

Nowcasting SAF: Current Status and future plans

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Convection Working Group, Florence

Outline

- **NWC SAF concept**
- **Current status (CDOP-2: 2012-2017)**
 - ✓ **MSG v2013: current operational software package for MSG**
 - ✓ **PPS v2014 current operational software package for polar satellites**
 - ✓ **New GEO v2016 release in summer 2016 for GEO satellites**
- **Future plans**
 - ✓ **CDOP-3: 2017-2022 (include support to MTG-I, EPS-SG A)**
 - ✓ **CDOP-4: 2022-2027 (include support to MTG-S, EPS-SG B)**
- **MTG Rapid Scan Service**

NWCSAF concept: objectives

Satellite Application Facility on Support to Nowcasting and Very Short Range Forecast (**NWC SAF**) belongs to the EUMETSAT SAF Network.

The general objective of the SAFNWC is to provide operational services to ensure the **optimum use of meteorological satellite data in Nowcasting and Very Short Range Forecasting** by targeted users.

To achieve this goal , the NWC SAF is responsible for the development and maintenance of appropriate **SW Packages (GEO and POLAR Satellites)**, as well as of all related tasks for **user's support**.



Help Desk



NWC SAF
Support to Monitoring and Now-Cast Range Forecasting



AEMet
Agencia Estatal de Meteorología



NWC SAF

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- NWCcasting SAF - EUMeTrain Event Week 2013 20130813
- MSG v2013 patch in SWI Packages and Patched site 20130813
- Examples of CRPN and PCR 20130813

MSG

MSG Cloud Products

Cloud Mask Description: 	Cloud Type Description: 	Cloud Top Temperature and Height Description: 
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MSG Precipitation Products

Precipitating Clouds Description: 	Convective Rainfall Rate Description: 	Prec. Prod. Cloud Physical Properties Description: 
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MSG Clear Air Products Physical Retrieval

Total Precipitable Water Description: 	Layer Precipitable Water Description: 	Stability Analysis Imagery Description: 
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MSG Wets, Conceptual Model and Convection Products

High Resolution Winds Description: 	Automatic Satellite Image Interpretation Description: 	Rapid Development Thunderstorms Description: 
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PPS

Cloud Mask Description: 	Cloud Type Description: 	Cloud Top Temperature and Height Description: 
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Precipitating Clouds Description: 	Cloud Physical Properties (CPN) Description: 	Cloud Physical Properties (LWP) Description: 
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- The **general cloud data** for running NWC SAF software are:
 - MSG package: MSG SEVIRI data and MPP (in some of them)
 - PPS package: AVHRR/3 data and SWP (in some of them)
- The user should be aware that using old SWP data might reduce the quality of the product.
- The processing area could be any rectangular area inside MSG full disk for the MSG package.
- The quality of the products is not guaranteed out of MSG full disk (Europe, North Africa and adjacent seas).
- For the PPS package the coverage area is half of the 50° diameter – depending on local radio horizon.

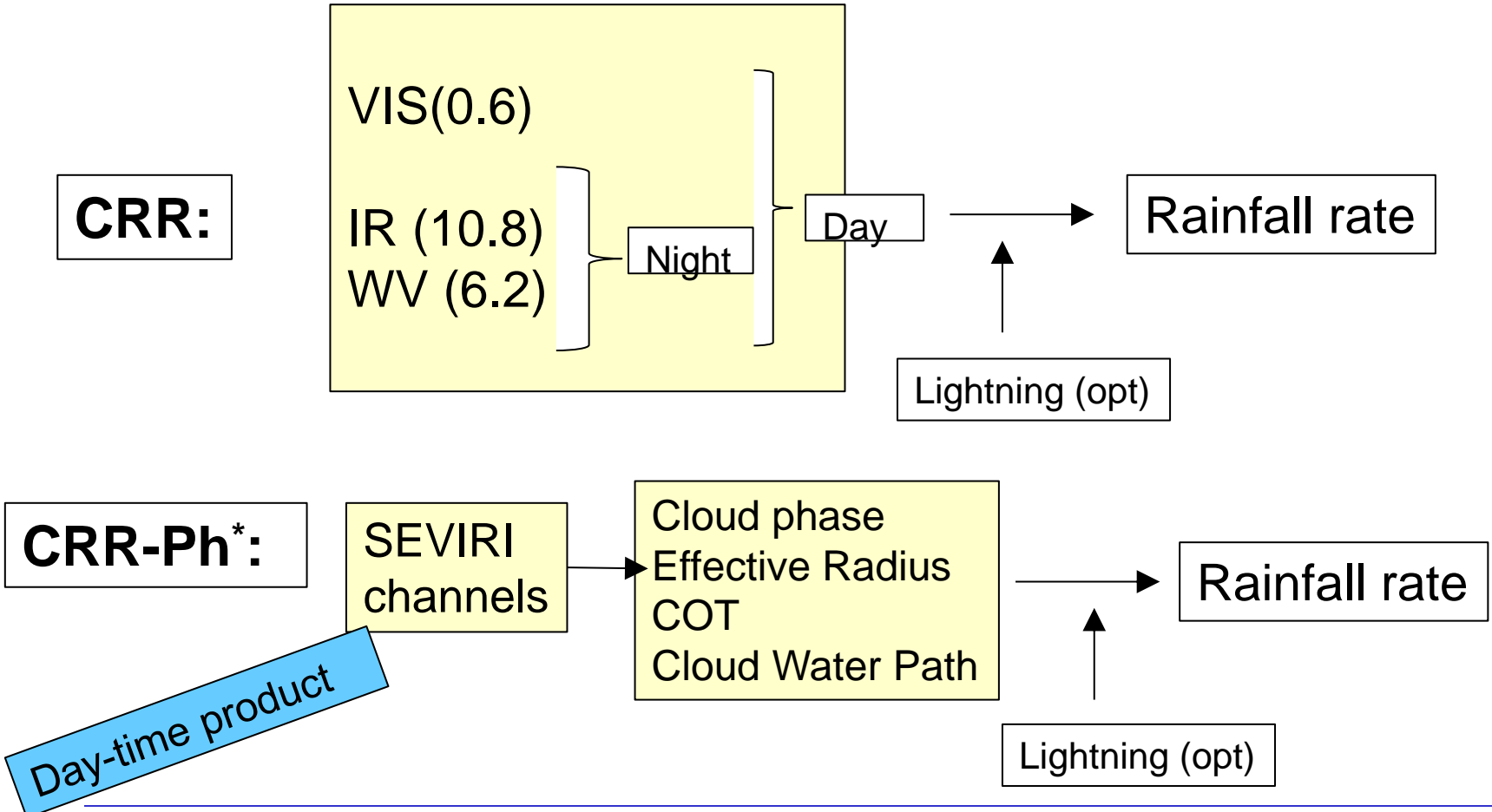
Current status: MSG v2013

- **Current operational SW package is MSG v2013**
- **Applicable to MSG data**
- **Products:**
 - ✓ **Cloud products (Météo-France)**
 - Cloud mask, Cloud Type, Cloud Top Temperature and Height
 - ✓ **Wind Product (AEMET, Spain): High Resolution Winds (HRW)**
 - ✓ **Automatic Satellite Interpretation (ZAMG, Austria)**
 - ✓ **Clear Air product (AEMET, Spain):**
 - total water content and water content at different levels
 - Instability indices

Current status: MSG v2013

- **Products:**
 - ✓ **Precipitation Products (AEMET, Spain):**
 - probability of precipitation
 - convective rainfall rate
 - day-time probability of precipitation and convective rainfall rate from microphysical properties.
 - ✓ **Convection product (Météo-France):**
 - Rapid Development Thunderstorms

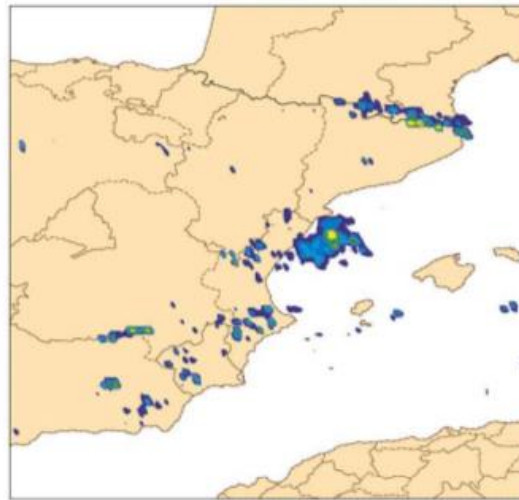
Convective Rainfall Rate. CRR and CRR-Ph



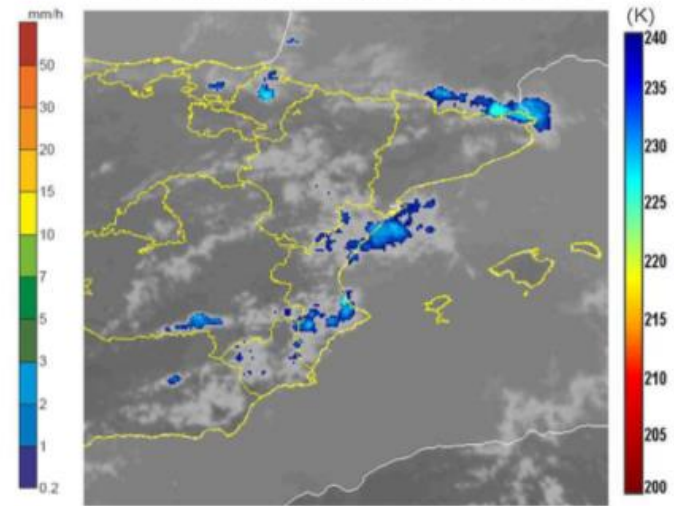
(*)Based on algorithm from Roebeling, R. A. and I. Holleman, 2009

Precipitation Products from Cloud Physical Properties (PGE14)

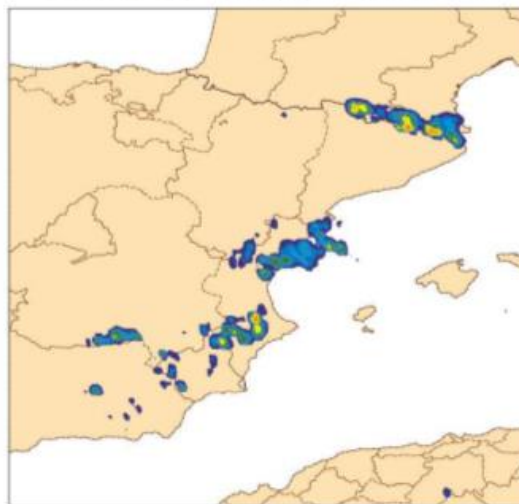
Radar Precip. 11 Aug 2012 at 14:10 UTC



SEVIRI IR10,8 11 Aug 2012 at 14:00 UTC



CRPh Precip. 11 Aug 2012 at 14:00 UTC



CRR Precip. 11 Aug 2012 at 14:00 UTC



Cecilia Marcos,
AEMET

Current status: PPS v2014

- **Current operational SW package is PPS v2014**
- **Developed by SMHI, Sweden**
- **Process data from the joint polar system (EUMETSAT and NOAA polar satellites)**
- **Products:**
 - ✓ **Cloud products:** Cloud Mask, Cloud Type, Cloud Top Temperature and Height, Cloud Physical Properties
 - ✓ **Precipitation product:** probability of precipitation

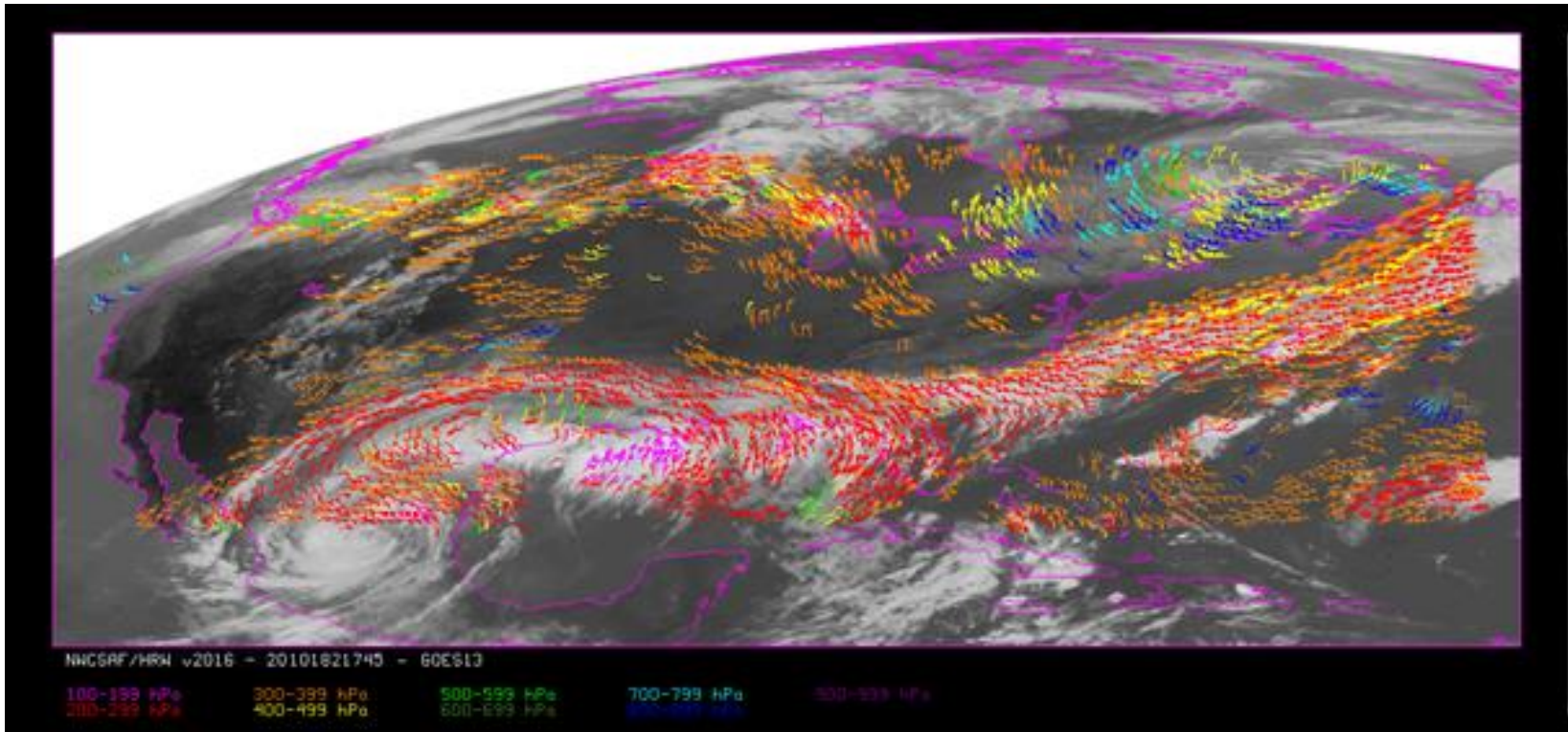
GEO v2016: main improvements

- **New common library NWCLIB:**
 - ✓ processing additional geostationary satellites
 - ✓ common tools to be used by all NWC/GEO products
- **New output format: NetCDF**
- **Use of updated version of RTTOV (11.2)**
- **General improvements**

GEO v2016: main improvements

- **New products:**
 - ✓ **CMIC:** cloud phase, cloud water path, effective radius, optical depth
 - ✓ **ASII-NG:** automatic satellite interpretation new generation
 - ✓ **EXIM:** extrapolation of SEVIRI imagery or NWCSAF products up to a lead time of 1 hour
 - ✓ **CI:** convection initiation
- **Adaptation of HRW to GOES-N satellites (included validation)**

GEO v2016: main improvements



*NWC/GEO High Resolution Winds v2016 AMV output
example in the Continental United States region (1 July
2010 1745Z, GOES13 satellite),*

Javier García
Pereda, AEMET

Future plans:

- **Provide software to generate day-1 products for the new EUMETSAT programmes MTG-I and EPS-SG, ensuring a continuity of service between current and future satellites and extending it by the use of innovative new EUMETSAT sensors:**
 - ✓ **MTG-FCI and MTG-LI on board of MTG-I**
 - ✓ **METimage on board of EPS-SG A**
- **Development studies to prototype MTG-LI derived products to become NWC SAF products in CDOP-4 (2022-2027)**

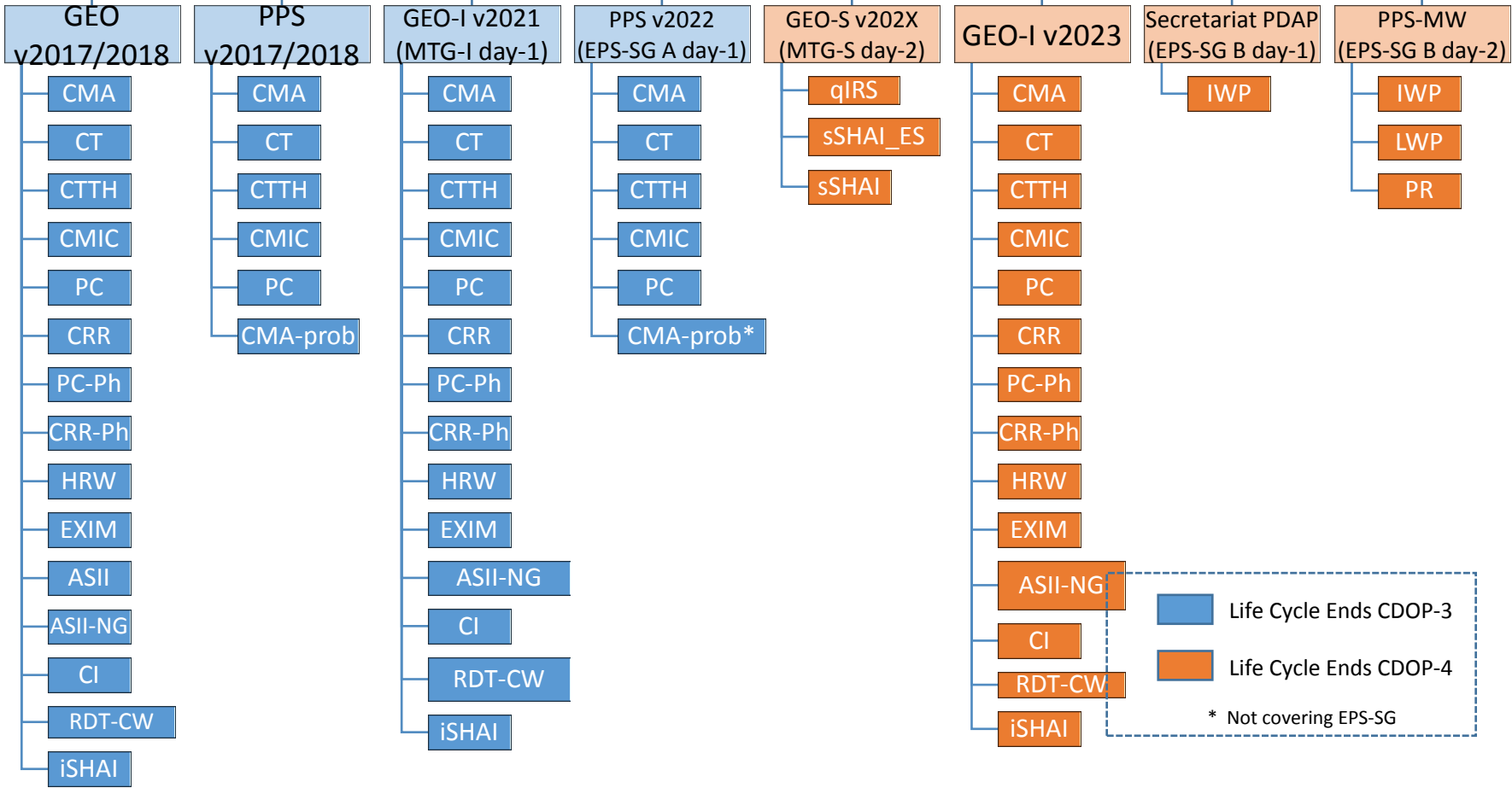
Future plans:

- **Comparison of cloud products from GEO and PPS SW packages**
- **Adaptation of GEO-I products to Himawari and GOES-R/S**
- **Adaptation of PPS to Chinese satellites in the Fung Yun 3 series, carrying the MERSI-2. This will considerably improve data coverage at high latitudes.**

Future plans:

- **Start preparation for new and extended NWC functionality using innovative new EUMETSAT sensors available in CDOP-4 (2022-2027):**
 - ✓ **MTG-IRS on board of MTG-S (New SW package GEO-S).
New products: qIRS, sSHAI_ES, sSHAI**
 - ✓ **MWI/ICI on board of EPS-SG B (New SW package PPS-MW): IWP, LWP, PR**

NWCSAF
SW & DOC deliverables



MTG Rapid Scan Service

- **Current Baseline for FCI-RSS: 2.5 min, VIS0.6, NIR2.2, IR3.8 and IR10.5 (0.5km,1km)**
- **NWC SAF products can not be generated or will have lower quality with the current FCI-RSS baseline**
- **NWC SAF opinion: a solution should be found to disseminate all channels to end-users**
- **Cost of dissemination versus cost of MTG-I RSS**
- **A recommendation of the CWG to this respect**

Thanks for your attention!!