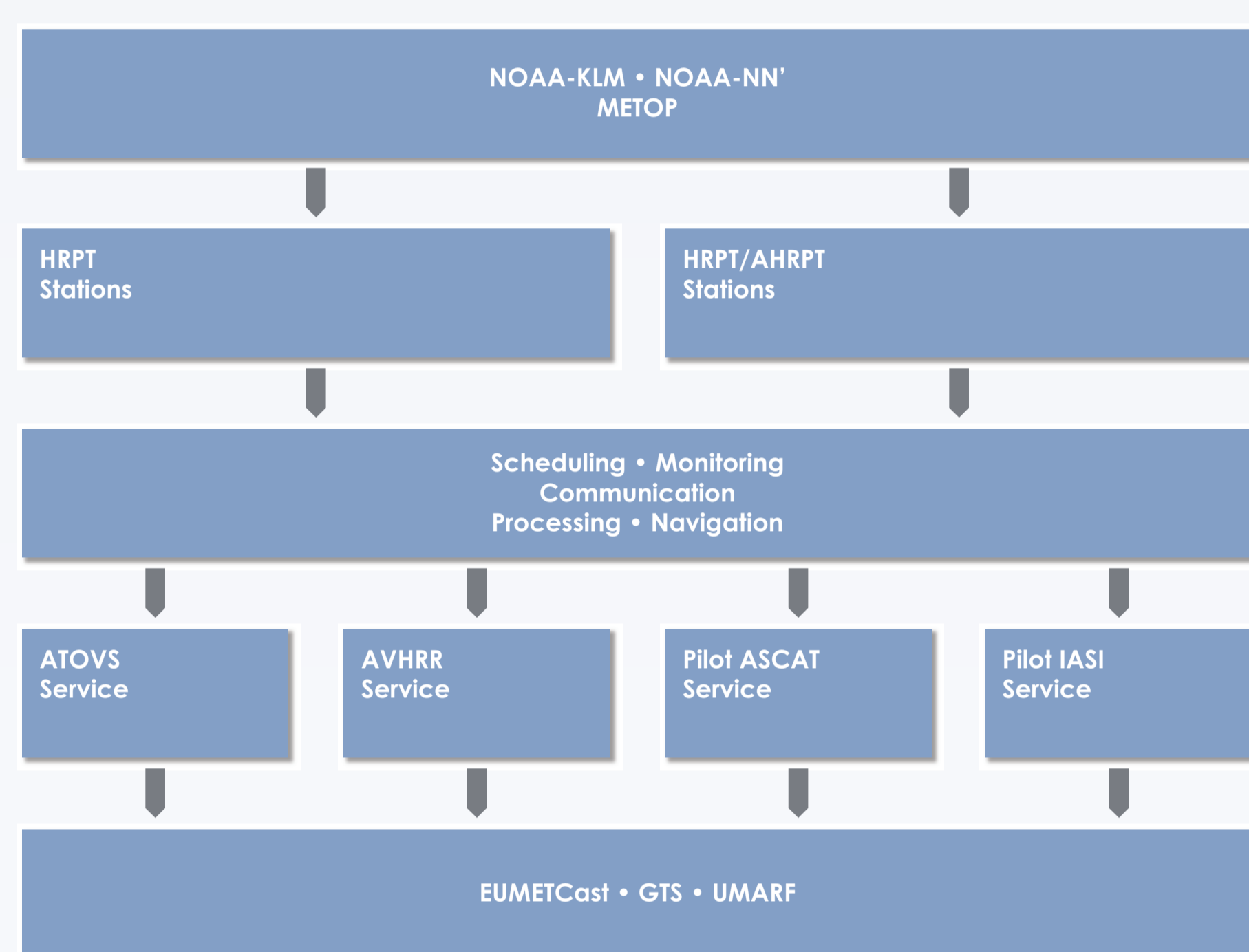# EARS-IASI Pilot Service
Description

OVERVIEW

The EUMETSAT Advanced Retransmission Service (EARS) collects data from a selected set of HRPT stations and retransmit the data to end users via the EUMETCast satellite broadcast mechanism. EARS aims to provide the Meteorological Community with data sets with timeliness adequate for local and regional numerical weather prediction applications.

The EARS services includes:

- ATOVS Retransmission Service (EARS-ATOVS)
- AVHRR Retransmission Service (EARS-AVHRR)
- Pilot ASCAT Retransmission Service (EARS-ASCAT)
- Pilot IASI Retransmission Service (EARS-IASI)

which are integrated into the overall infrastructure for acquisition of HRPT data, processing and dissemination to users as illustrated below.

Architecture of the EUMETSAT Advanced Retransmission Service

EARS-IASI PILOT SERVICE

The pilot IASI Retransmission Service is a new EARS service. The purpose of the pilot phase is to enable the EUMETSAT Member States to assess the value of the proposed service, in particular for NWP applications.

To minimize the data volume of the level 1C product, instead of 8461 raw channels the dataset will contain selected channels together with Principal Components scores, allowing users to reconstruct any desired channels.

It is planned that the eigenvectors to be used operationally will be generated by EUMETSAT, based on a training set of spectra to be selected from 12 months of IASI L1C data, in order to represent well all atmospheric situations encountered.

For EARS-IASI it is planned to use the 366 channels selected by ECMWF for use in NWP. These are listed in the "EARS Operational Service Specification" on the EUMETSAT web site. The selection includes temperature sounding channels (650-800 cm-1), ozone channels (~1050 cm-1), window channels, water vapour channels and solar channels (>2300 cm-1).

During the pilot phase the detailed requirements for a potential future operational IASI Retransmission Service will be established in co-operation with Users based on the experience from the pilot phase.

The EARS-IASI processing, formatting and dissemination mechanism are summarised in the table on the right. EARS-IASI products will not be available when the instrument is in calibration mode.
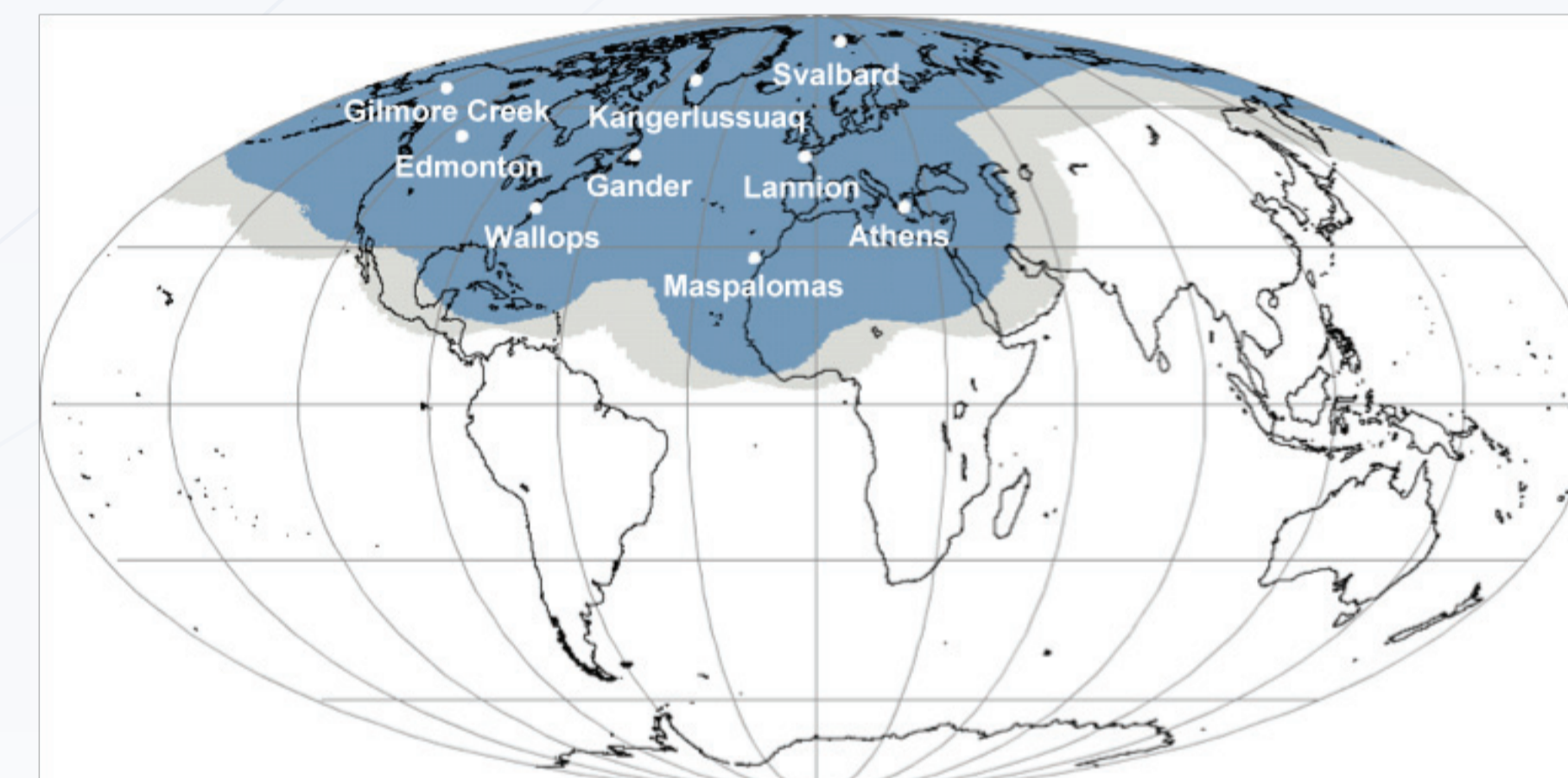
GEOGRAPHICAL COVERAGE

The EARS-IASI service geographical coverage is given by the set of HRPT stations in the table below. The table also lists desired HRPT stations for additional coverage. The corresponding coverage plots are shown in the two following figures.

HRPT STATION	NOAA HRPT	METOP AHRPT	TIMELINESS (MIN)	EARS ATOVS	EARS AVHRR	EARS ASCAT	EARS IASI
Svalbard	✓	✓	30	✓	✓	✓	✓
Maspalomas	✓	✓	30	✓	✓	✓	✓
Kangerlussuaq	✓	✓	30	✓	✓	✓	✓
Athens	✓	✓	30	✓	✓	✓	✓
Lannion	✓	✓	30	✓	✓	✓	✓
Gander	✓	(✓)	30	✓	✓	(✓)	(✓)
Edmonton	✓	(✓)	45	✓			(✓)
Gilmore Creek	✓	✓	30	✓			(✓)
Wallops	✓	✓	30	✓		(✓)	(✓)
Monterey	✓	(✓)	45	✓			
Ewa Beach	✓	(✓)	120	✓			
Miami	✓	(✓)	45	✓			
Saint-Denis	✓	✓	30	✓		(✓)	
Moscow	✓	(✓)	30	✓	(✓)	(✓)	(✓)
Muscat	✓	✓	30	✓		(✓)	(✓)
Khabarovsk	✓	(✓)	45	(✓)			(✓)
Novosibirsk	✓	(✓)	45	(✓)			(✓)

HRPT station capabilities, timeliness and supported EARS services. (✓) indicates potential service additions
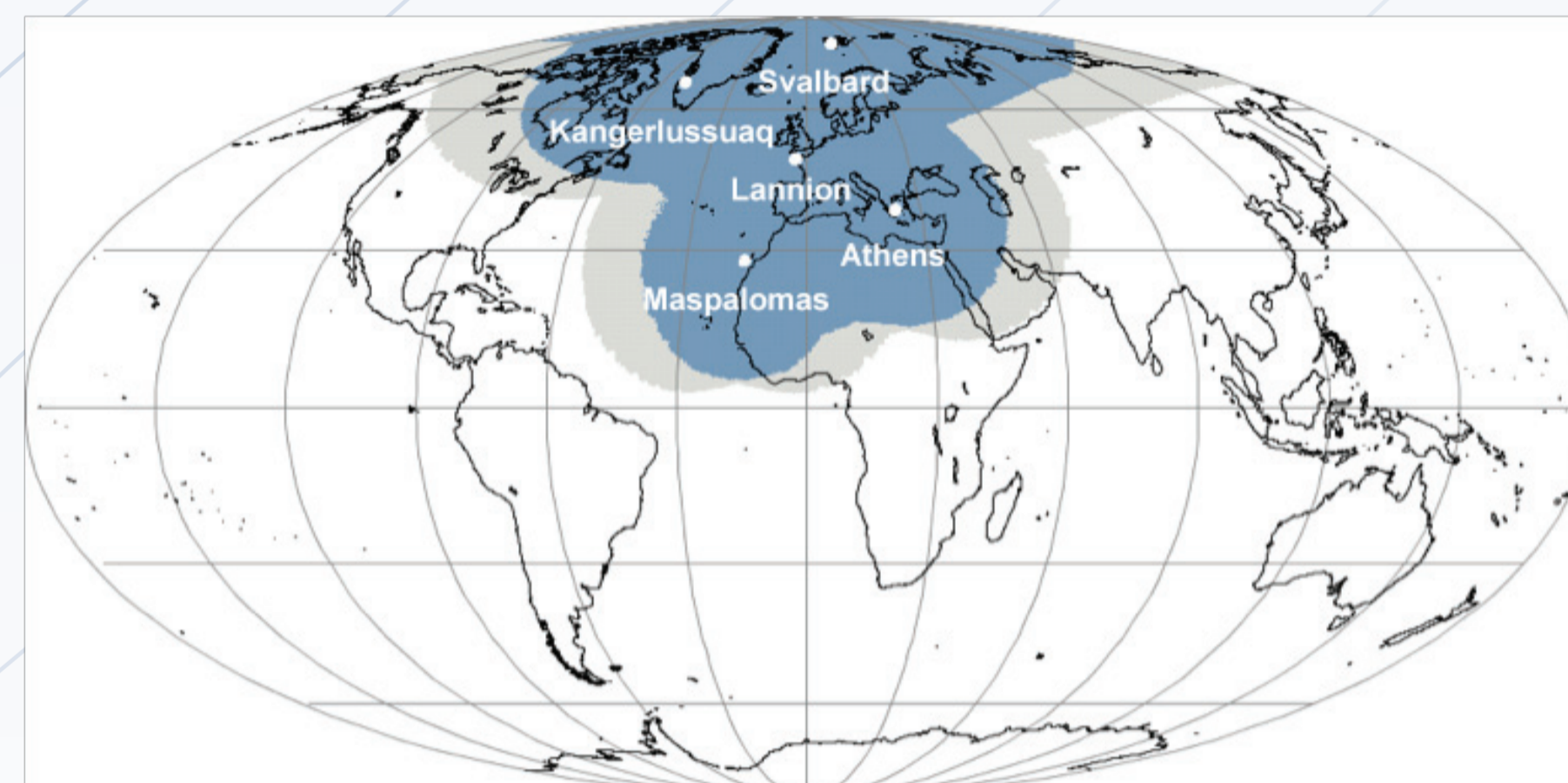
EARS-IASI geographical coverage

EARS-IASI geographical coverage when including some of the potential additional HRPT stations

EARS-IASI	
Product Processing	AAPP OPS-LRS level 1 processor as provided by the NWP SAF, configured and run by EUMETSAT.
	The AAPP OPS-LRS shares the processing core with the processor used at EUMETSAT for the global IASI data. Comparisons between regional and global IASI calibrated observations show a maximum deviation of around 0.1 K brightness temperature at 280K reference temperature, with the majority of observations being consistent to within 0.05 K.
Product Segmentation	One file per station pass.
Products via EUMETCast Ku-Band Europe	Level 1c, calibrated and geolocated IASI observations in a combined product containing both Principal Component scores and 366 original IASI Channels as defined in the EARS OSS, cloud/scene analysis information, BUFR formatted.
	No data thinning.
	Principal Component scores, representing the 8461 IASI channels by 90 scores for IASI Band 1, 120 scores for IASI Band 2 and 80 scores for IASI Band 3 (TBC). Consistency between the Principal Component score scheme used for EARS-IASI and for the global IASI data will be ensured, including the provision of a reference IASI Eigenvector File, required during compression and de-compression, common to EARS-IASI and the global IASI products. The IASI Eigenvector File will be made available to Users.
	Encoding of the 290 Principal Component scores and the 366 original IASI Channels in one BUFR product.
Products via RMDCN/GTS	As for EUMETCast

EARS-IASI processing, formatting and dissemination