Status: This is an action item for EUMETSAT. Relevant studies are here under way (e.g. recently done by the EUMETSAT Visiting Scientist Nikita Pougatchev, who will publish his results in a meteorological journal). Further feedback can be expected from Alexander Jann (ZAMG), and from Sarah Bedka (CIMSS), regarding the total precipitable water product.

**This is related to 02/07: EUMETSAT definitely needs to improve on the L2 product, especially concerning low-level temperature and moisture.**

**Recommendation 04/07:**

*To identify the potential and early detection of severe convection, it is not enough to look at isolated products. The whole set of products for use in the nowcasting process has to be used in a synergetic way. A document describing these best practices should be generated.*

Status: John Mecikalski and Daniel Rosenfeld have written some sections of the “best practices” document. Piotr Struzik is in the process of updating the document. It will be made available to CWG via the CWG web site for further discussion

**John Mecikalski will report on the status of this document?**

**Recommendation 05/07:**

*There is a need for exploiting the 3.9 m channel information in relation to lightning initiation*

Status: UAH has done some work in this respect (using GOES). It is recommended to make this material available for the CWG web site.

**Current status unclear. Has anybody followed this up?**

**Recommendation 06/07:**

*Virtual radar images based on satellite data are considered very valuable.*

Status: This is e.g. done by ZAMG. Again some examples should be communicated via the CWG web site.

**Current status unclear. Has anybody followed this up?**

**Recommendation 07/07:**

*The use of additional instability indices like MU (Most Unstable Cape), ML (Mixed Layer CAPE) and CIN (Convective initiation) and/or a definition of other new indices should be considered.*

Status: It is recommended to use the available local GII installations for the inclusion of further indices, as that would also help the assessment of the usefulness of such indices for the convection nowcasting. Estelle de Coning e.g. reported the inclusion of the Total Totals index in the SAWS installation.

**Estelle de Coning will report on related work in her presentation. Others are encouraged to also extend their local GII installation (or the corresponding NWC-SAF product).**

**Recommendation 08/07:**

*The use of a mesoscale divergence product may give additional insight in severity of rainfall and convection processes, so the generation of this product is encouraged.*

Status: The EUMETSAT DIV product (based on the upper tropospheric WV winds) was used in some case studies by IMGW. Monika Pajek included a case in her presentation to the EUMETSAT conference.

**Some more case studies, e.g. with the EUMETSAT DIV product, should be conducted (action on EUMETSAT?)**

**Recommendation 09/07:**

*Fields of vorticity and other NWP output should be used in combination with satellite and radar data.*

Status: Nobody reported any progress on this issue.

**Any news on this?**

**Recommendation 10/07:**

*The combination of NWP output and satellite products like GII in a composite visualisation are considered very useful*

Status: An overlay of NWP fields over some GII fields (K Index and total precipitable water) is possible on the satreponline web site (for Europe). It is encouraged to specifically offer the overlays of the two respective NWP based products.

**Jarno Schipper can maybe show us an example of these overlays.**

**Recommendation 11/07:**

*It was suggested to EUMETSAT to investigate whether a single cloud free pixel can be considered representative for the whole 15 x 15 pixel area of the global GII. Generally, the GII should be produced with higher resolution, if possible.*

Status: The two aspects of this recommendation are related as both are an issue of available CPU time for the GII processing. The current status is that a 3x3 pixel product is available for the Meteosat-8 rapid scan service for Europe. Furthermore, EUMETSAT is in the process of upgrading the MPEF hardware which will in the future most likely allow a higher resolution for the full disk product.

**Sauli Joro can shortly report on progress / plans in this respect.**

**Recommendation 12/07:**

*The Convective Initiation (CI) product using MSG SEVIRI data is considered very promising and it was recommended to work further on MSG specific improvements.*

Status: CIMSS worked extensively on that with SAWS, results should be provided to the CWG web site. Also, EUMETSAT has placed a study contract with John Mecikalski to further look into this issue, using the data of the COPS experiment as validation data. In addition, Chris Siewert (UAH) is working on this as a EUMETSAT Visiting Scientist. The cloud microphysical possibilities of MSG are extensively studied by Daniel Rosenfeld.

**A lot of progress has been made here: Chris Siewert delivered a prototype software using MSG data and the currently available cloud information (he will shortly report on that). A paper with these results will be published in "Meteorological Applications". John Mecikalski has worked with COPS data to find suitable MSG CI-parameters and parametr thresholds (a paper on this was written and is accepted for publication in JAMC). All this will be discussed in detail during the CI session.**

**Recommendation 13/07:**

*The need for data (radar and lightning) for validation of advanced products and cooperation between involved parties should be stimulated.*

Status: The group took note.

**The general availability / data policy of European radar data should be discussed / clarified.**

**Recommendation 14/07:**

*Climatologies of severe storms and derived severe convection indices derived from satellite data would be of interest and it should be investigated who could produce them.*

Status: Nikolai Dotzek reported that ESSL is building such a comprehensive dataset for Europe. The database currently covers the years back to 2000.

**EUMETSAT placed a CI Validation Study was placed with ESSL which uses these reports.**

**Recommendation 15/07:**

*EUMETSAT should apply for an institutional membership in the European Severe Storms Laboratory and contact N. Dotzek to get access to the European severe storms database.*

Status: EUMETSAT is now an institutional member of ESSL

**No further comment.**

**Recommendation 16/07:**

*For case studies it is strongly recommended to store the original volume radar data to allow for later reprocessing.*

Status: This is currently done at CHMI. Martin Setvak again stressed the importance of this.

**Any news on this?**

**Recommendation 17/07:**

*Information of low level moisture for identification of onset of convection should be provided. For future geostationary systems (e.g. MTG and GOES-R) hyperspectral sounding for tracking of retrieval information is very important to get a better handle on severe weather development.*

Status: Geostationary hyperspectral sounding instrument will of course only be realised at some time in the future – the work of CWG should concentrate on finding further arguments for a need of such a sounder for convection nowcasting purposes.

**Goes together with the needed improvement of IASI L2 data – the science community is working on that. Any other comments?**

**Recommendation 18/07:**

*For determination of detailed cloud structures the data from A-Train should be considered.*

Status: Martin Setvak and Kris Bedka reported that they are (independently) in the process of looking for suitable cases.

**EUMETSAT has a so-called "A-Train" Validation software which allows easy overlays of A-Train data and corresponding MSG data and product. Could also be useful for CWG. PoC: M. König.**

**Recommendation 19/07:**

*In addition it was felt that for optimisation of the global space based observation system the afternoon polar orbits should be more populated.*

Status: The realisation of this proposal is of course beyond the scope of CWG, so CWG simply took note.

**No further comment.**

**Recommendation 20/07:**

*Rigorous independent verification of the nowcasting products is important. Comparison with sounding data is considered important.*

Status: Initial work in this respect is done at SAWS. CWG took note.

**Work done at SAWS resulted in a poster that was presented at the recent EUMETSAT conference in Bath. An electronic copy of the poster is available from M. König.**

**Recommendation 21/07:**

*Added benefits of the rapid scanning service for nowcasting should be evaluated.*

Status: The Meteosat-8 rapid scanning service was declared operational in 2009, so CWG members are invited to provide suitable case studies.

**Any news?**

**Recommendation 22/07:**

*User requirements should be addressed through the operational needs (to predict certain phenomena) – too detailed requirements on design and architecture should be avoided.*

Status: CWG noted that feedback from the meteorological services is needed here.

**Any news?**

**Recommendation 23/07:**

*EUMETSAT to seek support for the implementation of the “Rosenfeld software tools” for operational use.*

Status: No progress was reported on this issue.

**Any news / requirements?**

**Recommendation 24/07:**

*For interpretation of the IR channels one should use standard colour tables for easier cooperation and couple the scheme to the tropopause temperature.*

Status: The standard colour scheme, originally suggested by Martin Setvak, is now widely used. CGMS published a workshop report on recommended RGB schemes.

**No further comment.****Recommendation 25/07:**

*Data formats for data exchange are important. Use of other formats than the currently used WMO formats should be investigated (e.g. HDF5, NetCDF4). However, it should be avoided to invent additional formats.*

Status: CWG noted the need to optimise the Metop HDF format. Concerning NetCDF, Kris Bedka added that the NetCDF standards must be met when a NetCDF file is produced.

**EUMETSAT installed an (internal) Format Advisory Group for the EUMETSAT data and products.** No further news.

**Recommendation 25a/07:**

*EUMETSAT to make standard parallax correction tables per km height for standard satellite positions available via the web.*

Status: The tables and parallax correction software will be made available soon via the CWG web site.

**Tables and software are available through the CWG website and the EUMETSAT ftp server.**

**Recommendation 26/07:**

*A mailing list for use by the workshop participants should be set up.*

Status: The mailing list exist, and registration is possible via the CWG web site. CWG participants are encouraged to check whether mails from this list are not caught by their email spam filter settings.

**Any further comments?****Recommendation 27/07:**

*EUMETSAT to consider putting a high level link to the training and tools section of its web site.*

Status: Will be implemented when possible.

**Any news?**

**Recommendation 28/07:**

*Topical training sessions are considered to be beneficial. Training on new products is essential*

Status: CWG took note.

**Any further comments?****Recommendation 29/07:**

*Some products should be described in form of nice examples for use at lectures in courses and at universities. Training material is often difficult to find. It is necessary to distinguish between education and training.*

Status: CWG members are encouraged to provide more case studies to the CWG web site.

**Easy uplink mechanism of test cases will probably be discussed by Jarno Schipper on Saturday.**

**Recommendation 30/07:**

*Developers of products should document their products and publish in refereed literature their methods and results*

Status: CWG took note. Marianne König reported that an article concerning the GII product has been accepted by “Weather and Forecasting” and will appear in this journal soon.

**Article was published in the February issue of Weather and Forecasting. A (limited) number of harcopies are available from M. König.**

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Piotr Struzik shortly added that, as an outcome of the Krakow Workshop, the workshop scope and the list of recommendations were presented to the Science Working Group (SWG), one of EUMETSAT’s Delegate Bodies.

Volker Gärtner informed the group about a draft version of “Terms of Reference for the Convection Working Group” (the draft is attached in Annex II).

**CWG should endorse the Terms of Reference.**

The following discussion addressed the collaboration with the US National Severe Storms laboratory (NSSL), where Daniel Rosenfeld suggested to further stress the link to NSSL. Kris Bedka recommended to formally contact NSSL via Bob Rabin.

John Mecikalski addressed the issue of training and demonstration, so the link to the European training organisation EUMETCAL and EUMeTrain should also be included in the terms of reference, where applicable.

Daniel Rosenfeld suggested adding to the terms of reference that the CWG activities are to support the activities of the meteorological services.

Jarno Schipper then shortly presented the CWG web site ([www.convection.satreponline.org](http://www.convection.satreponline.org)), which currently gets ~40 hits every day, which is considered highly successful, considering that this site is not linked from anywhere else. He also showed the link to the June 2008 Convection Training Week, where CWG web site offers a link to the recorded presentations for individual download. Jarno Schipper also reported that he intends to change this web site in a wiki format, which will enable everyone to insert suitable case studies, which will ultimately be of high value for both research and training.

Concerning the storage of test data, EUMETSAT will take the action to provide suitable storage.

Finally, Nikolai Dotzek and Martin Setvak informed the group about the plans for the 2009 European Severe Storms Conference (ESSC), which will take place between 12-16 October in Landshut, Germany. It is suggested to have the next formal Convection Working Group Workshop in the days preceding the conference, 8-10 October. Nikolai Dotzek will inquire the availability of the conference location in Landshut.

## Annex I

### List of Participants

Name	Affiliation	Email Address
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#### Explanation of acronyms:

AEMet: Spanish Meteorological Service

CIMSS: Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin – Madison, USA

CHMI: Czech Meteorological Service

DHZ: Croatian Meteorological Service

DLR: German Aerospace Agency

ESSL: European Severe Storms Laboratory

IMGW: Polish Meteorological Service

NIMH: Bulgarian Meteorological Service

OMSZ: Hungarian Meteorological Service

UAH: University of Alabama, Huntsville, USA

SAWS: South African Weather Service

ZAMG: Austrian Meteorological Service

## **ANNEX II**

### **Draft Terms of Reference**

#### **Purpose**

Gathering experts in the field of satellite meteorology for progression of using satellite data for detection and forecasting severe storm systems.

#### **Activities**

Coordination of development and enhancement of techniques for early detection and prediction of severe storms.

Contribution to documentation of historic cases of severe storm events.

Development of training material for introduction of newly developed methods and techniques into operational meteorology.

Exchange of information on an international level for leading scientist and experts in satellite meteorology studying nowcasting techniques.

Fostering use of satellite data in conjunction with other available data (NWP / LI / Radar etc.) for convection forecasting.

In pursuing these aims, the activities of the CWG should be aligned with the goals of the European Severe Storms Laboratory e.V., wherever appropriate.

The CWG will aim to hold annual meetings for planning and reporting on progress.

The CWG is open to all interested parties – individuals and organisation. No formal membership is required.

The coordination of the group will be done by co-chairing the CWG by a member of ESSL and EUMETSAT.

To facilitate the routine running of the CWG a secretary should be appointed by the annual meeting of the CWG.

It is envisaged to keep a close liaison to the National Severe Storms Laboratory (NSSL) in the United States.

The CWG will maintain a web site for efficient information exchange and provision of documentation.

For the exchange of information and documentation the web site should be operated under guidance of the secretary of the CWG.