

Dissemination of Global Products from EUMETSAT

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Overview

- **NRT Replaced by EUMETCast**
- **What is EUMETCast?**
- **Which data sets will be available via what mechanism?**
- **What will the data sets contain?**
- **Local mission, EARS and RARS**
- **Some useful links**

NRT Replaced by EUMETCast

- **Original baseline:**
 - ❖ **Direct dissemination of global MetOp products in near real time via NRT system. Specific system for MetOp data.**
 - ❖ **Data available to EUMETSAT member states and their partners only.**
 - ❖ **Data were to be disseminated in special format defined specifically for MetOp products.**
- **At request of users:**
 - ❖ **EUMETCast will be used for direct dissemination instead of NRT system**
 - ❖ **Many data sets on EUMETCast will be in BUFR**

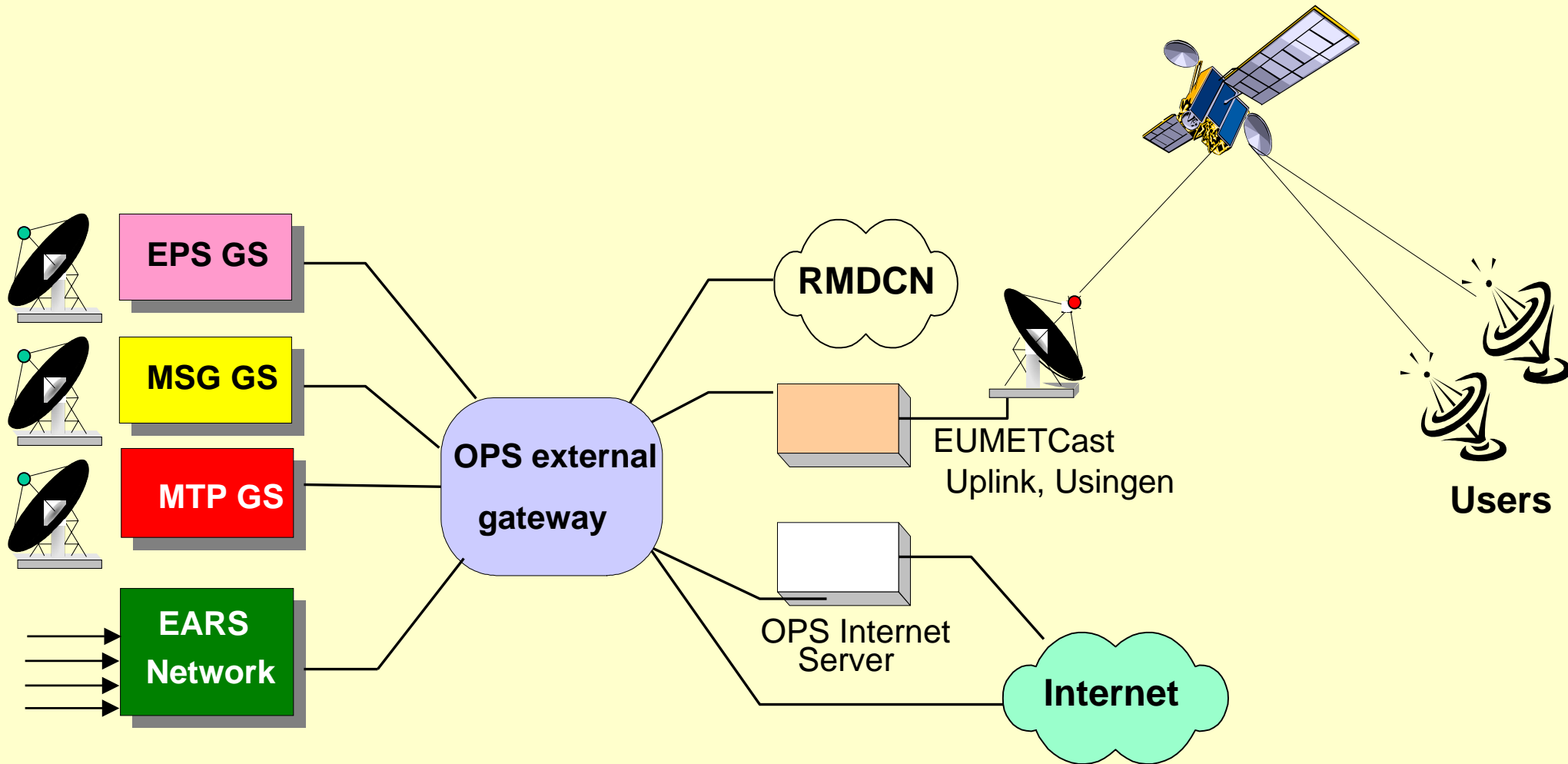


EUMETCast Concept and Overview

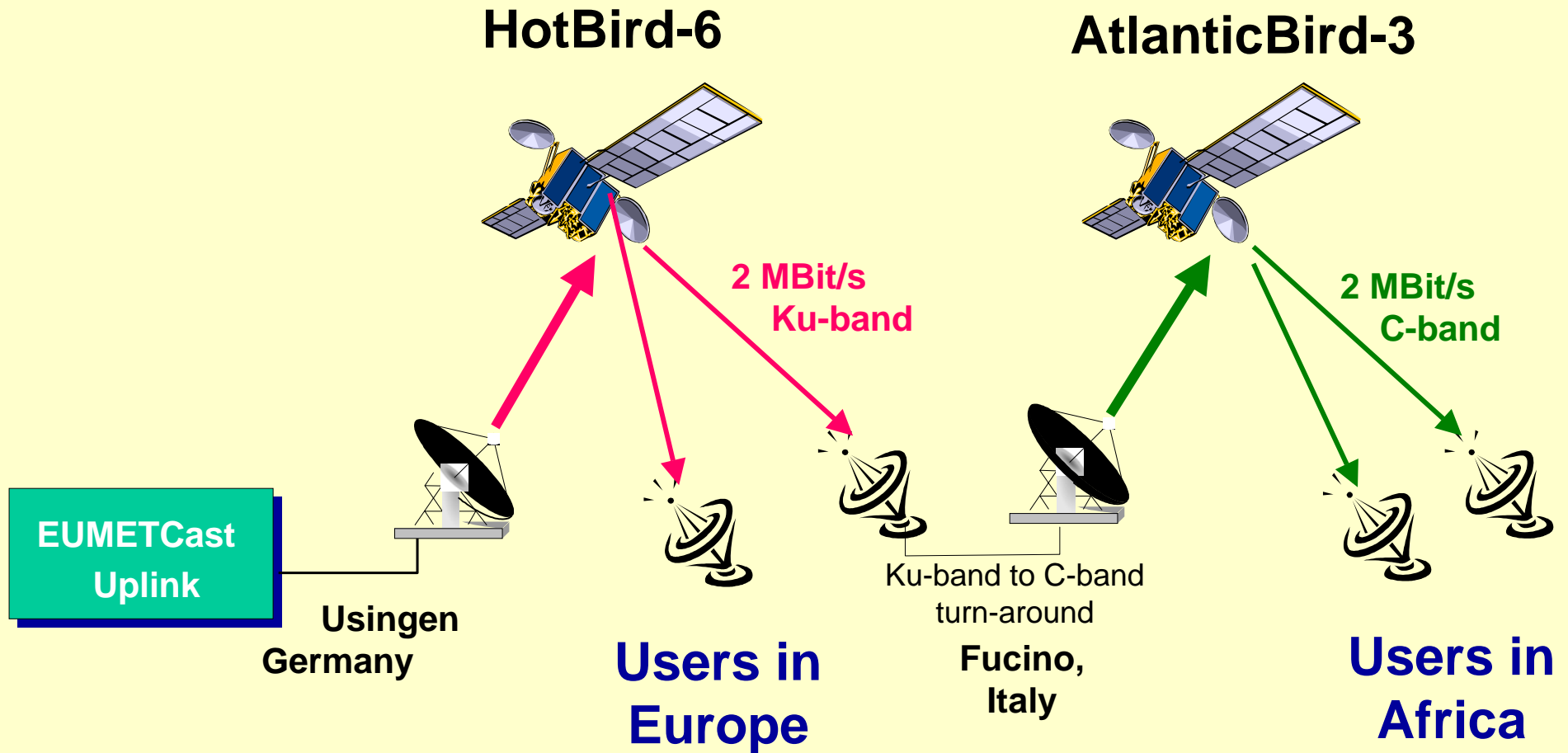
- **Generic, multi-service dissemination system based on the standard Digital Video Broadcast (DVB) multi-cast technology**
- **Data relayed via commercial telecommunication satellites**
- **Off-the shelf, commercial, inexpensive equipment resulting in relatively low cost reception stations**
- **Service priority handling**
- **Highly configurable encryption facility - using EUMETCast Key Unit (EKU) and EUMETCast Client Software**



EUMETCast Concept and Overview



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EUMETCast Concept and Overview

A typical reception station comprises:

- **Standard PC equipment - recommend two PCs, one for reception one for data processing**
- **DVB PCI card**
- **Satellite off-set antenna fitted with a digital universal V/H LNB - C-band for Africa**
- **EUMETCast Client Software**
- **EUMETCast Key Unit (EKU) - USB device**
- **Processing/visualisation software**
- **List of known manufacturers see:
http://www.eumetsat.de/en/dps/helpdesk/msg_suppliers.html**

EUMETCast Delivered Services

- **High Rate SEVIRI Image Data - data from Meteosat-8 (15-min)**
- **Low Rate SEVIRI Image Data - data from Meteosat-8 (30-min)**
- **High Resolution Image (HRI) - data from Meteosat-7 (30-min)**
- **Indian Ocean Data Coverage (IODC) - data from Meteosat-5 (30-min)**
- **Data Collection and Retransmission (DCP)**
- **Meteorological Data Dissemination (MDD)**
- **Meteorological Products (including Satellite Application Facility products)**
- **Foreign Satellite Data (FSD)**
- **EUMETSAT ATOVS Retransmission Service (EARS) - *Ku only***
- **Rapid Scanning Service (RSS) - data from Meteosat-6 - *Ku only***
- **DWDSAT - *Ku only***



Future Plans for EUMETCast

EUMETCast/NRT convergence - Detail:

- **Original EPS baseline:**
 - ❖ **Direct Readout Service (HRPT/LRPT)**
 - **Data Policy - data is classified as essential**
 - ❖ **Near Real-Time Terminals - restricted to Member State Meteorological Services and their partners**
 - **Global EPS products - Level 1 and 2**
 - Level 2 products classified as “essential”**
 - Level 1 Data Policy decision expected spring 2005**

Future Plans for EUMETCast

EUMETCast/NRT Convergence – Detail:

- **Proposed New Baseline:**
 - ❖ **Direct Readout Service - unchanged**
 - ❖ **Replace NRT dissemination system with EUMETCast**
- **Discussions in progress on:**
 - ❖ **Technical/financial implications of adding Global EPS Products to EUMETCast in Europe**
 - ❖ **Preferred data formats - majority in BUFR**

EUMETCast Summary

- **EUMETCast is a highly configurable system**
- **EUMETCast is the baseline direct dissemination mechanism for all Meteosat satellite data**
- **EUMETCast can be expanded**
 - ❖ **geographical coverage**
 - ❖ **additional services**
- **EUMETCast can be used to deliver third party, non-meteorological and/or non-satellite data**
- **EUMETCast future expansion lies with the user**
 - ❖ **Sharing experience/knowledge of new data and new technologies**



Summary of MetOp distribution formats

	EUMETCast		GTS	
	Level 1	Level 2	Level 1	Level 2
AMSUA	BUFR	-	BUFR	-
HIRS	BUFR	-	BUFR	-
MHS	BUFR	-	BUFR	-
ATOVS	-	BUFR	-	BUFR
IASI	BUFR	BUFR	BUFR	BUFR
ASCAT	BUFR and PFS	BUFR from SAF	BUFR	BUFR from SAF
AVHRR	PFS	-	-	-
GOME	PFS	BUFR from SAF (TBC)	-	BUFR from SAF
GRAS	BUFR and PFS	BUFR from SAF (TBC)	-	BUFR from SAF

Data Set Contents

- **ATOVS level 1 data in BUFR according to WMO sequences**
 - ❖ **3-10-008 for HIRS**
 - ❖ **3-10-009 for AMSU-A**
 - ❖ **3-10-010 for MHS (borrowed from AMSU-B)**
- **IASI level 1c BUFR sequence established after multi-party discussions. Will be presented for WMO approval at next opportunity.**
- **Full IASI level 1c data set on EUMETCast. Subset of channels (300 ...) on GTS.**
- **ASCAT level 1b and GRAS level 1b BUFR sequences are being established and will be presented for WMO approval.**
- **IASI and ATOVS level 2 data to be sub-sampled for GTS.**



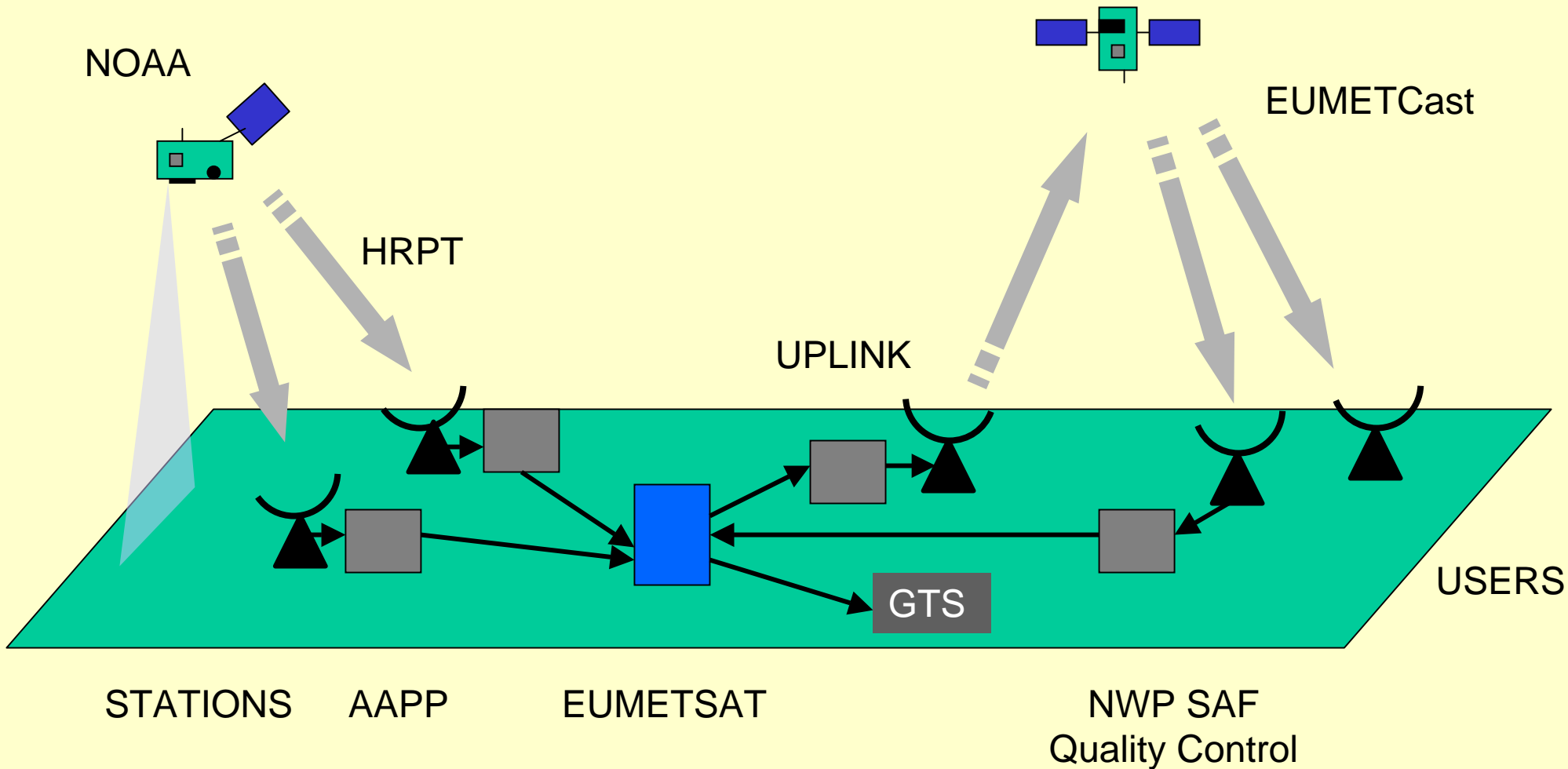
BUFR - Data grouping and compression

- **BUFR supports compression of data**
- **Compression factor best for large sets of self similar data**
- **Data are grouped in order to**
 - **maintain meaning to group**
 - **make encoding efficient**
- **IASI level 1c - 1 scan line per BUFR message**
- **Other level 1 data - many complete scan lines per message**
- **Messages grouped: one file per PDU (3 mins of data)**

GTS Distribution

- **GTS network gives global NRT access to users outside the EUMETCast footprint**
- **Data will be distributed in standard WMO format (BUFR)**
- **Abbreviated bulletin headers will have CCCC group “EUMP” for MetOp products generated by EUMETSAT**

EARS System Overview



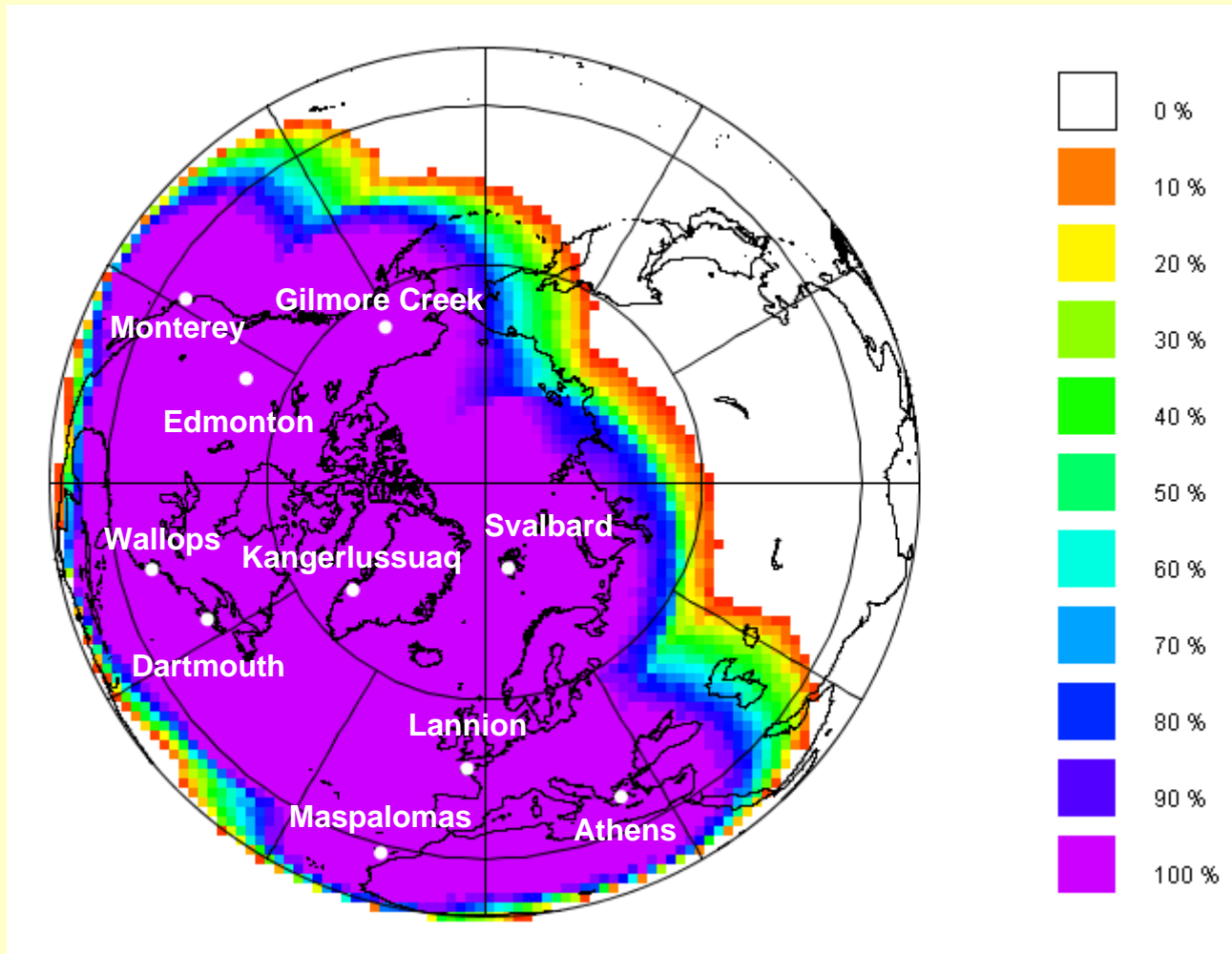
Instruments-Based EARS Services

	NOAA KLM	NOAA NN'	Metop
EARS ATOVS	HIRS/3 AMSU-A AMSU-B	HIRS/4 AMSU-A MHS	HIRS/4 AMSU-A MHS
EARS AVHRR	AVHRR/3	AVHRR/3	AVHRR/3
EARS ASCAT	-	-	ASCAT

Satellites Supported by EARS

Morning Orbit	Afternoon Orbit	Launch / Expected Launch
NOAA-15		May 1998
	NOAA-16	September 2000
NOAA-17		June 2002
	NOAA-N	May 2005
Metop-2		April 2006
	NOAA-N'	2008
Metop-1		2010

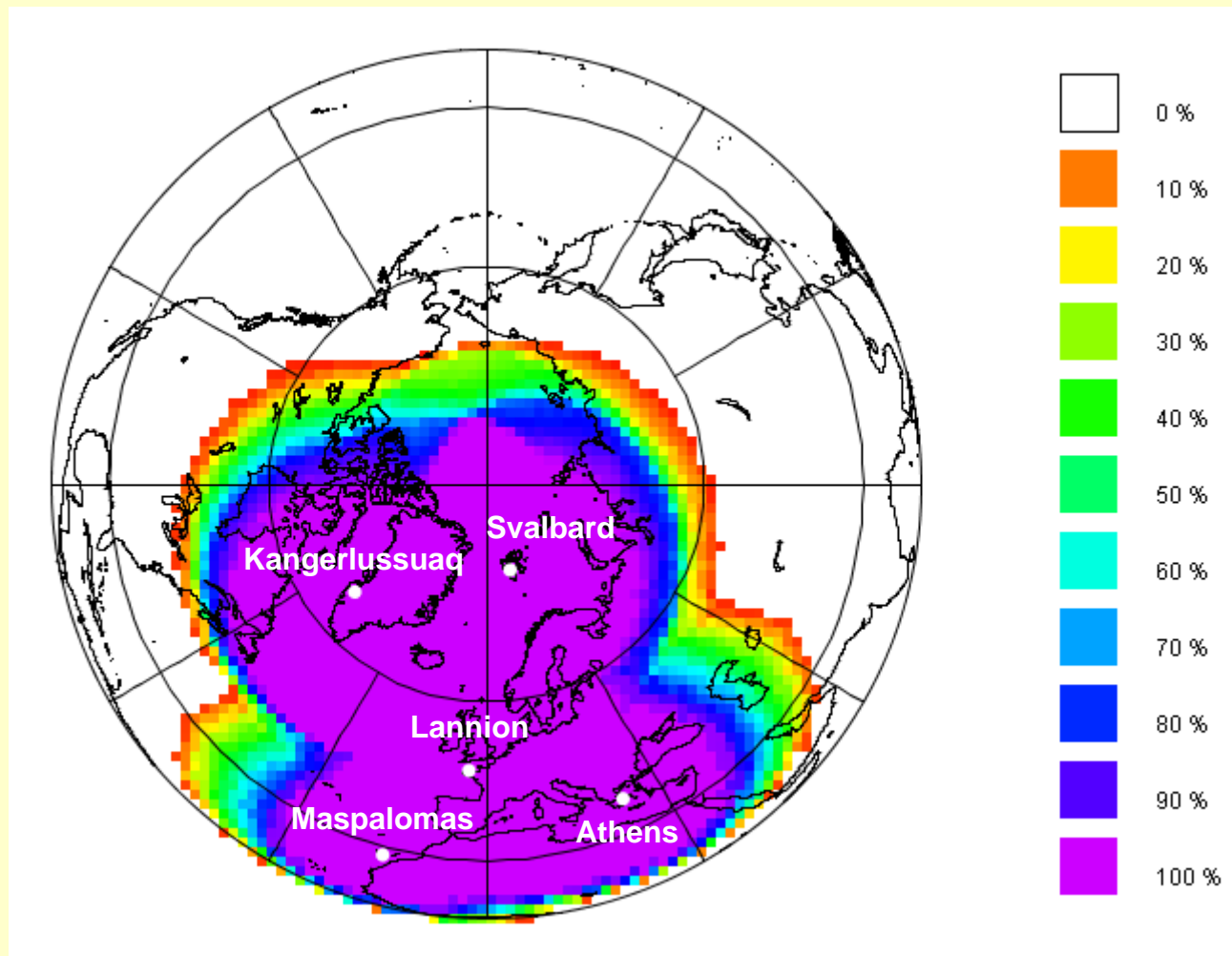
EARS ATOVS



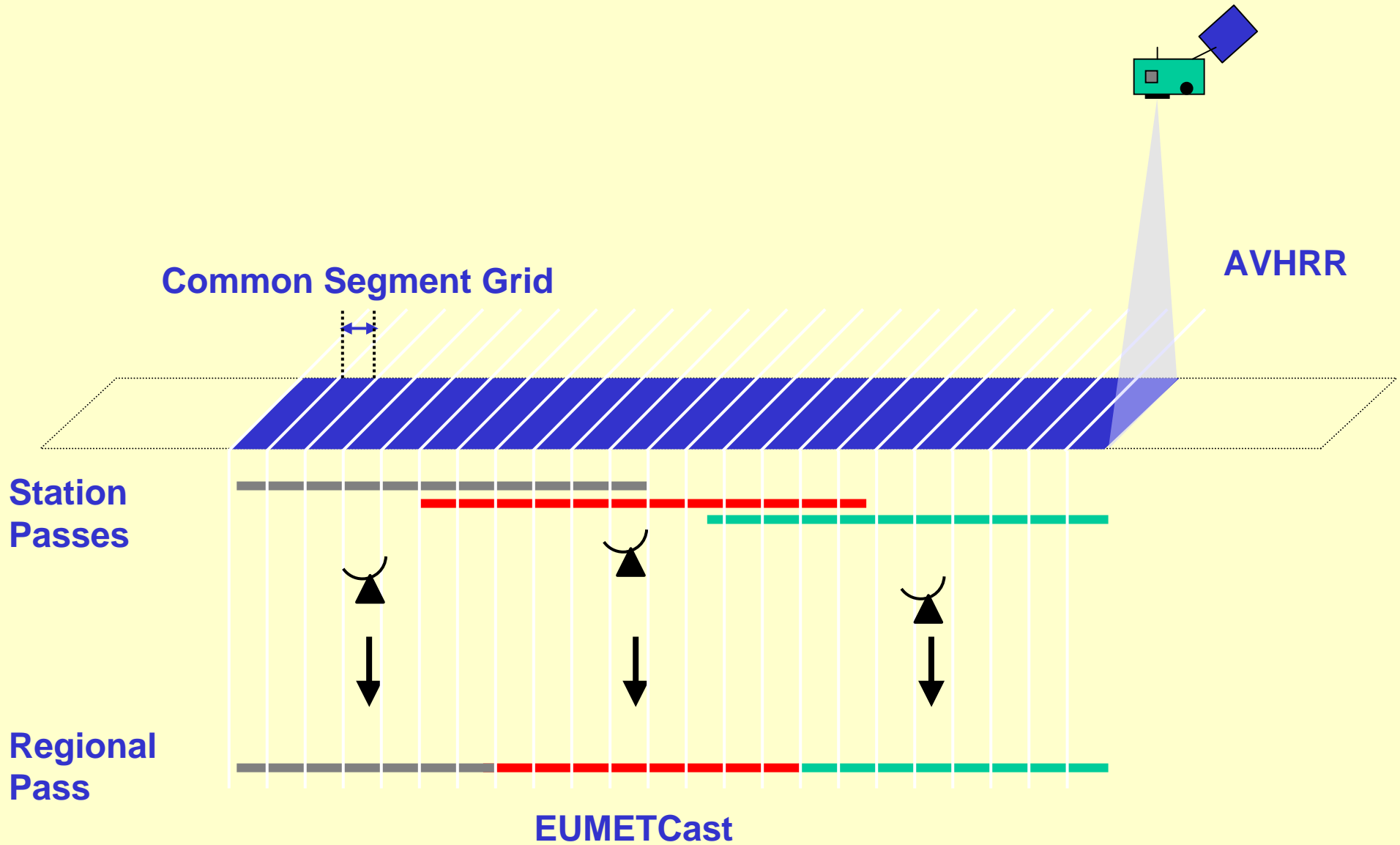
EARS ATOVS

Product Processing	AAPP as provided by the NWP SAF, configured and run by EUMETSAT.
Product Segmentation	One file per station pass, instrument and processing level.
Products via EUMETCast Ku-Band Europe	<ul style="list-style-type: none">• Level 1a per ATOVS instrument, data in AAPP format, bzip2 compressed.• Level 1c per ATOVS instrument, data on original instrument grid, BUFR format.• AVHRR derived cloud mask on HIRS instrument grid, BUFR format.
Products via RMDCN/GTS	<ul style="list-style-type: none">• Level 1c per ATOVS instrument, data on original instrument grid, BUFR format.

EARS AVHRR



EARS AVHRR



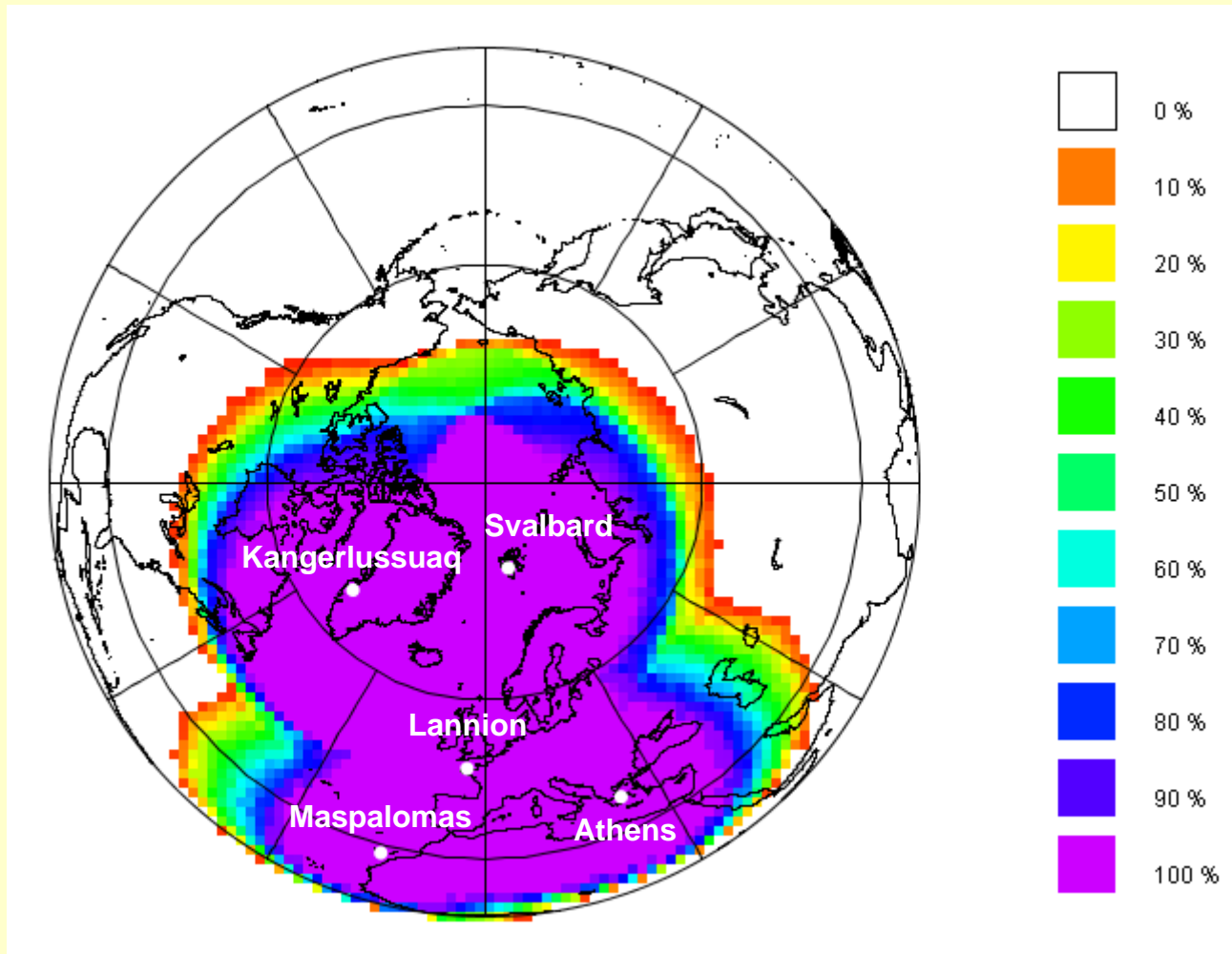
EUMETCast



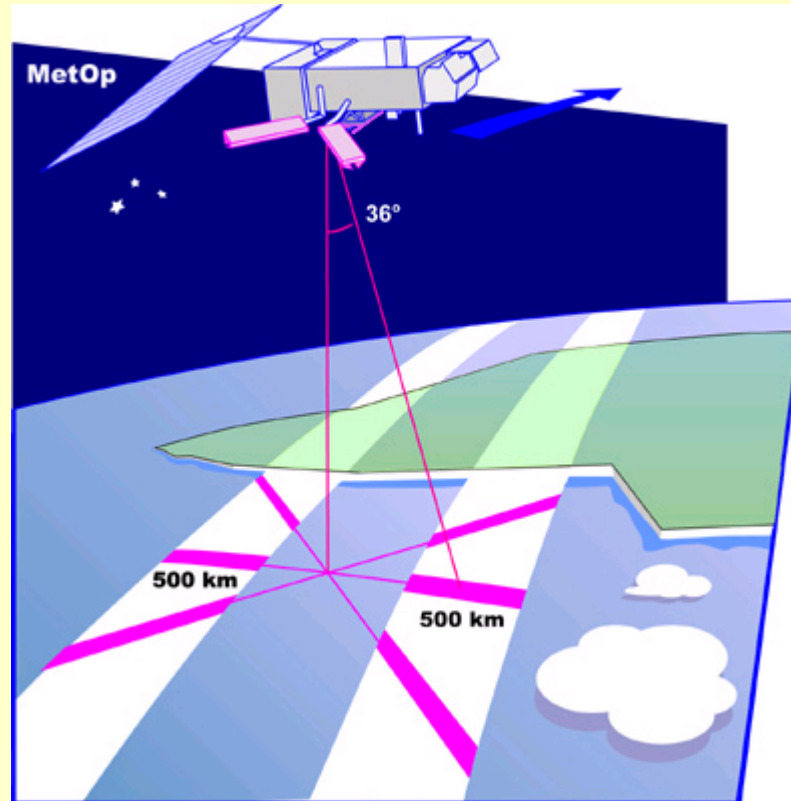
EARS AVHRR

Product Processing	None.
Product Segmentation	Segments each containing 1 minute (TBC) of observations. Duplicate segments removed before dissemination.
Products via EUMETCast Ku-Band Europe	<ul style="list-style-type: none">• For NOAA KLM and NN': HRPT data, expanded to 16 bits, big endian, bzip2 compressed.• For Metop: EPS level 0, bzip2 compressed.• TLE orbit data in support of local processing and visualisation (Compatibility with revised NASA policy on TLE distribution to be confirmed).
Products via RMDCN	None.

EARS ASCAT



ASCAT Viewing Geometry



BUFR - Resources

- **Software for processing BUFR is widely available**
 - **via free download, e. g. from ECMWF:**
<http://www.ecmwf.int/products/data/software/bufr.html>
 - **via commercial supplier**
- **BUFR tables can be downloaded from WMO:**
<http://www.wmo.int/web/www/WMOCodes.html>
- **A BUFR guide is available from WMO:**
http://www.wmo.int/web/www/WMOCodes/Guides/BUFRCREXPreface_en.html

METEOSAT positions

	10 W	3 W	0 E	10 E	63 E
Now		MET 8	MET 7	MET 6	MET 5
During MSG 2 (MET 9) commissioning	MSG 2 (MET 9)	MET 8	MET 7	MET 6	MET 5
Post MET 9 (MSG 2) commissioning		MET 8	MET 9 (MSG 2)	MET 6	MET 7

