Satellite Application Facility on Ocean and Sea Ice (OSI SAF)

Cécile Hernandez
Plouzané, 20 June 2017

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About OSI SAF

- EUMETSAT SAFs : dedicated centres of excellence for processing satellite data
- OSI SAF : answer to requirements, from the meteorological and oceanographic communities, for comprehensive information derived from meteorological satellites at the ocean-atmosphere interface

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About OSI SAF

- The OSI SAF develops, processes and distributes, in near real-time, products related to key parameters of the ocean-atmosphere interface.
- The OSI SAF team focuses on
  - Scatterometer winds (and soon microwave winds),
  - Sea Surface Temperature (SST) and sea Ice Surface Temperature (IST),
  - Radiative fluxes : Surface Short wave Irradiance (SSI) and Downward Long wave Irradiance (DLI),
  - Sea ice concentration, edge, type, emissivity, drift.

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OSI SAF partners

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Ifremer

Royal Netherlands Meteorological Institute
Ministry of Infrastructure and the Environment

Danish Meteorological Institute

Norwegian Meteorological Institute

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Three OSI SAF subsystems

Research, development and production are based on 3 subsystems :

- Low and Mid Latitude (LML) subsystem
  - SST and radiative fluxes for LML, NAR and GLB areas
- High Latitude (HL) subsystem
  - SST and radiative fluxes for HL areas
  - Sea ice
- Wind (WIND) subsystem
  - Scatterometer winds

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Norwegian Meteorological Institute

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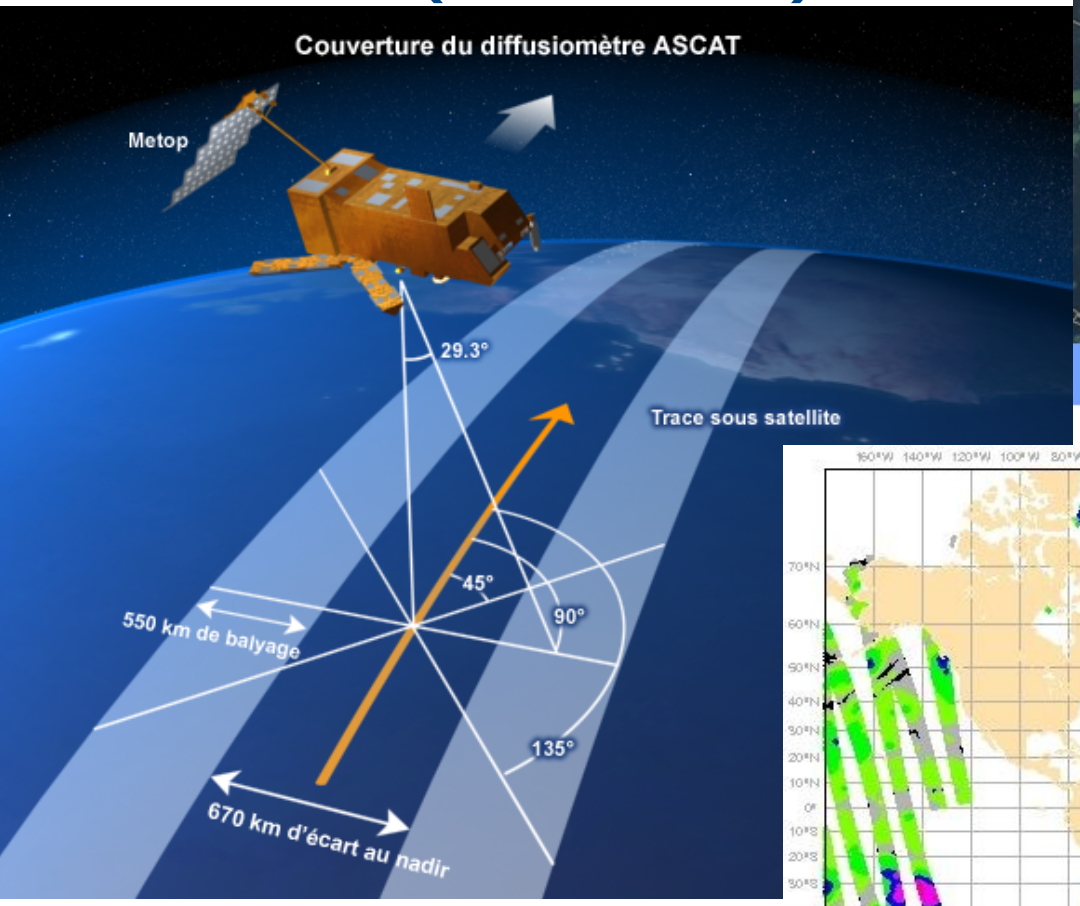
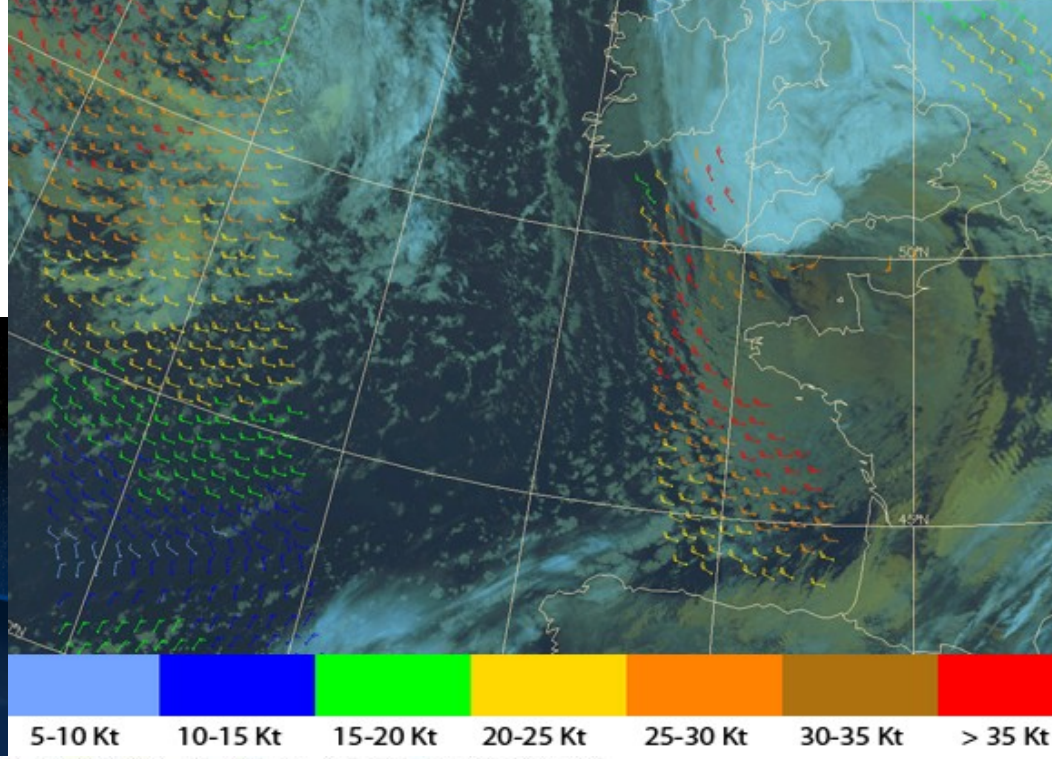
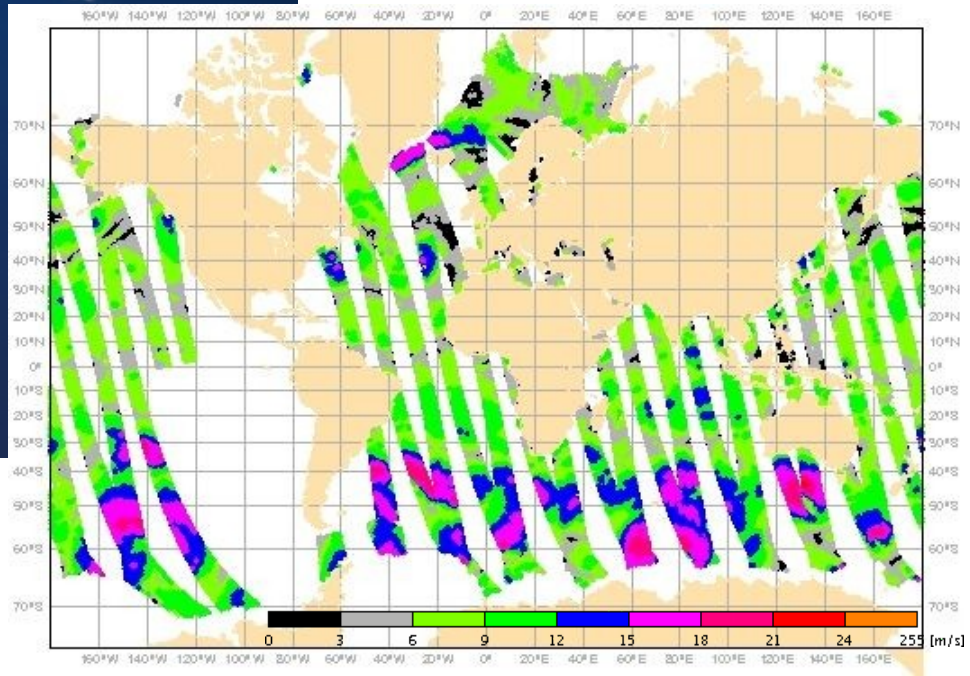
Scatterometer winds (ASCAT)







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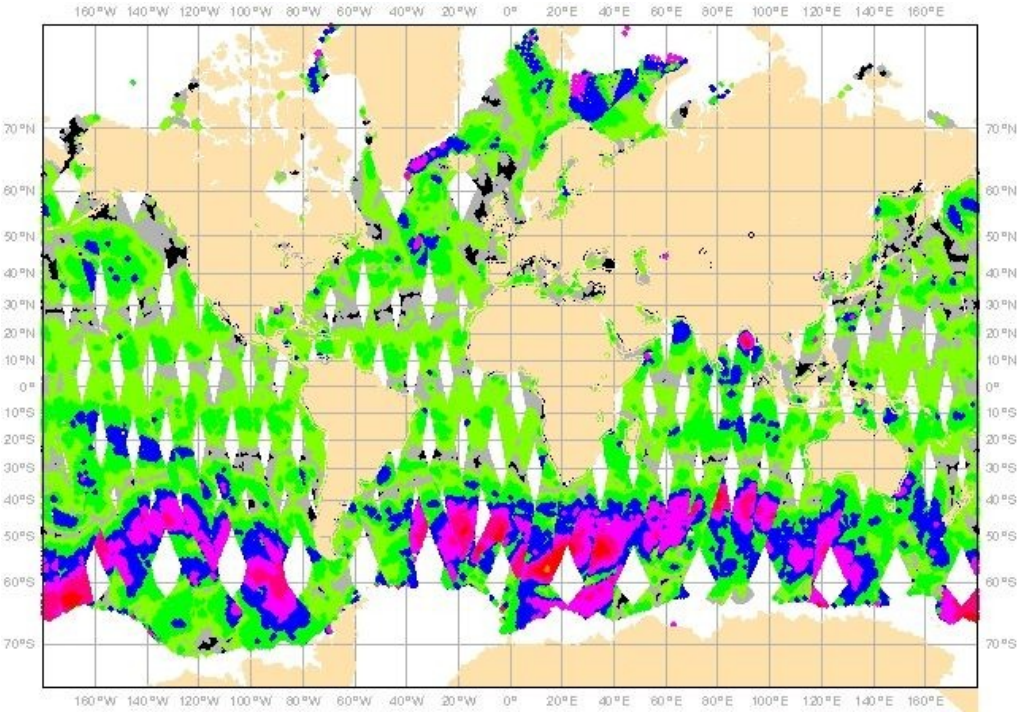
Scatterometer winds (ASCAT, SCA)

- ASCAT on Metop-A and -B, later Metop-C
- 2 spatial resolutions : 12.5 km “coastal” and 25 km
- Level 2 “swath”
- Global coverage
- In the future : SCA

  on Metop-SG



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Scatterometer winds (discontinued)

- QuikSCAT on SeaWinds 1999-2009
- OSCAT on Oceansat-2 2009-2014
- RapidScat on ISS 2014-2016
- NRT archived data + Reprocessing (data records)

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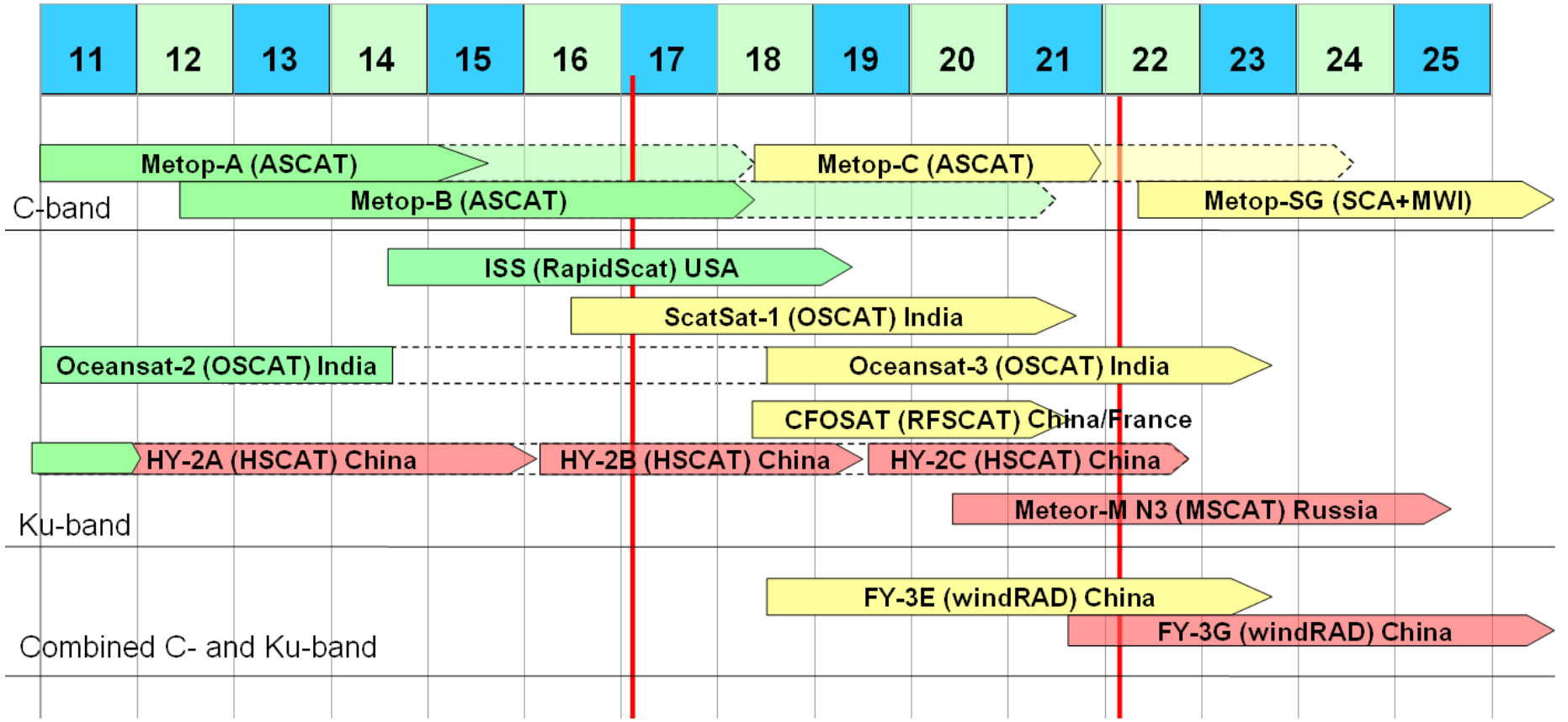
Satellite missions for OSI SAF NRT wind products



In orbit Approved Planned/Pending approval

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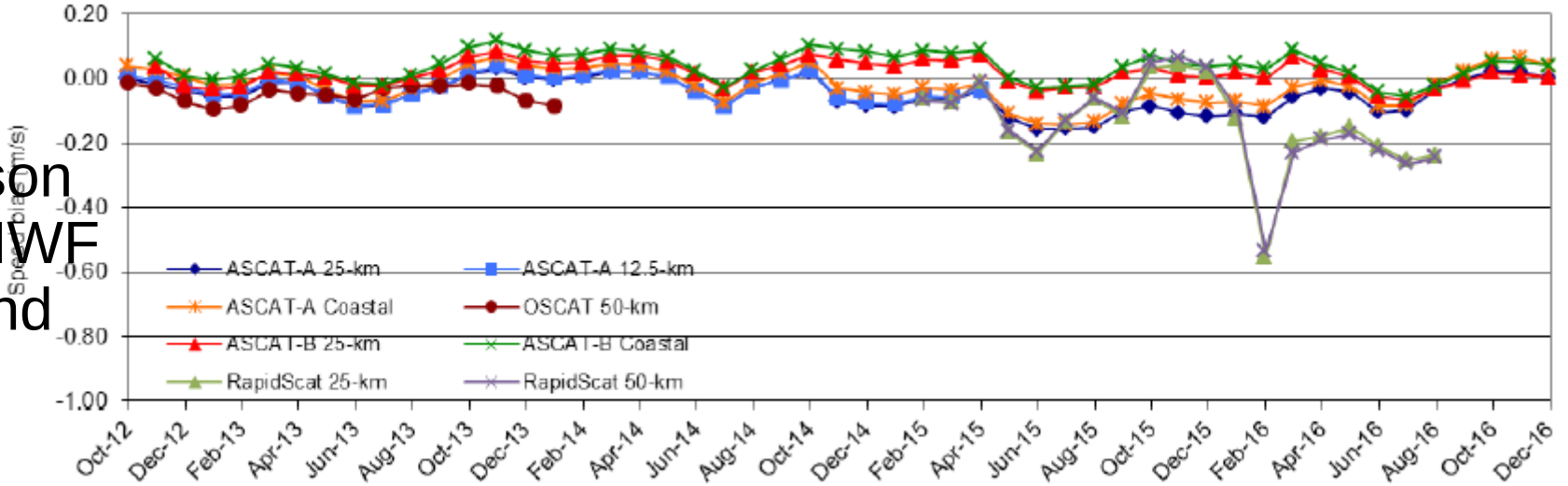
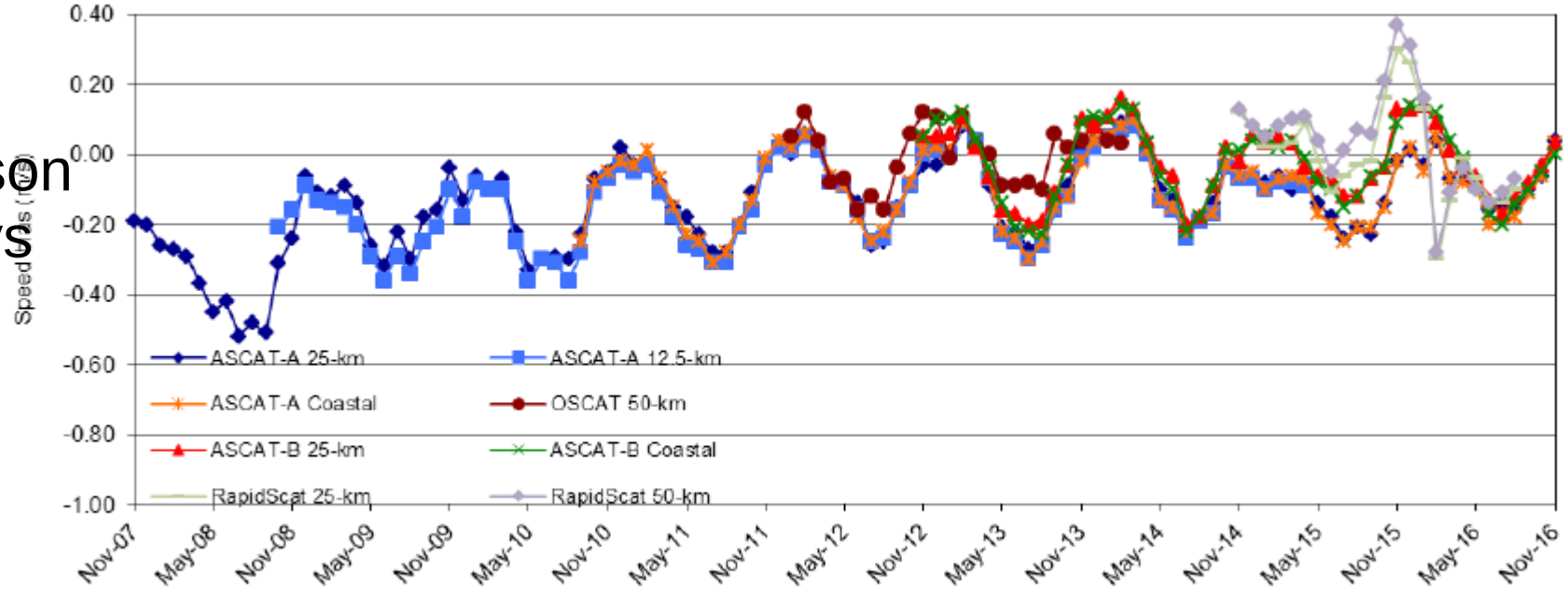
Scatterometer winds quality assessment

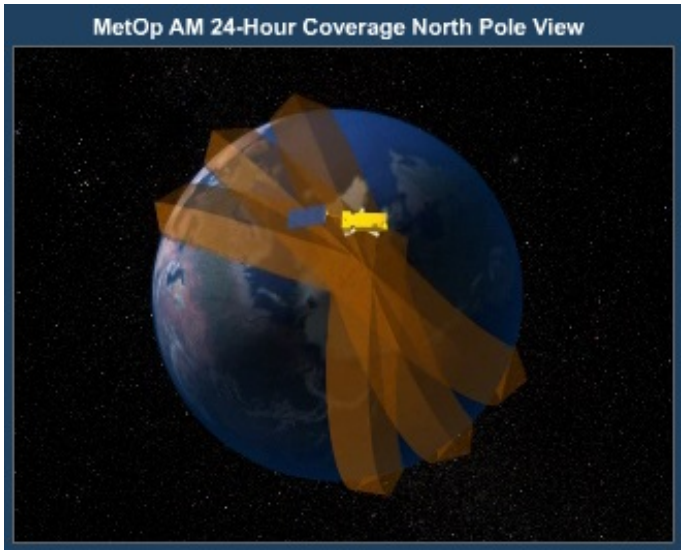
Comparison with ECMWF model wind data

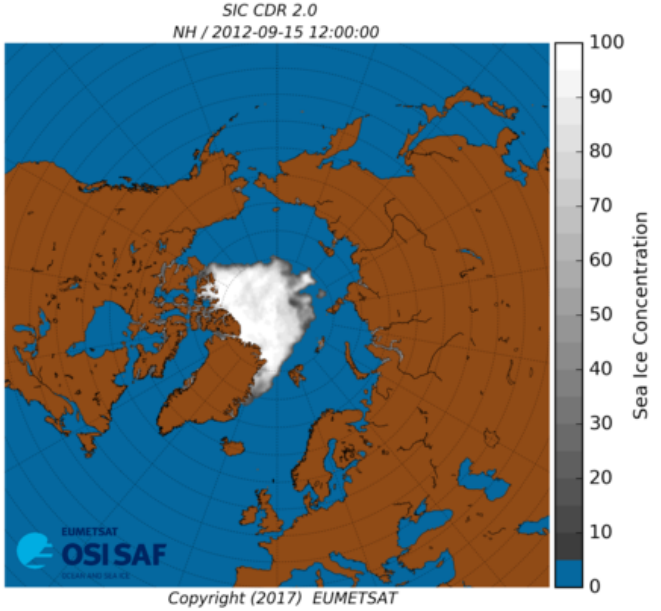


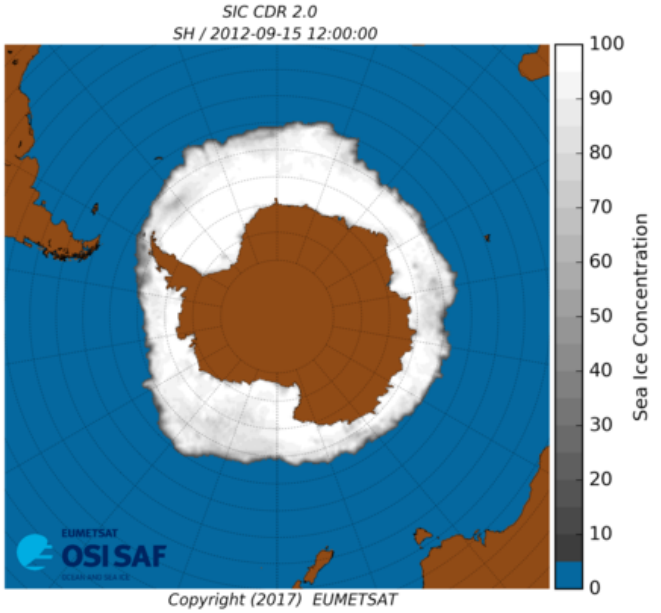
Comparison with buoys



High latitudes products : Sea Ice, Sea Surface Temperature, radiative fluxes







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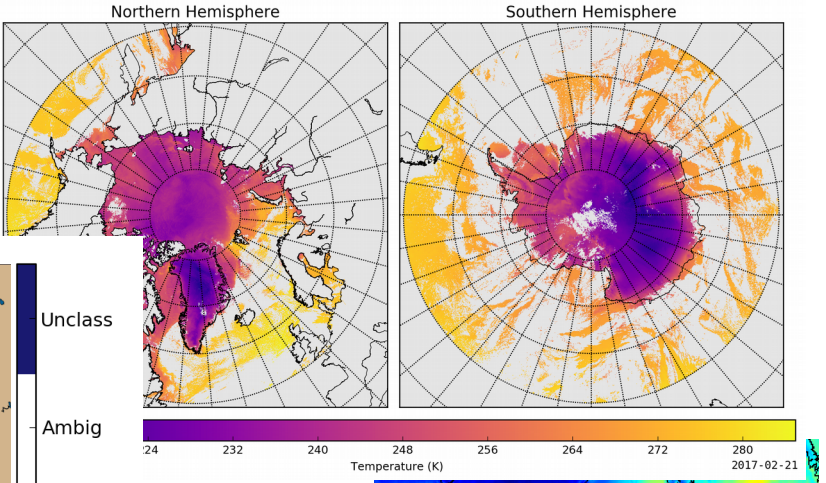
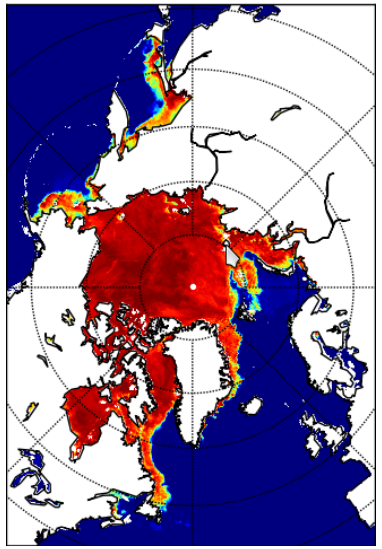
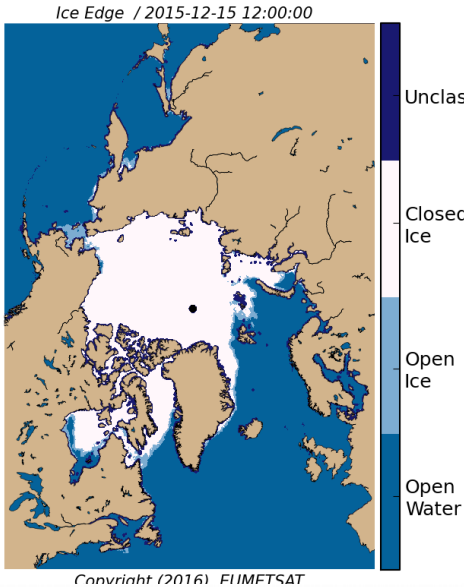
High latitudes products : Sea Ice, Sea Surface Temperature, radiative fluxes

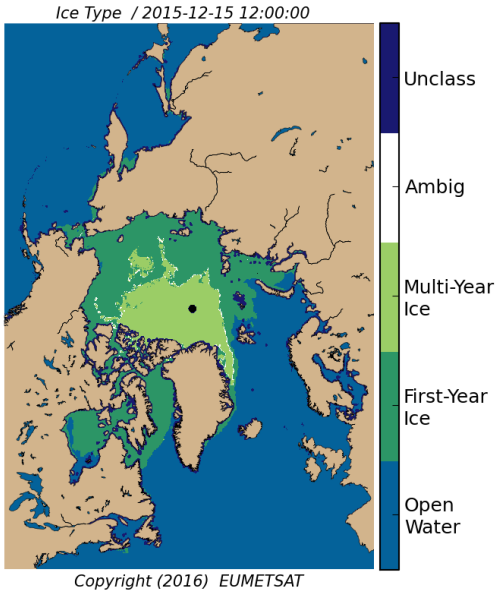
Satellite input	Product	Freq.
DMSP/SSMIS GCOM-W/AMSR-2	L3 **sea ice concentration**	daily daily
DMSP/SSMIS and Metop/ASCAT	L3 **sea ice edge**, L3 **sea ice type**	daily daily
DMSP/SSMIS	L3 **sea ice emissivity**	daily
DMSP/SSMIS, Metop/ASCAT & GCOM-W/AMSR-2 Metop/AVHRR	L3 low resolution **sea ice drift** L3 medium resolution sea ice drift	daily daily, NH
Metop-A/AVHRR & NOAA/AVHRR Metop-A/AVHRR	L3 high latitudes **sea and sea ice surface temperature** L2 high latitudes sea and sea ice surface temperature	12 hourly continuous
METOP/AVHRR & NOAA/AVHRR	L3 Atlantic high latitudes **Downward Longwave Irradiance** (DLI) L3 Atlantic high latitudes **Surface Solar Irradiance** (SSI)	daily daily

Sea Ice products









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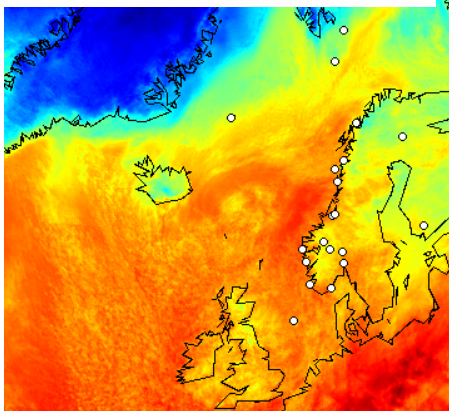

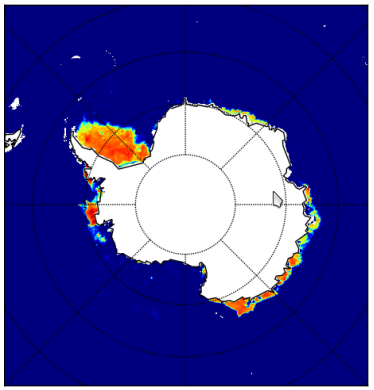

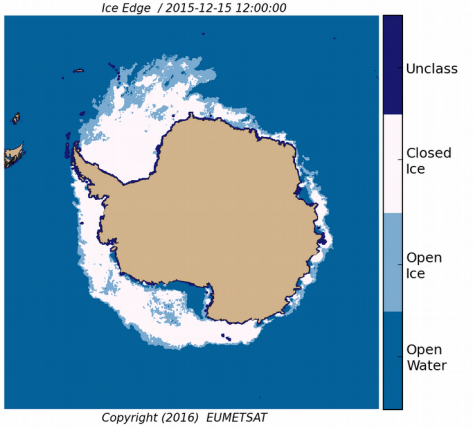

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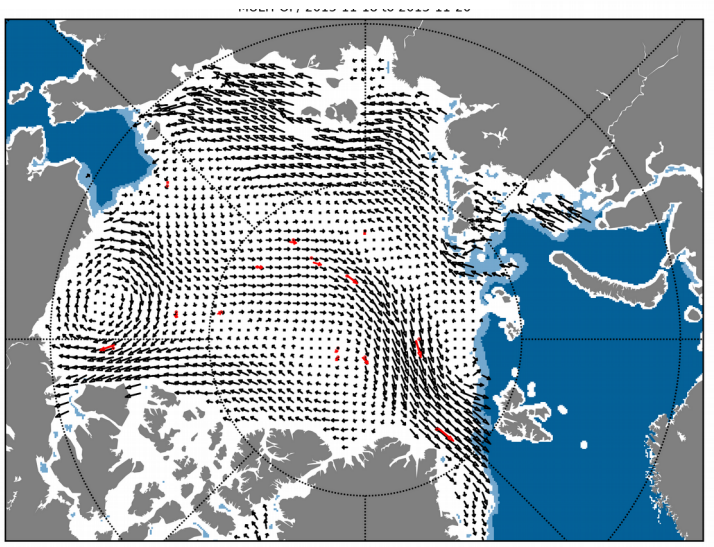

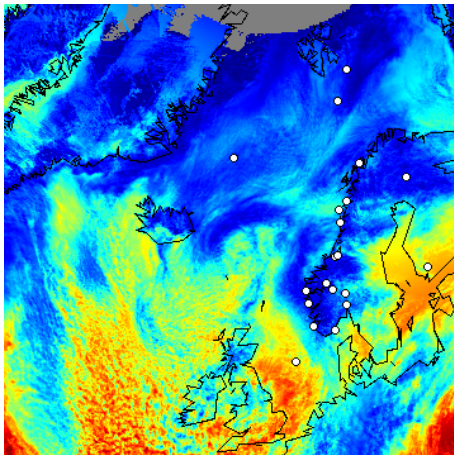

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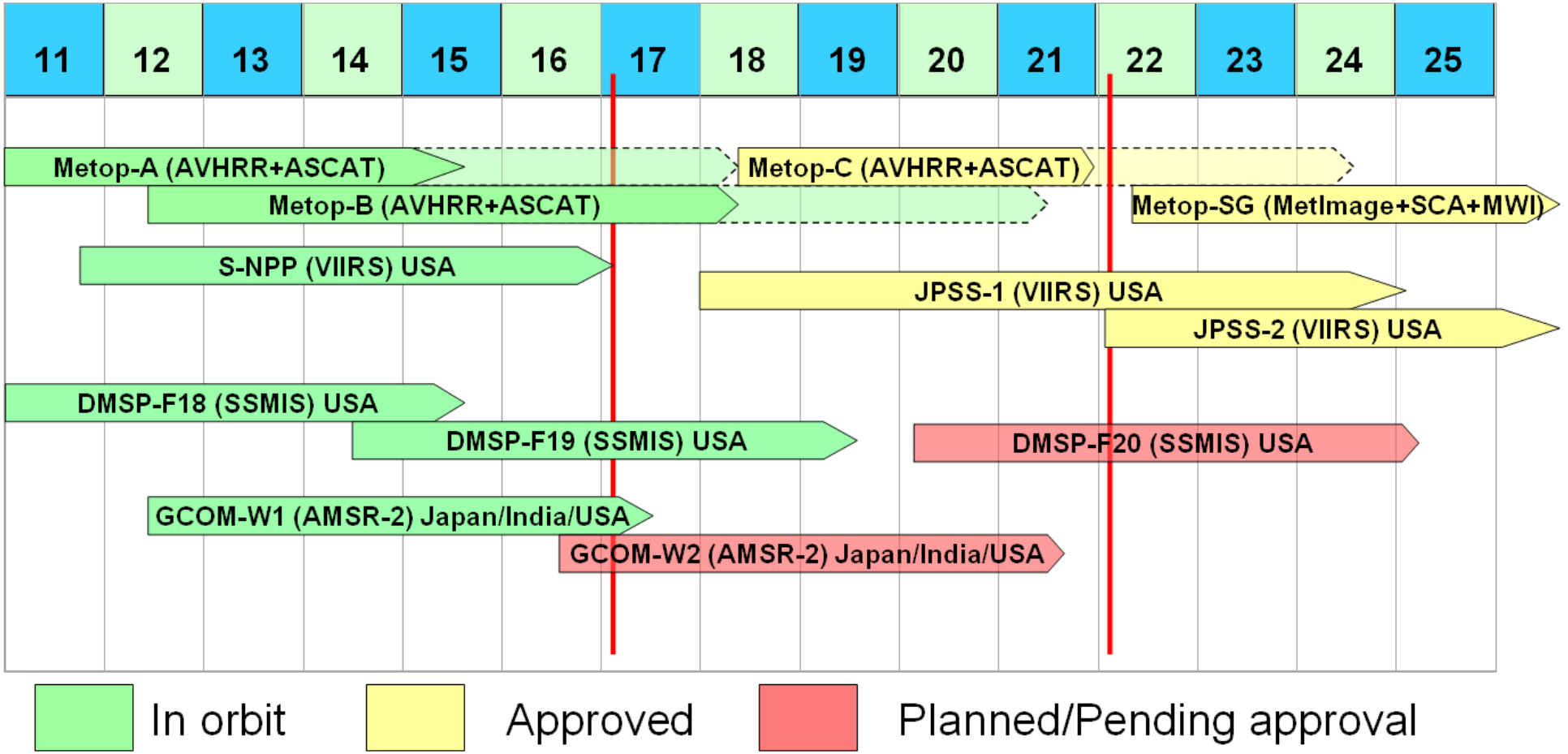
Satellite missions for OSI SAF NRT sea ice products



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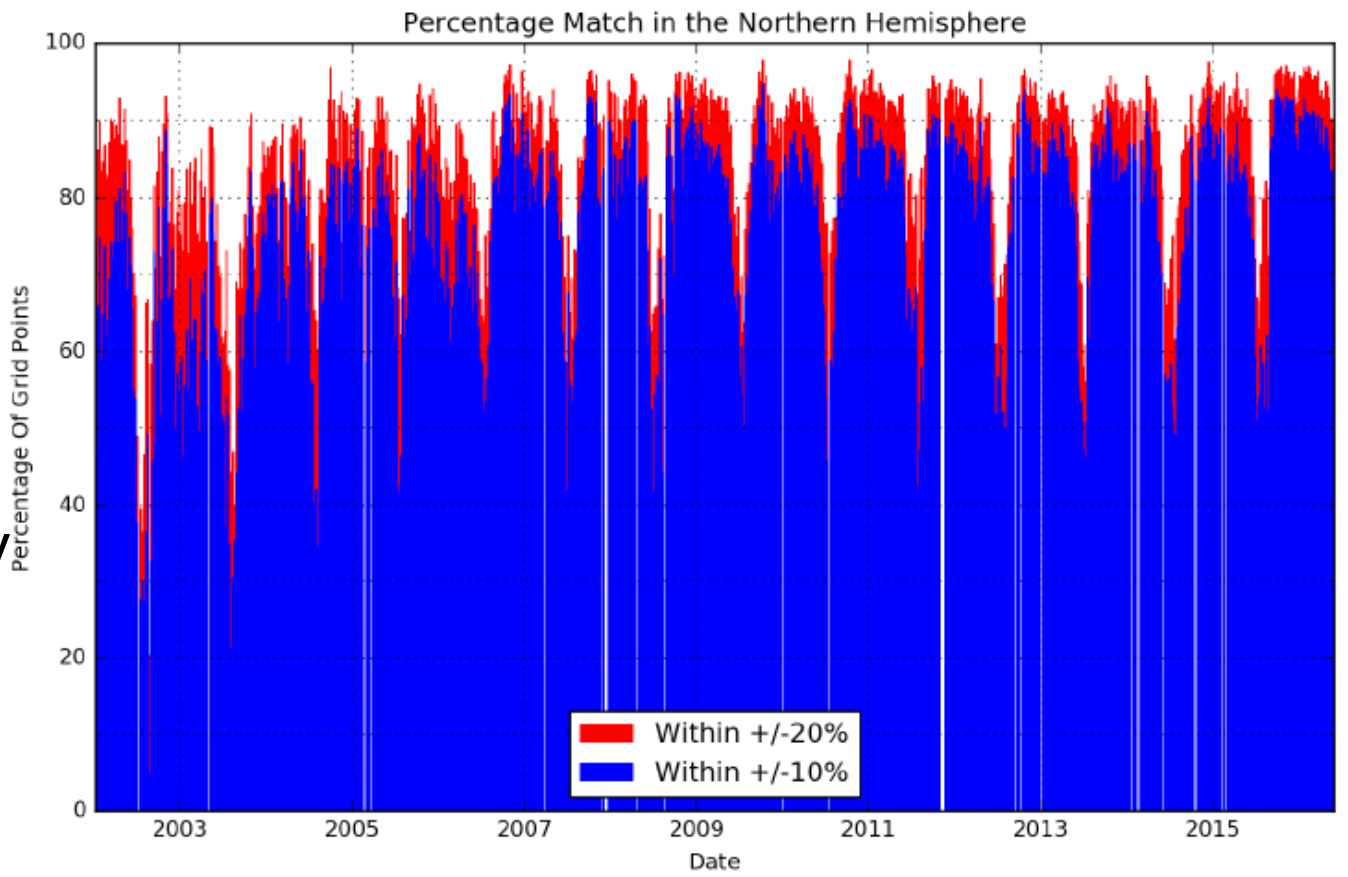
Sea ice quality assessment

Example :

Comparison between ice concentrations from the Greenland overview charts made by DMI and the OSI SAF concentration product



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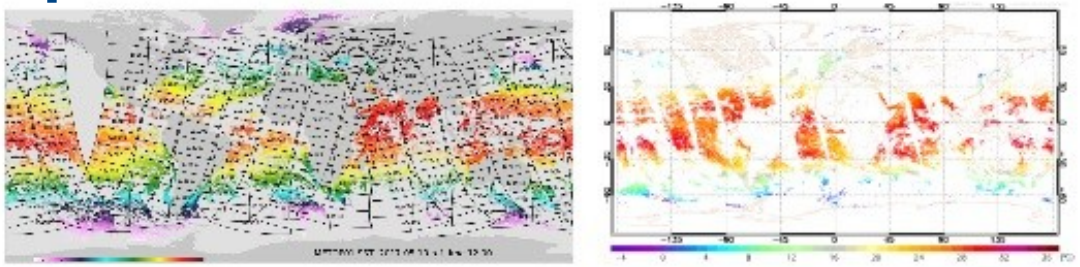
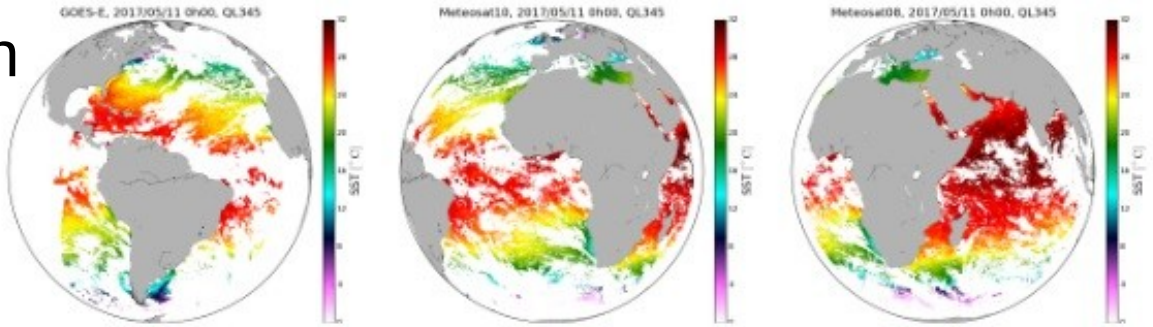
Sea Surface Temperature

- LEO and GEO satellites
- Various coverage and various spatial resolution depending on the satellite and sensor
- Level 2 “swath” or L3
- In the future : ABI on GOES-R, FCI on MTG and Metimage on Metop-SG



Global SST products from Metop-B/AVHRR (left) and IASI (right).



SST from GOES13 (left), Meteosat 10 (left), and Meteosat 8 (right).

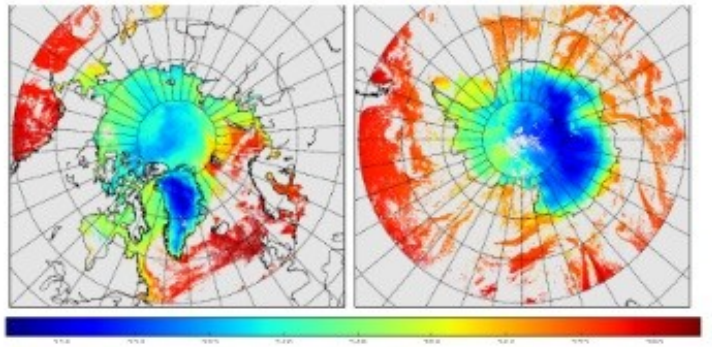


Illustration of the Sea Surface Temperature and Ice Surface Temperature product (OSI-205) from Metop-A/AVHRR: 21/2/2017.

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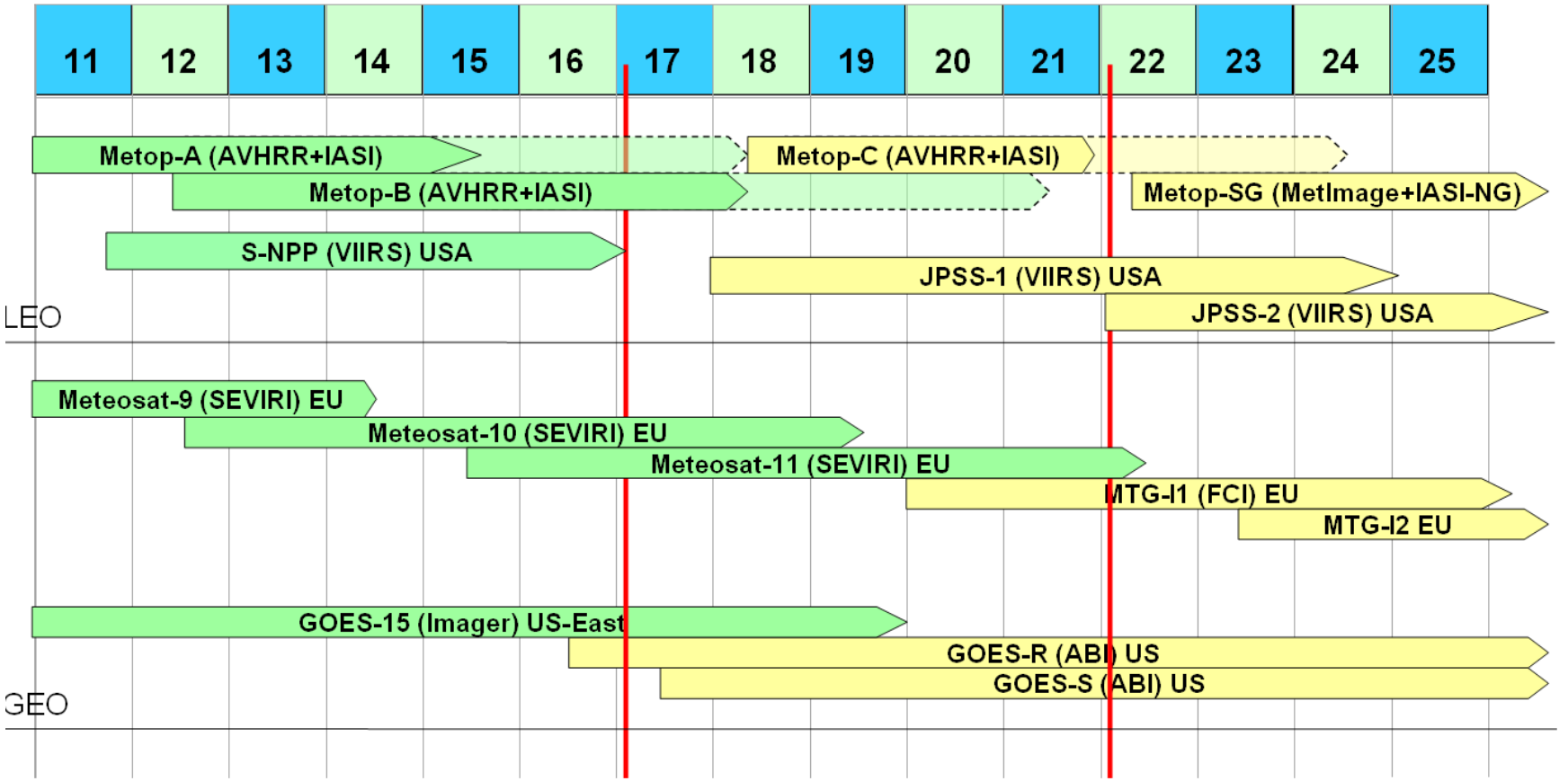
Satellite missions for OSI SAF NRT SST and radiative fluxes products



Satellite missions for OSI SAF CDOP3 – NRT radiative fluxes products

Same as SST missions (without IASI and IASI-NG)

In orbit Approved Planned/Pending approval

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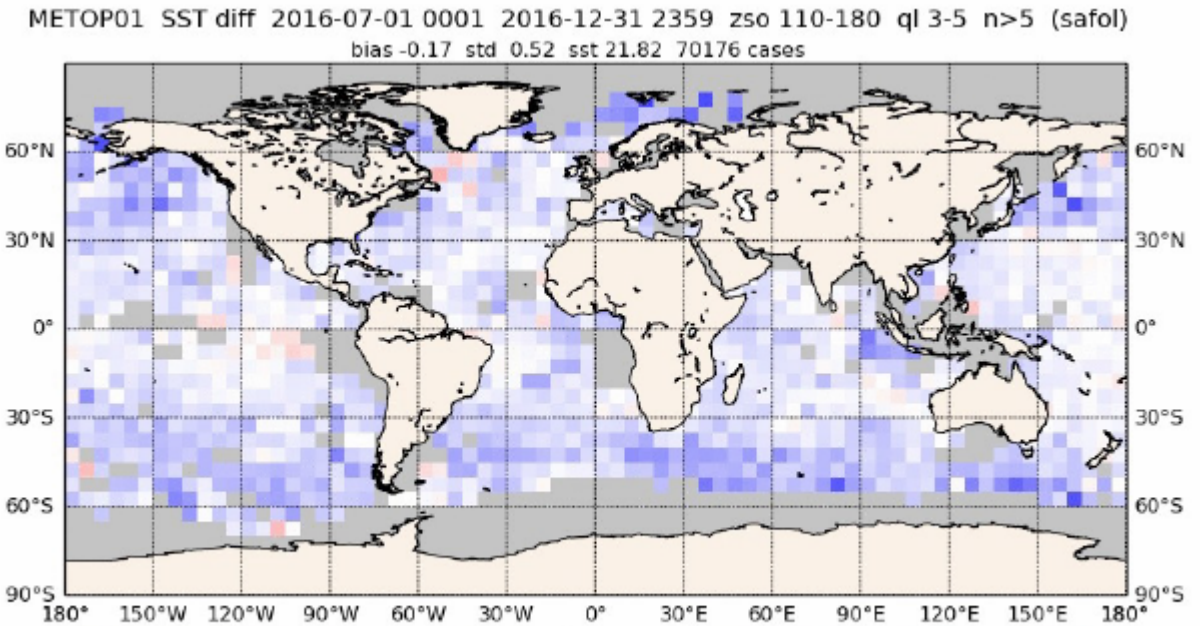
Sea surface temperature quality assessment

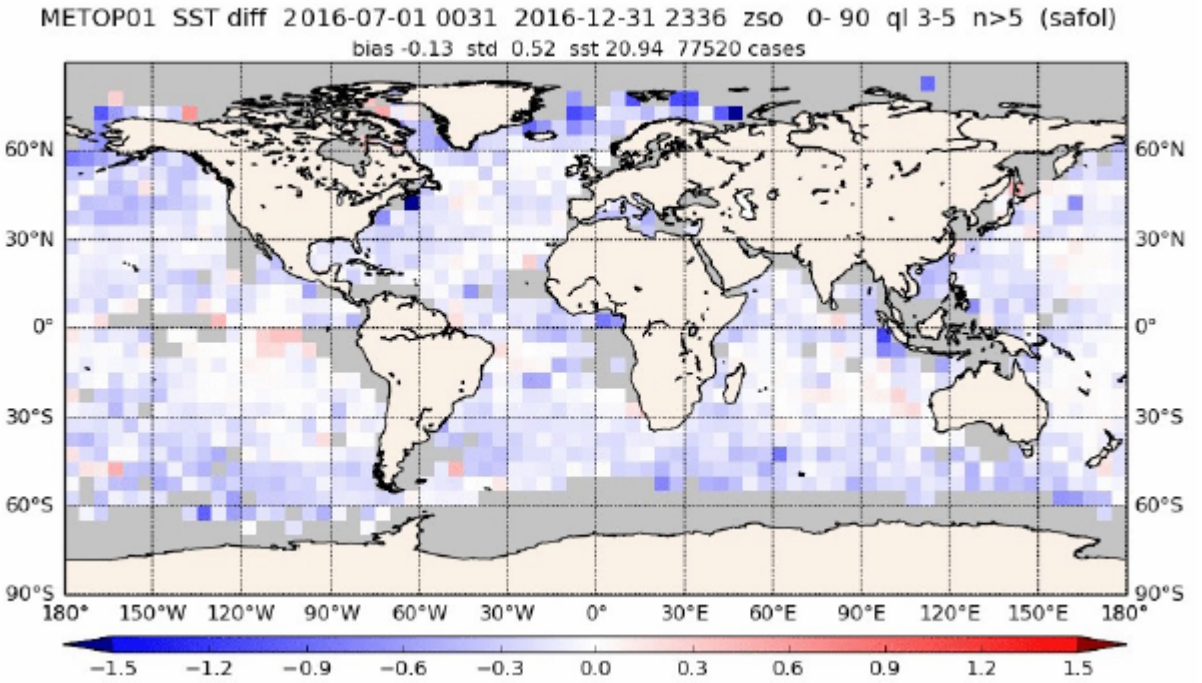
Example :

Metop-B/AVHRR SST

Comparison with buoys (night)



Comparison with buoys (day)



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Sea Surface Temperature data record

- Posters Session 3 :

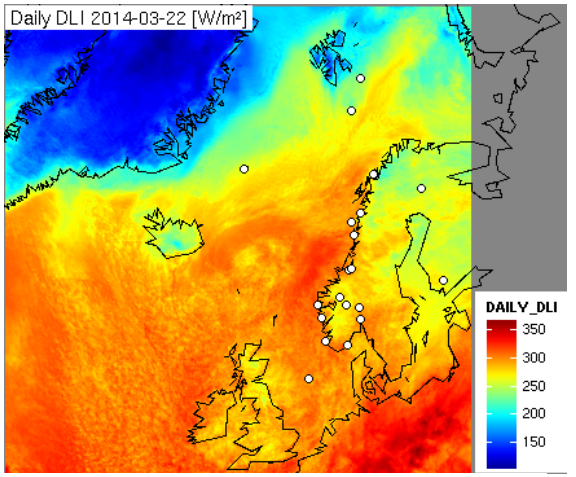
74. Stéphane Saux Picart (Météo France):

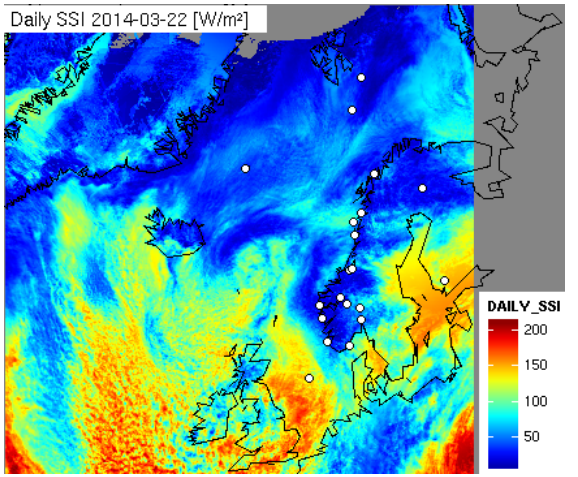
OSI SAF Sea Surface Temperature reprocessing of MSG/SEVIRI archive.

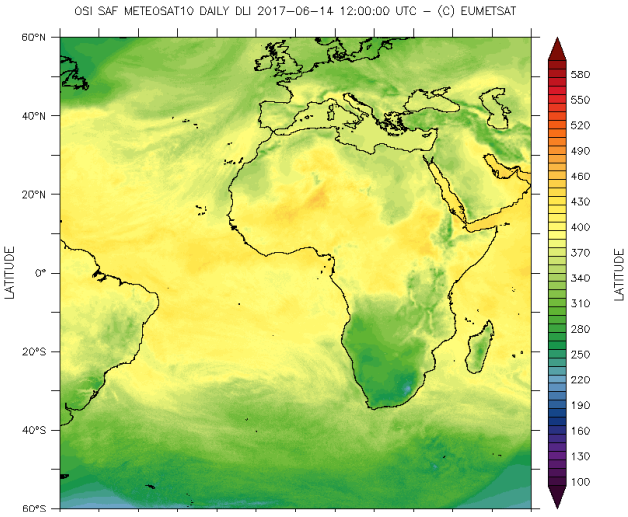
  - Retrival method
  - Cloud mask
  - Validation againt drifting buoys measurements

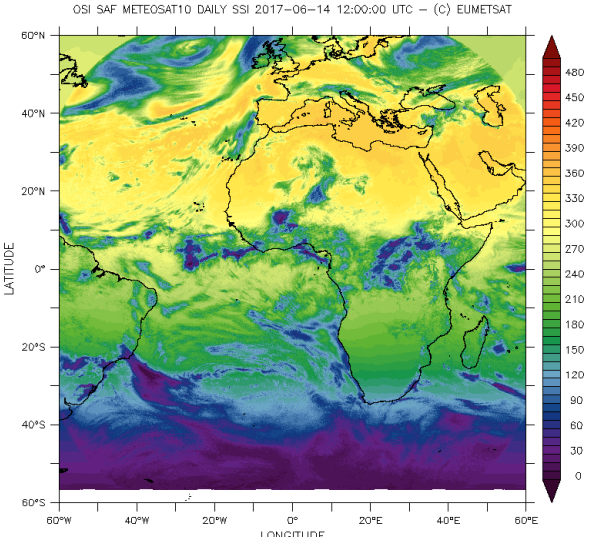
Radiative fluxes

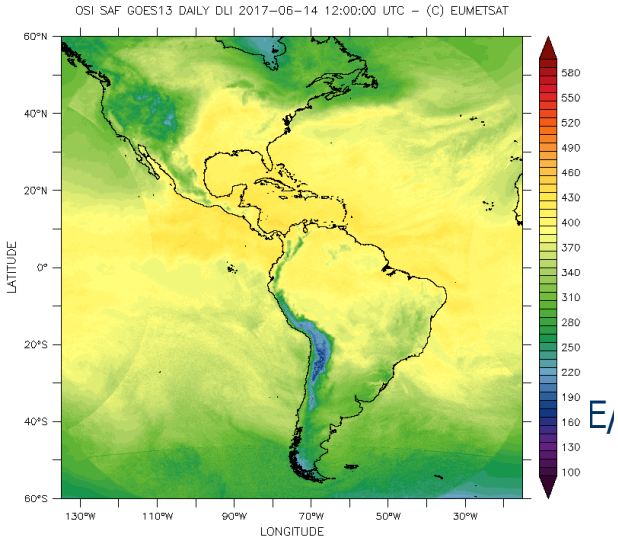
- LEO (Atlantic high latitudes) and GEO (GOES-E et Meteosat) satellites
- DLI : Downward Longwave Irradiance
- SSI : Solar Surface Irradiance
- Level 3
- In the future : ABI on GOES-R, FCI on MTG and Metimage on Metop-SG

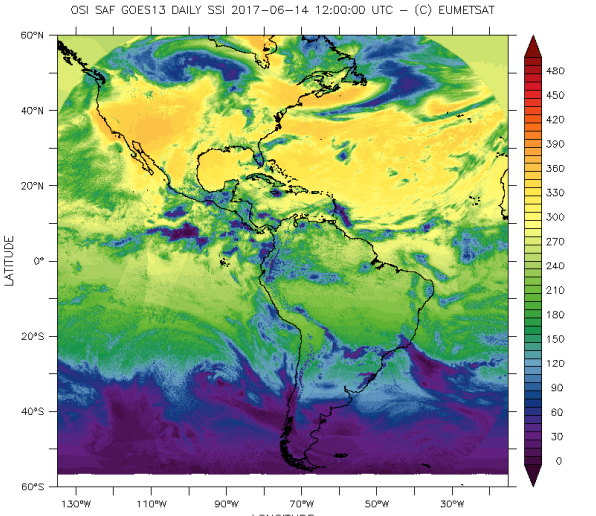












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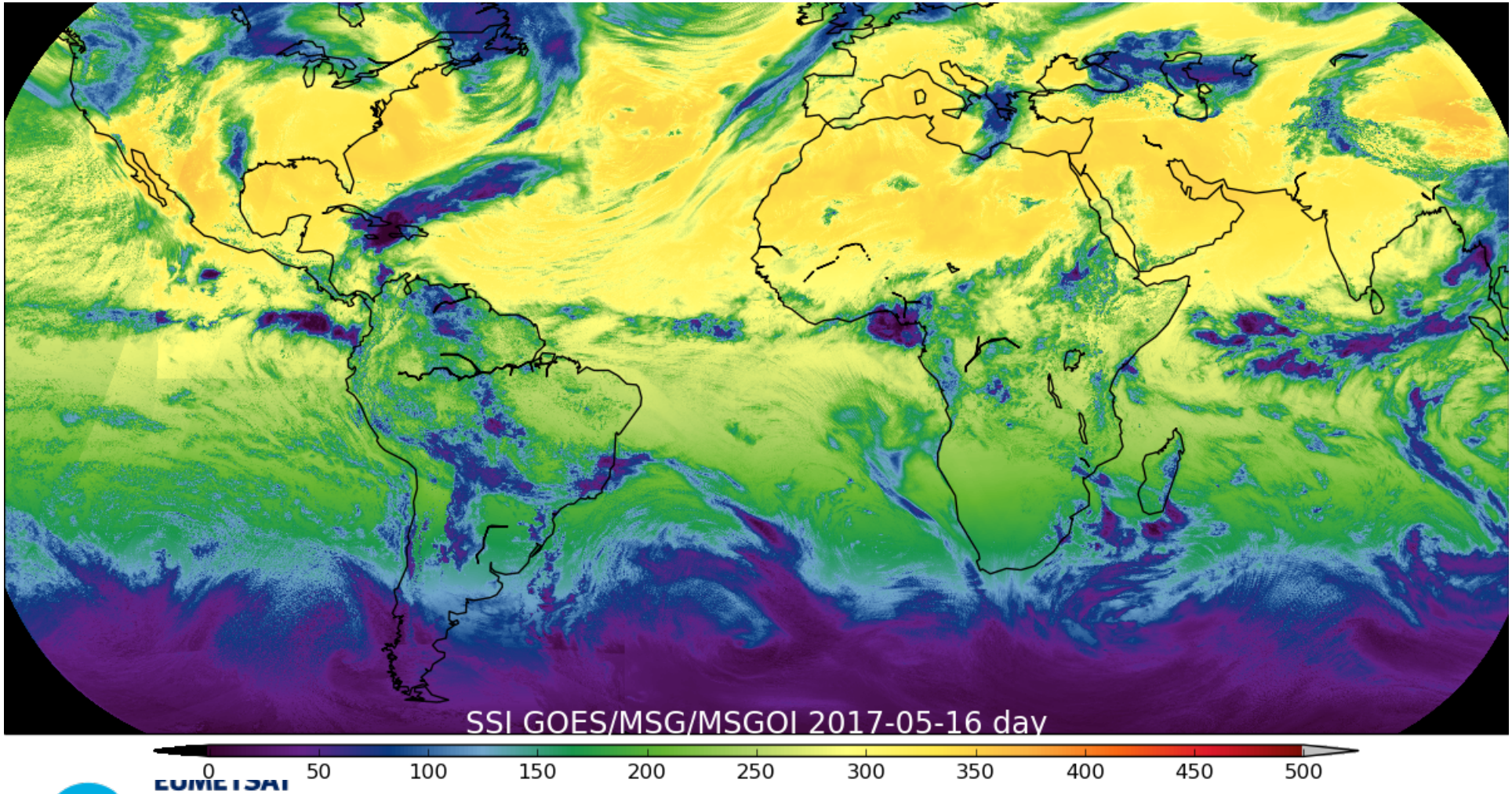
Solar Surface Irradiance with GOES-13, Meteosat-10 and Meteosat-8



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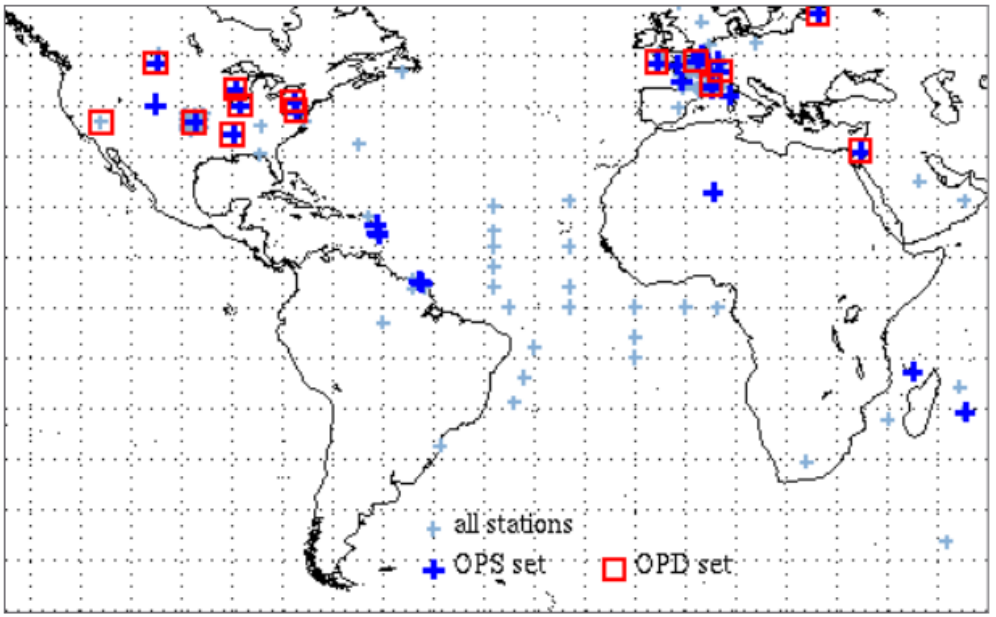
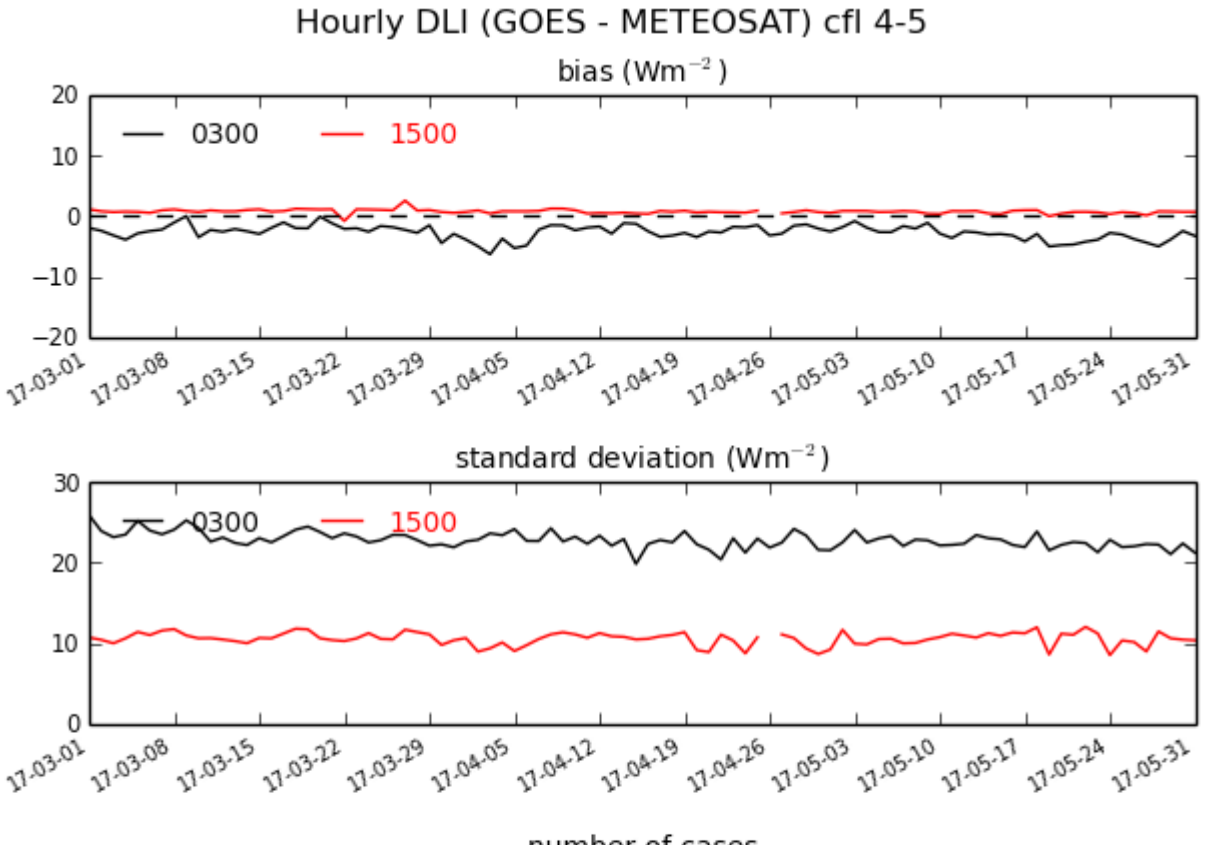
Radiative fluxes quality assessment

Comparison with measurements stations



Comparison GOES-E/ Meteosat



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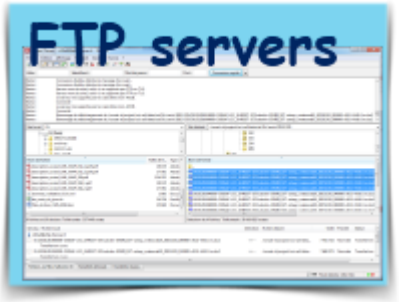
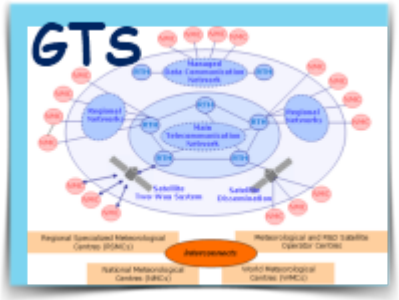
Access to OSI SAF data

EUMETCast is a multi-service dissemination system based on standard Digital Video Broadcast (DVB) technology. It uses commercial telecommunication geostationary satellites to multi-cast files (data and products) to a wide user community. EUMETCast also delivers a range of third-party products.



The OSI SAF production is based on three subsystems so you can find

- wind products on KNMI FTP server
- high latitude sea surface temperature, sea ice and radiative fluxes products on MET Norway FTP server
- other sea surface temperature and radiative fluxes on Ifremer FTP server



Only wind products are available trough the WMO Global Telecommunication System.

The EUMETSAT Data Centre provides a long-term archive of data and generated products from EUMETSAT, which can be ordered online.

More information on http://www.osi-saf.org Access to data

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Community

- Products documentation, quicklooks, validation results
- Frequent Asked Questions,
- User registration,
- Stories,
- Helpdesk
- Training, workshops and surveys
- Visiting scientists program
- Operational service messages (subscription)

on http://www.osi-saf.org

Le Centre de météorologie spatiale

Le CMS a été créé en 1963, il emploie aujourd'hui 65 personnes.
Ses principales missions :

- acquisition, traitement et archivage des données satellitaires ;
- diffusion en temps réel des produits ;
- conception et développement d'algorithmes et de logiciels de traitement satellitaires ;
- expertise, formation, assistance et fourniture de produits d'imagerie extraits de l'archive pour des besoins scientifiques, institutionnels ou commerciaux.

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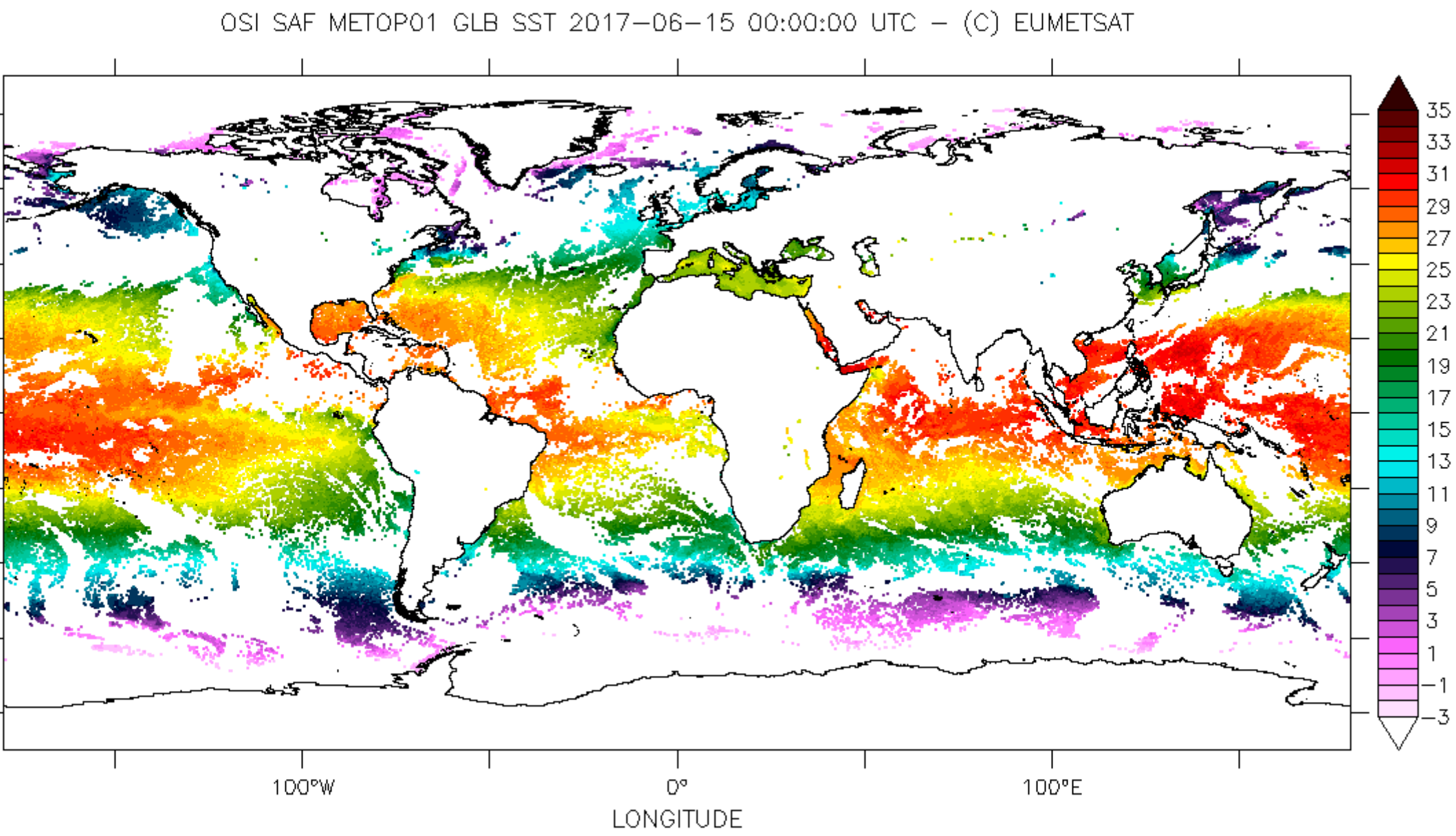
Le centre de météorologie spatiale



SST (Celsius) – quality levels 3,4,5

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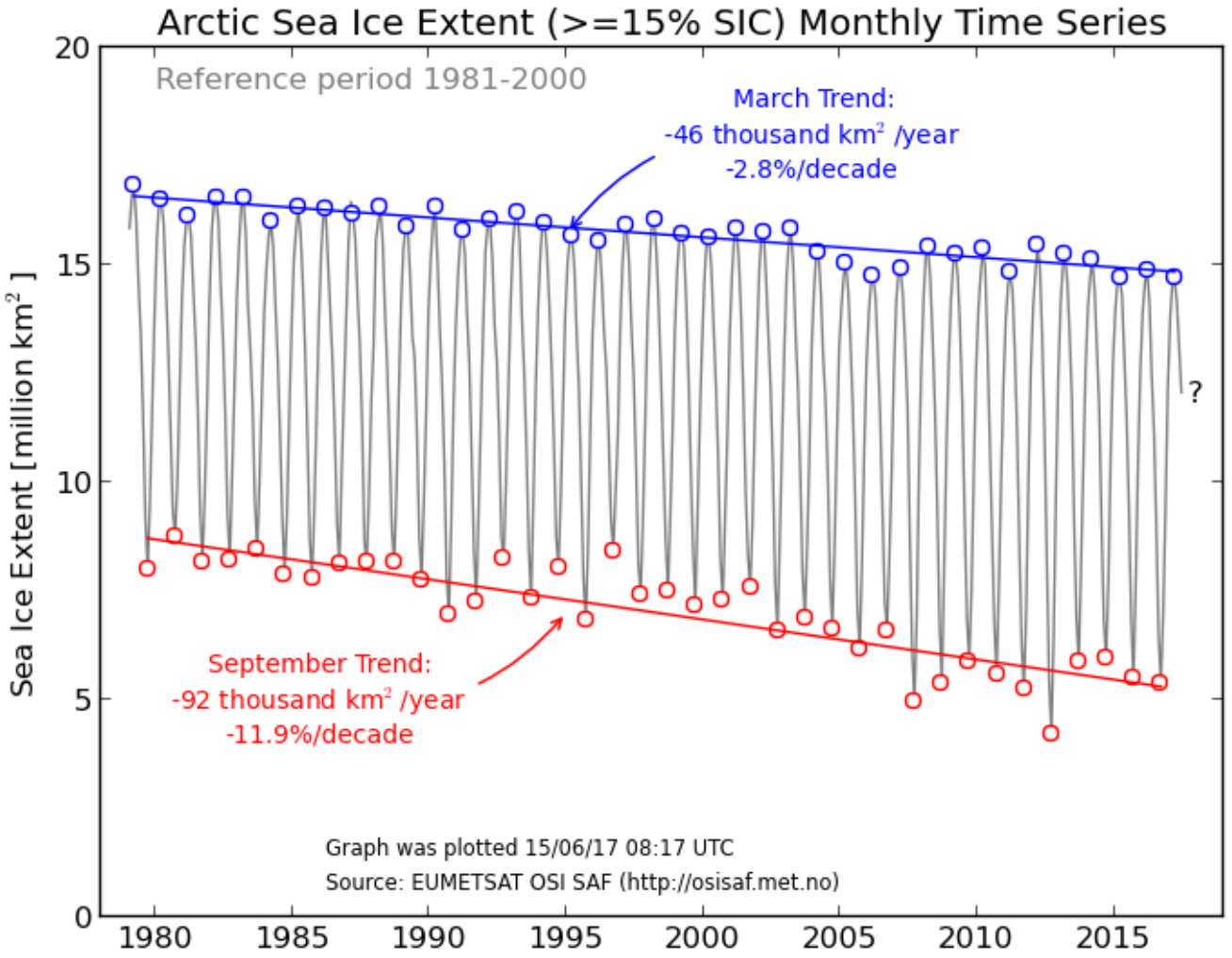
Sea ice concentration usage



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