



The EUMETSAT
Network of
Satellite Application
Facilities



NWC SAF

Support to Nowcasting and
Very Short Range Forecasting

Workshop Outcome

2010 Users' Workshop, Madrid 26-28 April 2010

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SAF Network after 2012

Funding for 5 CDOP-2 years and 5 CDOP-3

- MTG
- Synergy SAF-CAF, inter SAF: Integrate all the experiences as much as possible
- Reprocessing
- Interfacing with other initiatives
- Invites users to express their needs

COMMON ELEMENTS

- Fog
- Snow **Nowcasting???**
- Microphysical
- RDT improvements
- Early Convection warning
- User requirements in training

Engineering (GEO+LEO)

Common need (GEO + LEO)

- **Format output:**
 - Alternative format (netcdf proposal)
 - Integrated module for generating HTML files and images for the web
- **Climate requirement**
 - Full possibility to apply (own) intercalibration and homogenisation to radiance and BT before product processing
 - Cloud detection only based on IR
- Possibility to run more instances of SAFNWC (for handling different NWP model)
- Improve documentation on requested NWP format
- “Merge” GEO and LEO or “interoperability”? (Paul, discussed in plenum)

Engineering (GEO)

- BUFR output: user friendly output formats are requested (OGC format : GML for all vector products)
- Possibility to apply software to all GEO's (plan for GOES ??)

Engineering (LEO)

- Easier installation and configuration
 - Melfi: request for Autoinstalling version (example ./configure (checking for python, hdf5lib, AAPP,RTTOV...) ./make
 - Integration of the software packages into one package
 - Full test data set for testing installation with none or minimal user configuration
- Info: processing 1 region (Italy) 1000*1000 Pixel resolution without TM (using Crontab). Maybe interested in using TM (melfi@meteoam.it)
- The third party software is partly on very old versions not compatible with standard installations coming with modern LINUX distributions.
- Standalone libraries to utilise the products in another environment.
- Cleaner python API
- Improved tools for checking user-contributed NWP fields during pre-processing.
- Satellites??????
- Task Manager ???????

Validation

- Validation should include other products:
 - LEO/GEO
 - SAF and CAF
 - External
 - Comparison of RDT with CbTram and Nefodina
- Validation of products for Africa (cloud, precip. Etc)
- Cloud validation
 - Snow cover: consider possible contributions of NMS already operationally running snow maps over central Europe, derived by SEVIRI ->ref snow map (fellowship@MeteoSwiss (Igor)
 - Any collaboration with other SAFs developing snow cover products? Validation? Crossvalidation? (LandSAF, HSAF)

CLOUD

- Clouds: consistency/comparison with PPS/MSG clouds
- Snow cover: consider possible contributions of NMS already operationally running snow maps over central Europe, derived by SEVIRI ->ref snow map (fellowship@MeteoSwiss (Igor))
- Any collaboration with other SAFs developing snow cover products? Validation? Crossvalidation? (LandSAF, HSAF)
- *For CDOP2:-1rst set of "basic products" (follow up of existing, proven, mandatory)*
-2nd set of "product dev. Areas" (e.g. cloud and cloud based,-as precipitation-convection, syninTr????, air mass and air mass based, winds)...rather than locked fixed list of additional products!

CLOUD

- Special interest on stratiform/cumuliform distinction at MSG/CT product (even if it is only
- CTTH, Others: improve tropopause accuracy or it's identification
- **Microphysical properties: what are the "real" requirements for these products for NWC and other applications?**
- Aerosol products interest: Yes –air quality and cloud development (drop size distribution rosenfeld)
- Applications for probabilistic cloud masking at your institute: yes, cloud cover (automatic observation complementary to e.g. synop)
- What microphysics cloud product are you most interested in?-reff, cloud water path

Precipitation

- Precipitation “real time” Calibration with ground based radar (MMR)
- PC,CRR: possibility to (in any way) “use” local radar/rain gauge data in the product (e.g. as lightning data in RDT)
- CRR, PC, RDT maybe others to converge considering issues as case/met. Situation/day etc. dependence (even day-night problems – differences)
- **CRR/PC/RDT combine precipitation product ??**

Convection and Pre Convection Warning

- RDT: cooperation with ongoing EUM fellowship
- RDT detects mainly mature phase convective clouds, developing convective cells are more often missed. Decaying phase convective clouds are not detected in this version.
- The small and/or warm cells are often missed.
- Better performance in 'pure' convective situation (Cbs, MCSs and no front), than in frontal situation. Sometimes a huge part of a front is detected as convective.

Convection and Pre Convection Warning

- in some cases the contour is too 'loose', This happens more often at the beginning of the detection. Later the algorithm finds better the edge of the cloud/tower.
- The trajectory is not smooth
- some high level Lee clouds detected by RDT as convective. However their time stability was low.

Displacement field (wind and others)

- Study of wind shear with HRW product
- Study of trajectories products considering rapid scan cycle and tracer persistence

Clear Air Product

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Automatic Satellite Image Interpretation

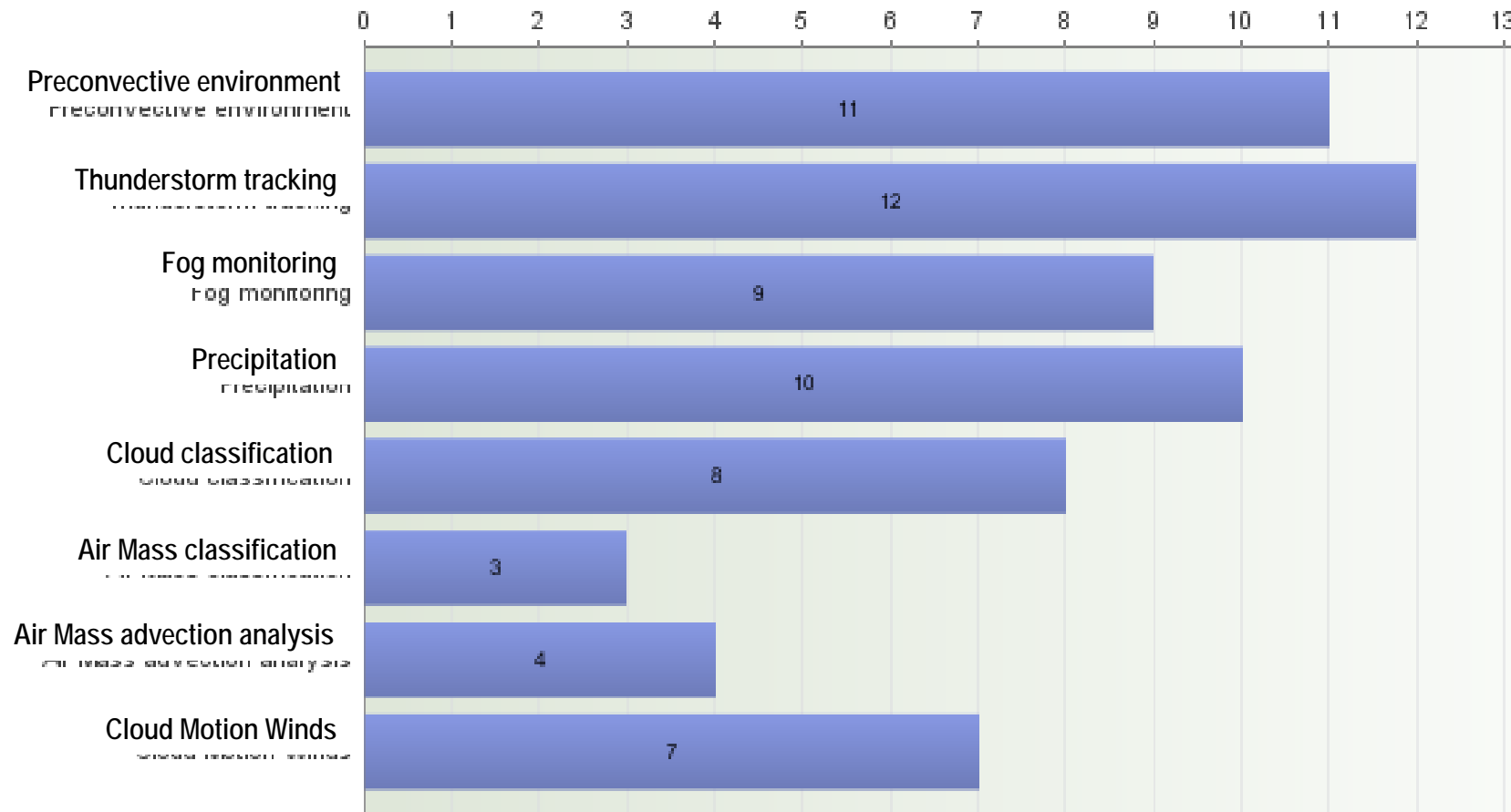
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Sounder products

- IASI L2:tropopause and/or T/RH profiles
- IASI L2 -> volcanic ash (height assignment)
- MTG sounding products
- NWC in 10 years, how will it look like?
- Local production of products? Integration in local NWP?

Survey results: MSG

Can you specify your future needs in Nowcasting? (13)



Survey results: MSG

Which new Nowcasting products to be codified at NWC SAF could cover your needs? (13)

- AMV extrapolated SAF products
- Tropopause height evaluation
- Predicted IR images up to 24 hours
- Cloud divergence, convergence, vertical mass transport
- Lifted index for “mixed very low-level layer”
- Convection initiation (and lightning initiation) product
- Increased use of temporal analysis

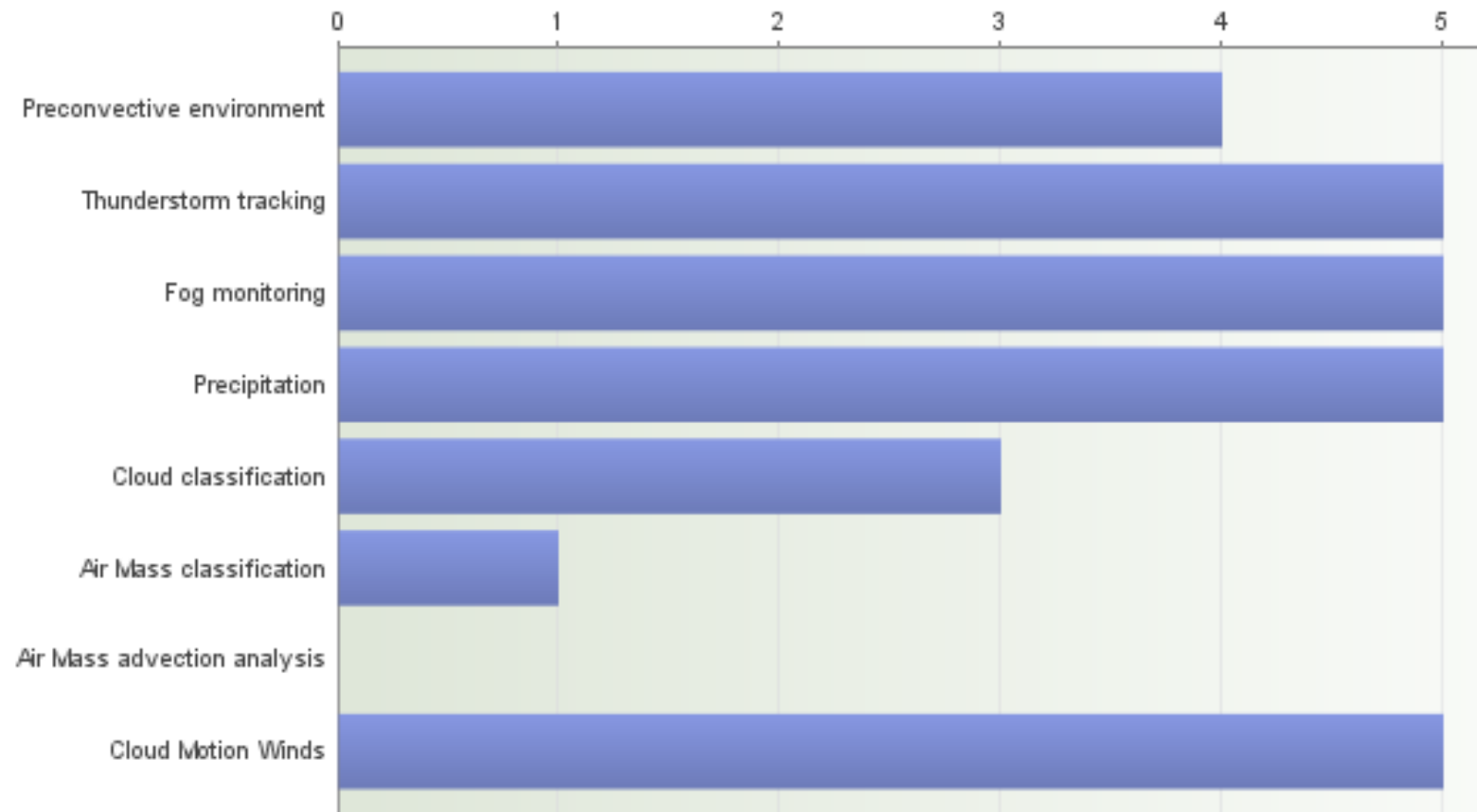
Survey results: MSG

Which new products MTG based can be of interest for your service? (5)

- Products using lightning data
- Atmospheric soundings
- Soft transition MSG to MTG
- To consider comparing/combining products
- To consider mixed PPS and GEO cloud and precipitation products

Survey results: PPS

Can you specify your future needs in Nowcasting? (6)



Survey results: PPS

Which new products NPP/NPOESS based can be of interest for your service? (1)

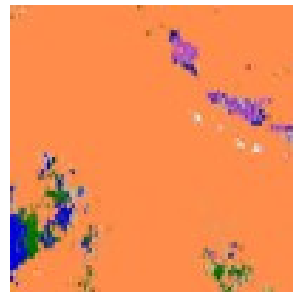
- A cloud phase and/or other cloud microphysical product would be most interesting and useful

Requested Improvements PGE01 & PGE01b (CMA)



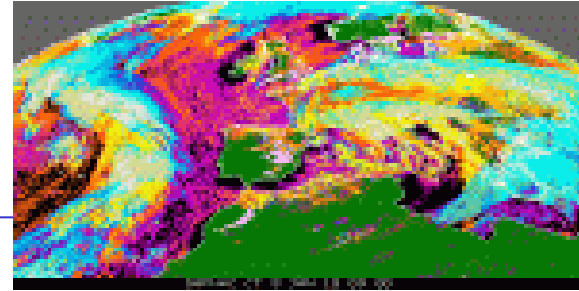
MSG part

- Improve quality in higher latitudes with low solar angles
- Smoke as a separate 'flag'
- To reduce snow false alarms
- To improve information on atmospheric dust
- Temporal analysis to be applied to snow contaminated pixels correction



- No comments for the **PPS part**

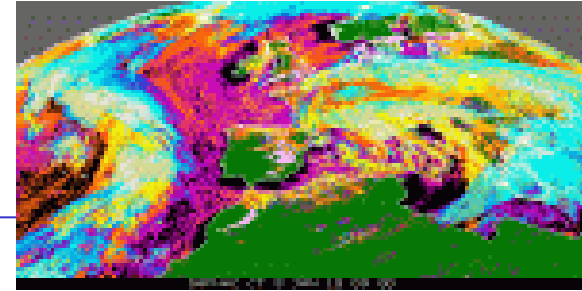
Requested Improvements PGE02 & PGE02b (CT)



MSG part

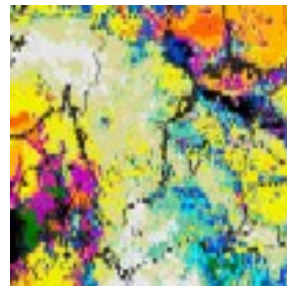
- Cold land surfaces
- To improve the detection of small cloudiness and allow for additional parameters in broken cloudiness (HRV analysis)
- To use MTG NIR1.3 channel data to better discriminate thin cirrus clouds.
- Cumuliform/stratiform distinction
- Solid/liquid phase distinction
- Other microphysical properties as effective particle radius and cloud liquid path.

Requested Improvements PGE02 & PGE02b (CT)



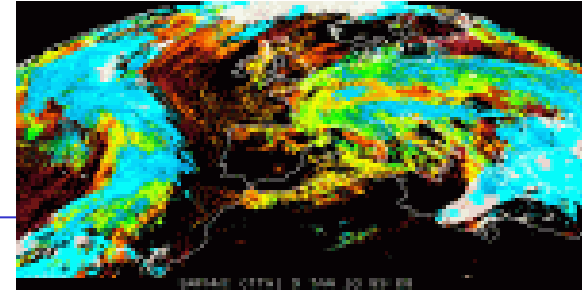
MSG part

- To create snow covered by thin cirrus class as well.
- To make more use of HRV data at 1km resolution
- To use LI data with MTG to create a convective cloud class within the (very) high cloud class
- In case of multilayer class identified, it would be very useful to get more detailed information.



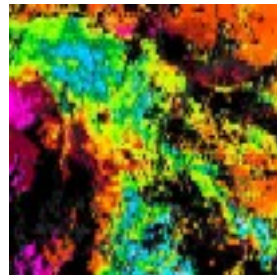
- No comments for the **PPS part**

Requested Improvements PGE03 & PGE03b (CTTH)



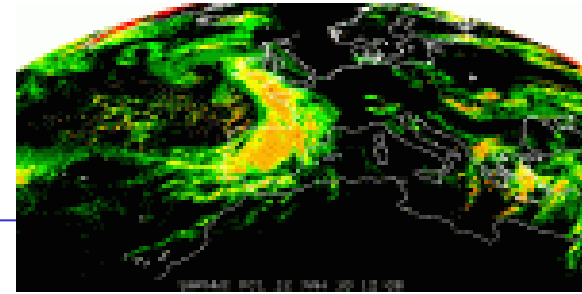
MSG part

- Reduction of "boxes" when showing semitransparent cloudiness
- To improve low-level cloud height assignment in case of inversion.
- To improve vertical resolution near tropopause (mature convection)
- To create snow covered by thin cirrus class as well
- To indicate somehow that the cloud top height may be wrong for cold U or cold ring shape clouds
- To fill in the ring?
- CTTH could provide useful information to PGE11(RDT)



- No comments for the **PPS part**

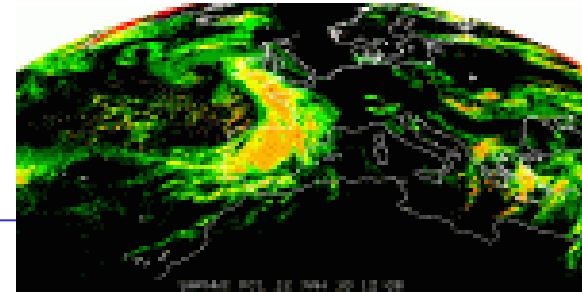
Requested Improvements PGE04 & PGE04b (PC)



MSG part

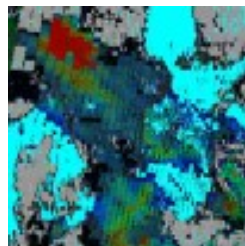
- More focus on severe weather areas maybe combining with other sources
- To limit sun dependence
- Better tuning the method for low solar elevation cases
- To take into account the cloud top microphysical information more directly
- To include parallax corrections
- Quality information easier to use
- To include some microwave information from polar satellites for strong fronts and at night

Requested Improvements PGE04 & PGE04b (PC)



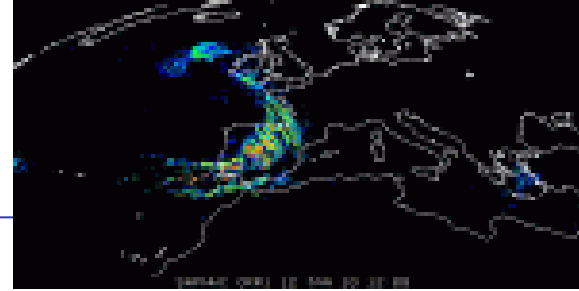
MSG part

- To integrate some recent/close PPS rain product information in the product itself (updated recalibration), or in form of quality indicators (indication on real confidence on the calibration).
- To allow introducing local corrections in the SW from current/recent radar or gauge data.
- To rethink product or product use considering similar developments and specified needs.
- To consider also internal contrast/comparison/merging to other products (e.g. PGE05-CRR).



- No comments for the **PPS part**

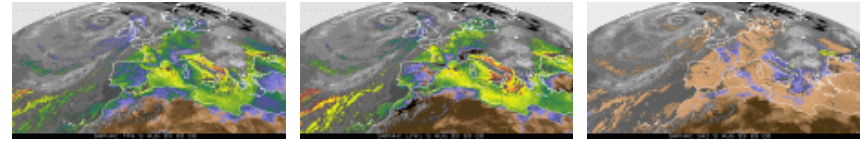
Requested Improvements PGE05 (CRR)



- Information on confidence or probability in each rain intensity.
- Better selection between convective and not convective cases.
- To use more channel data.
- Take into account some microphysical info.
- To use lightning information with MTG.
- To add MW info from a polar satellite.
- To study reduced number of classes.
- Reconsider alternative calibration for "warm tops"

Requested Improvements

Clear Air products

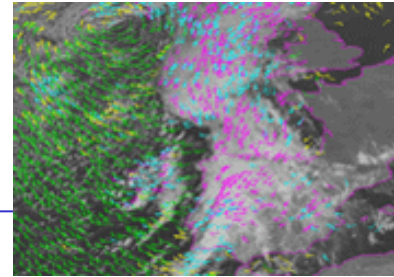


PGE06 (TPW) PGE07 (LPW) PGE08 (SAI)

- PGE08 (SAI) only reacted to very unstable events
- Underestimation of instability compared to model fields (and Regional Instability Index RII)
- PGE08 (SAI) product quality is too much variable (dependent on air mass and ground characteristics) to be actually useful and used.
- PGE08 (SAI) to be substituted by equivalent simulated Lifted Index product.
- PGE08 (SAI) equivalent products less ground-dependent

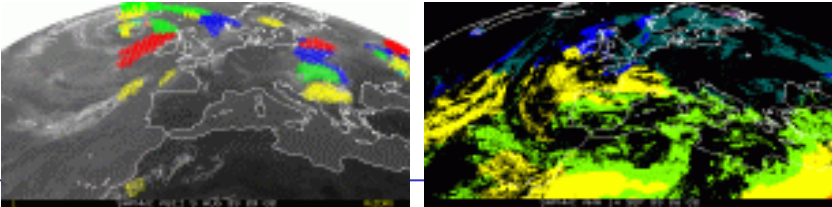
PGE13 covers most of these issues

Requested Improvements PGE09 (HrW)

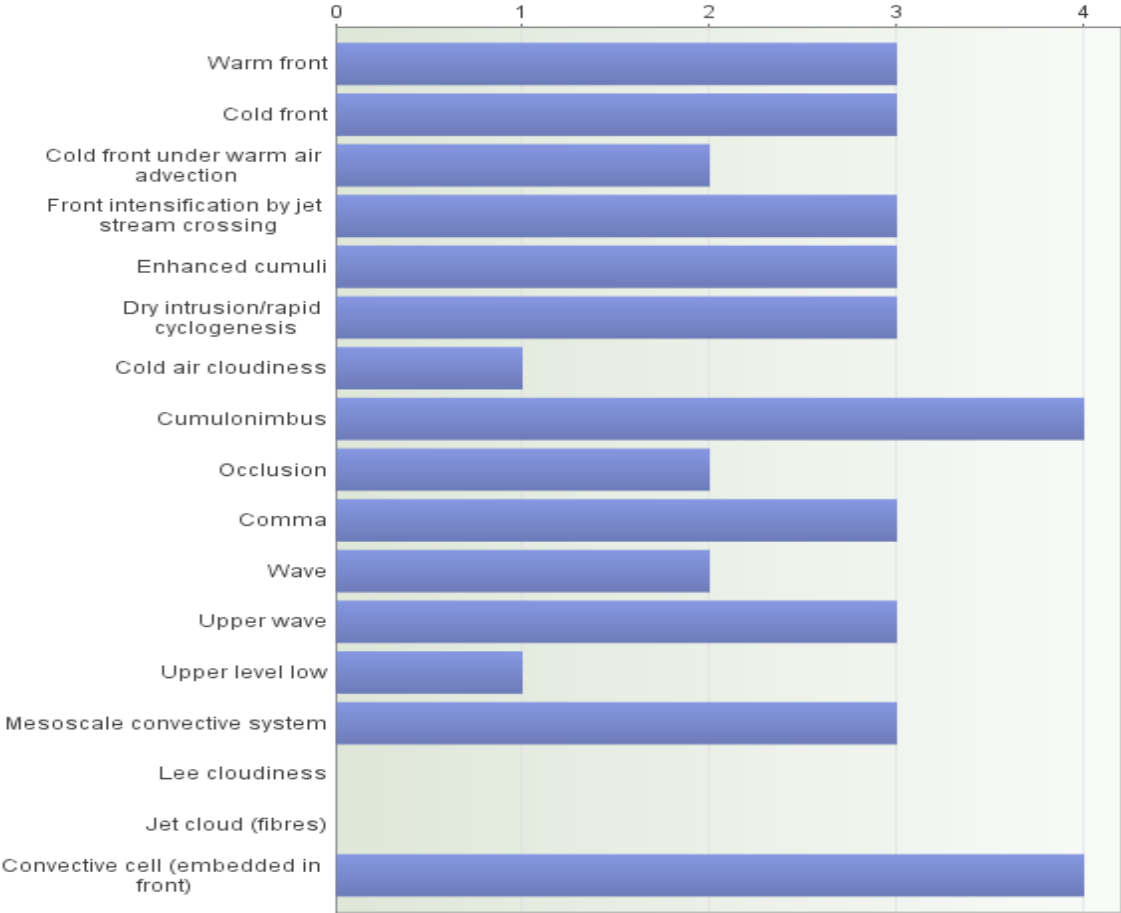


- The product is useful for convergences/divergences, wind over mountains or offshore
- Include in the product information fields on displacements/trajectories
- To allow for detailed wind computations for specific CT classes as additional option
- QI threshold variable

Requested Improvements PGE10 (ASII), PGE12 (AMA)

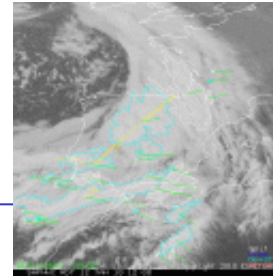


Which conceptual models do you consider most desirable to be objectively diagnosed?



Requested Improvements

PGE11 (RDT)



- To avoid identifying some Cs/Ci structures as convective.
- Identification of Mesoscale Convective System (or even Mesoscale Convective Complex)
- Earlier detection of convective clouds - almost all detected clouds are in mature phase
- To add severity info better discrimination between convective and not convective clouds (fronts!)
- Contours are sometimes too loose
- Some tendency to detect too large structures, Cs/Ci but also merging sometimes several cells. CRR and other products could be useful in these cases.

PPS overview

- Is it necessary to continue the IASI development? The improvement is under expectations.
- JPSS + post EPS (VIIRS) + MW.
- Adaptation to FY-3. MWIRI, VIRR, MERSI (0.25-1km)
- Molnyia orbit; 15 minutes images in northern latitudes. Potential launch within CDOP-2-
- CDOP-2 HQ masking, improve aerosol flagging.