A global Network of Regional ATOVS Retransmission Services (RARS)

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WMO
OMM

Outline

- Definition and historical background
- Description of the different RARS
- Expected outcome by the end of 2007

Purpose of RARS Network

- To improve availability and timeliness of time-critical polar-orbiting satellite data for the global domain in order to fulfill global and regional requirements

- To take advantage of Direct Broadcast (timeliness) without the limitations of single local acquisition area

Background

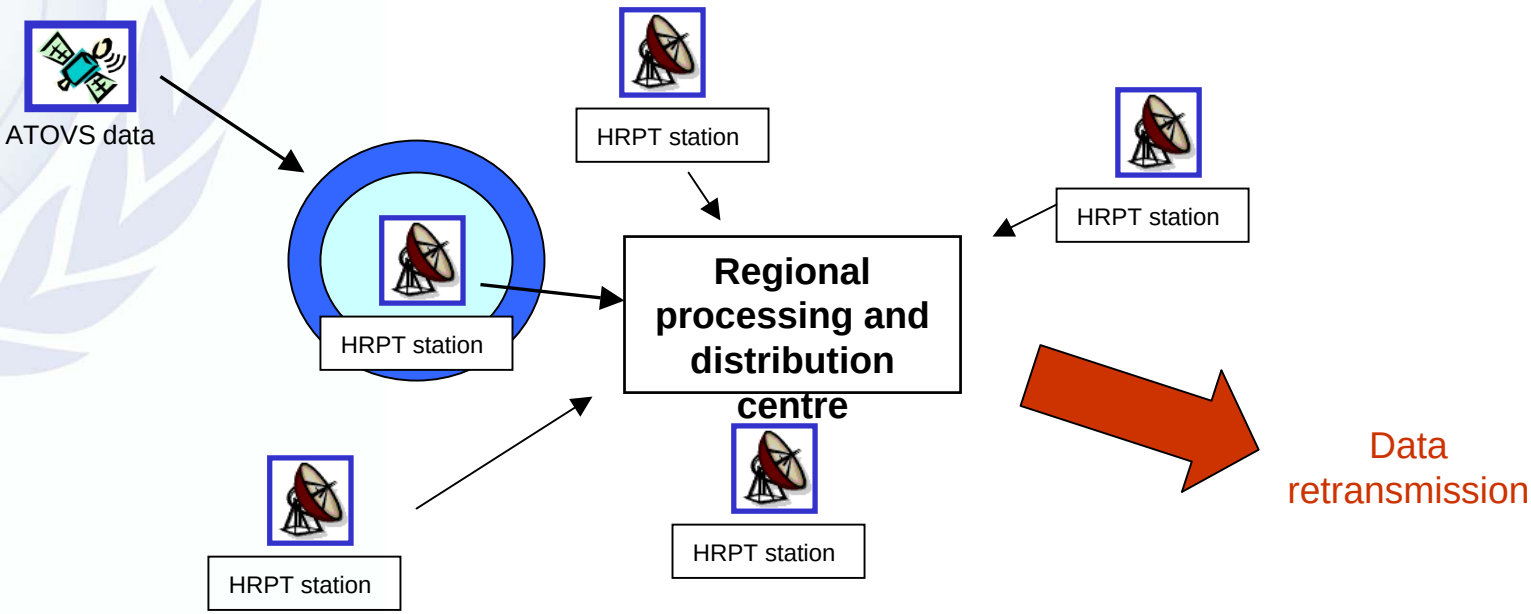
- The global RARS network is building on the EUMETSAT ATOVS Retransmission Services (EARS)
- CBS XIII, EC-57 and CGMS, requested the implementation of a global network of RARSs

- ITSC action IIFS-4 requests WMO to '*promote the implementation of a globally coordinated system of RARS…'*
- ITSC action IIFS-5 requests WMO to '*coordinate the development of backbone reception stations and dissemination nodes, contacts and implementation standards, including quality, formats and processing software requirements…*'

- 3 Global RARS workshops (2004,2005,2006) and a RARS Implementation Group being established

Definition

- RARS: Regional ATOVS Retransmission Service
  - An extension of the EARS concept implemented by EUMETSAT (2002)
  - To collect ATOVS and AVHRR data by direct broadcast from polar-orbiting satellites through several HRPT stations and make these data globally available in a timely manner



RARS requirements and data content

- RARS data content:
  - *AMSU-A*
  - *AMSU-B* or *MHS* for NOAA-N or MetOP
  - *HIRS*

  } *ATOVS*

  - *AVHRR* on HIRS grid (20.3 km) for local cloud information

- Global NWP requirements for soundings call for a 30 min timeliness (breakthrough), BUFR format and consistency of data calibration.

RARS objectives

- **Timeliness** : near-global data are available within 30 minutes (instead of 2-3 hours) in NWP centers through GTS and/or Alternative Dissemination Means (ADMs)
  - potentially reduced to 10 minutes with data segmentation for some instrument data
- **Data quality and consistency**:
  - Use of common pre-processing software (AAPP)
  - Standardization of products formats, quality tagging and service management
  - Data monitoring with support of EUMETSAT SAF on NWP
- **Cost effectiveness**
  - few HRPT stations needed to ensure near-global coverage
  - telecom costs for data concentration are decreasing
  - GTS or ADMs allow low-cost access

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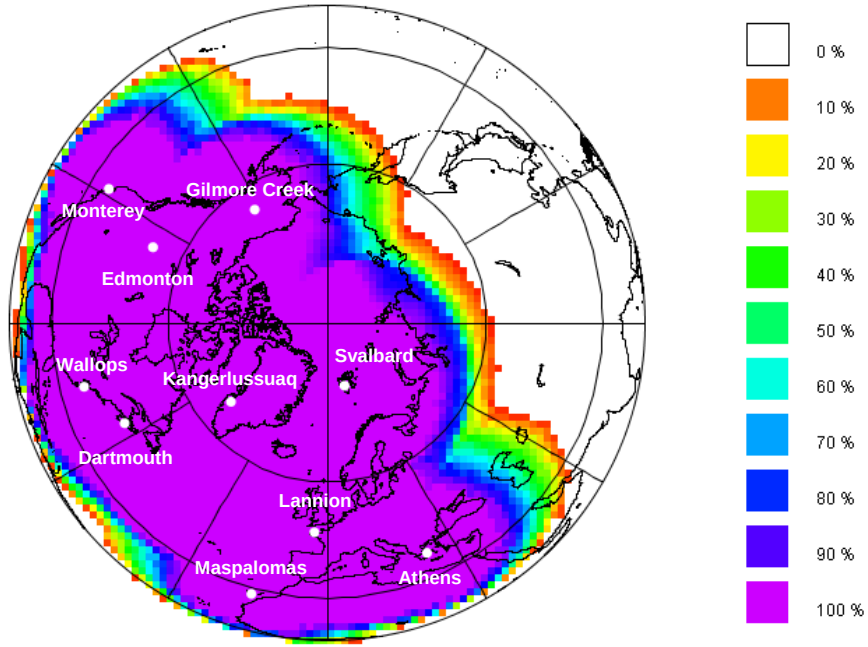
EUMETSAT RARS (EARS)

- ATOVS retransmission from 10 HRPT stations
- Additional services :
  - Pilot AVHRR retransmission from 5 stations
    ‘1 minute’ segments disseminated within 10 min !
  - Pilot ASCAT collection from 7 stations
  - Plans for IASI to be refined after Metop commissioning

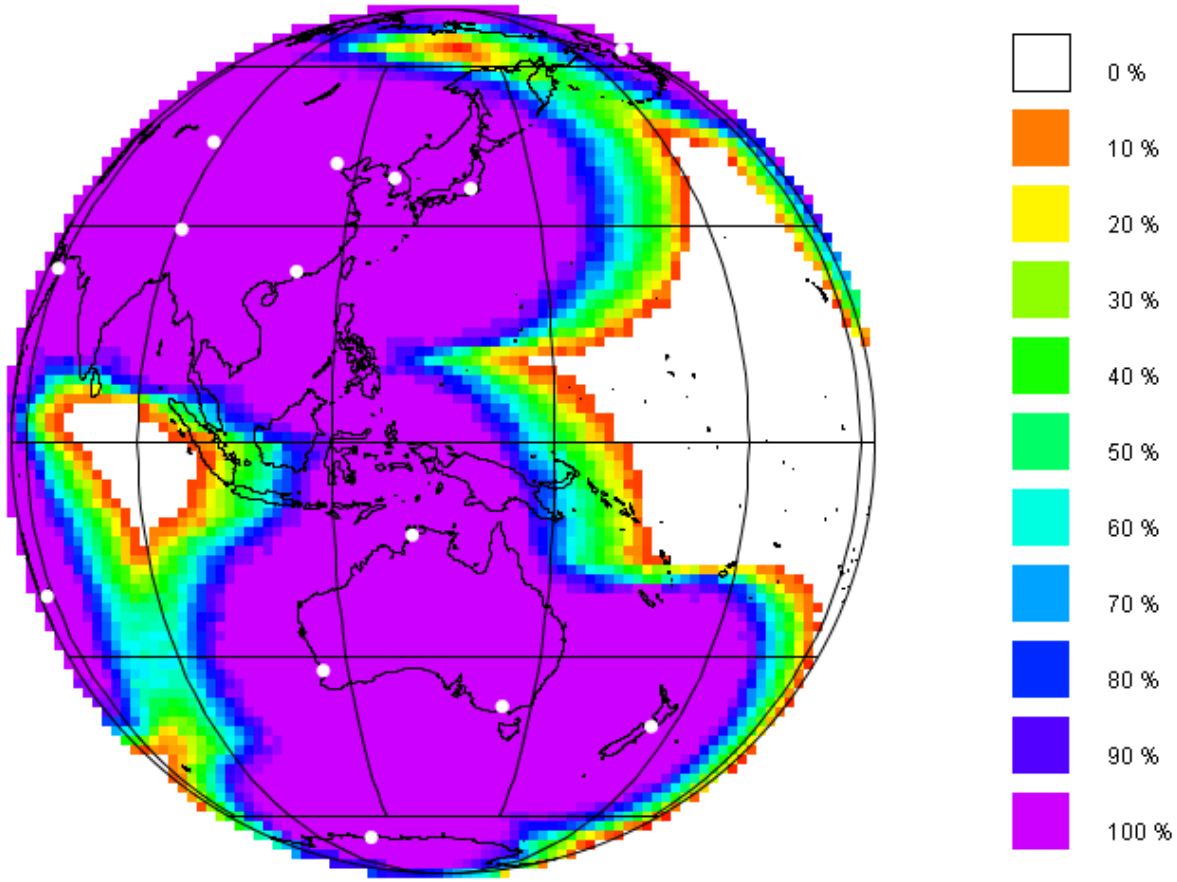
3 stations ready



Asia-Pacific RARS (1)

- **Coordinator**: D. Griersmith (Australia)
- RARS currently includes 10 HRPT stations from Japan, Korea, China (concentrated in Tokyo) Australia (concentrated in Melbourne)
- Tokyo and Melbourne inject ATOVS data into GTS
- Preliminary feedback of positive impact on NWP
- 5 HRPT stations to be added by December 2006

Asia-Pacific RARS (2)



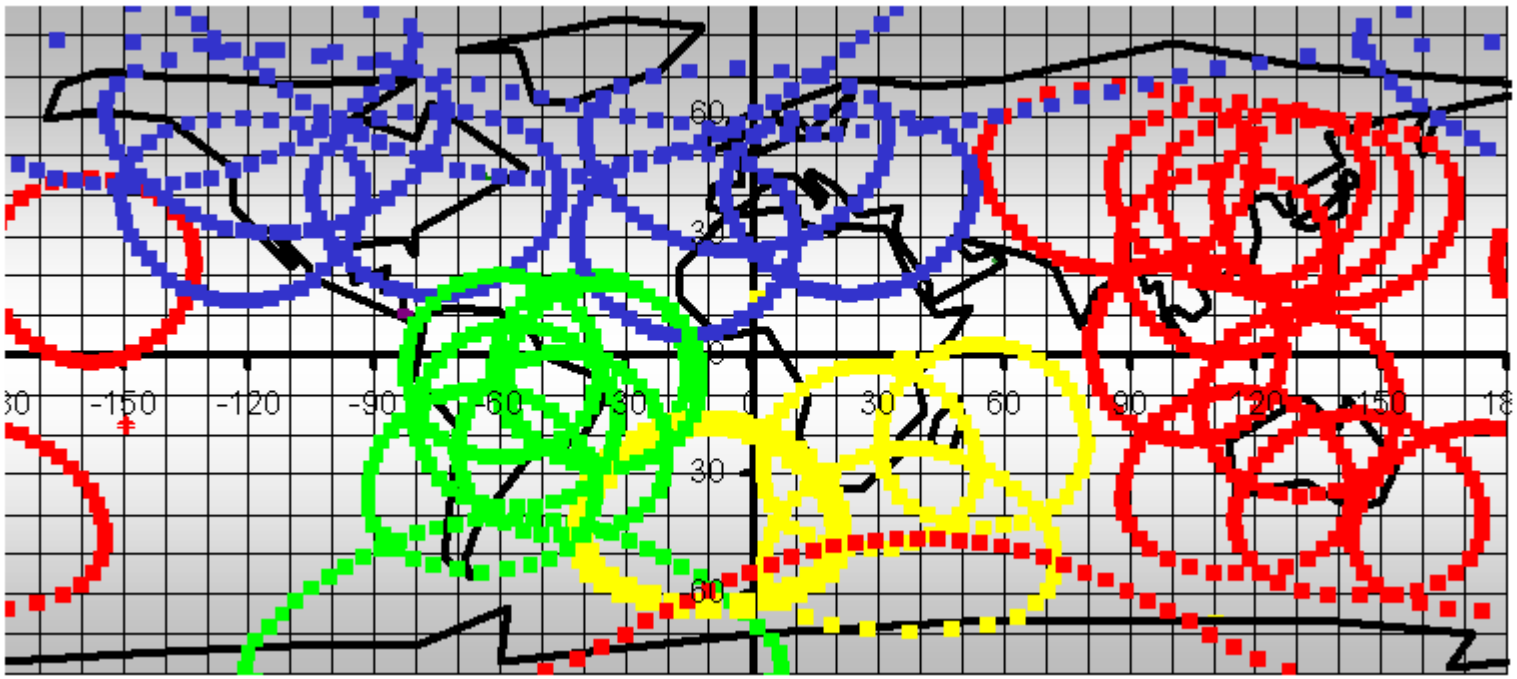
South American RARS(1)

- In development and testing phase (software, communications)
- Planned to be fully operational by the end of 2007

Processing and distribution centre	HRPT stations planned in 1st stage	Considered expansion
Brazil (INPE) **S. Pereira**	Fortaleza Natal Cachoeira Paulista Brasilia Manaus Cuiaba	Peru Chile (TBC) Central-America (TBD)
Argentina (CONAE) **G. Pujol**	Cordoba	Marambio (Antarctica)

Towards global coverage

- EARS covers a large part of the Northern hemisphere
- Asia Pacific RARS is starting and South American RARS is a new priority



→ But there are still gaps over Africa and eastern Pacific …

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Expected outcome and potential expansion

- Short-term (end 2007)
  - Near-global coverage
  - Improved timeliness
  - Improved data consistency
    - quality monitoring with support of SAF NWP
  - Enhanced user information through WMO RARS web site
- Extending the RARS concept beyond ATOVS
  - **Advanced sounders**: Similar requirement for IASI (after suitable data compression/channel selection)
  - **Scatterometer data:** RARS can provide the wider coverage required for ASCAT data processing
  - **AVHRR imagery**: RARS can provide full resolution AVHRR data while global data from NOAA/POES only available in GAC (4 km) resolution

Acknowledgements

- EARS : *EUMETSAT, NOAA, KSAT, DMI, HNMS, INTA, MSC/CMC, Météo-France*
- Asia-Pacific RARS : *JMA, ABoM, KMA, CMA*
- South-American RARS: *INPE/CPTEC, INMET, SMN, CONAE*

Thank you …

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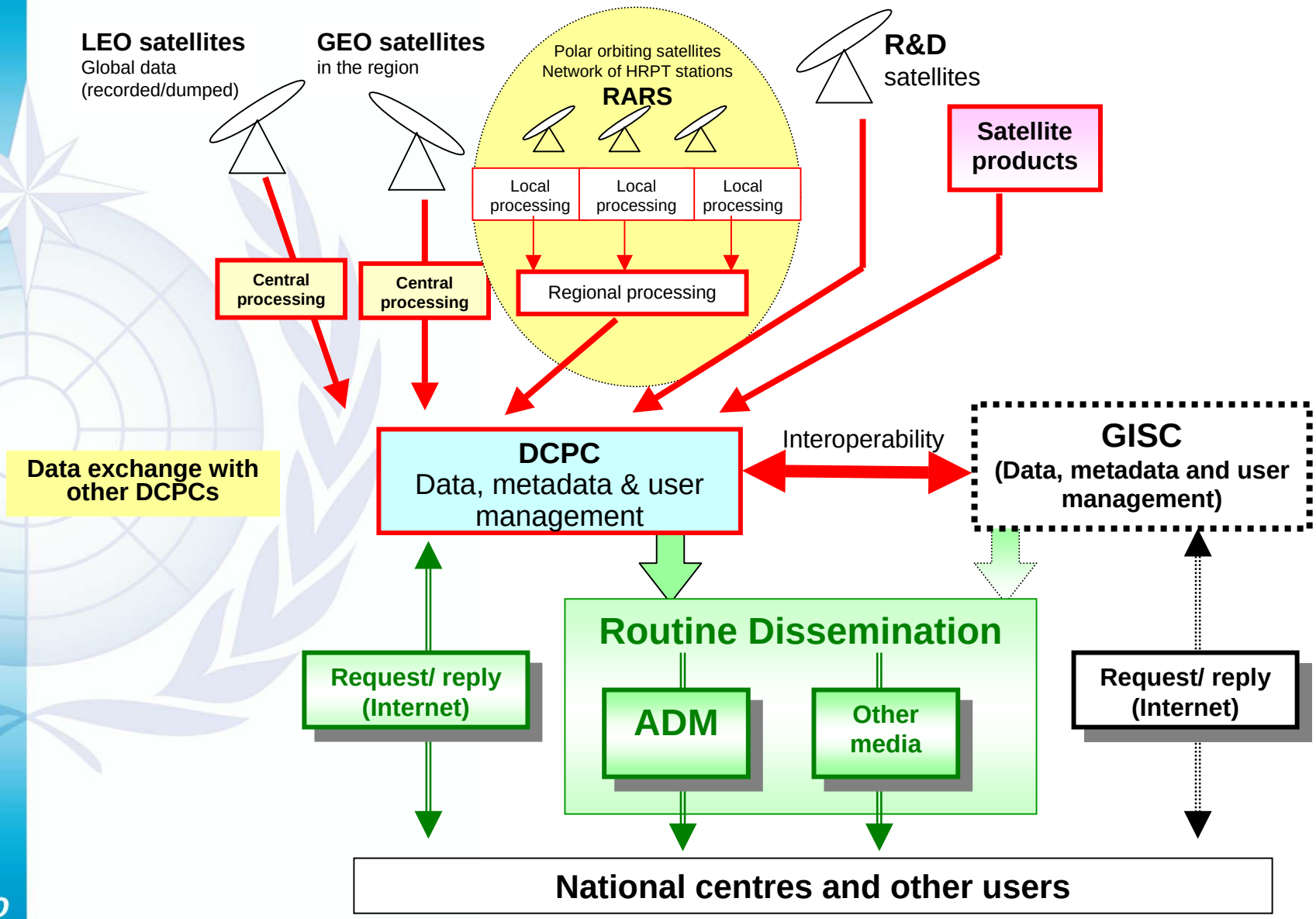
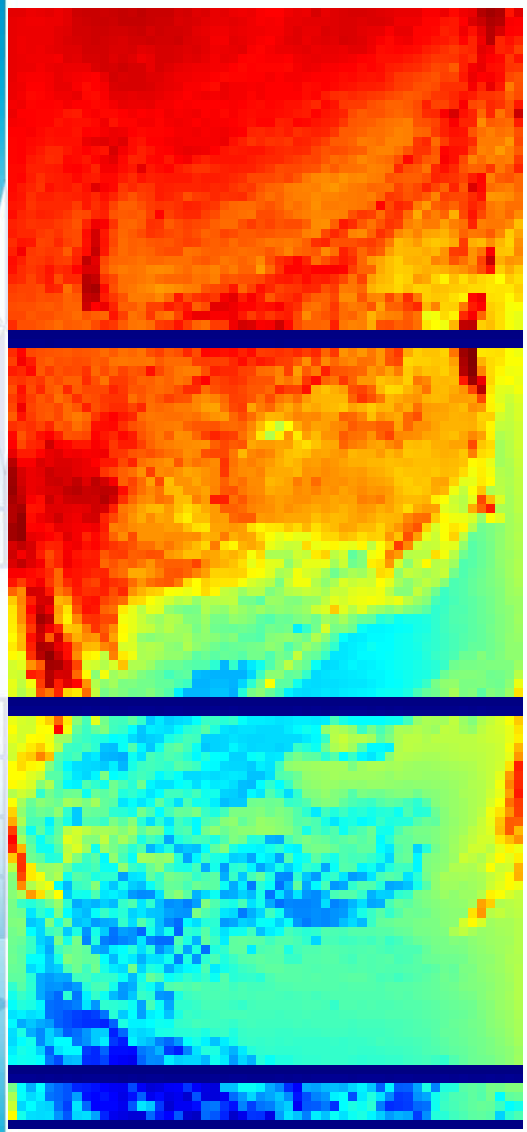
Definitions

- RARS: Regional ATOVS Retransmission Service
  - An extension of the EARS concept implemented by EUMETSAT to collect ATOVS and AVHRR data by direct broadcast from polar-orbiting satellites through several HRPT stations and make these data globally available in a timely manner
- IGDDS: Integrated Global Data Dissemination Service
  - The WMO project ensuring that satellite data and products are made available worldwide in a timely and cost-efficient manner, within the WMO Information System

RARS within IGDDS, IGDDS within the WIS



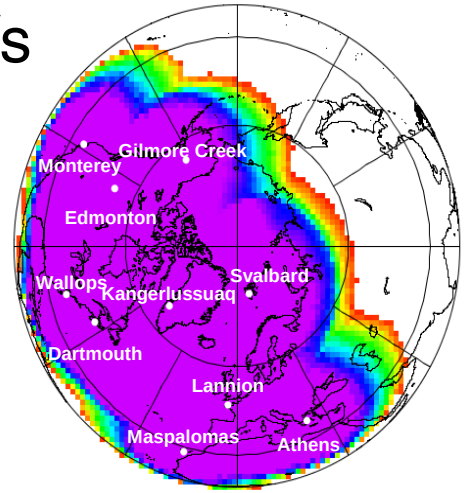
EARS ATOVS



Satellites: NOAA-K,-L,-M, NOAA-N,-N'
Metop

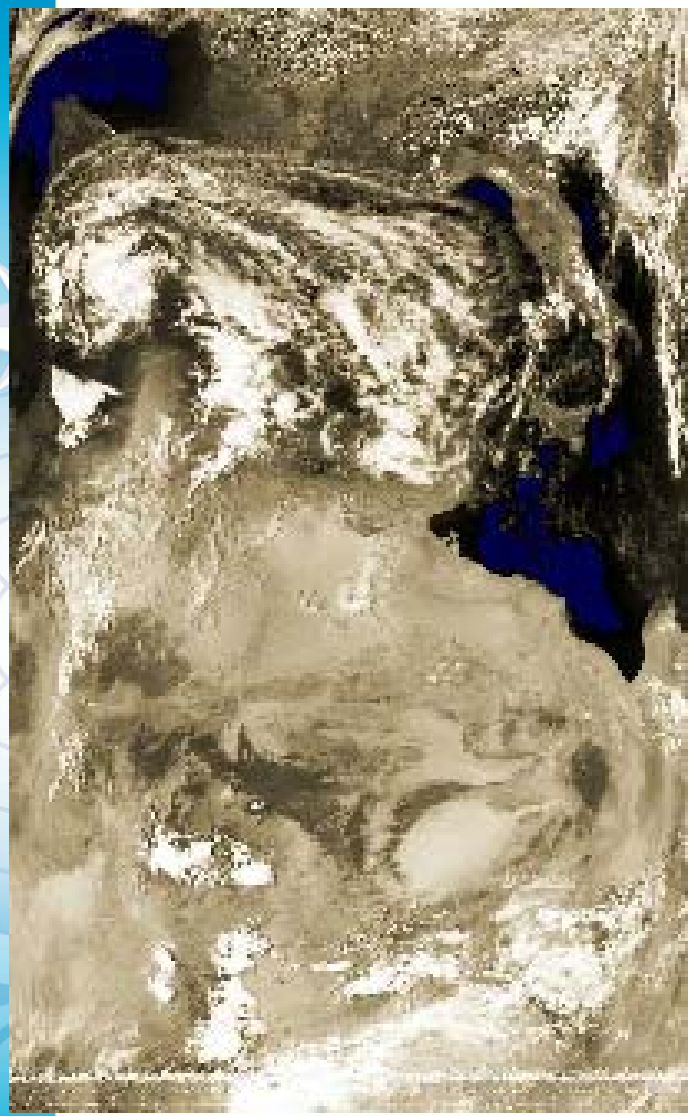
Instruments: HIRS, AMSU-A,
AMSU-B, MHS

Data Rate: ~10 kb/s



HIRS data visualised using EPSView

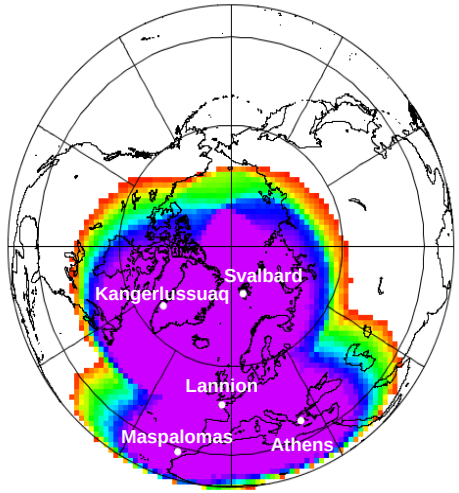
EARS AVHRR



NOAA-18 received by EARS

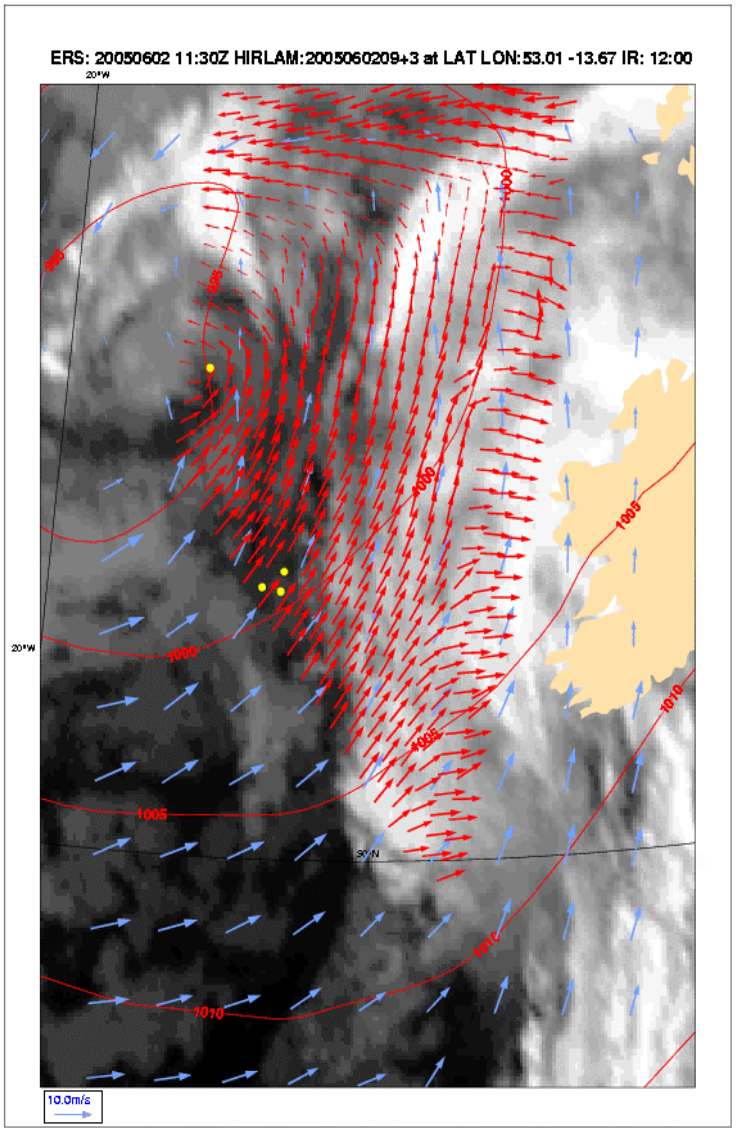
Satellites: NOAAKLM, NOAA NN' Metop

Data Rate: 622 kb/s



EARS AVHRR Regional Pass

- Recombination of data from Maspalomas, Lannion and Svalbard
- Data disseminated via EUMETCast as 1-minute segments
- Achieved end-to-end timeliness of the segments in the order of 10 minutes

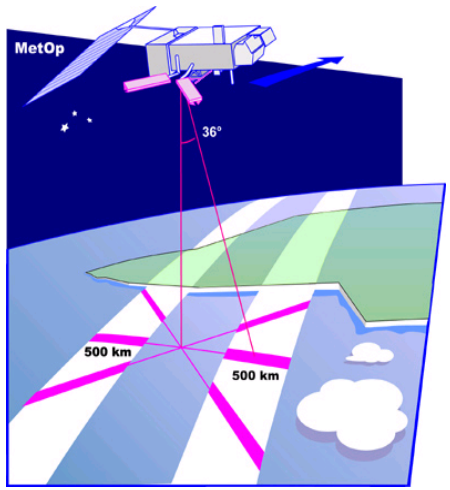


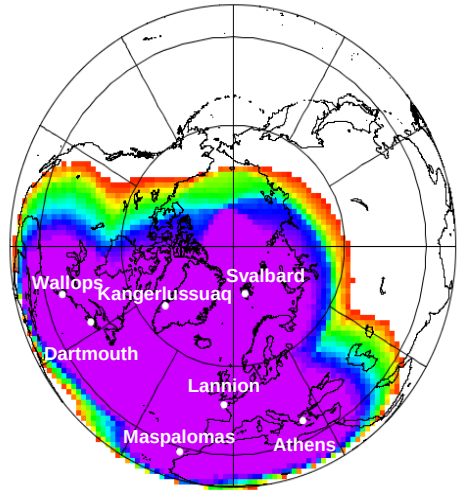
ERS-2 SCAT by KNMI

EARS ASCAT

Satellites: Metop

Data Rate: 60 kb/s





Asia-Pacific RARS (2)

Processing or Dissemination Centre	*HRPT stations providing ATOVS data*	
	September 2006	***To be added December 2006***
Tokyo	**Tokyo-Kiyose** **Syowa (Antarctica)** **Seoul** **Beijing** **Guangzhou** **Urumiji**	
Melbourne	**Melbourne (x 2)** **Darwin** **Perth**	**Singapore** **Vladivostok** **Honolulu** **New Zealand** **Hong Kong**

Next Steps

- CGMS 34, 2-7 November, Shanghaï
- CBS, 9-16 November, Seoul
- 4th RARS-IGDDS Implementation workshop in June 2007 (location TBD)