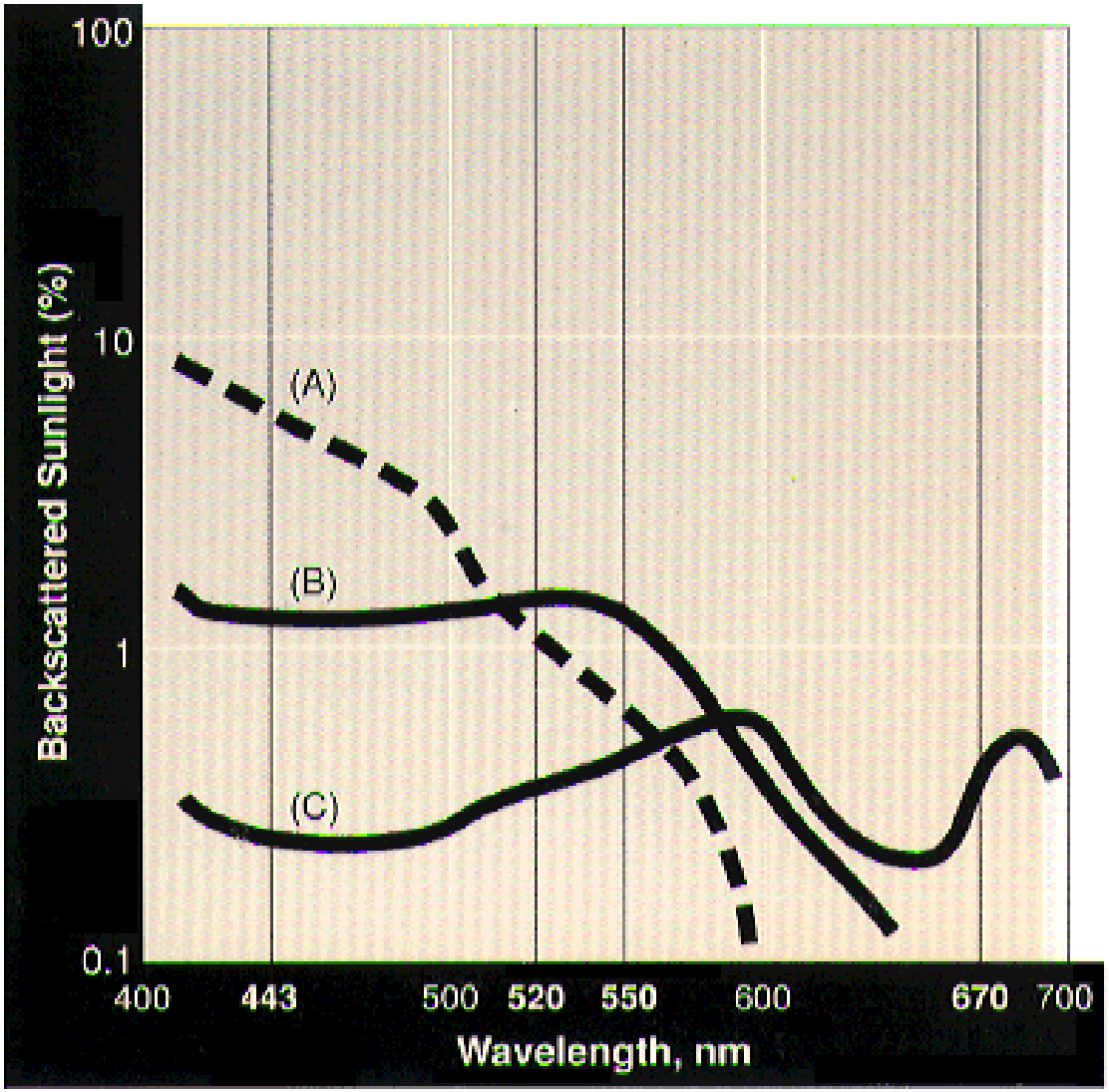
OCEAN COLOUR



Percentage backscatter from upper ocean layers

(A) clear open ocean water, low phytoplankton concentration;

(B) moderate phytoplankton bloom, open ocean;

(C) turbid coastal waters containing sediment as well as phytoplankton.

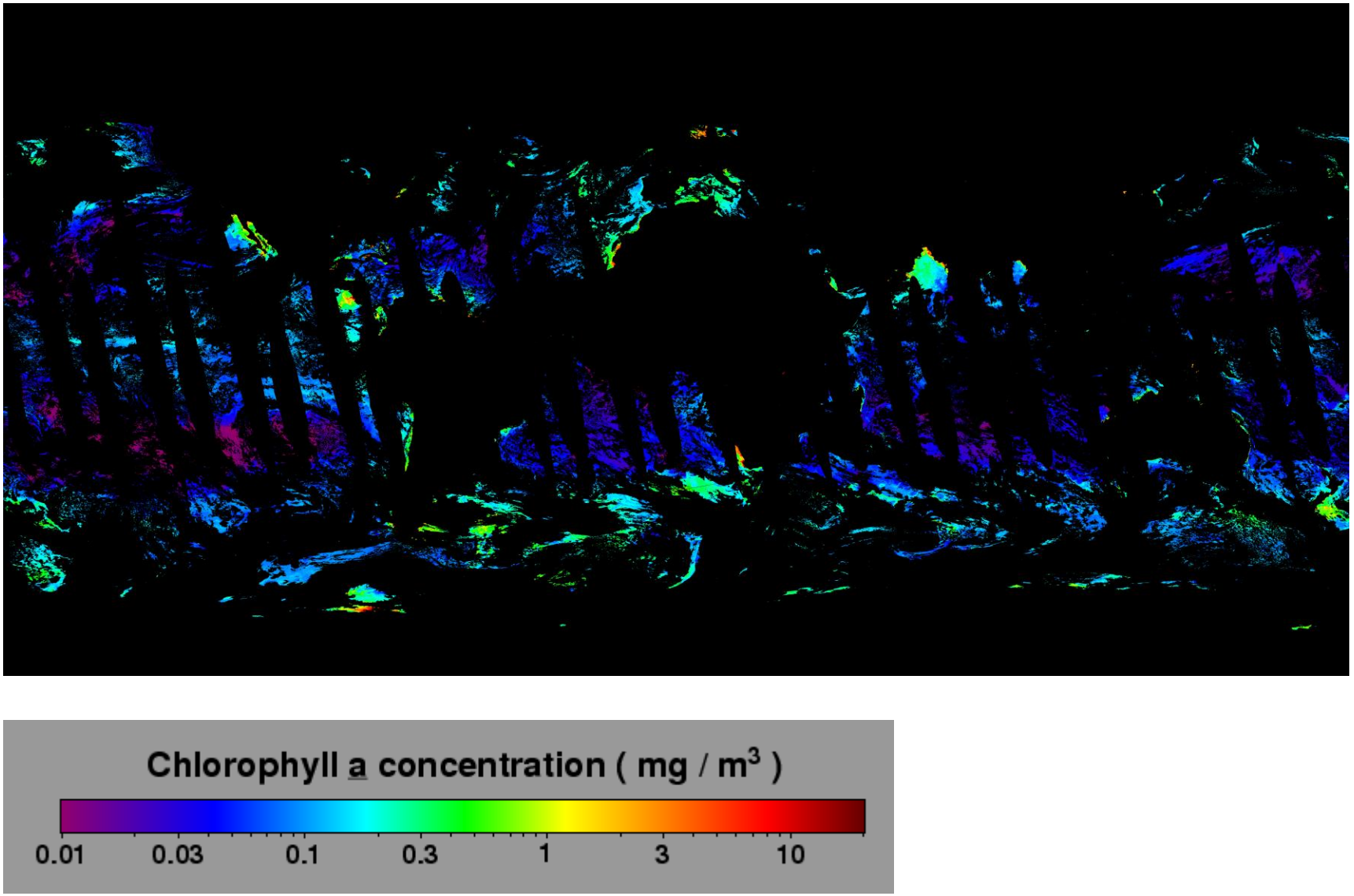
Ocean color from visible channels (when blue available)

MSG SEVIRI Channels

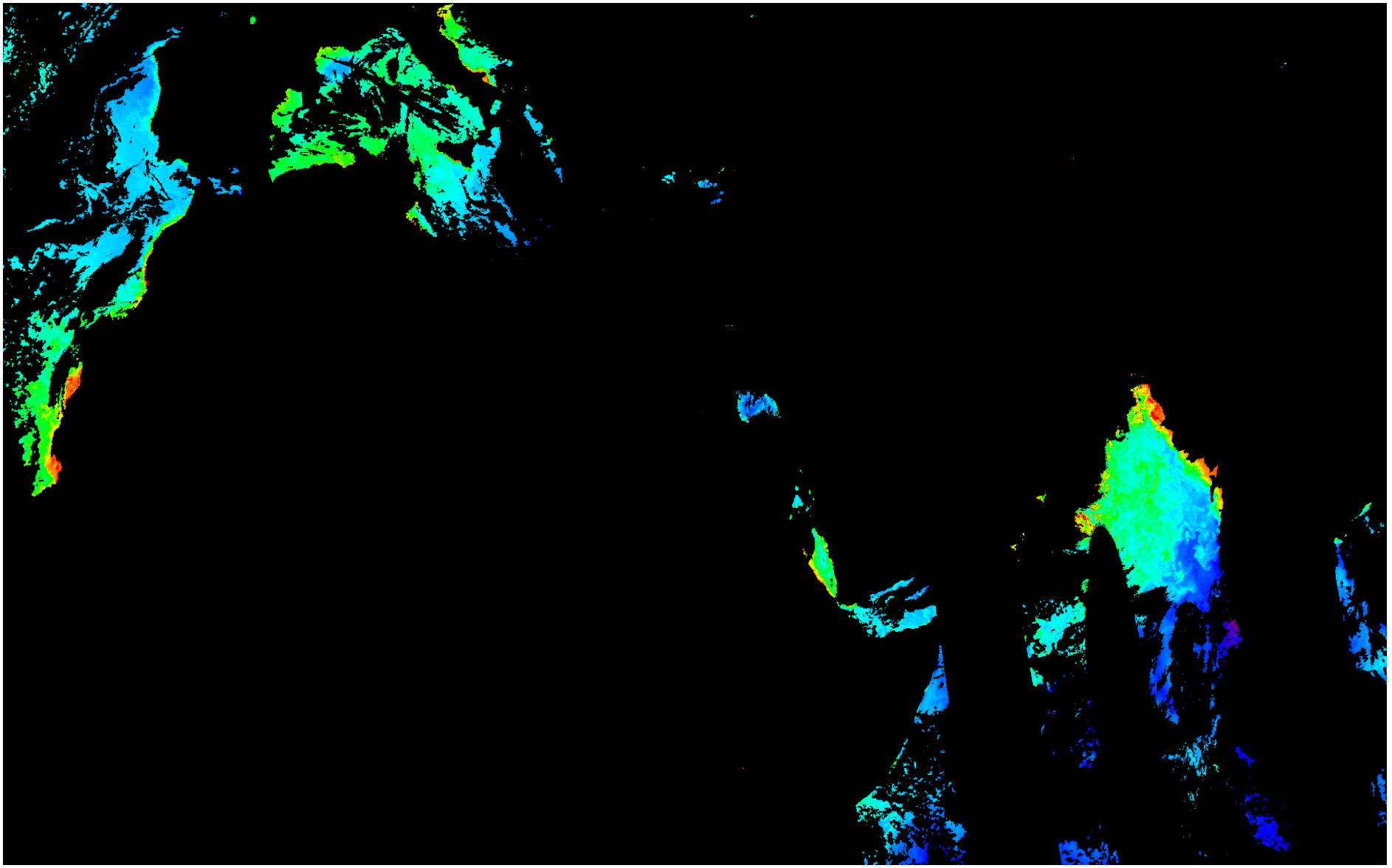
Channel	Main Surface Properties (cloudfree areas, NADIR viewing)
01 (VIS 0.6)	surface reflectivity (albedo) at 0.6 μm
02 (VIS 0.8)	surface reflectivity (albedo) at 0.8 μm, "greeness" of vegetation
03 (NIR 1.6)	surface reflectivity (albedo) at 1.6 μm

MSG does **not** have the blue channels needed.

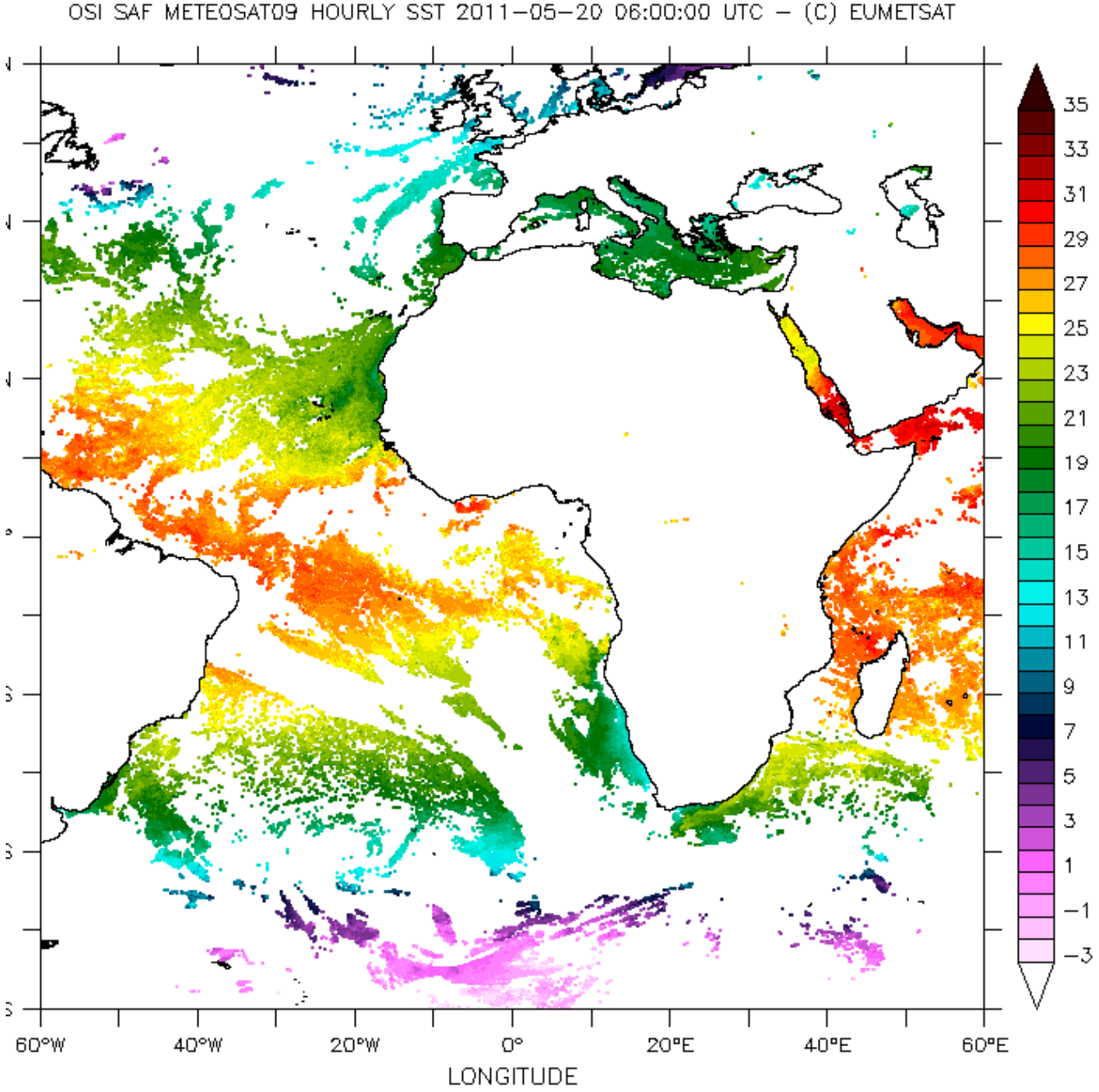
Now available on MODIS and NPP
Will be available on MTG and EPS-SG



From http://oceancolor.gsfc.nasa.gov/

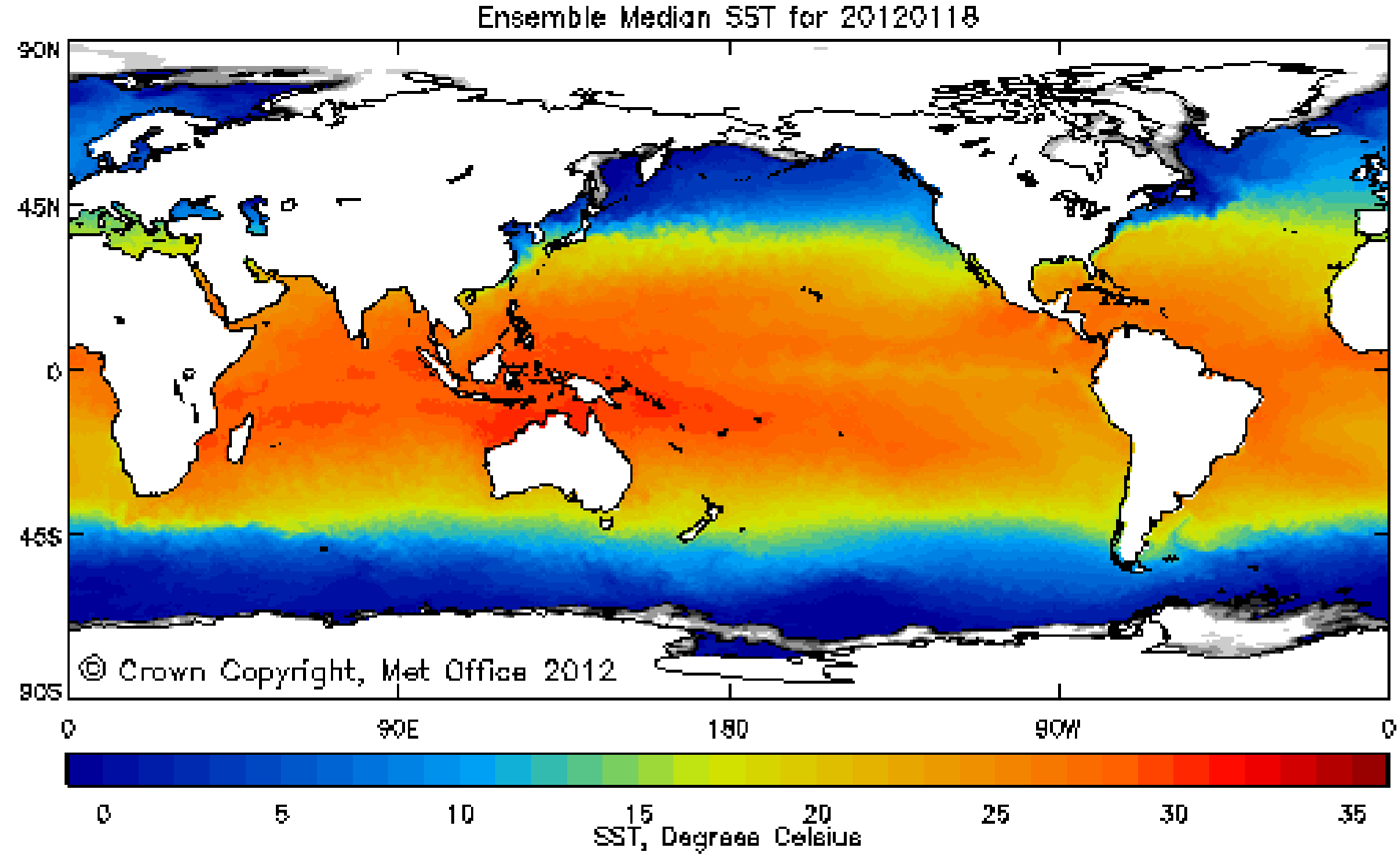


From http://oceancolor.gsfc.nasa.gov/



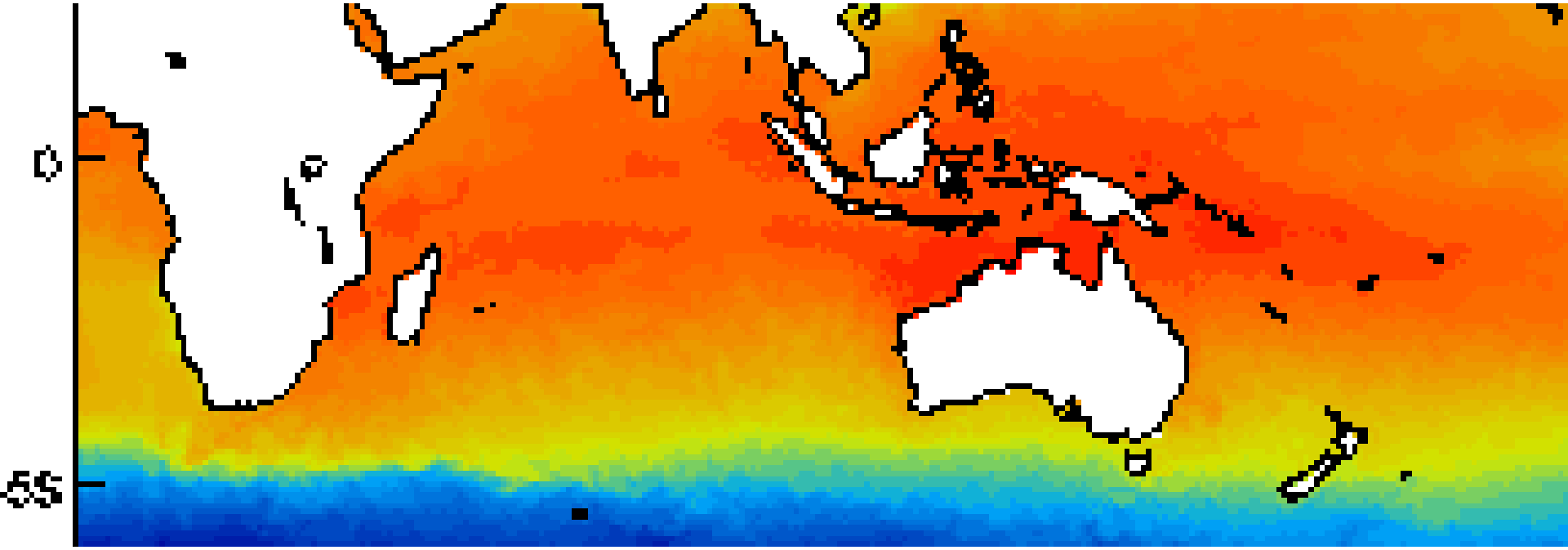
sea surface temperature (Celsius)

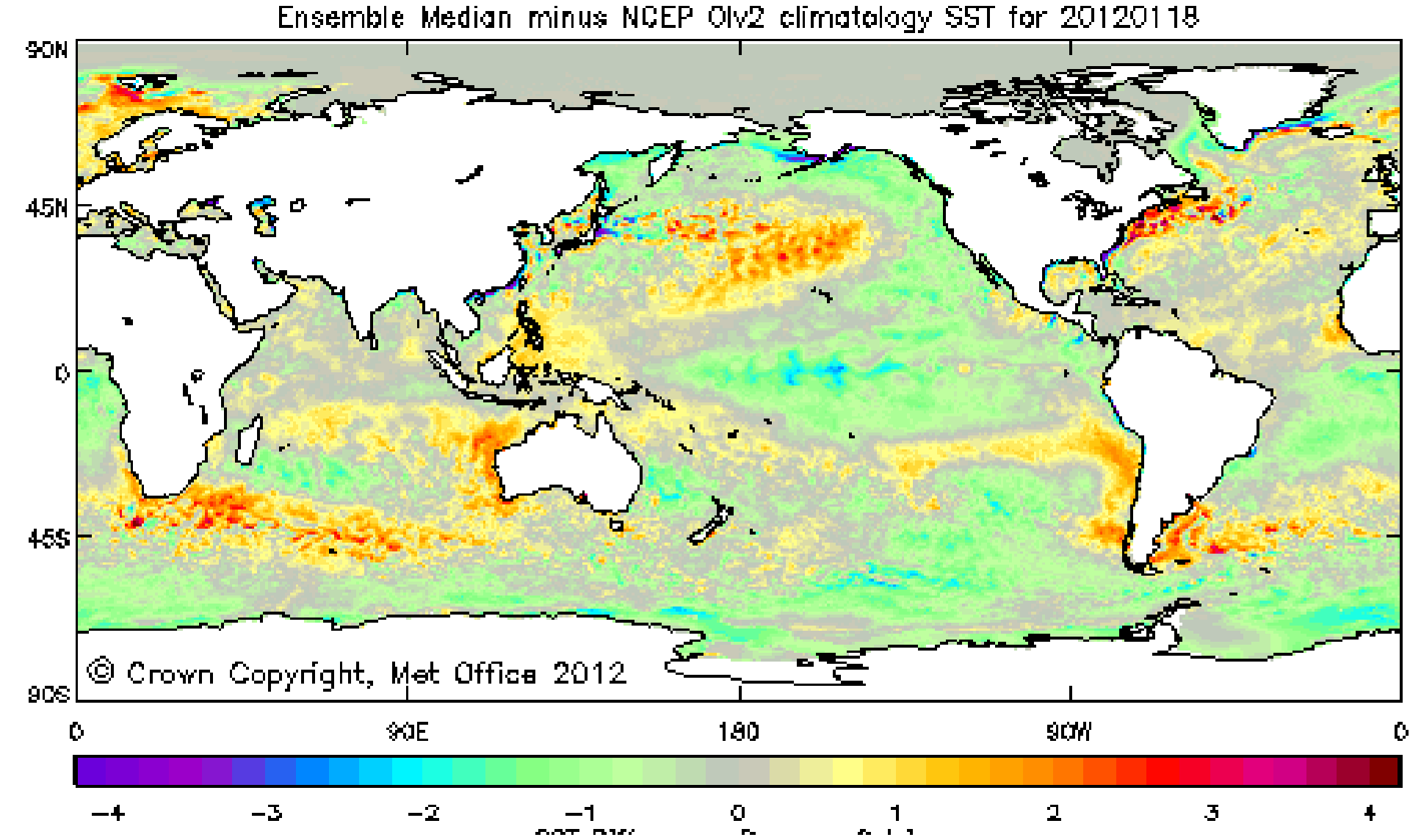
What are the Gaps?



Ensemble SST from https://www.ghrsst.org/data/todays-global-sst/

Where are the cloud gaps?


0
-55



Ensemble SST anomaly from NCEP climatology
from https://www.ghrsst.org/

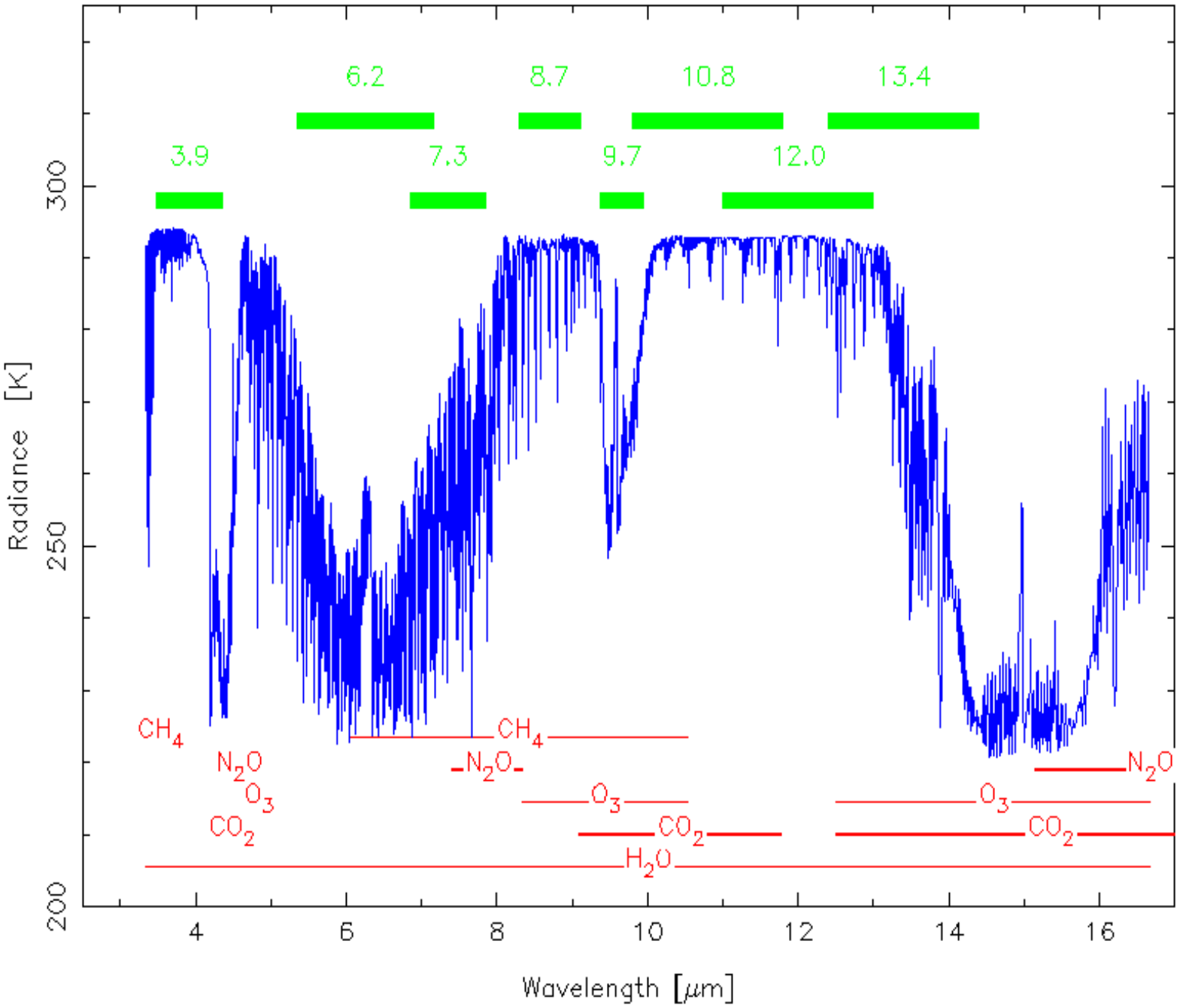
OSI SAF – Geo SST:
The operational SST algorithm used in day and night conditions for MSG is:

SST = (a + b Sq) T11 + (c + d TCLI + e Sq) (T11 - T12) + f Sq+ g (2)

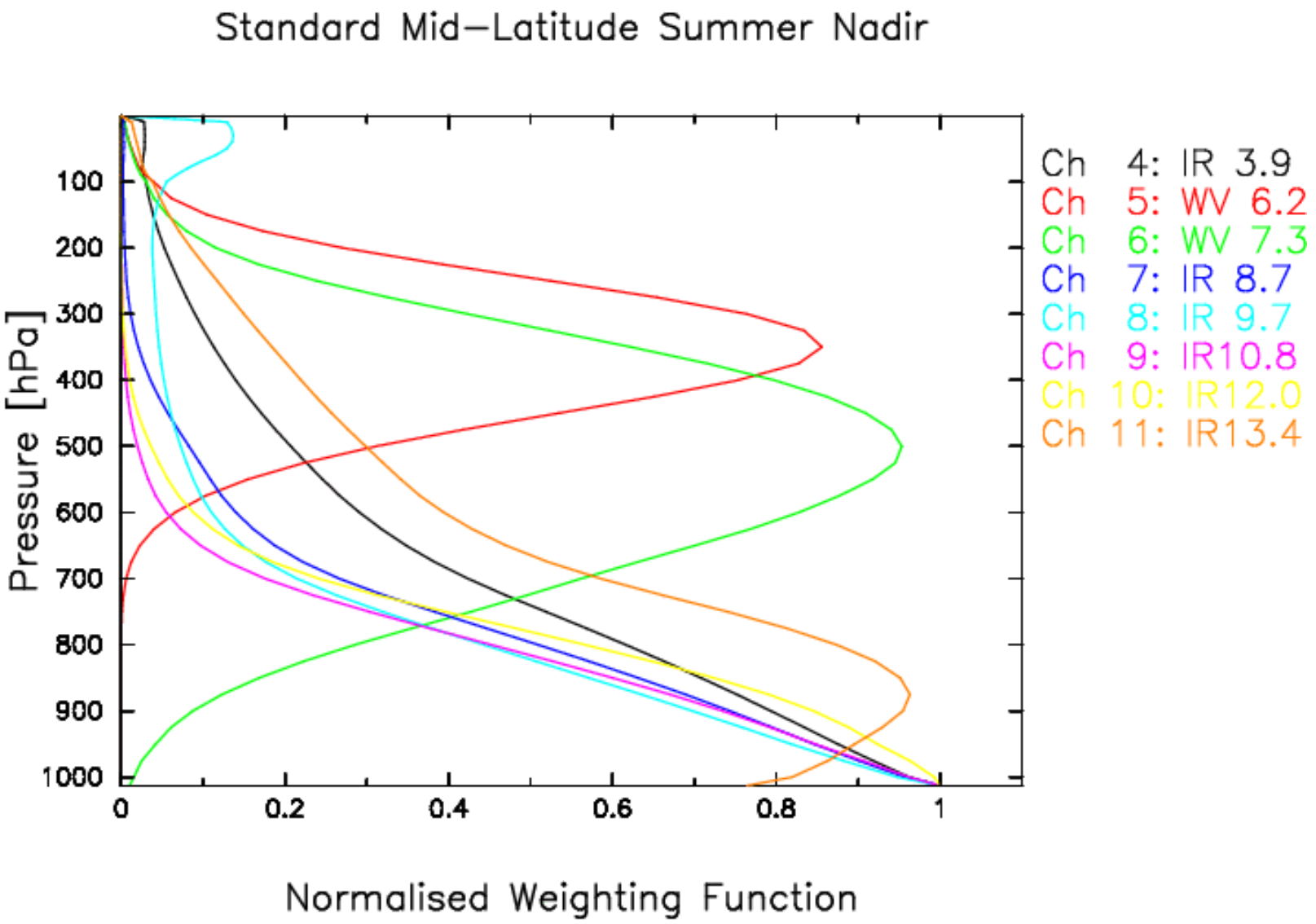
where T11 and T12 are the BTs at **10.8** and **12.0** microm, respectively. TCLI is a climatological SST value.

a, b, c, d, f and g are coefficients determined from brightness temperature simulations on a radiosonde profile database (Francois *et al.,* 2002), with the offset coefficient corrected relative to buoy measurements. Sq = secant(qsat) –1; qsat is the satellite zenith angle

A Saharan Dust Index (SDI) correction term is calculated as a quadratic function of the SDI values (Merchant *et al.,* 2006), for 0.1<SDI<0.8. This correction depends on the algorithm used. No corrections are made when there is no SEVIRI observations. In these conditions there is a residual aerosol error that is flagged using the aerosol information in the NWC cloud mask or the NAAPS AOD.


6.2
8.7
10.8
13.4
3.9
7.3
9.7
12.0
300
250
200
Radiance [K]
4
6
8
10
12
14
16
Wavelength [μm]
CH4
N2O
O3
CO2
CH4
N2O
O3
CO2
H2O
O3
CO2
N2O

Contribution Functions



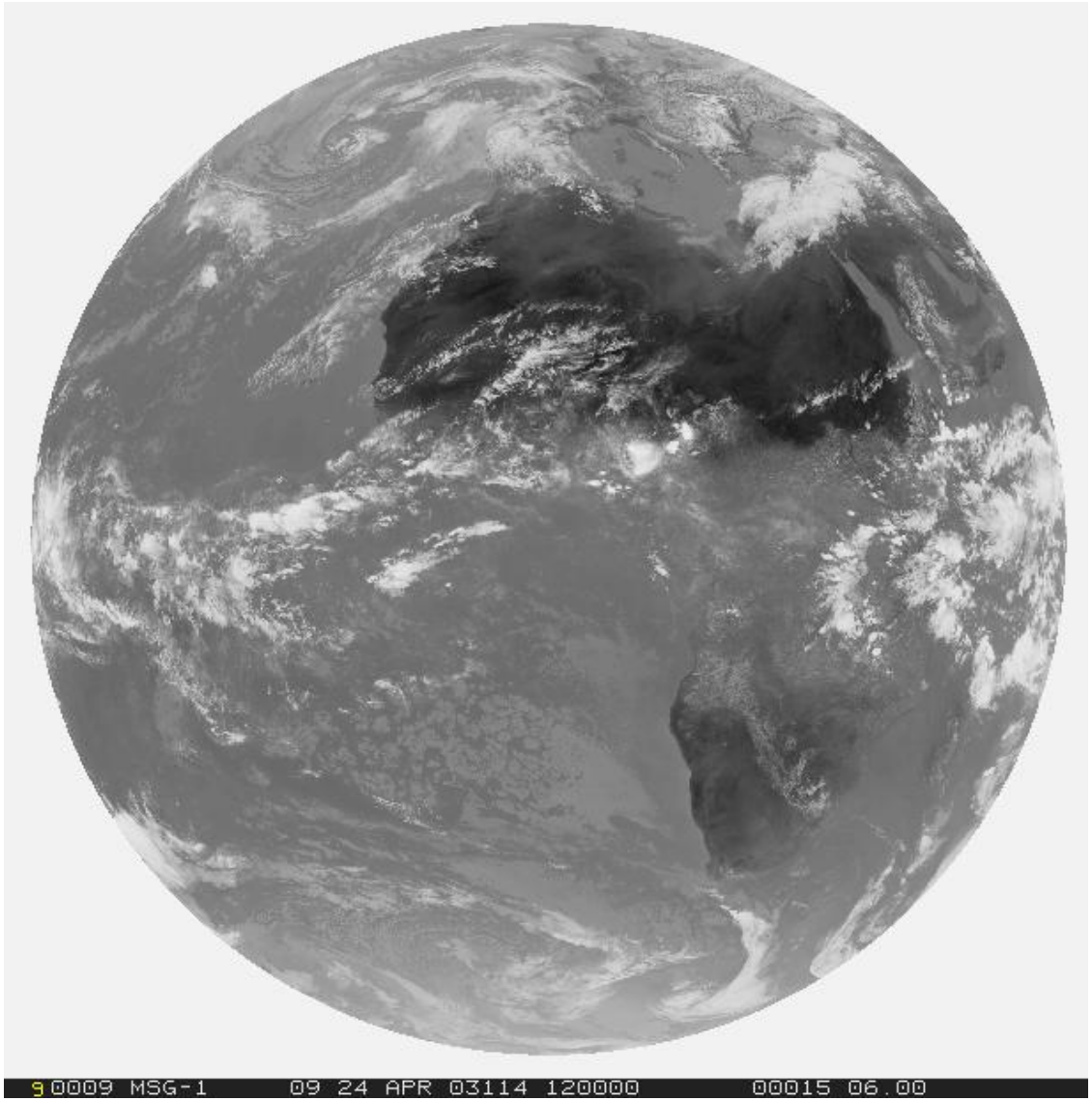
MSG Channel IR10.8

Land Surface

cold land surface

warm sea surface

hot land surface



Clouds

cold

high-level clouds

mid-level clouds

low-level clouds

warm

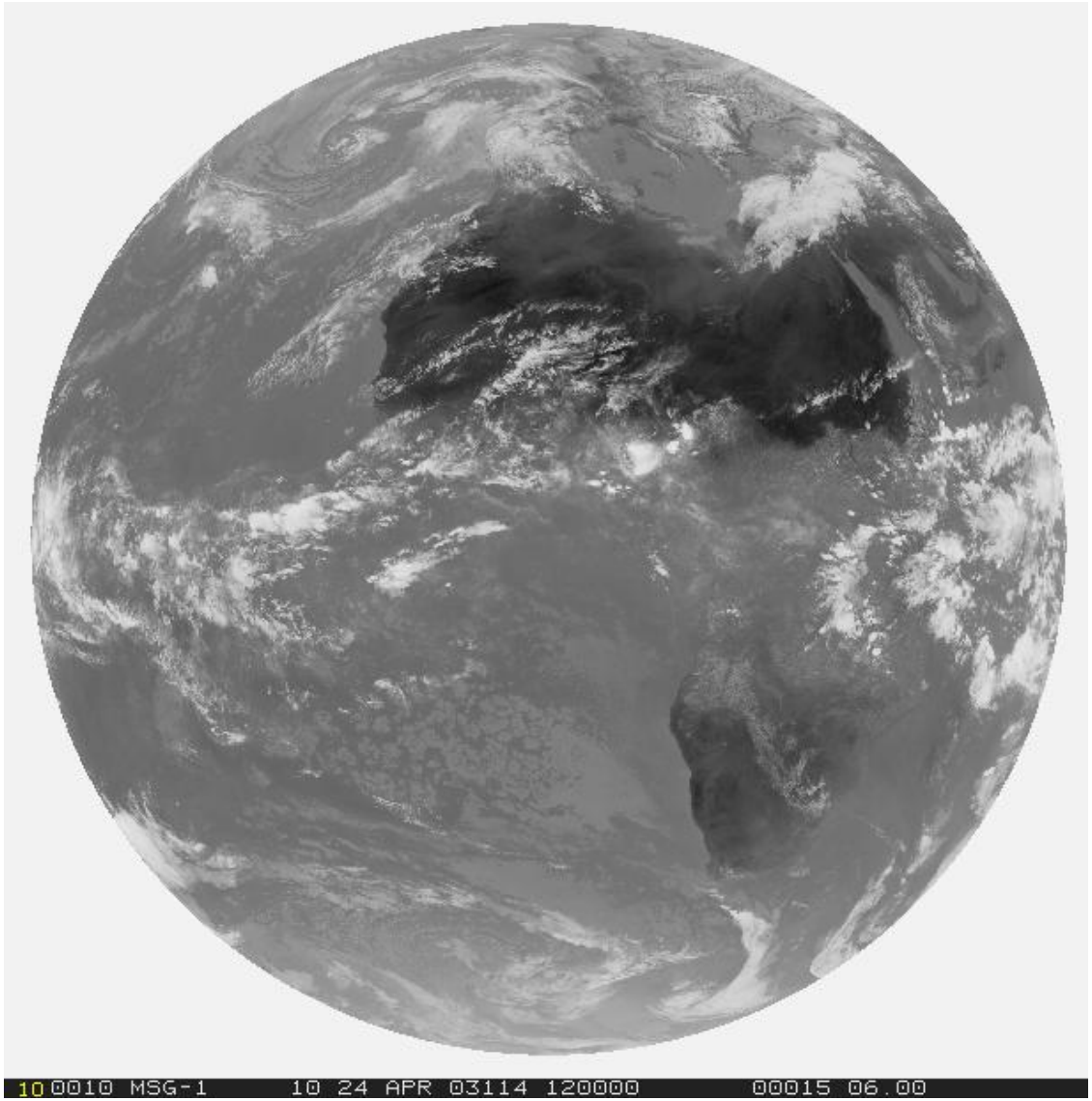
MSG Channel IR12.0

Land Surface

cold land surface

warm sea surface

hot land surface



Clouds

cold

high-level clouds

mid-level clouds

low-level clouds

warm

MSG SEVIRI Channels

Channel	Main Surface Properties (cloudfree areas, NADIR viewing)
01 (VIS 0.6)	surface reflectivity (albedo) at 0.6 μm
02 (VIS 0.8)	surface reflectivity (albedo) at 0.8 μm, "greeness" of vegetation
03 (NIR 1.6)	surface reflectivity (albedo) at 1.6 μm
04 (IR 3.9)	Day-time: surface temperature, surface reflectivity (albedo) at 3.9 μm, surface emissivity Night-time: surface temperature, surface emissivity
05 (WV 6.2)	upper-level moisture
06 (WV7.3)	mid-level moisture
07 (IR 8.7)	surface temperature, surface emissivity, humidity
08 (IR9.7)	surface temperature, ozone content
09 (IR 10.8)	**surface temperature**
10 (IR 12.0)	**surface temperature, humidity**
11 (IR13.4)	surface temperature, lapse rate between surface and 800 hPa
12 (HRV)	surface reflectivity (albedo, broadband 0.4 - 1.1 μm)

MSG SEVIRI Channels

Channel Diff.	Main Cloud Physical Properties
IR8.7 - IR10.8	Day/Night: optical thickness, phase
IR10.8 - IR12.0	Day/Night: optical thickness
NIR1.6 - VIS0.6	Day: phase (ice index), particle size
IR3.9 - IR10.8	Day: particle size Night: particle size (only for warm clouds)
WV6.2 - IR10.8	Day/Night: overshooting tops

What "Surface"?

Satellites actually measure the **skin temperature** – how can that be validated?

Data can only be obtained by buoy measurements: depths 0.5 to 1m.
The skin-bulk difference is about 0.2 K by night (skin cooler than bulk), but this difference may reach several K by day under favorable diurnal heating conditions (skin warmer than bulk).

The energy available to the atmosphere is not represented by the skin SST quantity.

Data are corrected to give a **sub-skin SST**. This may vary with respect to bulk SST depending on the diurnal thermocline.

The sub-skin SST definition has thus been adopted in the operational stage, since it allows a representative validation by night, and preserves the evaluation of skin SST by day.