

EGU General Assembly
22-27 April 2012
Vienna, Austria

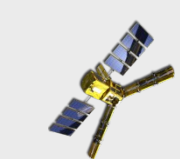


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SMOS

- Soil Moisture & Ocean Salinity
- Satellite launched on November 2nd 2009
- Provides **Soil Moisture** and Ocean Salinity
- Soil Moisture maps accuracy better than 0.04 m³/m³
- Radiometric accuracy better than 55 km
- Revisit time : less than 3 days



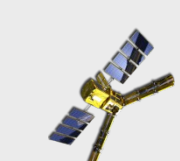
CATDS

- Centre Aval de Traitements des Données SMOS: the Level 3 and 4 data processing ground segment of the SMOS mission developed by CNES, the French space agency.
- Retrieve enhanced soil moisture from SMOS brightness temperatures (L1C) by using the temporal information
- Provides global maps of soil moisture temporal syntheses



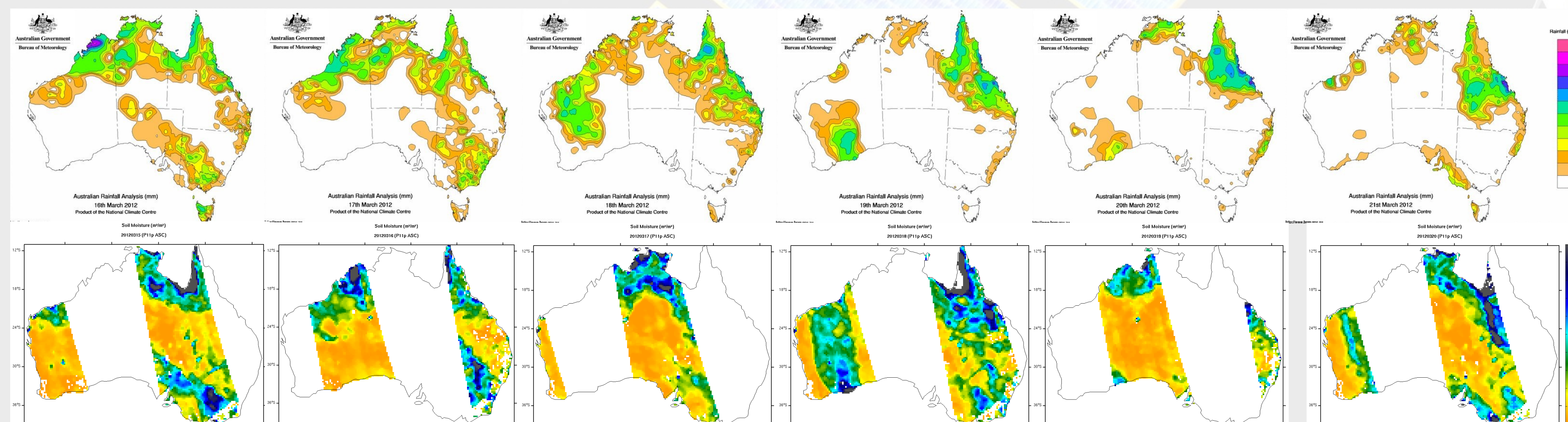
FEATURES

- Enhancement of the retrieval algorithm using temporal information:
- Minimization of a quadratic difference between observed and modeled brightness temperature (TB) in a multi-orbit retrieval scheme
- Geophysical parameters derived from SMOS brightness temperature : soil moisture, vegetation optical thickness, dielectric constant, surface temperature, etc.
- Production on **global EASE grid 25 km**, cylindrical equal-area projection
- Filtering and aggregation of the data over several time periods
- **Netcdf** format



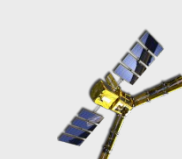
APPLICATIONS

A severe tropical cyclone (category 4), named Jasmine, occurred in the South Pacific Ocean between the 6th of February 2012 and the 19th. When it reached Australia, it released important rainfalls increasing soil moisture all over the country.



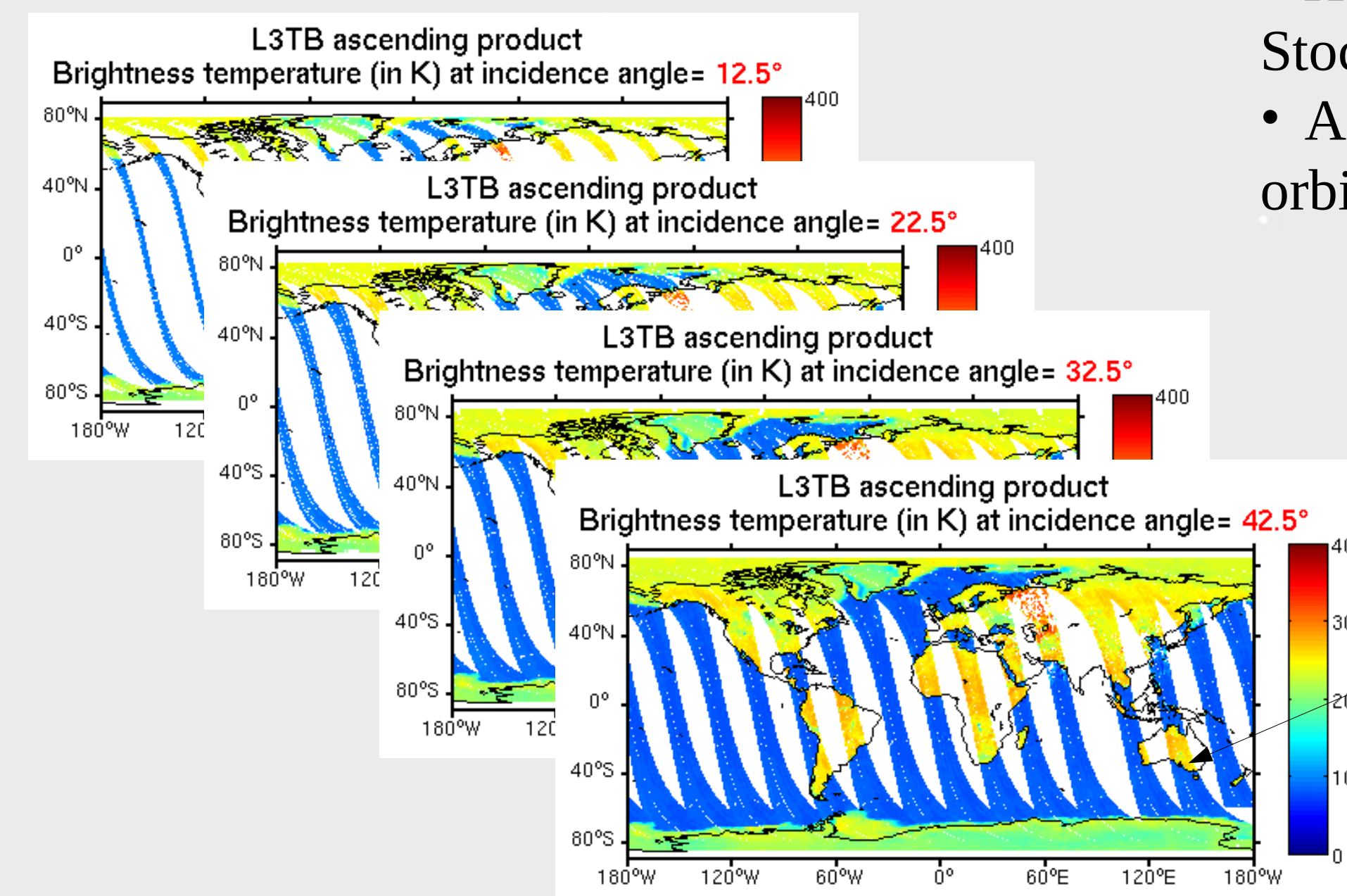
On the bottom: soil moisture (in m³/m³) from the P11p SMOS products

On the top: daily rainfall rate (in mm) from the Australian Government – Bureau of Meteorology (www.bom.gov.au)



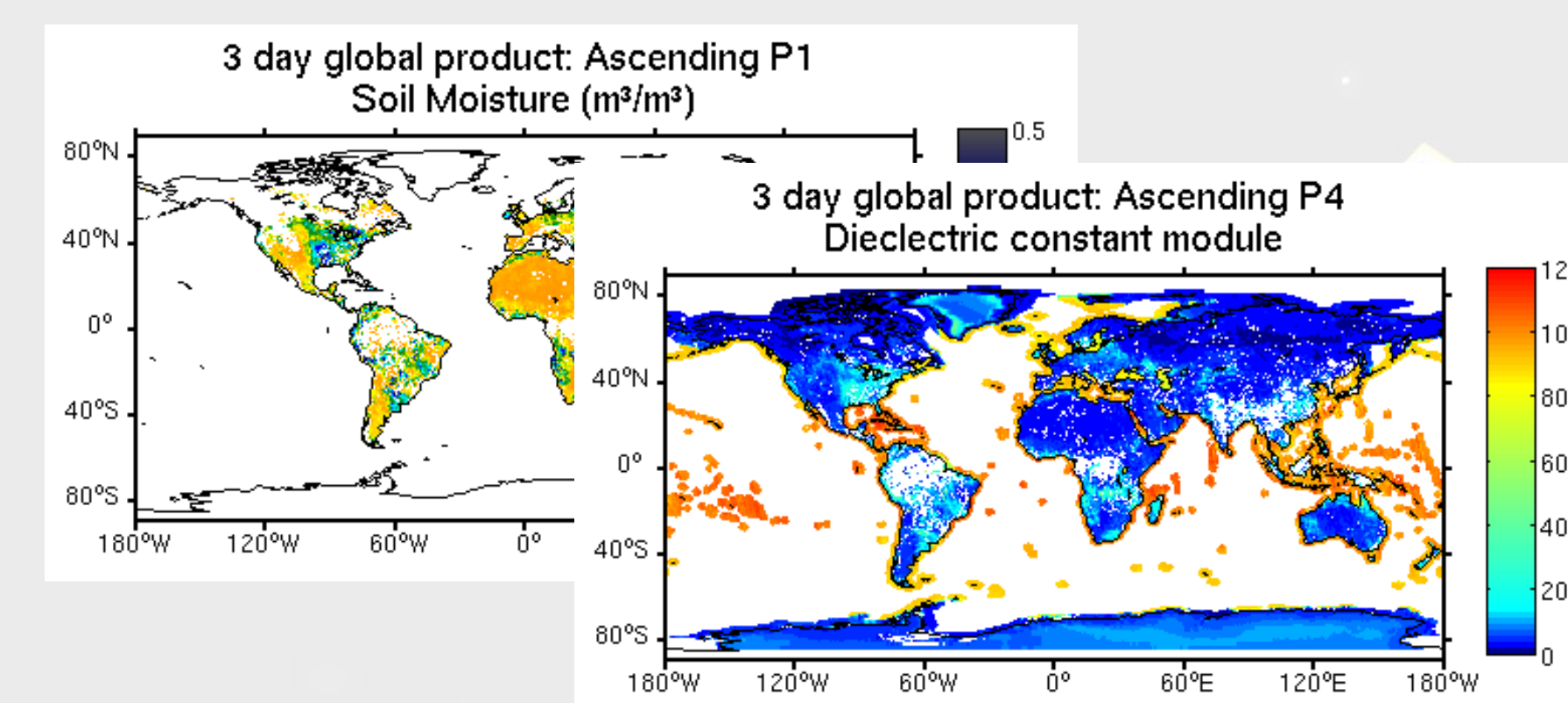
PRODUCTS

→ Reprocessed data since January 2010 will be available in May 2012.



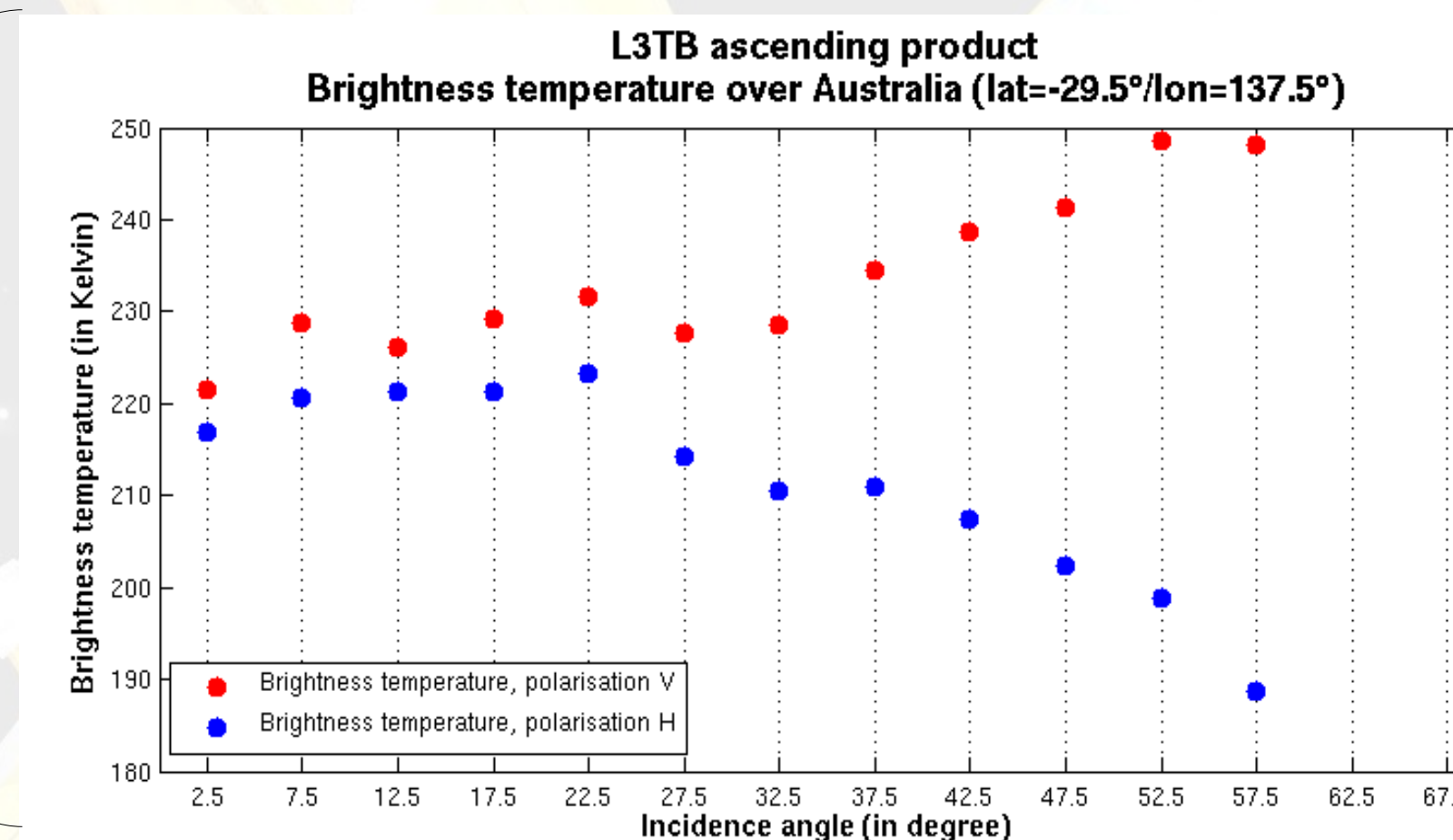
3-day global product

- One product for surface soil moisture, another for the dielectric constant
- corresponds to the aggregation of daily maps over a 3-day moving window : the best retrieval is chosen.



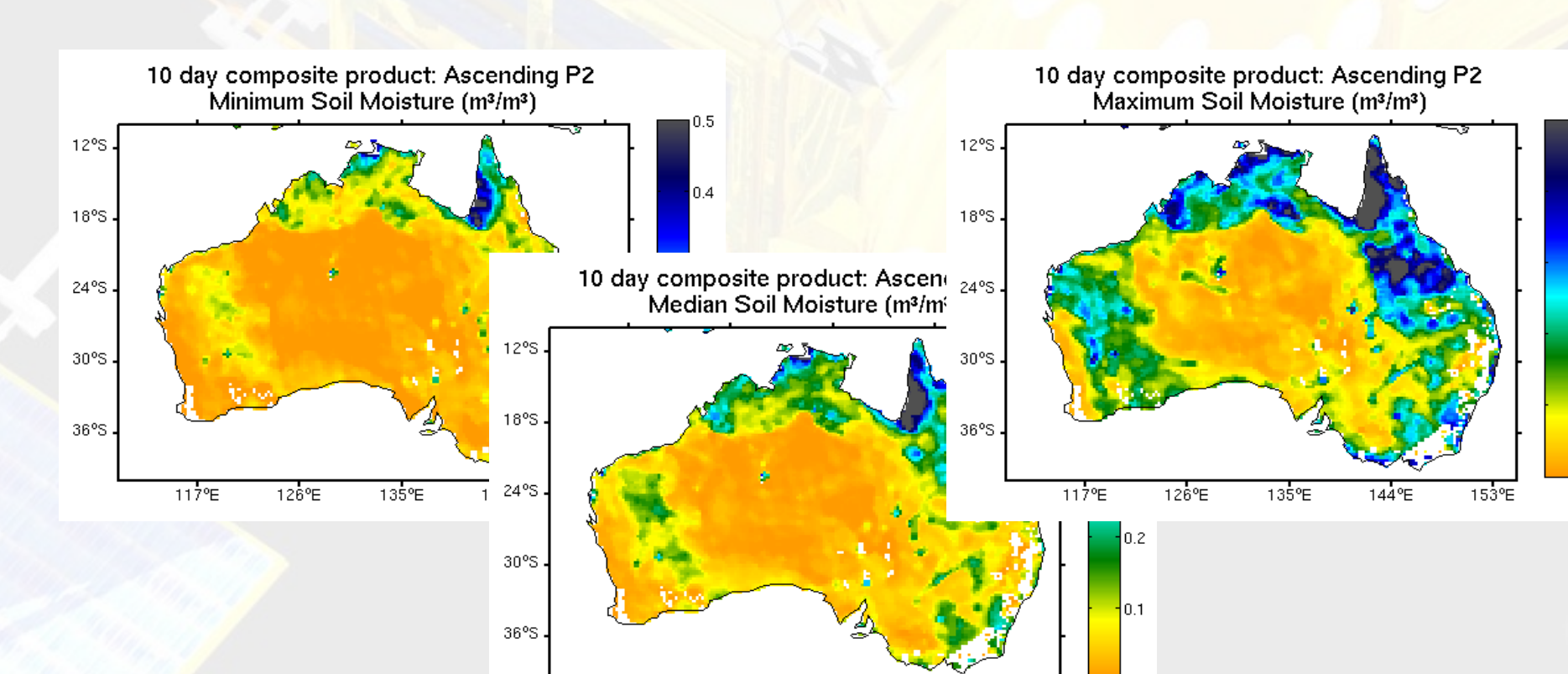
L3 Brightness Temperature product

- daily product
- includes all brightness temperatures acquired that day
- H&V polarisations at fixed angles from 2.5° to 62.5°, and Stockes 3 and 4 parameters
- Ascending orbits (6 a.m. solar local time) and descending orbits (6 p.m. solar local time)



10-day product

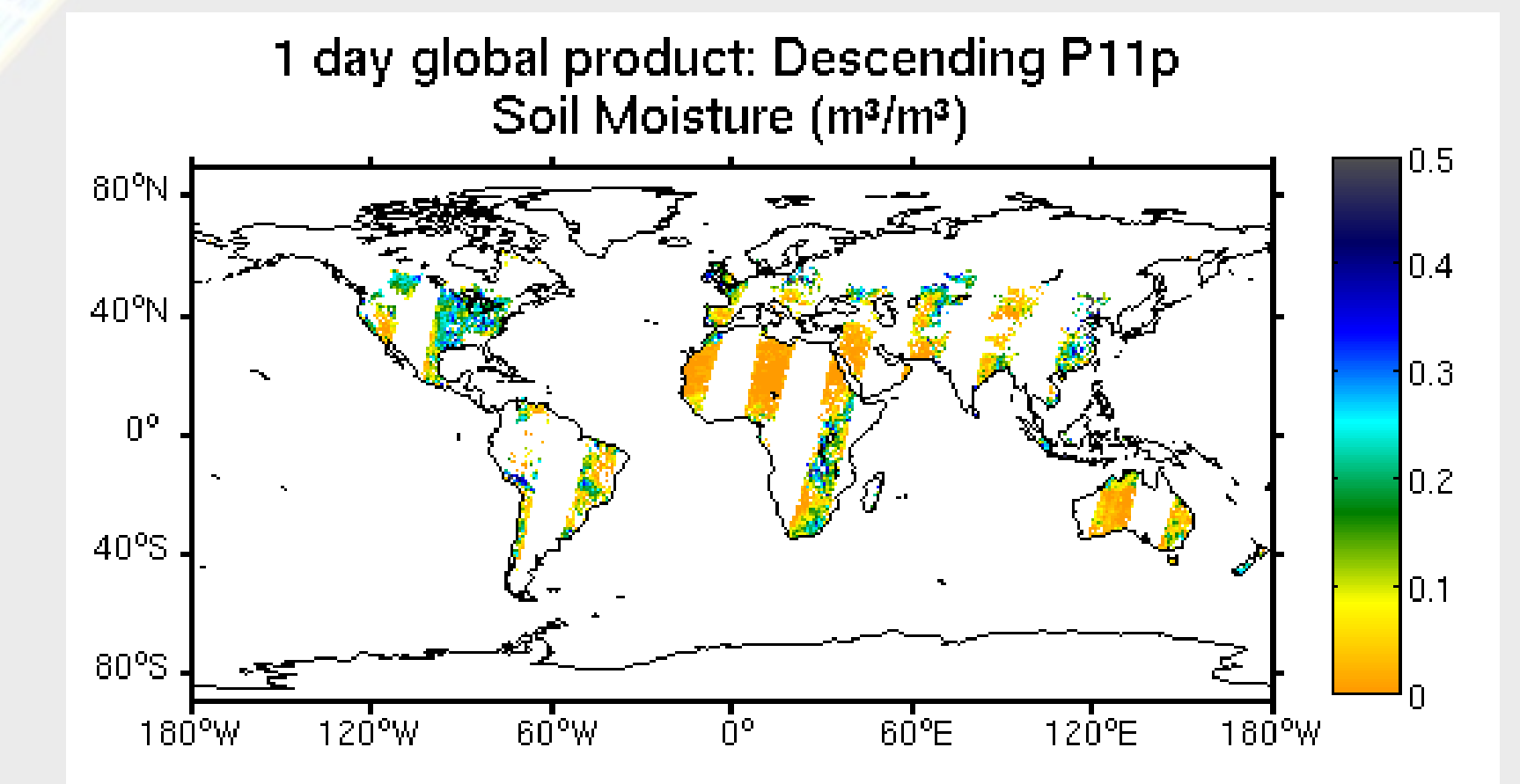
- a 10-day aggregation of daily global maps
- contains minimum, maximum and median values of soil moisture and its associated parameters
- useful for agronomy, water resources monitoring, etc.



1-day global product

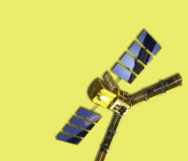
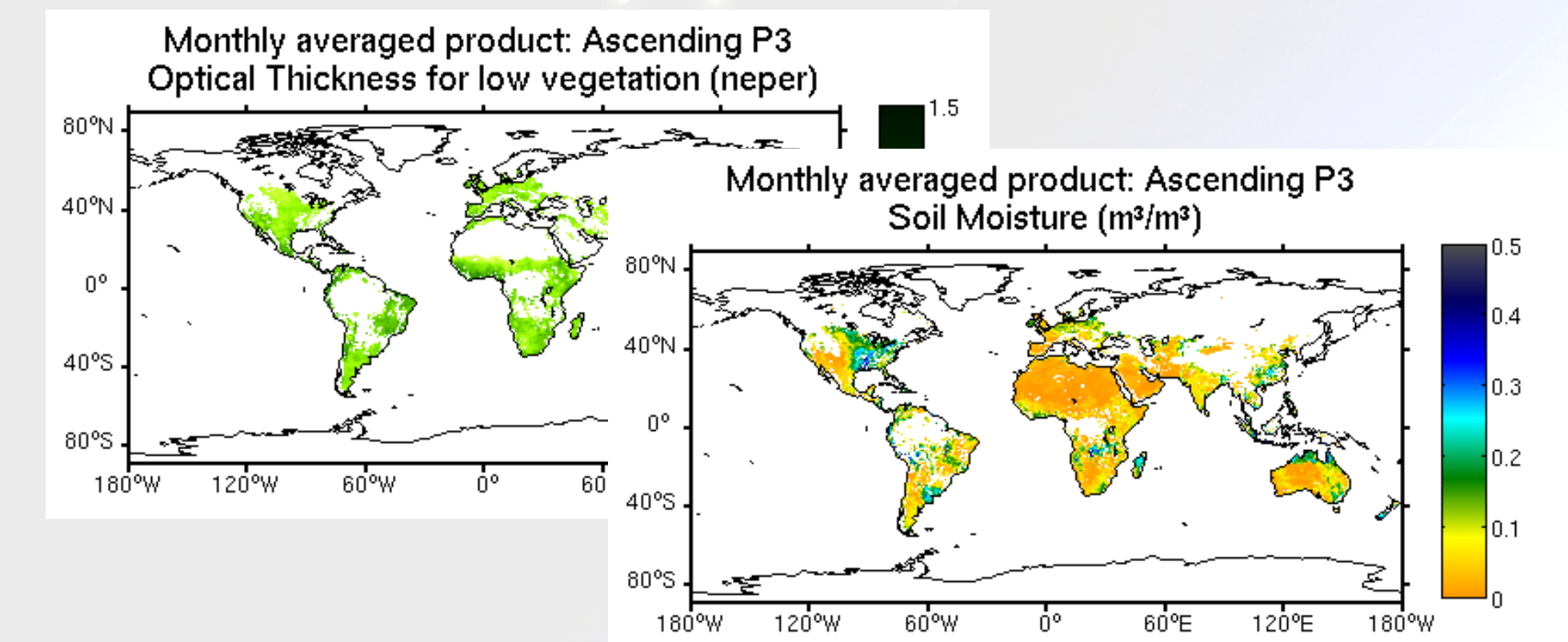
This contains filtered geophysical parameters (surface soil moisture, vegetation optical thickness, dielectric constant).

→ The best estimation is selected for each node when several multi-orbit retrievals are available for a given day. The data is flagged when particular events occur (freezing for example).



Monthly averaged product

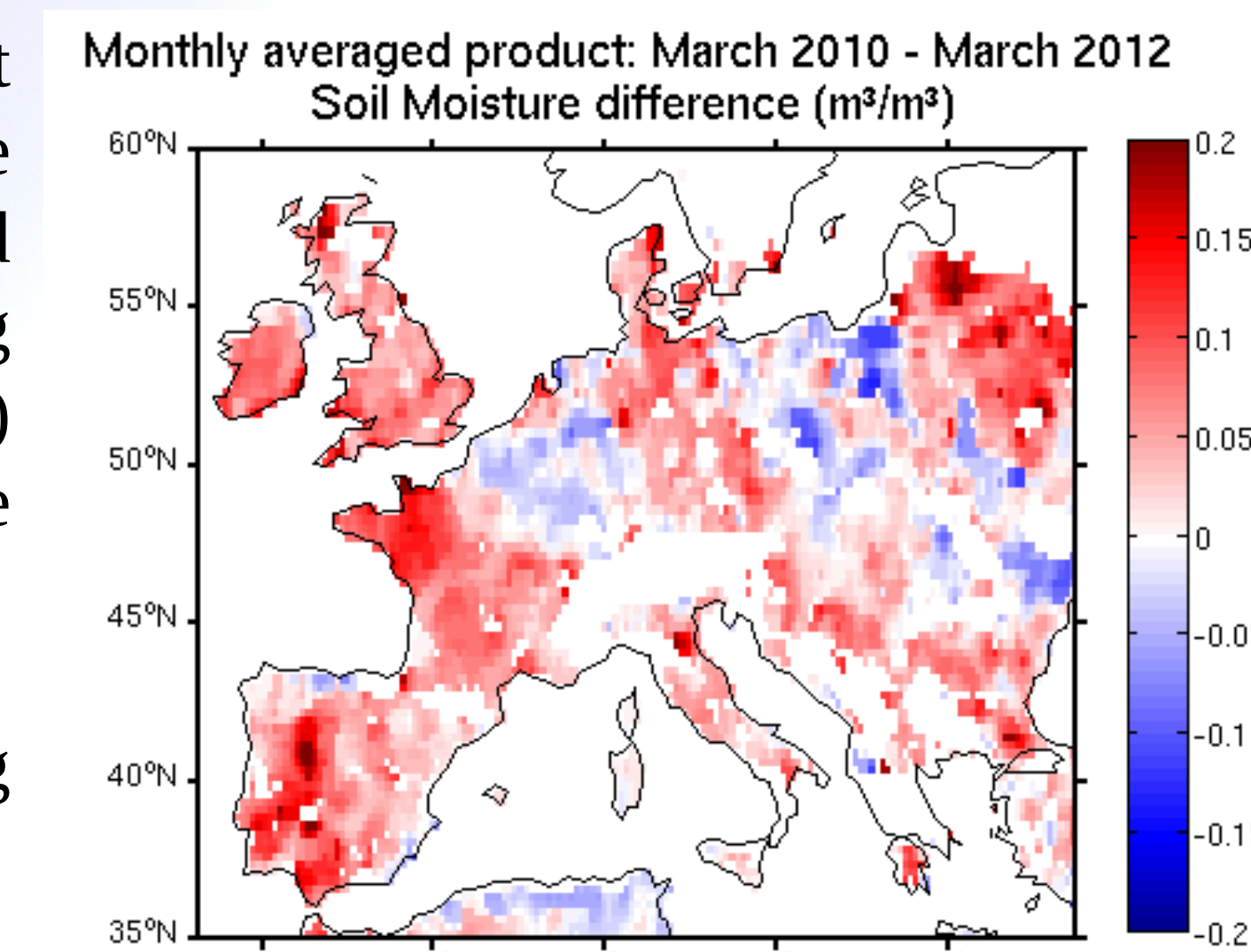
- a monthly aggregation of daily global maps
- provides a weighted mean soil moisture, vegetation optical thickness, RFI statistics over a month
- useful for climate monitoring



Where to find the products? → ftp://eftp.ifremer.fr/catds/cpdc (Request your access to CATDS Products by sending an email to support@catds.fr.)

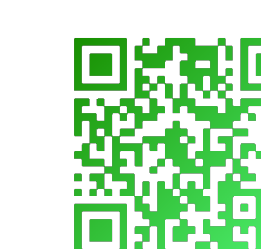
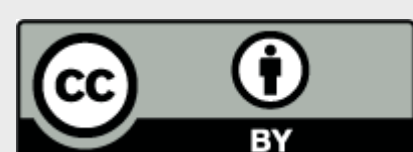
Western Europe is experiencing a noticeable deficit of water. The figure to the right shows the differences between the months of March 2010 and March 2012 over Europe for the ascending overpasses. The red color (i.e. positive values) stands for 2012 being drier than 2010, whereas the blue is the opposite.

→ Higher level products are currently being developed.



See also...

Al Bitar A., Jacquette E., Merlin O., Kerr Y.H., Mialon A., Cabot F., Richaume P., Quesney A., Vergely J.L., « **Multi-orbit inversion of SMOS surface soil moisture** », IGARSS 2010, July 25-30, Hawaii (USA).
Jacquette E., Al Bitar A., Mialon A., Kerr Y.H., Quesney A., Cabot F., « **Overview of SMOS CATDS Level 3 Soil Moisture products** », IGARSS 2010, July 25-30, Hawaii (USA).
Jacquette E., Al Bitar A., Mialon A., Kerr Y.H., Quesney A., Cabot F., Richaume Ph., « **SMOS CATDS level 3 global products over land** », proceeding SPIE, sept. 2010, Toulouse (France).



And latest news on SMOS blog :
http://www.cesbio.ups-tlse.fr/SMOS_blog