



# Copernicus VWG Template

Measuring fires and pollutants from Sentinel-3

14.10.2020 (On-Line)

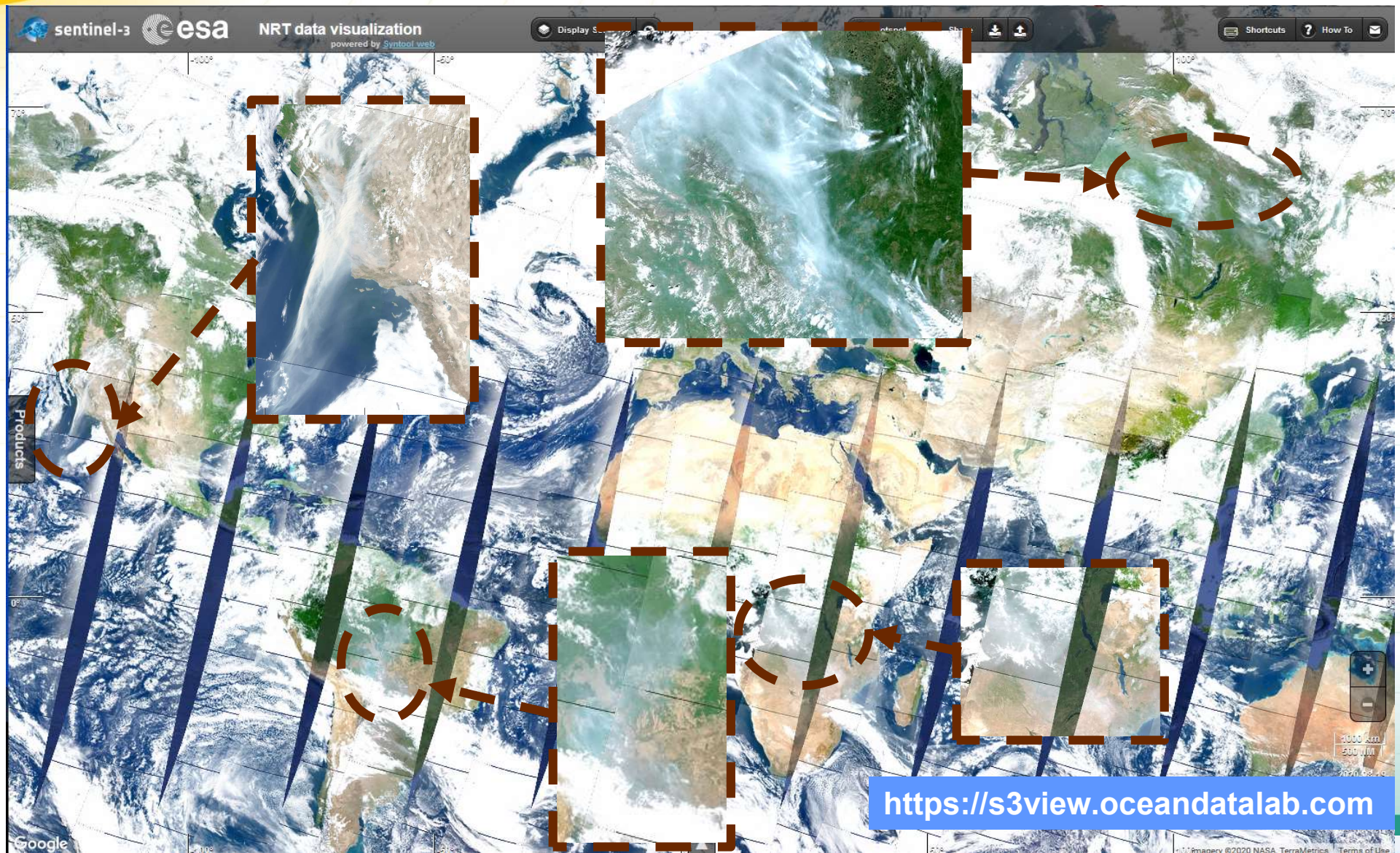
[Julien Chimot](#)





# First, a satellite picture with our eyes

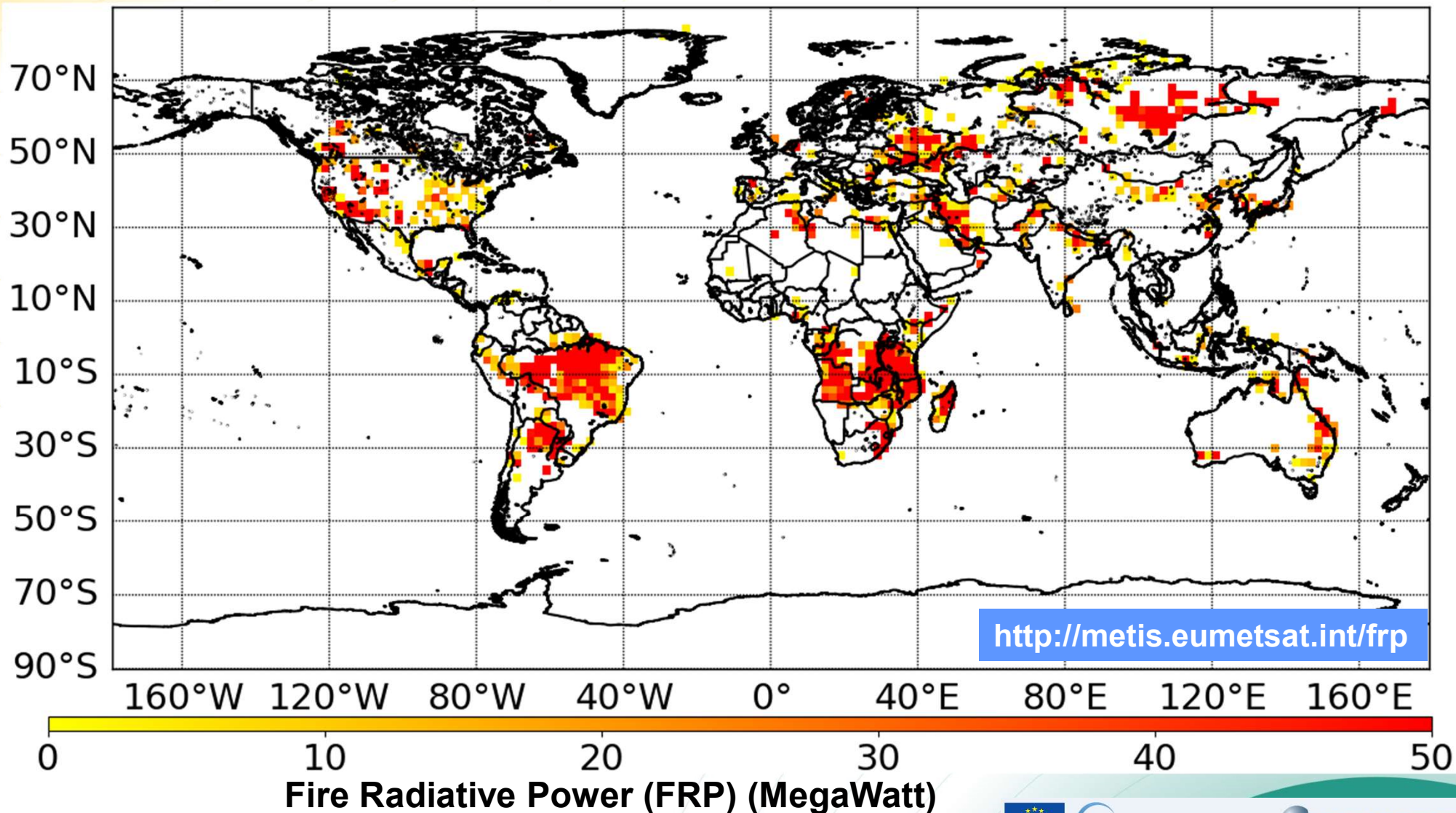
Sentinel-3 A+B, OLCI, 19.08.2020 – A normal day?





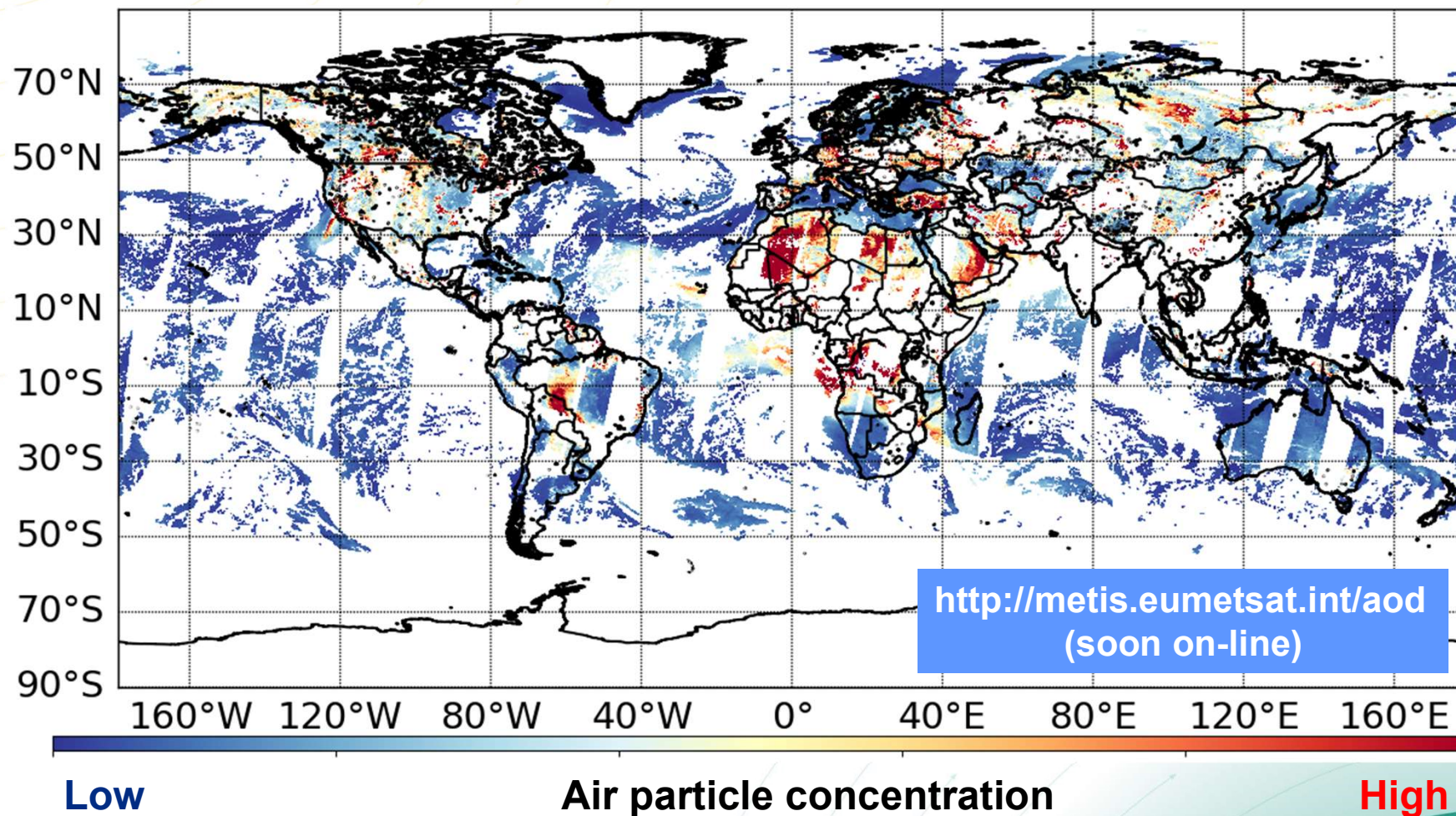
# A Sentinel-3 satellite picture, beyond our eyes

Night 18.08.2020 – 14 152 fires!



# A Sentinel-3 satellite picture, beyond our eyes

Day 18.08.2020 – High air pollution!





# Outline

- Copernicus, Sentinel-3, and EUMETSAT for NRT\* atmosphere applications
- The Copernicus Sentinel-3 NRT\* Fire data
- The Copernicus Sentinel-3 NRT\* Aerosol data
- Data & visualisation access

\* NRT = Near Real Time, Measurement Time – User access < 3h

- Copernicus, Sentinel-3, and EUMETSAT for Near Real Time (NRT) atmosphere applications
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# Aerosols

Aerosols, or particulate matter (PM) = solid / liquid matter suspended in the atmosphere

- ✓ Smaller than a cloud particle
- ✓ Variety of colours, size, shapes, chemistry composition...
- ✓ Many issues: air pollution, reduced visibility, climate, satellite observation interference (e.g. ocean colour)

→ Sources are multiple... and can be mixed with gas pollutants

*Dust*



*Volatile organic compounds (vegetation)*



*Smoke (fire & industrial gas flares)*



*Volcanic ash*



*Sea salt*



*Trace gas precursors (SO<sub>2</sub>, NO<sub>2</sub>, ...) from anthropogenic activities*



- The European system, funded by the European Commission, for monitoring the Earth using satellites and *in situ* sensors.
- 
- The Sentinels – Space fleet component: developed and deployed by ESA
  - Sentinels-1, 2, 3, 5-Precursor, & 6: satellites dedicated to land, marine, and Atmosphere application
  - Sentinel-4 & 5: Atmospheric instruments to be deployed on EUMETSAT meteorology satellites
- Nominal routine (after launch & commissioning):
  - ESA operates Sentinel-1, 2, 5 Precursor (5P).
  - EUMETSAT (will) operate Sentinel-3, 4, 5, and 6 satellites
- Data provided to users through a set of six Copernicus services: land, marine, atmosphere, climate change, emergency management and security.
- Free, full & open access to environmental data provided to users.



# CAMS – The Chemistry weather forecast

- The Copernicus Atmospheric monitoring System (CAMS) operationally provides daily analyses and forecasts of worldwide long-range transport of atmospheric pollutants as well as the background air quality for the European domain.
- Operated by ECMWF – The European Centre Medium Weather Forecast
- How CAMS data are used:
  - Aircraft support & maintenance service
  - Pollen forecasting
  - City & regional air quality services
  - Air report on smartphone to dodge the smog & find clean air
  - Forecast of personal allergy symptoms
  - Broadcast on CNN & Euronews



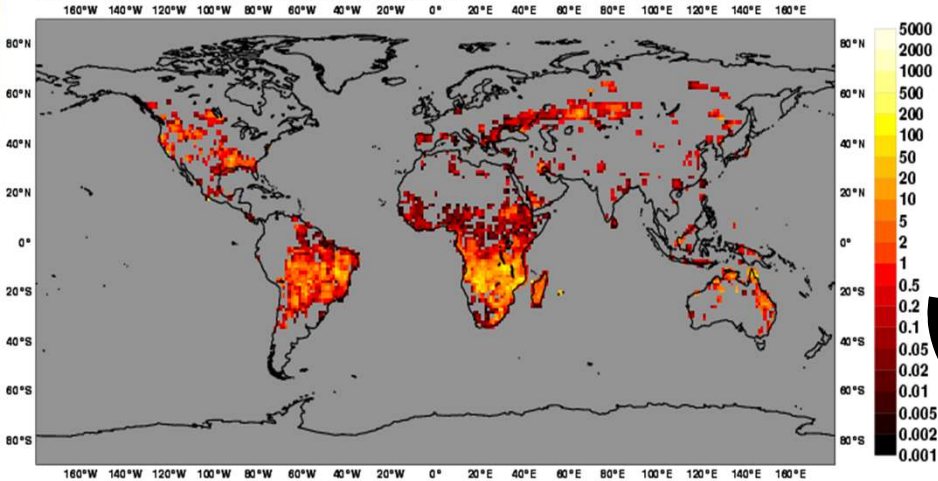
Satellite measurements => Atmospheric EUMETSAT products => Operational CAMS services  
< 3h (NRT)

# CAMS Global Fire Assimilation System (GFAS) - FRP → Smoke Emissions

GEMS Fire Intensity Products Wednesday 1 October 2008

Daily Average of Observed Fire Radiative Power [ mW/m<sup>2</sup> ]

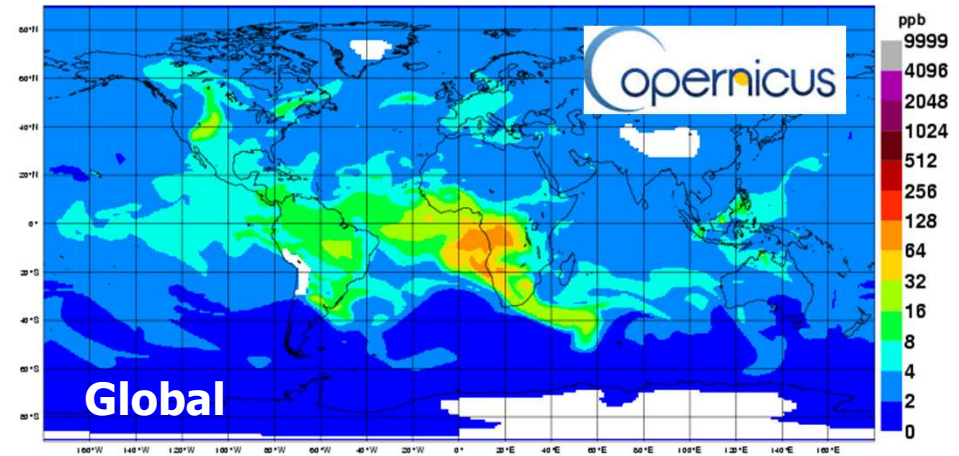
max value = 0.17 W/m<sup>2</sup>



Global Active Fire (AF) location / timing plus source strength [FRP] ingested into GFAS

Global NRT Biomass Burning Impacts on Atmosphere (here CO @ 700 hPa)

Monday 07 September 2009 00UTC ECMWF/GEMS Forecast t+006 VT: Monday 07 September 2009 06UTC  
700 hPa NRT Biomass-Burning Carbon Monoxide Tracer



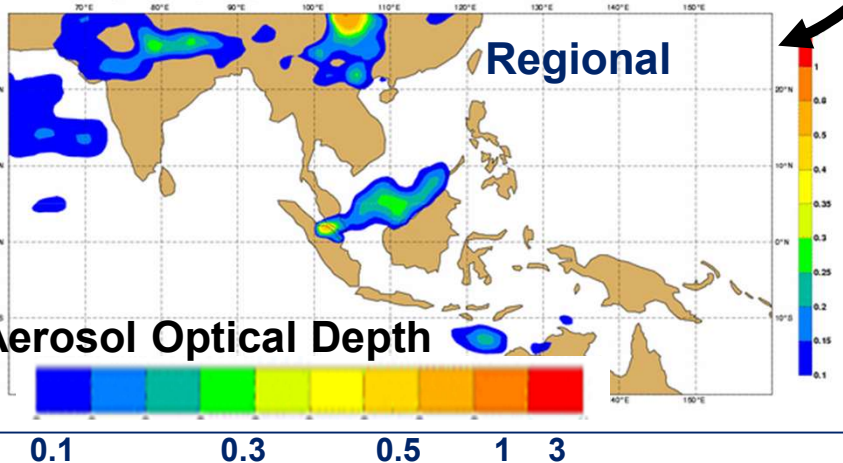
Courtesy Martin Wooster, S3VT, May 2019

[www.gmes-atmosphere.eu/services/gac/fire/](http://www.gmes-atmosphere.eu/services/gac/fire/)

SE Asia : 4-day AOD Forecast

Wednesday 19 June 2013 00UTC MACC Forecast t+003 VT: Wednesday 19 June 2013 03UTC

Biomass Burning Aerosols Optical Depth at 550 nm



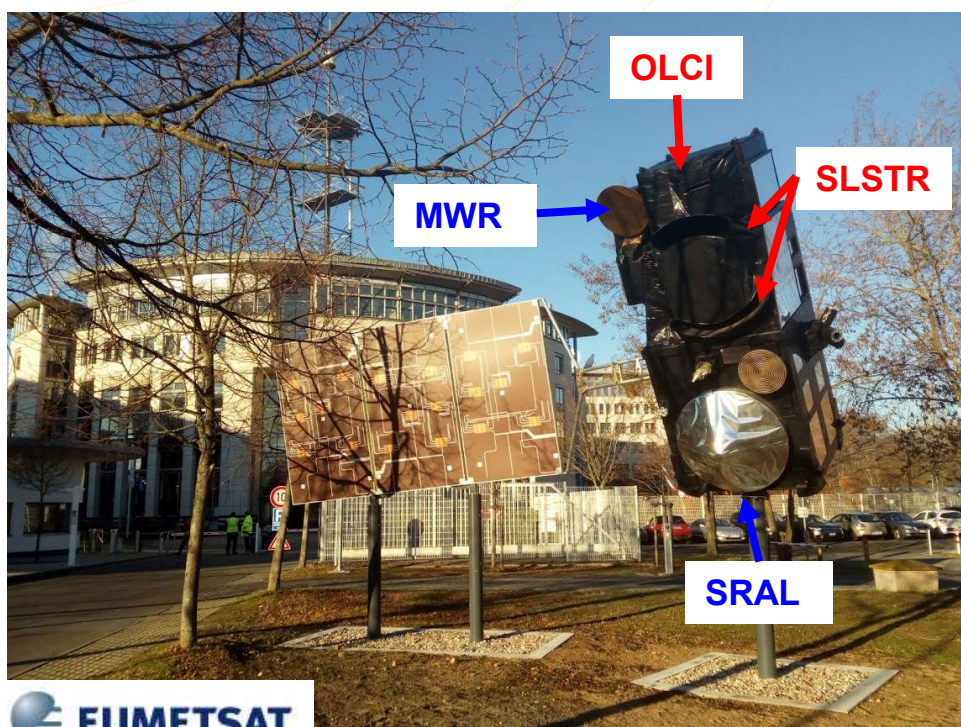


# Sentinel-3 – An operational Marine & Land constellation



Since 2020: an operational NRT atmospheric mission procured by EUMETSAT

Local Equatorial crossing time 10:00 am



Altimetry sensors

Two optical sensors

- Ocean and Land Color Instrument (**OLCI**)
- Sea & Land Surface Temperature Radiometer (**SLSTR**)

S3 A since 2016.02.16, twin S3 B since 2018.04.25

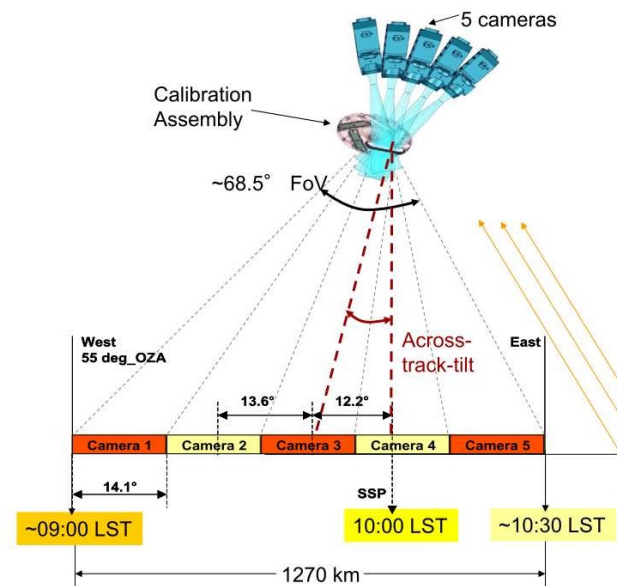


# OLCI & SLSTR

2 **optical** instruments with **medium spectral resolution** & **high spatial resolution**

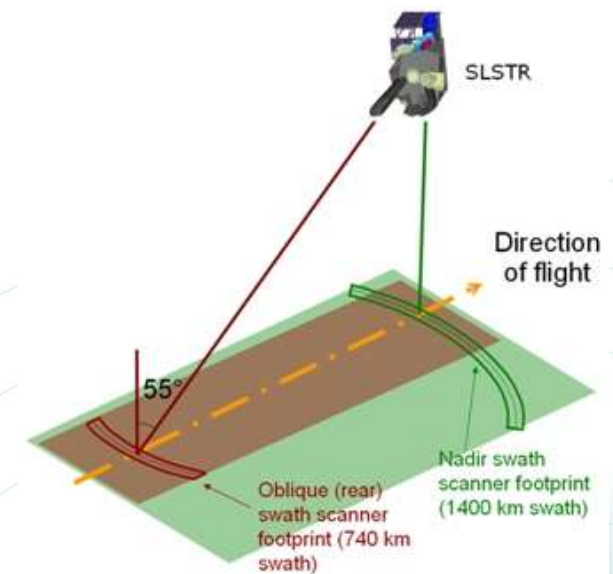
## OLCI

Swath 1250 km  
Pixel size nadir: 300 m (fine)



## SLSTR Dual-view

Swaths 1420 km (nadir) & 750 km (oblique)  
Pixel size nadir: between 500 m & 1 km



$\lambda$ [nm]	$\lambda$ [nm]
400	
412.5	
442.5	
490	
510	
560.0	555
620.0	659
665.0	
673.75	
681.25	
708.75	
753.75	
761.25	
764.375	
767.5	
778.75	
865	868
885	
900	
940	
1020	
	1375
	1613
	2250
	3742
	10854
	12022

Additional  
2 same ch



# Sentinel-3 Mission Product Responsibilities



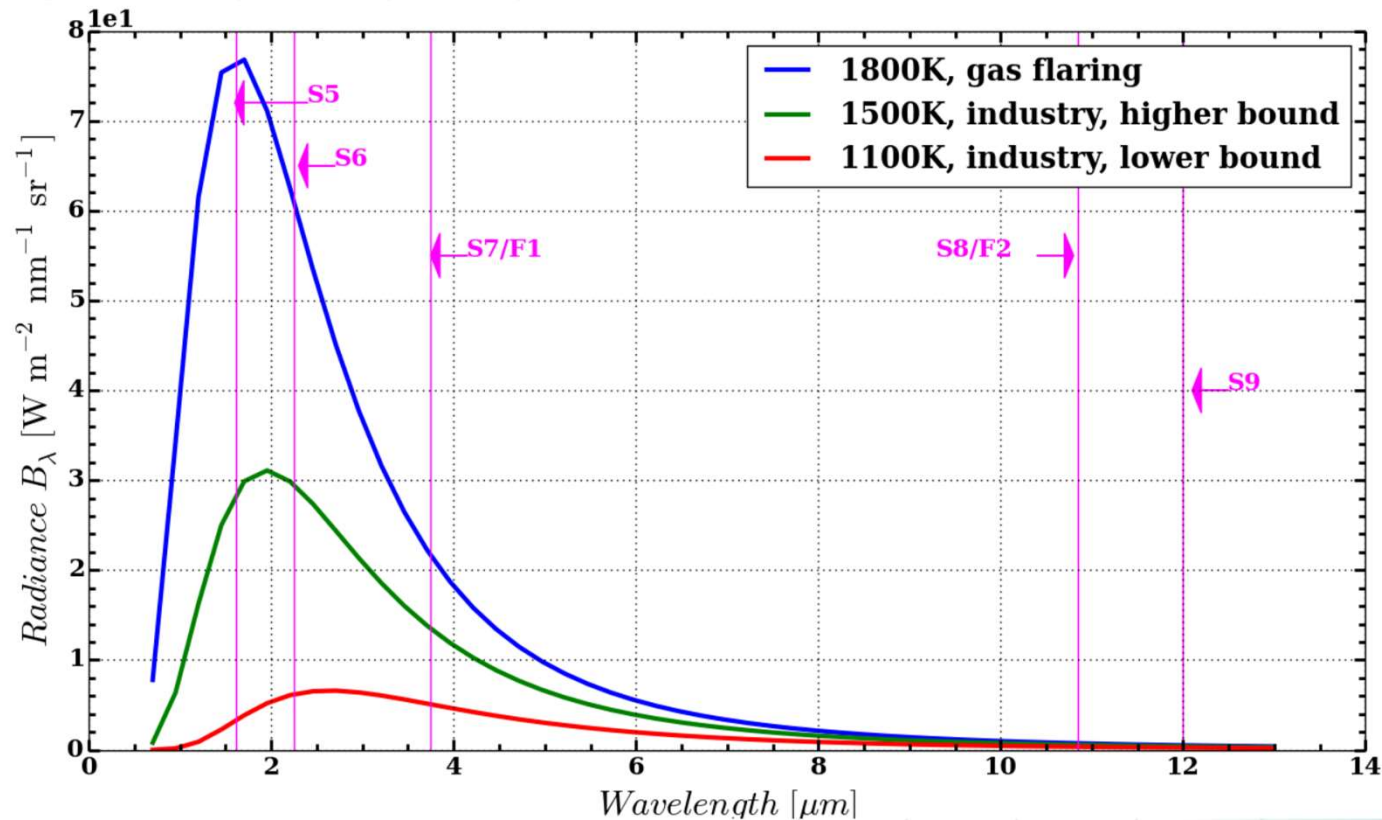
- Copernicus, Sentinel-3, and EUMETSAT for Near Real Time (NRT) atmosphere applications
- **The Copernicus Sentinel-3 NRT Fire data**
- The Copernicus Sentinel-3 NRT Aerosol data
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# Hot-Spot from space – In a nutshell

- A hot spot radiates a strong heating signal.
- Spectral wavelength ( $\lambda$ ) of the peak is a function of Temperature (T):
  - The hotter (T), the shorter ( $\lambda$ )
  - Middle warm – MWIR, Very warm = SWIR

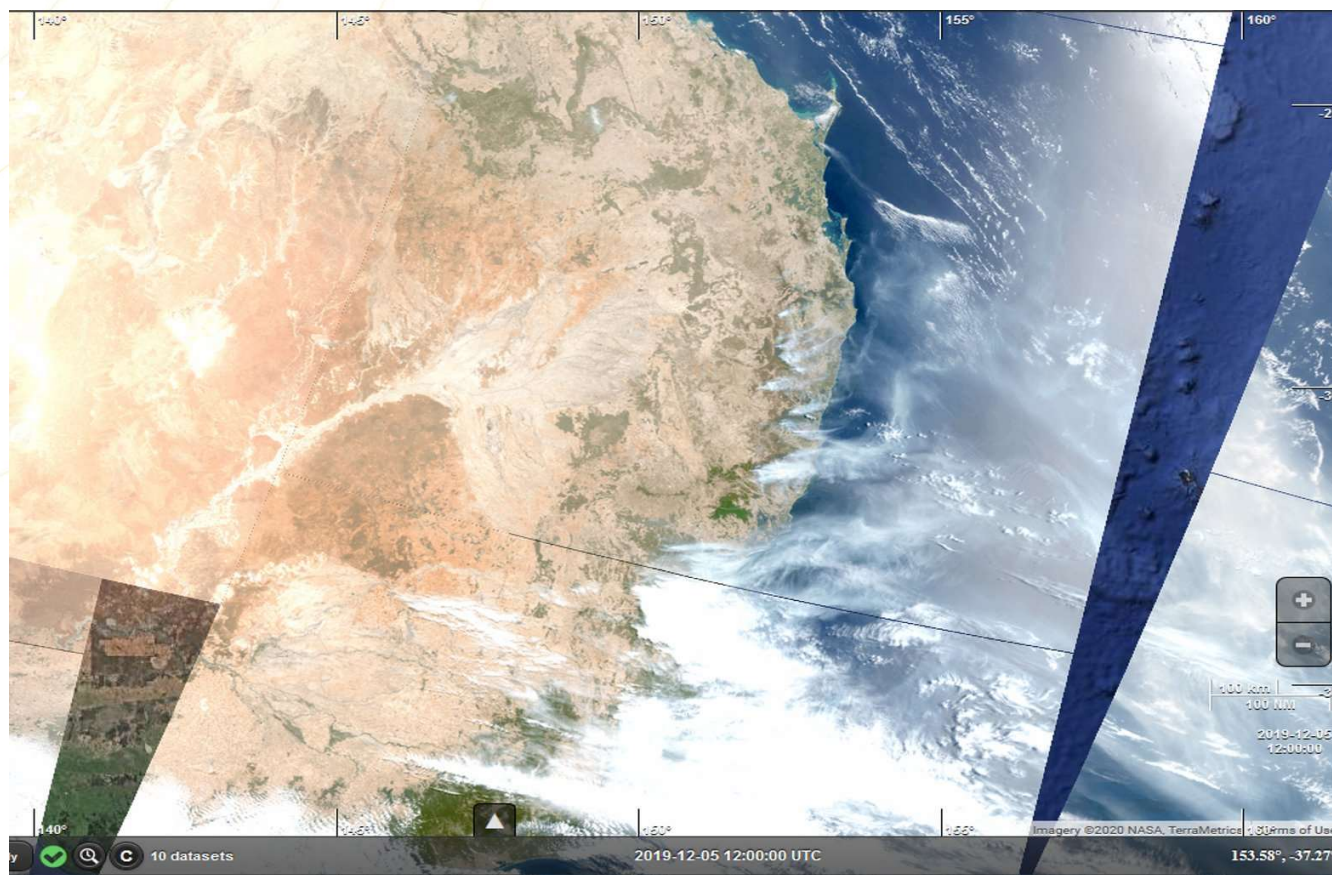


Caseiro et al. (2018)

# OLCI RGB image – Looking at our Earth

05.12.2019

Australia bush-fires



<https://s3view.oceandatalab.com>

ESA



# What does Sentinel-3 offer for hot spot monitoring

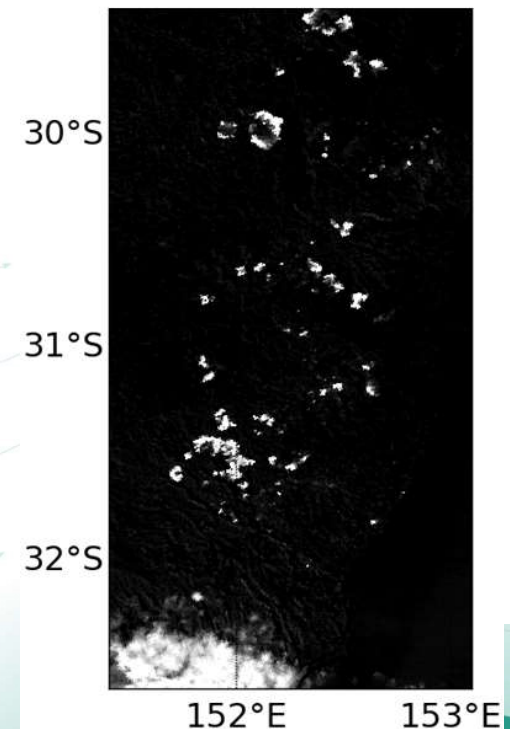
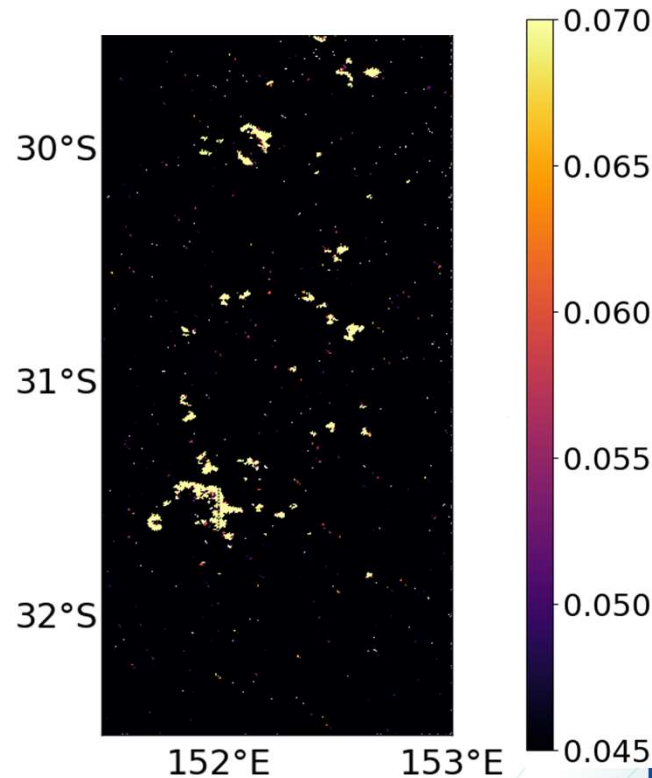
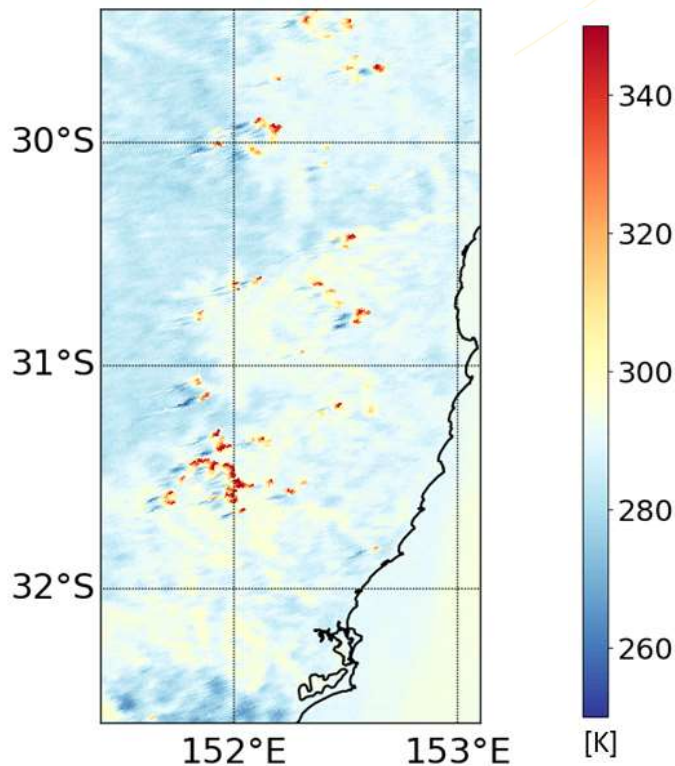
- Fine pixel resolution: 500 m – 1 km => Good for hot-spot!
- Early morning / evening observation time
- A series of channels sensitive to surface temperature anomalies with variable dynamic range (small & big fires).

05.12.2019 – Australia bush fires – night - SLSTR-A

F1 (3.7  $\mu\text{m}$ ) [K]

S6 (2.25  $\mu\text{m}$ ) [ $\text{mW m}^{-2} \text{sr}^{-1} \text{nm}^{-1}$ ]

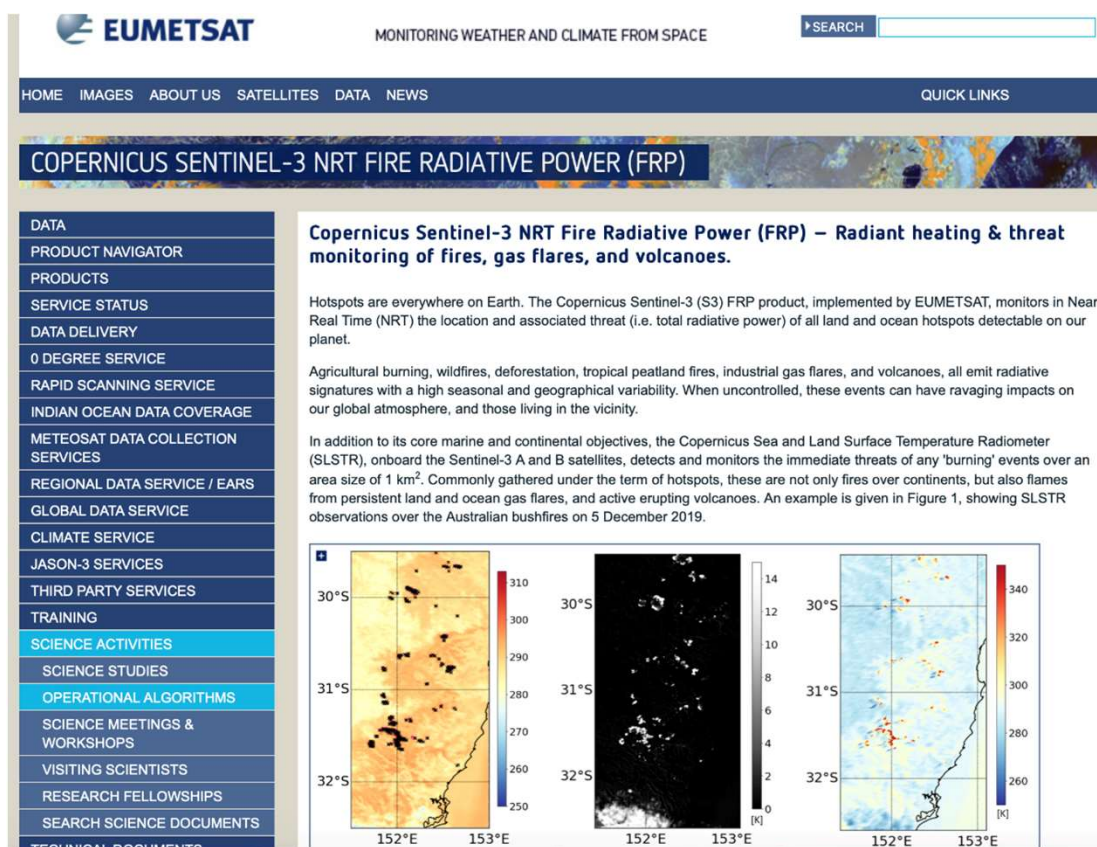
S7 (3.7  $\mu\text{m}$ ) - S8 (10.8  $\mu\text{m}$ ) [K]



# S3 NRT Fire radiative Power (FRP)

## EUMETSAT webpage Copernicus Sentinel-3 NRT FRP

<https://www.eumetsat.int/website/home/Data/ScienceActivities/OperationalAlgorithms/CopernicusSentinel3NRTFireRadiativePowerFRP/index.html>






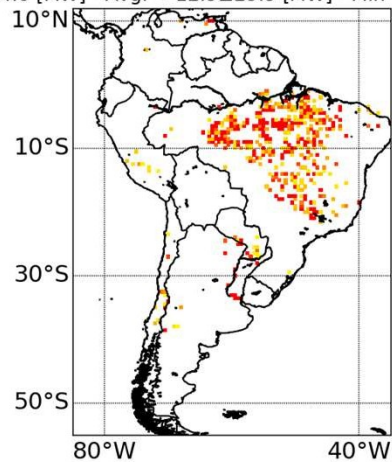
- EUMETSAT processor v2.0, baseline Collection 1:
  - Algorithm specified in 2012 by KCL & NCEO: Prof. Dr Martin Wooster & Dr. Weidong Xu.
  - Processor v1.03 developed and delivered by ACRI-ST in February 2020.
  - Further improved by EUMETSAT:
    - False alarms strongly reduced
    - Product volume reduction for NRT users
    - Partial reprocessing to support CAMS developments
- Labelled as 'preliminary operational' - Good quality overall. Further validation on-going
  - Mostly night-time
  - V3.0 under specification => full day-time.
- Key parameters:
  - FRP MWIR [MW]: Fire temperature < 110 K
  - FRP SWIR [MW]: Fire Temperature > 110 K
  - Filtering & quality flags (recommended for advanced users).
  - 1 km spatial resolution
- Minor evolution in July 2020: wildfires in high latitude (Siberia).



# NRT Sentinel-3 FRP v2.0 examples




Sentinel-3 A+B SLSTR - FRP MWIR [MW] - Night - 0.5 deg resolution - 21.08.2020

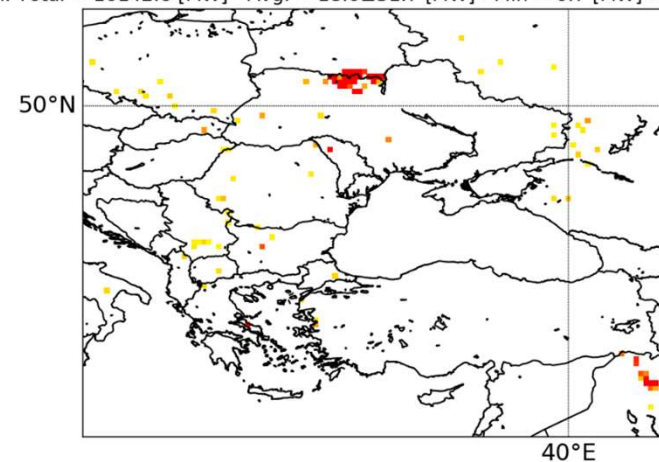
   Total number 1 km hot-spots = 2823  
FRP 1 km: Total = 36464.0 [MW] - Avg. =  $12.9 \pm 29.9$  [MW] - Min = 0.1 [MW] - Max = 833.3 [MW]



Amazonia fires

Sentinel-3 B SLSTR - FRP MWIR [MW] - Night - 0.25 deg resolution - 16.04.2020

   Total number 1 km hot-spots = 562  
FRP 1 km: Total = 10142.6 [MW] - Avg. =  $18.0 \pm 31.7$  [MW] - Min = 0.7 [MW] - Max = 286.8 [MW]

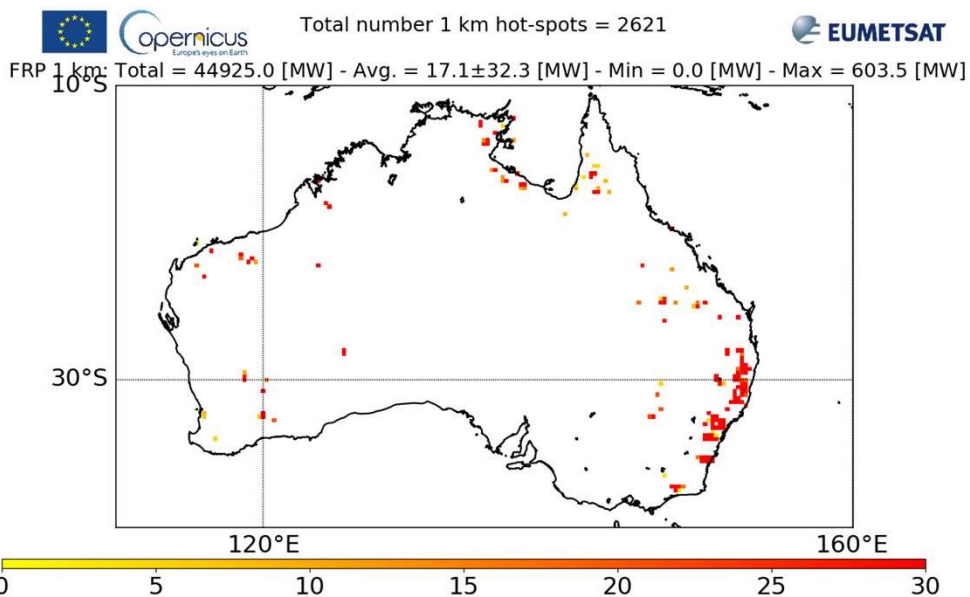


Chernobyl forest fire

More on <http://metis.eumetsat.int/frp>

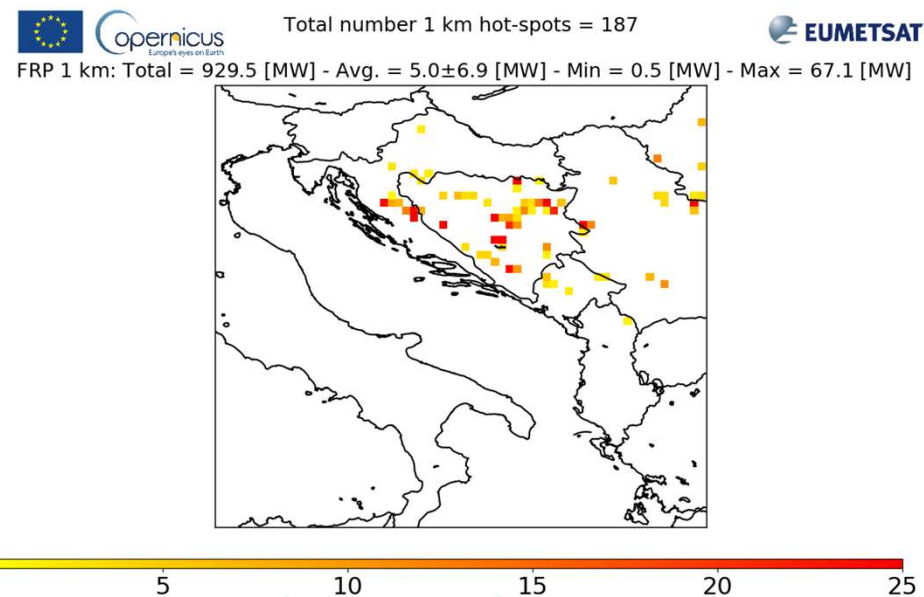
# NRT Sentinel-3 FRP v2.0 examples

Sentinel-3 A SLSTR - FRP MWIR [MW] - Night - 0.25 deg resolution - 05.12.2019



**Australia bushfires**

Sentinel-3 A SLSTR - FRP MWIR [MW] - Night - 0.15 deg resolution - 06.04.2020



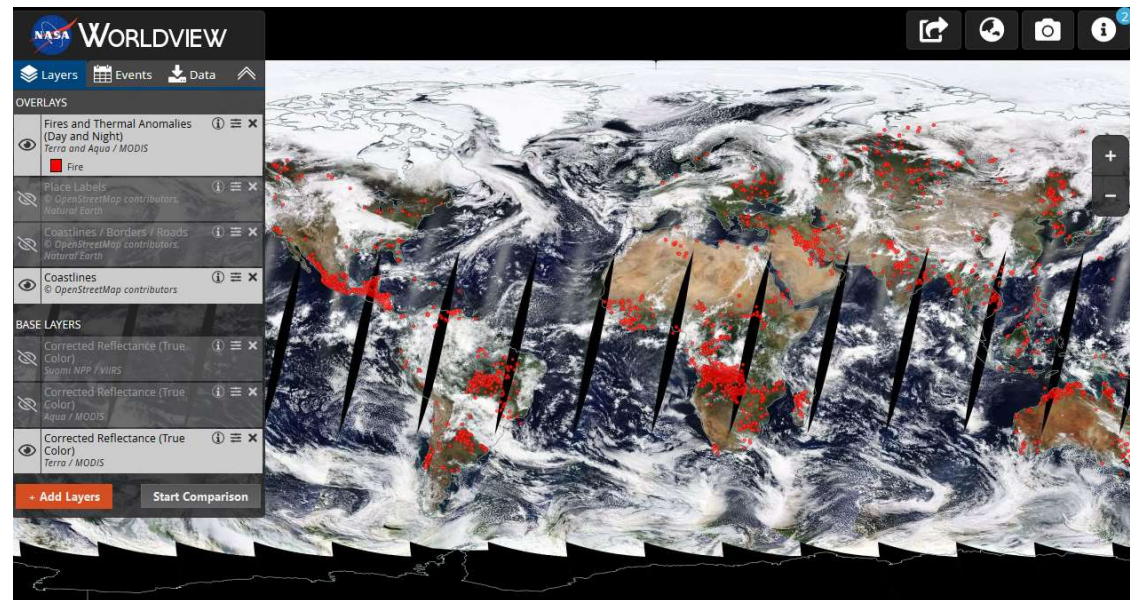
**Croatia & Balkans fires Early April**

More on <http://metis.eumetsat.int/frp>

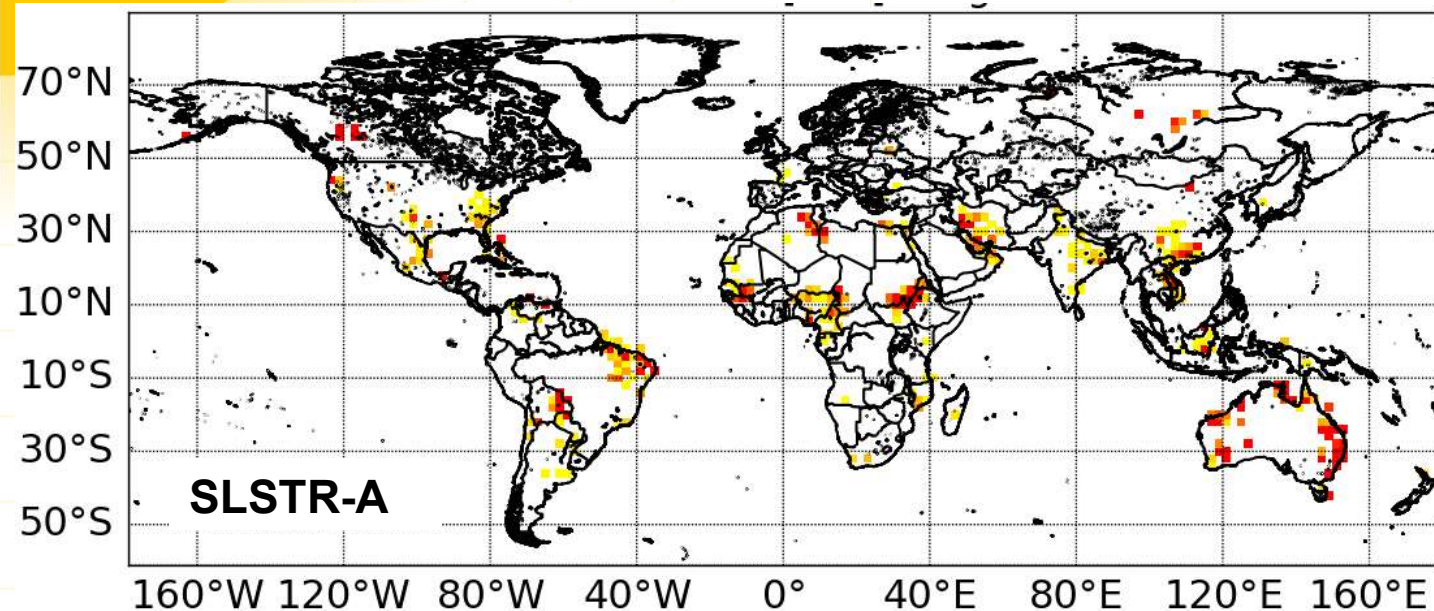


# Sentinel-3 & the constellation of fire satellites

- NASA Aqua/Terra MODIS => the reference operational NRT FRP product
- But MODIS will not last:
  - SUOMI VIIRS is taking over for the afternoon & middle night
- And Copernicus Sentinel-3 for early morning / evening

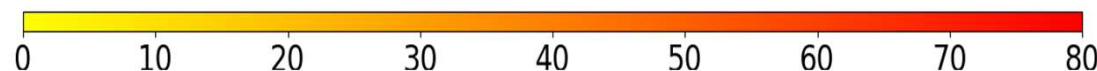


# Copernicus NRT Sentinel-3 FRP – More detection of low fire signals than MODIS!



**2019.12.05**  
**Night time**  
**2 Deg gridded**

**FRP MWIR [MW]**

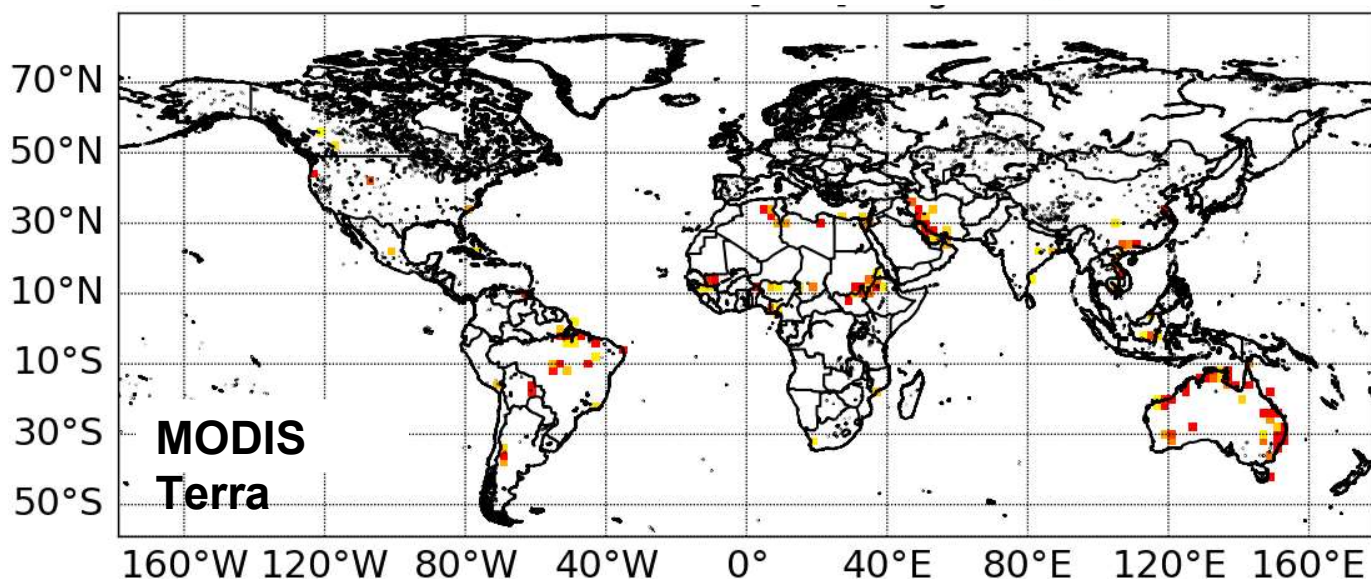


**SLSTR-A**

**Fort McMurray  
Fire, Alberta,  
13.05.2016**

**SLSTR less than  
conservative than  
MODIS!**

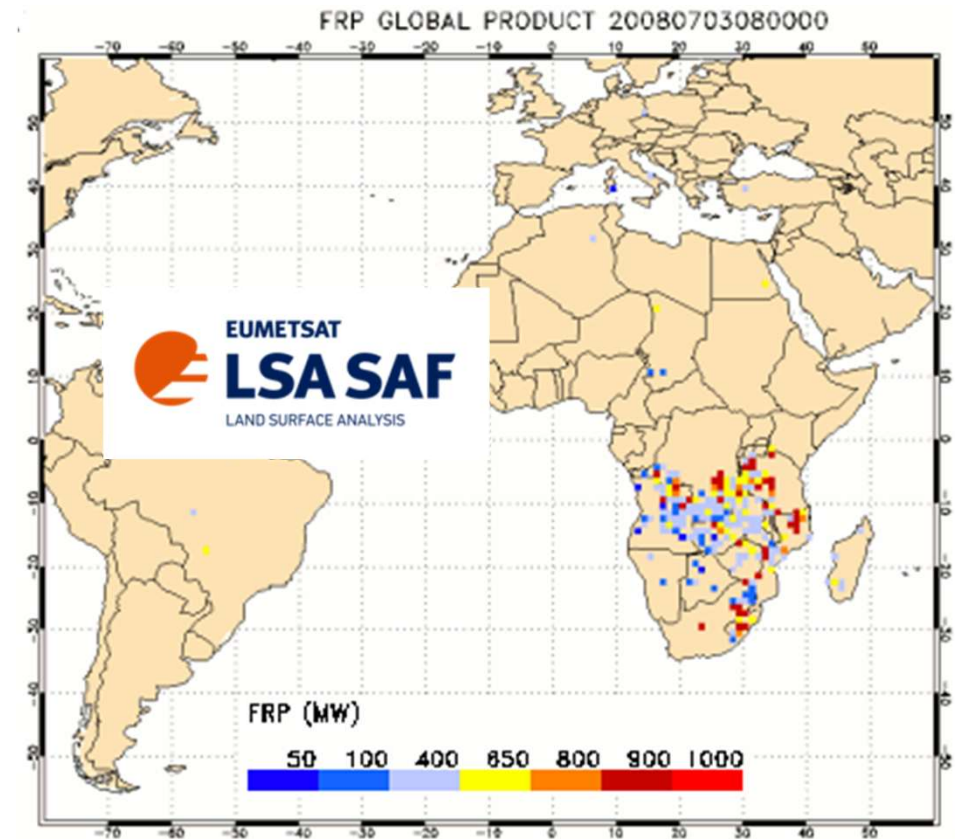
**MODIS Terra**





# Sentinel-3 & the constellation of fire satellites - Geostationary

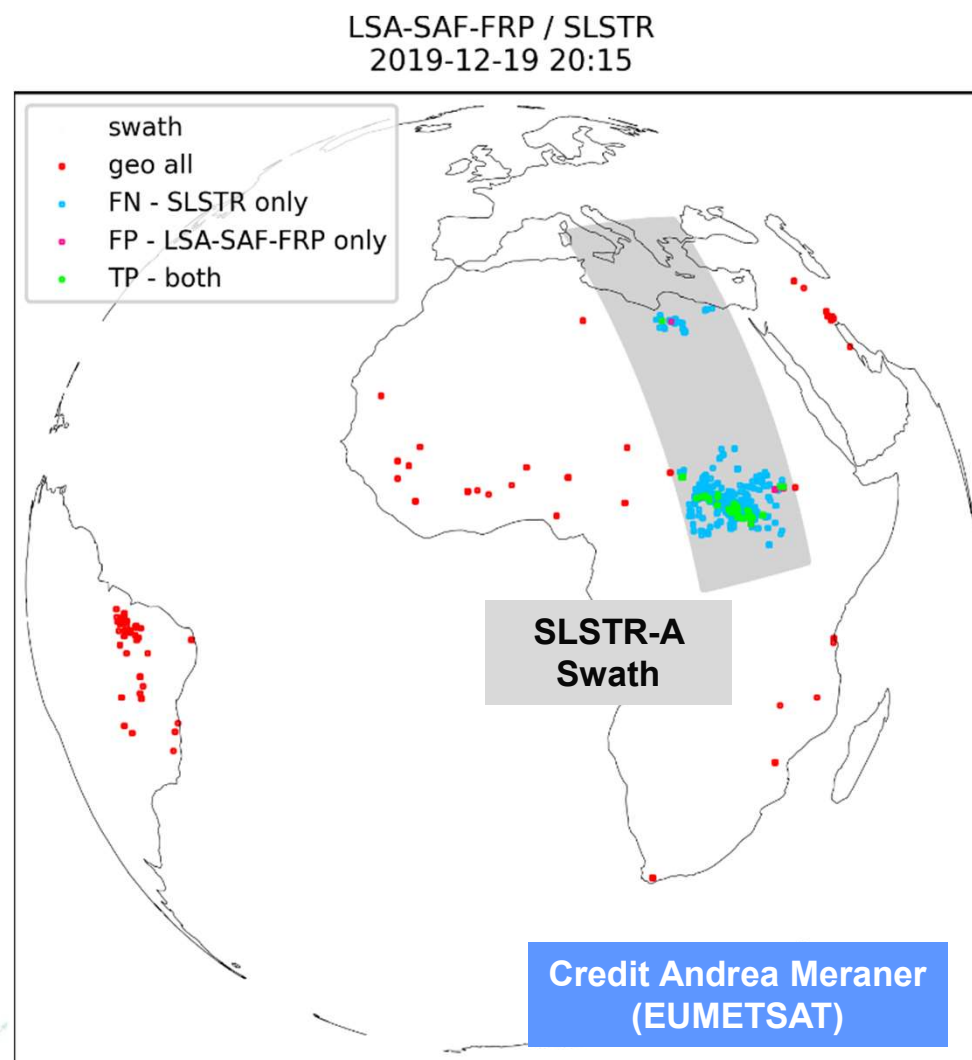
- Several Geostationary sensors for FRP:
  - e.g. EUMETSAT Meteosat (Africa & Europe)
    - Second & Future Third generations
  - High temporal frequency / sampling => good for fire diurnal cycle
  - Focused on restricted areas



<https://landsaf.ipma.pt/en/products/fireproducts/frppixel>

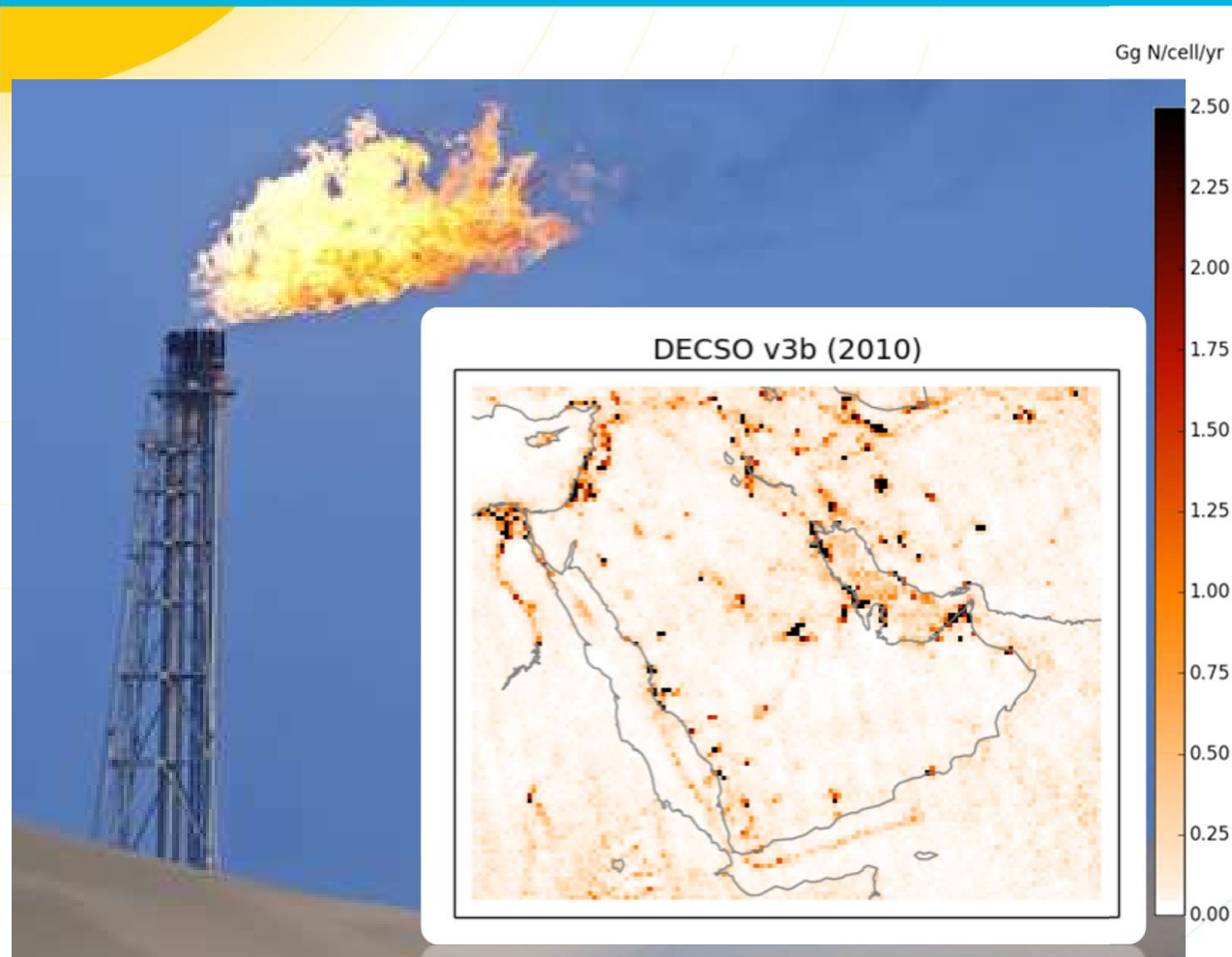
# Comparison SLSTR & Meteosat Geostationary fires

- Development of a generic fire validation tool: Sentinel-3 vs. Geostationary
- Currently: SLSTR-A vs. Meteosat Second generation:
  - FRP > 10MW: More than 80% of common fires
  - FRP < 10 MW: better detectability with SLSTR (to be validated).
- Operational monitoring system to be publicly displayed end of 2020.





# Industrial gas flares – An independent survey needed



Heating flames due to flammable gas disposed at the tip industrial Gas Flaring (GF) released:

between 2003 and 2012 ~304 Tg CO<sub>2</sub> yearly

Olivier *et al.* (2014)

270 and 210 Gg of BC in 2005 and 2010, respectively.

Klimont *et al.* (2017)

Contribute to half the near-surface BC concentration in the Arctic.

Stohl *et al.* (2013)

Daily N emission estimates constrained by satellites  
DECSO algorithm from KNMI  
Bas Mijling, Ronald van der A, KNMI

# NRT Sentinel-3 FRP v2.0 examples

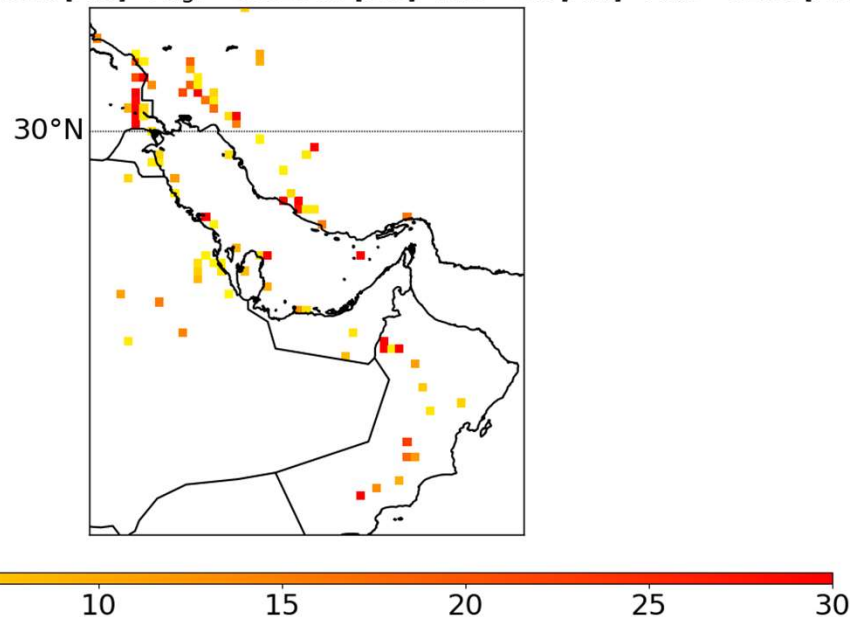
Sentinel-3 A SLSTR - FRP SWIR [MW] - with SAA - Night - 0.25 deg resolution - 25.04.2020



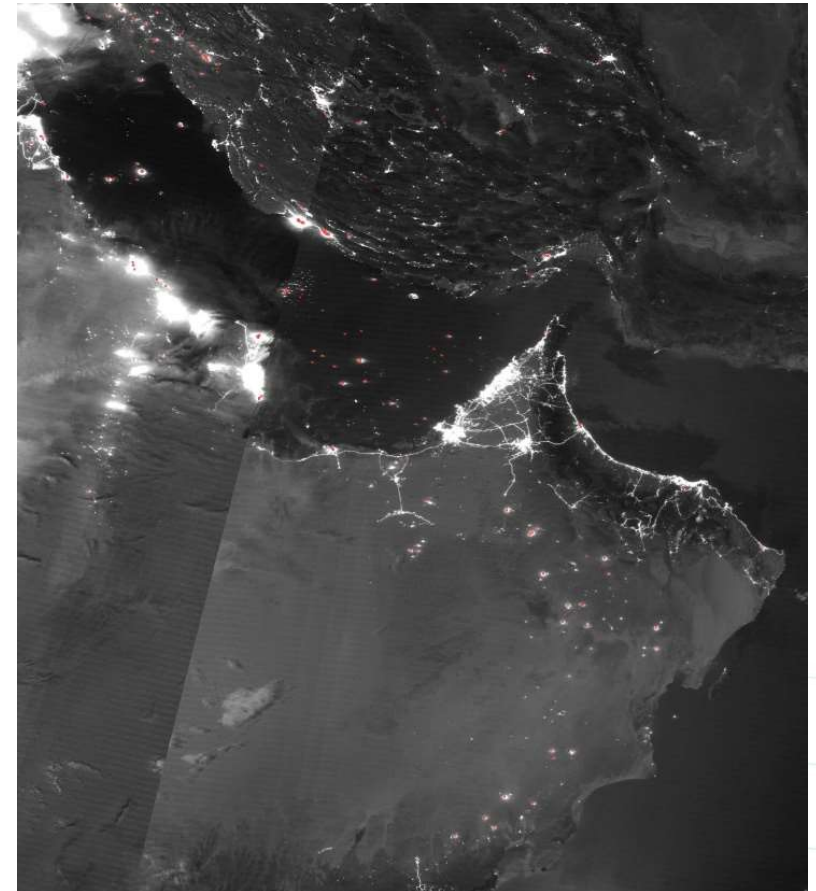
Total number 1 km hot-spots = 265



FRP 1 km: Total = 2586.8 [MW] - Avg. =  $9.8 \pm 24.3$  [MW] - Min = 1.0 [MW] - Max = 320.0 [MW]



Persian Gulf industrial gas flares



NASA SUOMI/VIIRS night-time imagery + hot-spot detection

More on <http://metis.eumetsat.int/frp>





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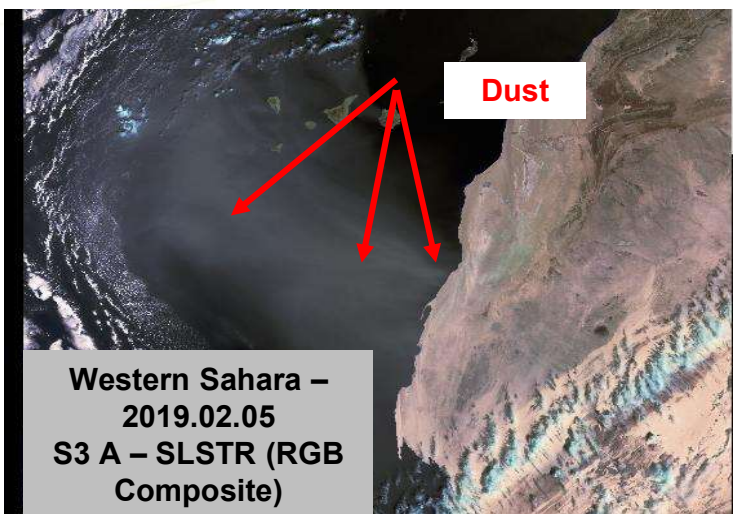
# Aerosol from space – In a nutshell

**AOD (Aerosol Optical depth) = How much Solar light attenuated by aerosols?**

- A proxy of aerosol amount.
- Spectrally variant: usually given at 550 nm.

**Decoupling aerosol & the surface layer underneath: the highest challenge!**

- Surface information from external data (e.g. ocean wind speed, vegetation type), and measurements (both spectral & multi-viewing).
- SLSTR challenge: 2 views! Future EUMETSAT multi-viewing instruments will have 14 views (e.g. EPS-SG 3MI)!





# The genesis of EUMETSAT Processor v2.0

A proper understanding of the **aerosol information content** combined with radiometric improvements

"How the geometry of acquisition impacts the aerosol retrieval",  
Fougnie, Chimot, *et al.*, JQSRT, 2020, Accepted <https://doi.org/10.1016/j.jqsrt.2020.107304>

- **Land & Ocean:**
  - Update of the absolute, inter-band & dual-view radiometric calibration
- **Land / Ocean surface aerosol decoupling: A function of information content & dual-view geometry**
  - **Ocean:** AOD is retrieved. Surface reflectance is ~~retrieved~~ **estimated** over 670 – 2500 nm.
  - **Land Geometry method:** joint aerosol-surface retrieval for favourable dual-view geometry. North *et al.*, 1996, 1998, 2002
  - **Land Spectral method:** AOD is retrieved. Surface reflectance is ~~retrieved~~ **estimated** for unfavourable dual-view geometry. Karnieli *et al.*, 2000
    - Detection of land cover via the **Aerosol Free Ratio Index (AFRI)** → based on NIR and SWIR TOA radiometry
    - Development of a Red-SWIR spectral surface model, inspired by the Enhanced deep blue algorithm of Suomi VIIRS.
- **Spectral channel weights:** Hsu *et al.*, Sayer *et al.*
  - To focus on channels the most sensitive to aerosol signals, the less possible to land soils!
- **Additional features:**
  - Outlier filtering (e.g. clouds & sediments) => user guidance for AOD best quality
  - LOG(AOD) filtering
  - Cloud fraction coverage

<https://www.eumetsat.int/website/home/Data/ScienceActivities/OperationalAlgorithms/CopernicusSentinel3NRTAerosolOpticalDepth/index.html>

# S3 NRT AOD – Release status

- The very 1<sup>st</sup> public release of the Copernicus S3 NRT AOD product, implemented and procured by EUMETSAT:
  - Processor v2.0, Baseline Collection 1.0
  - Disseminated to public users on 27.08.2020
- Processor v2.0: directly reworked from a previous processor / algorithm to match the measurement information content.
- Product maturity labels:
  - AOD Ocean ‘Preliminary Operational’:
    - Close to user requirements - Validation continues.
  - AOD Land ‘Demonstrational’:
    - Temporary label
    - Known limitations
- Key parameter: AOD(550 nm)
- Additional parameters: Aerosol & surface properties, quality flags, etc..

## EUMETSAT WebPage Copernicus Sentinel-3 NRT AOD

<https://www.eumetsat.int/website/home/Data/ScienceActivities/OperationalAlgorithms/CopernicusSentinel3NRTAerosolOpticalDepth/index.html>

**EUMETSAT** MONITORING WEATHER AND CLIMATE FROM SPACE

HOME IMAGES ABOUT US SATELLITES DATA NEWS QUICK LINKS

### COPERNICUS SENTINEL-3 NRT AEROSOL OPTICAL DEPTH

**DATA**

- PRODUCT NAVIGATOR
- PRODUCTS
- SERVICE STATUS
- DATA DELIVERY
- 0 DEGREE SERVICE
- RAPID SCANNING SERVICE
- INDIAN OCEAN DATA COVERAGE
- METEOSAT DATA COLLECTION SERVICES
- REGIONAL DATA SERVICE / EARS
- GLOBAL DATA SERVICE
- CLIMATE SERVICE
- JASON-3 SERVICES
- THIRD PARTY SERVICES
- TRAINING
- SCIENCE ACTIVITIES**
- SCIENCE STUDIES
- OPERATIONAL ALGORITHMS**
- CAL/VAL AND FIDUCIAL REFERENCE MEASUREMENTS
- SCIENCE MEETINGS & WORKSHOPS
- VISITING SCIENTISTS
- RESEARCH FELLOWSHIPS
- SEARCH SCIENCE DOCUMENTS
- TECHNICAL DOCUMENTS

**Air quality, long-range transport & threat monitoring of suspended air particles.**

Everywhere on Earth, particles are suspended in the air, with a high regional and temporal variability, and threaten our air quality. EUMETSAT is the technical agent and scientific leader, entrusted by the European Commission (EC), to implement and produce the Copernicus Sentinel-3 (S3) Near Real Time (NRT) Aerosol Optical Depth (AOD) product. It monitors, in less than three hours, the location, abundance, and long-range transport of all atmospheric aerosol particles.

Air pollution is a long-running global problem, sometimes named the 'silent killer'. Tiny particles suspended in the air, known as 'Particulate Matter' (PM) are one of the major environmental causes of disease around the world. In particular, PM2.5 (PM of less than 2.5 µm size) is a key health risk factor in Europe, above others, such as noise, ozone, or radon (Hanninen and Knol, 2011).

In addition to its core marine and continental objectives, in the daytime the Sea and Land Surface Temperature Radiometer (SLSTR), on board the Sentinel-3 A and B satellites detects the abundance of air suspended particles and monitors the immediate threats related to the variability and long-range transport of any type of air suspended particles. Commonly gathered under the name of 'aerosols', these are not only nitrates and sulfates from anthropogenic activities, but also desert dust, sea salt spray, smoke from wildfires (see Figure 1, top right, click to expand), black soot, and volcanic ashes.

► Objectives  
► Background  
► Overview of the algorithm  
► Overview of the performance  
► Access to Sentinel-3 NRT AOD products  
► Focus on the SLSTR instrument — the asset and drawbacks of dual-view for aerosol observations  
► References  
► Contact

**► Find out how to access the data**

**OBJECTIVES**

The Copernicus NRT S3 AOD processor quantifies the abundance of aerosol particles and monitors their global distribution and long-range transport, at the scale of 9.5 x 9.5 km². All observations are made available in less than three hours from the SLSTR observation sensing time. It is only applicable during daytime.

User attention is drawn to the different maturity levels of the various parameters available in the current version of the NRT S3 AOD product in ► Product Quality Status.

**BACKGROUND**

What do we breathe?



# California Wildfire – Smoke over the entire USA & oceans



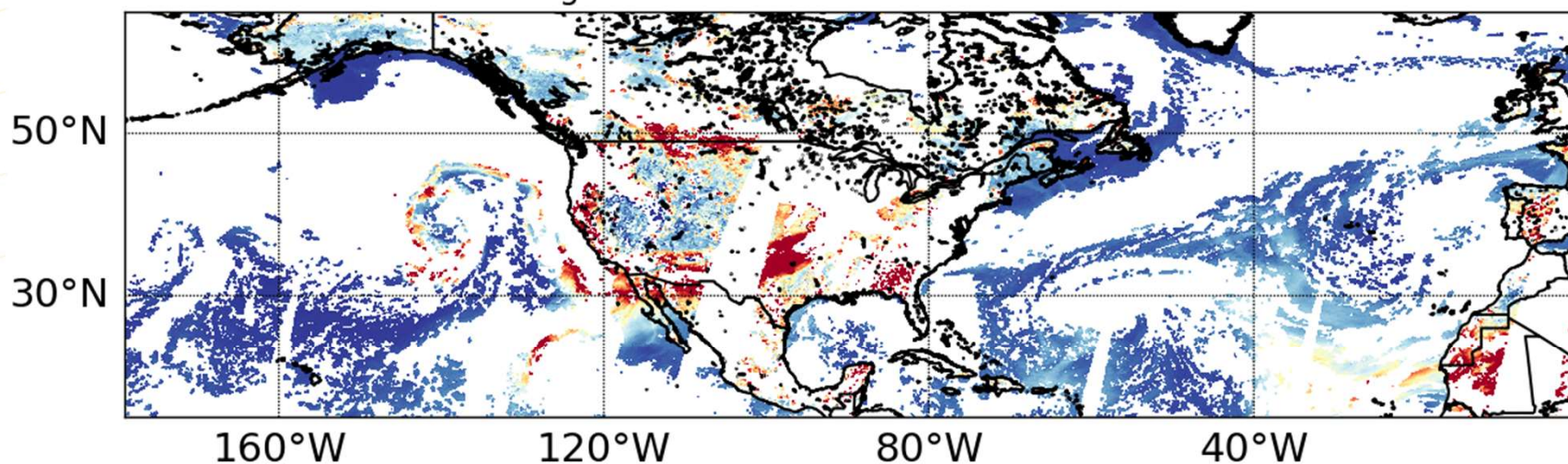
Copernicus  
Europe's eyes on Earth

EUMETSAT

Sentinel-3 A+B SLSTR - AOD(550 nm) Land & Ocean - Post-Filtered - 12.09.2020

9.5 km Resolution

Average =  $0.23 \pm 0.30$  - Min = 0.00 - Max = 2.93



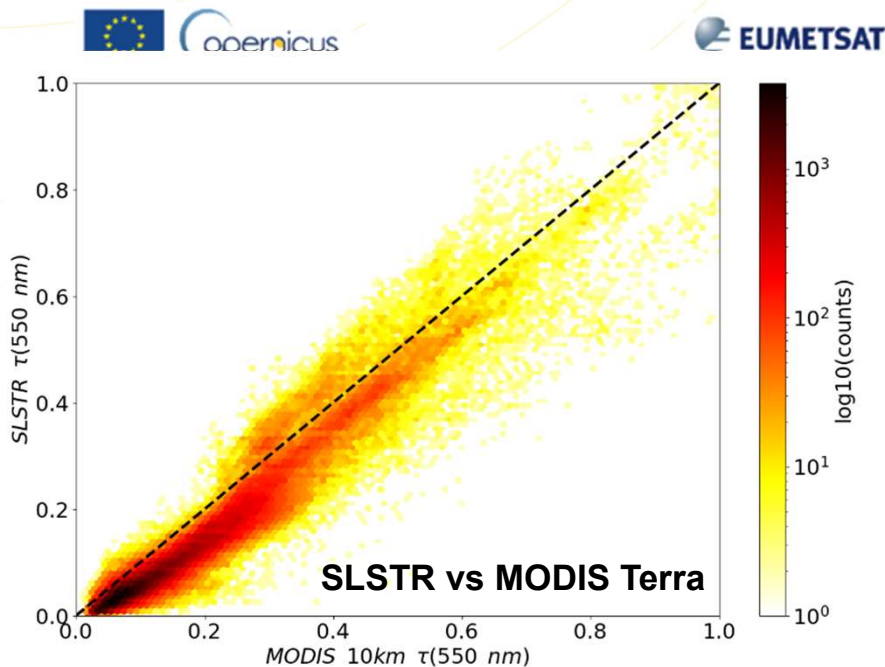
Processor v2.0  
REF platform



# S3 NRT AOD – Processor v2.0 performances - Ocean

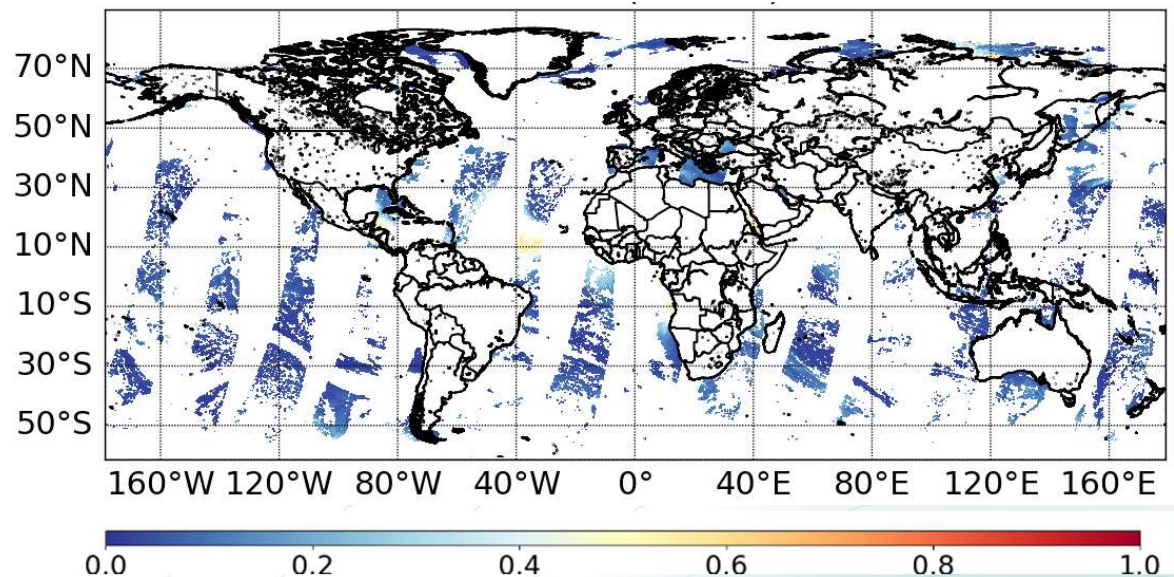
- Excellent consistency with NASA MODIS-Terra Ocean & AERONET
- Slightly lower values than MODIS ( $< -0.02$ ) reveal potential high benefits

AOD Ocean – New interest under investigation with CAMS



December 2019 – January 2020 – Atlantic ocean – Sentinel-3 A SLSTR  
Near-Simultaneous spatially collocated match-up with MODIS Terra  
Processor v2.0 (off-line)

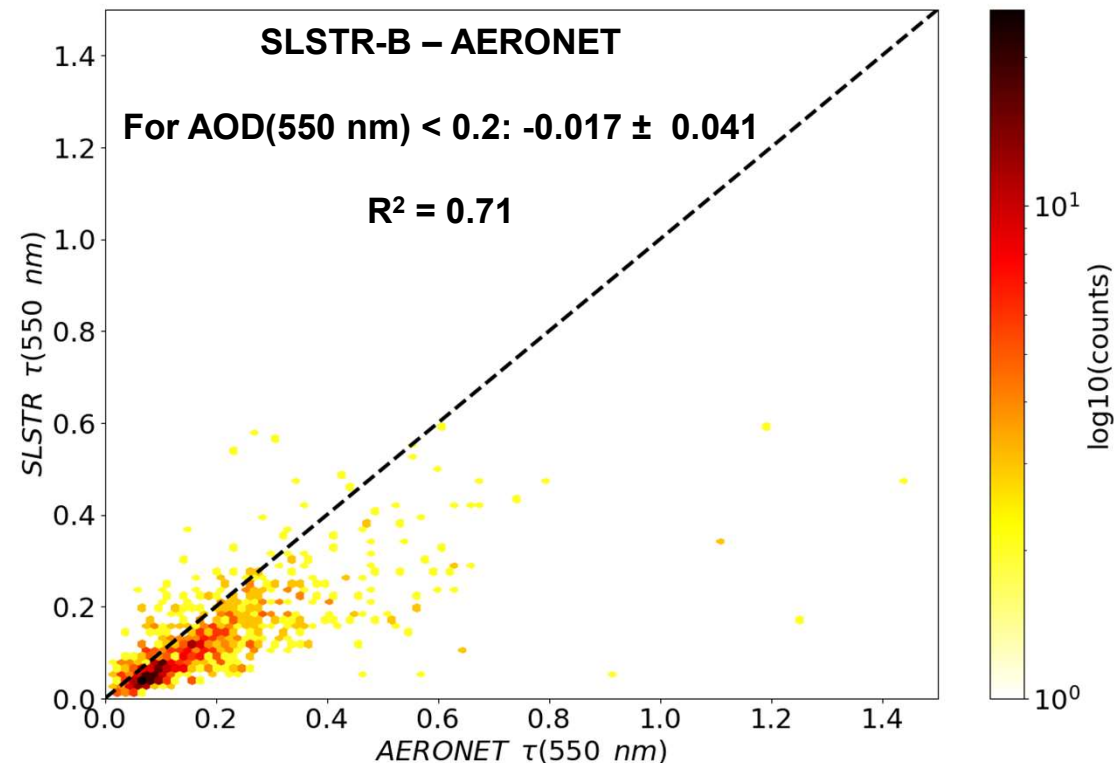
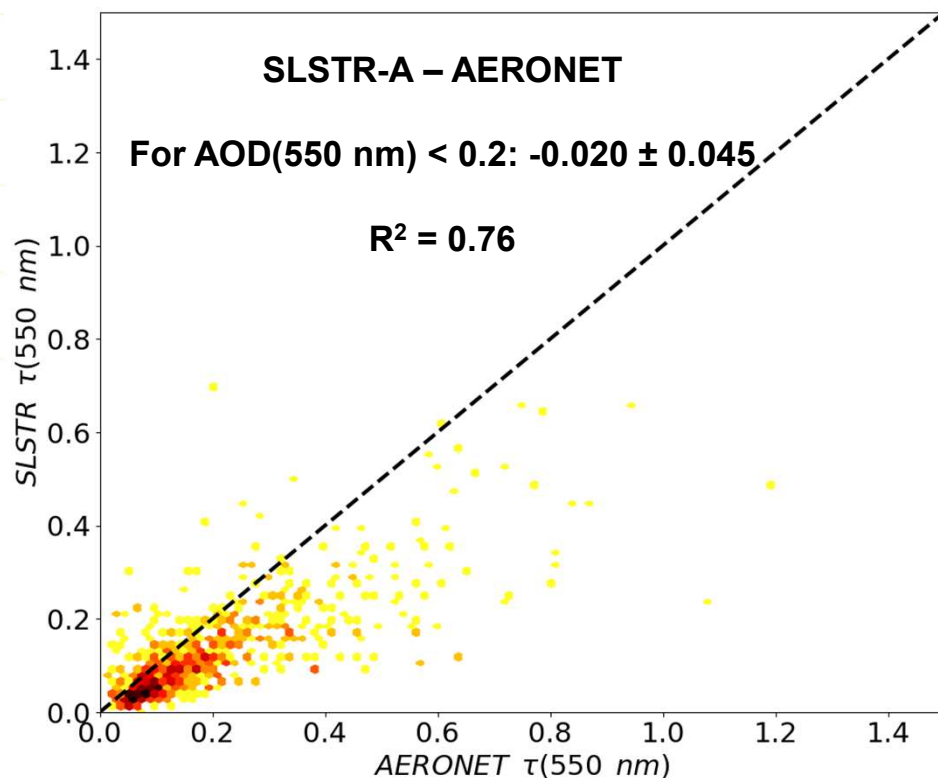
30.06.2020 – SLSTR-A  
Ocean AOD(550 nm) post-filtered  
Processor v2.0 (off-line)





# S3 NRT AOD – Processor v2.0 performances - Ocean

- Excellent consistency with ground-based AERONET Level 1.5.
- Dispersion at high AODs due to coastal features (Mediterranean sea, coastal, inland waters, etc...)



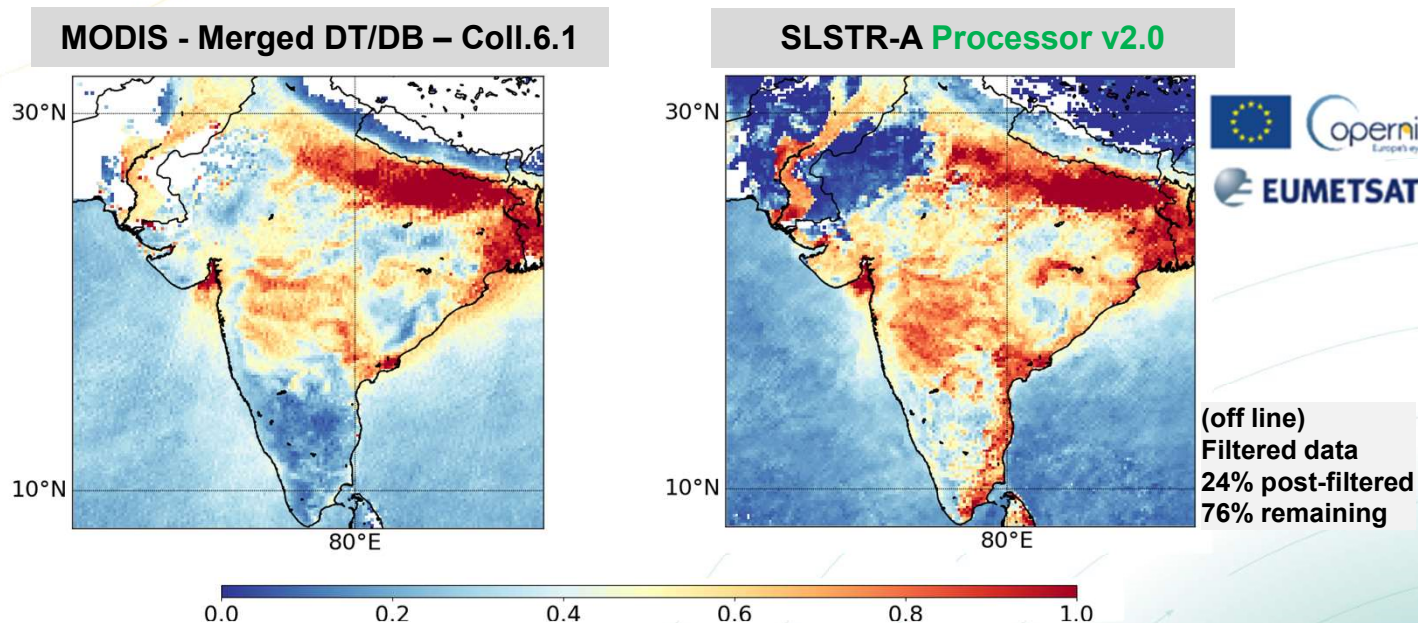
August 2019 – February 2020 – All AODs Ocean – Sentinel-3 A & B SLSTR  
Near-Simultaneous spatially collocated match-up with AERONET Level1.5  
Processor v2.0 (off-line)



# S3 NRT AOD – Processor v2.0 performances - Land

2 months: Dec 2019 – Jan 2020

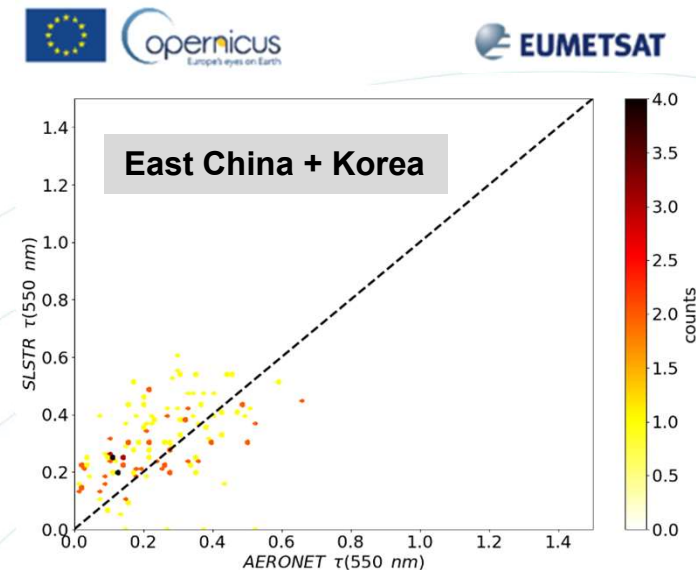
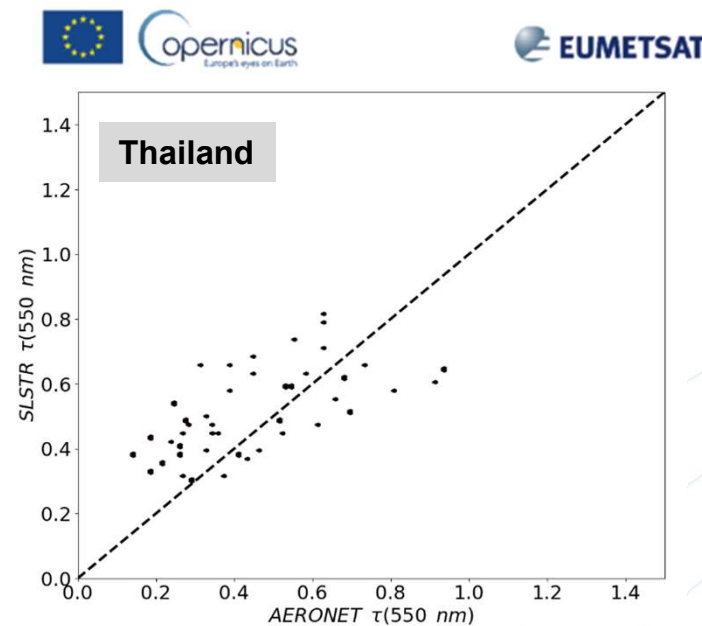
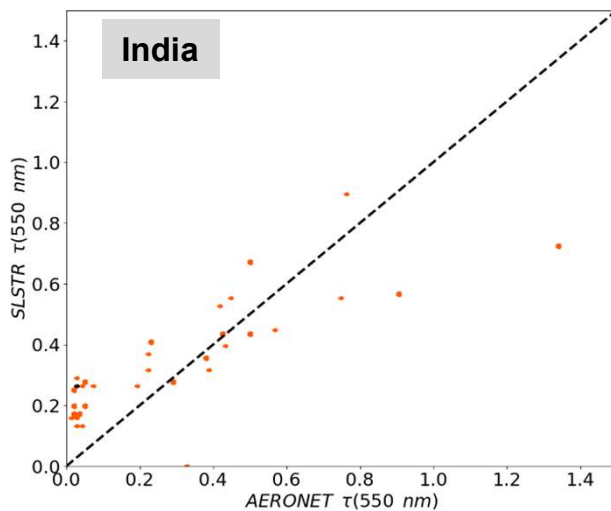
- High pattern consistency with NASA MODIS-Terra & ground-based AERONET
- Some cloud residuals still persisting (to be further optimised)



# S3 NRT AOD – Processor v2.0 performances - Land

## Validation with ground-based AERONET 2 months: Dec 2019 – Jan 2020

**Small bias at low AOD (AERONET):** need to adjust empirical land coefficients.



**SLSTR-A Processor v2.0  
(off line)**





### Siberia Wildfire : 24 June – 4 July 2020

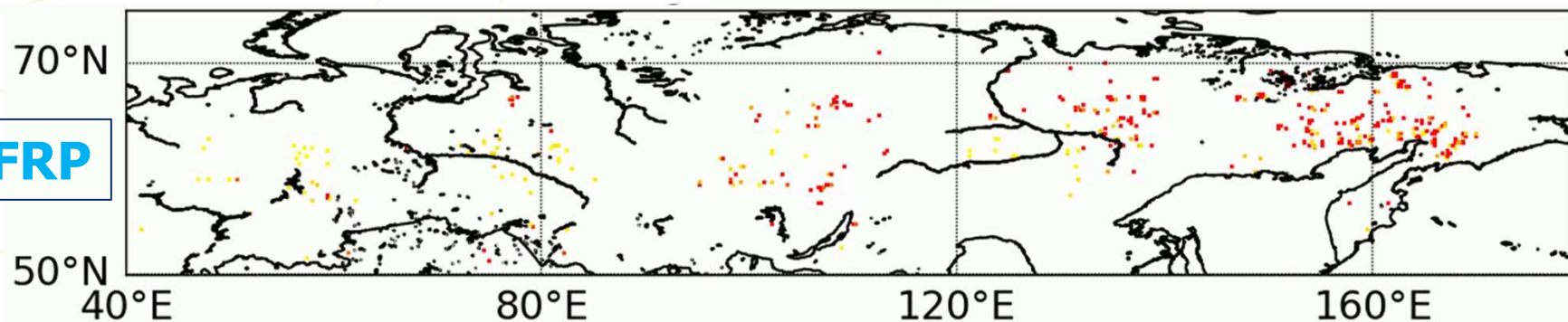
From Copernicus Sentinel-3 A+B NRT Atmospheric L2 products deployed by EUMETSAT in 2020

NRT FRP Processor v2.0, Baseline Collection 1 (off-line)

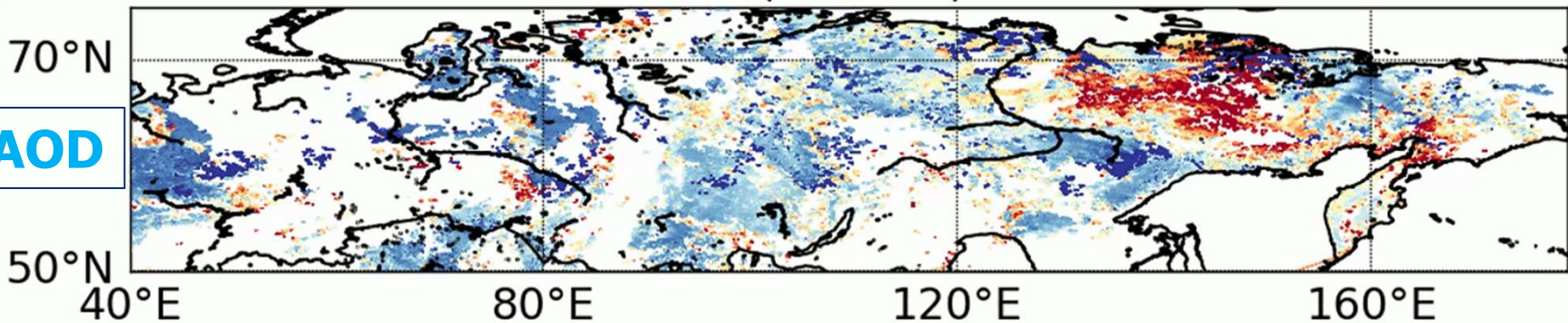
NRT AOD Processor v2.0, Baseline Collection 1 (off-line)

24.06.2020

NRT FRP



NRT AOD



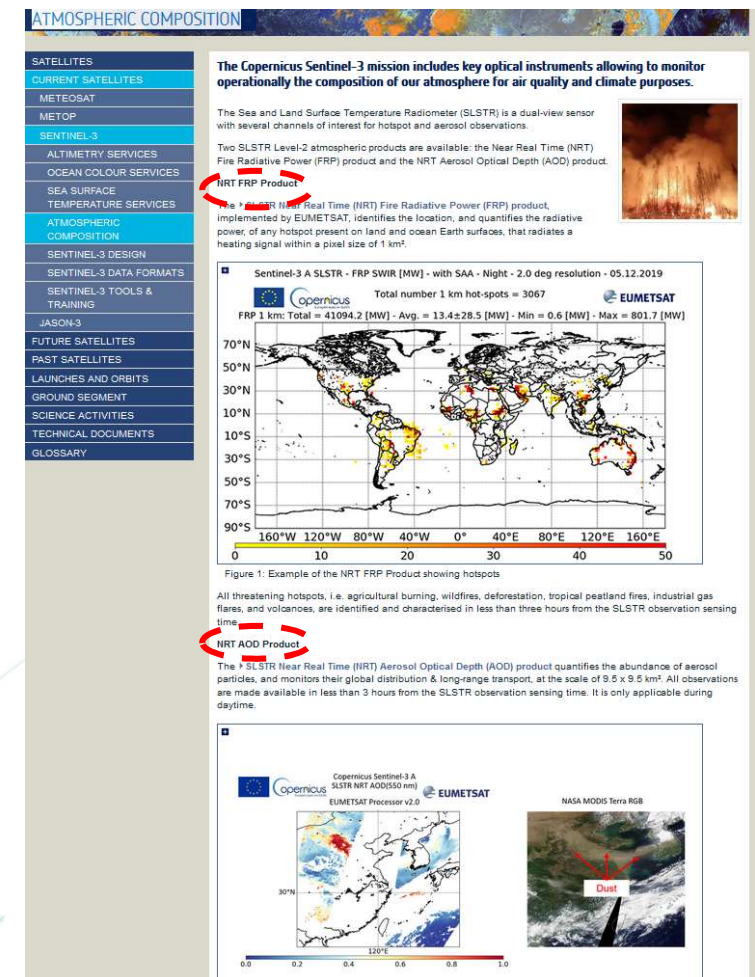
- Copernicus, Sentinel-3, and EUMETSAT for Near Real Time (NRT) atmosphere applications
- The Copernicus Sentinel-3 NRT Fire data
- The Copernicus Sentinel-3 NRT Aerosol data
- **Data & visualisation access**

# Sentinel-3 Near Real Time Atmospheric composition data access

EUMETSAT WebPage  
Sentinel-3 Atmospheric Composition NRT products

<https://www.eumetsat.int/website/home/Satellites/CurrentSatellites/Sentinel3/AtmosphericComposition/index.html>

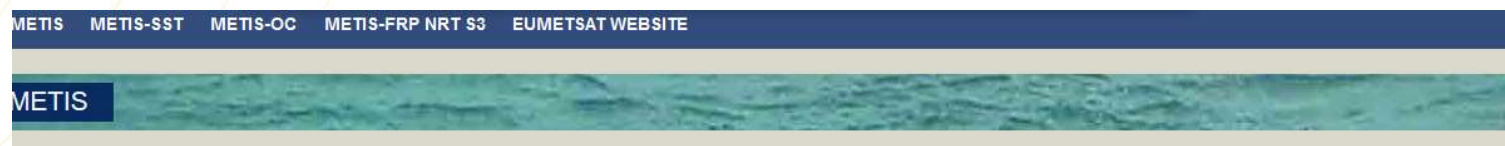
- All documentation & guidelines for data access download available!
- Please read carefully the Product Notices (PN) => Contain all details about product quality, processor functionalities, known limitations, caveats, etc...
- Feedbacks / Questions to [ops@eumetsat.int](mailto:ops@eumetsat.int)





# METIS - Monitoring & Evaluation of Thematic Information from Space

<http://metis.eumetsat.int>



## Monitoring & Evaluation of Thematic Information from Space (METIS)

The Monitoring and Evaluation of Thematic Information from Space (METIS) tool is developed to monitor EUMETSAT operational remotely sensed products for stability, quality and performance on a global and regional basis in routine. The current METIS modules are:



### METIS-SST

METIS-SST, the Sea Surface Temperature component of Monitoring & Evaluation of Thematic Information from Space (METIS), provides near-real time diagnostics of EUMETSAT operational level-2 (L2) satellite SSTs.

Current Satellite SST Products monitored in METIS-SST are from: Sentinel-3 SLSTR-A and -B, Metop-B (M1) AVHRR and M1 IASI.



### METIS-OC

METIS-OC, the OC component of Monitoring & Evaluation of Thematic Information from Space (METIS), provides near-real time diagnostics of EUMETSAT operational level-2 and level-3 satellite Ocean Colour products.

Current Satellite OC Products monitored in METIS-OC are from: Sentinel-3A OLCI, Aqua (AQ) MODIS, OrbView-2 SeaWiFS, Envisat MERIS and Suomi-NPP VIIRS.



### METIS-FRP NRT S3

METIS-FRP NRT S3, the FRP component of Monitoring & Evaluation of Thematic Information from Space (METIS), provides near-real time diagnostics of the Copernicus Near Real Time (NRT) Sentinel-3 FRP product procured by EUMETSAT.

Current Satellite FRP NRT Products monitored in METIS-FRP NRT S3 are from: Sentinel-3 SLSTR-A and -B.

A public on-line tool  
to monitor  
EUMETSAT  
operational  
remotely sensed  
products

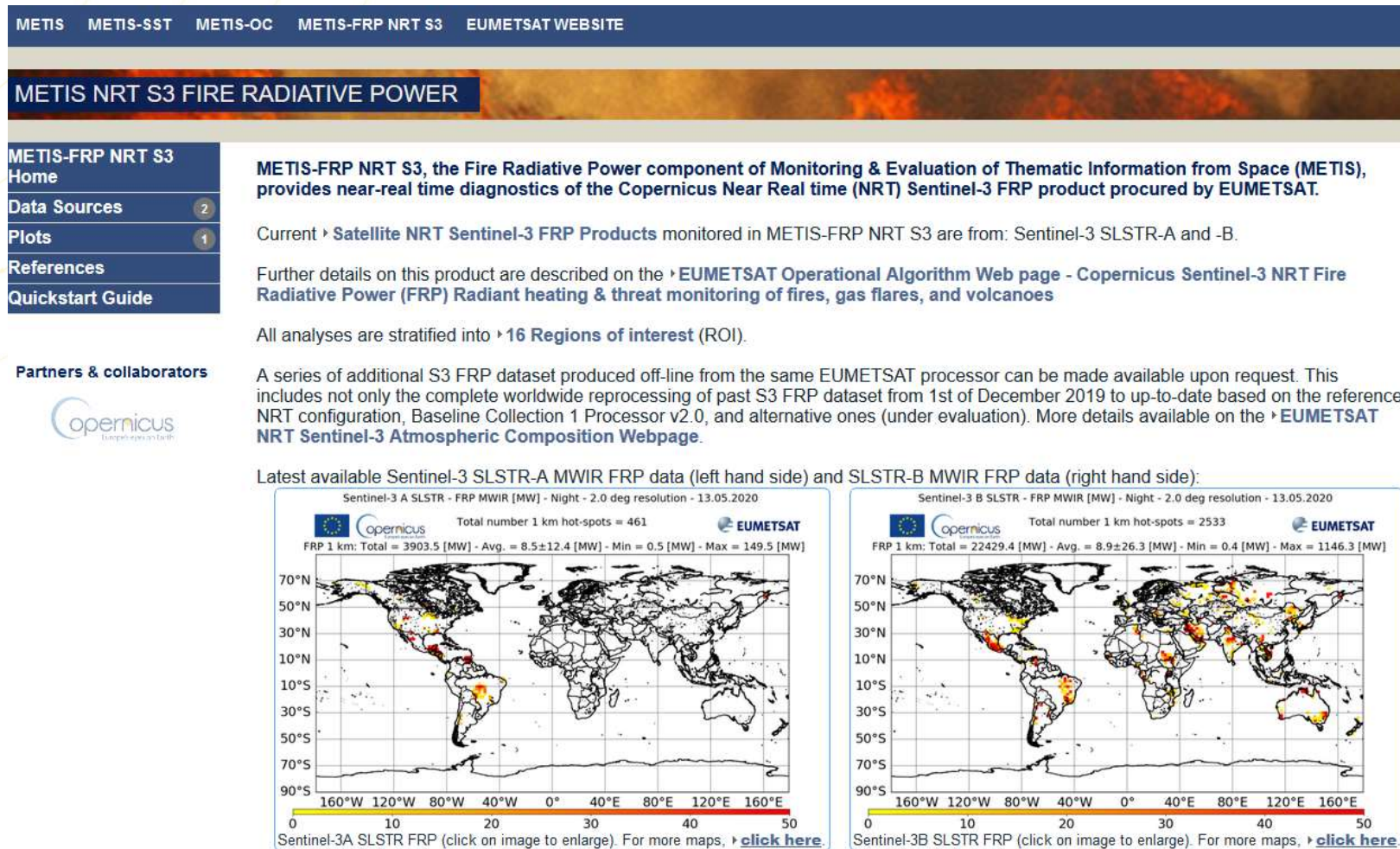
NRT AOD to be  
added soon

# METIS FRP NRT S3

<http://metis.eumetsat.int/frp>

**METIS**  
Monitoring &  
Evaluation of  
Thematic  
Information from  
Space

Public  
visualizations +  
diagnostics the  
Copernicus Near  
Real time (NRT)  
Sentinel-3.





MAPS: GLOBAL

METIS-FRP NRT S3

Home

Data Sources 2

Plots 1

References

Quickstart Guide

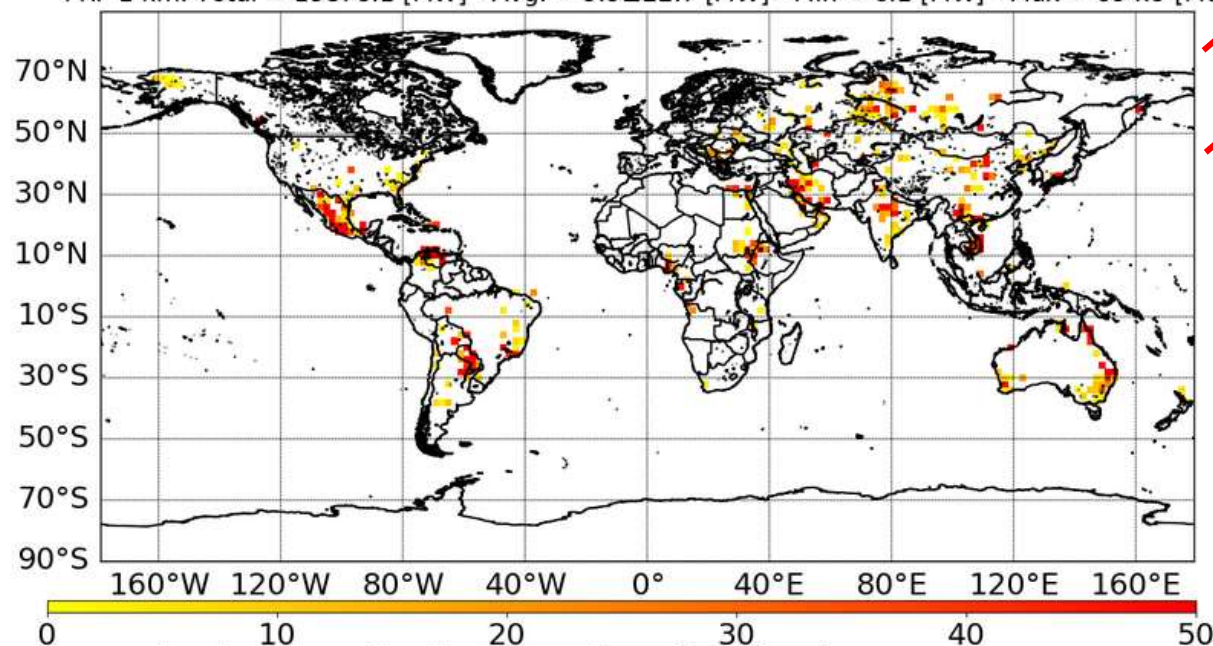
Sentinel-3 A SLSTR - FRP MWIR [MW] - Night - 2.0 deg resolution - 11.05.2020



Total number 1 km hot-spots = 2014



FRP 1 km: Total = 19876.1 [MW] - Avg. =  $9.9 \pm 22.7$  [MW] - Min = 0.1 [MW] - Max = 694.9 [MW]



Region of Interest

Global

Product of Interest

☒ Sentinel-3A SLSTR

☐ Sentinel-3B SLSTR

Algorithm of Interest

☒ MWIR

☐ SWIR

☐ SWIR No SAA

☐ MWIR F1

☐ MWIR S7

☐ MWIR S7/S8

☐ SWIR S6



# Access to Sentinel-3 NRT Fire & aerosol products from EUMETSAT

- < 1 year: CODA – Copernicus Online Data Access

<https://coda.eumetsat.int/#/home>

The screenshot displays the Copernicus Online Data Access (CODA) web interface. The header includes the EUMETSAT and Copernicus logos, the title "Copernicus Online Data Access", and user icons. A search bar at the top left contains the text "Insert search criteria...". Below this, the "Advanced Search" section is visible, featuring several filters:

- Sort By:** Ingestion Date
- Order By:** Descending
- Sensing period:** From: [calendar icon] to: [calendar icon]
- Ingestion period:** From: [calendar icon] to: [calendar icon]
- Mission:** Sentinel-3
- Product Type:** A dropdown menu with the following options: OL\_1\_EFR\_, OL\_1\_ERR\_, OL\_2\_WFR\_, OL\_2\_WRR\_, SL\_1\_RBT\_, SL\_2\_FRP\_, SL\_2\_AOD\_ (highlighted with a red dashed circle), SL\_2\_WST\_, SR\_1\_SRA\_, SR\_1\_SRA\_A\_, SR\_1\_SRA\_BS, and SR\_2\_WAT\_.
- Timeliness:** [dropdown menu]
- Product Level:** [dropdown menu]
- Orbit Number:** [text input field]
- Detected fire:** [dropdown menu]

The right side of the interface shows a map of Europe and surrounding regions, with a search icon in the top right corner.

# Access to Sentinel-3 products from EUMETSAT

- CODA – Copernicus Online Data Access

<https://codata.eumetsat.int/#/home>

The screenshot displays the CODA web interface. On the left, a sidebar shows a list of products. The top of the sidebar indicates 'Display 26 to 50 of 406 products' and 'Order By: Ingestion Date'. Below this, a 'Request Done' section shows search criteria. The product list includes columns for product ID, status (S3B, FIRE, S3A, NO FIRE), and download URL. Two products are circled in red: one with status 'S3B FIRE' and another with status 'S3A NO FIRE'. The main area of the interface is a map of Europe with a grid overlay. The bottom of the interface shows a taskbar with various application icons and a system clock indicating 21:25 on 22/04/2020.

**EUMETSAT** **copernicus** Copernicus Online Data Access

Insert search criteria...

Display 26 to 50 of 406 products. Order By: Ingestion Date

Request Done: ( beginPosition:[2020-04-22T00:00:00.000Z TO 2020-04-22T23:59:59.999Z] AND endPosition:[2020-04-22T00:00:00.000Z TO 2020-04-22T23:59:59.999Z] ) AND

**S3B** **FIRE** S3B\_SL\_2\_FRP\_\_\_\_20200422T154024\_20200422T154524...  
Download URL: [https://codata.eumetsat.int/odata/v1/Products\('cc42...](https://codata.eumetsat.int/odata/v1/Products('cc42...)  
Mission: Sentinel-3; Instrument: SLSTR; Sensing Date: 2020-04-2

**S3B** **FIRE** S3B\_SL\_2\_FRP\_\_\_\_20200422T154524\_20200422T155024...  
Download URL: [https://codata.eumetsat.int/odata/v1/Products\('1be6...](https://codata.eumetsat.int/odata/v1/Products('1be6...)  
Mission: Sentinel-3; Instrument: SLSTR; Sensing Date: 2020-04-2

**S3B** **FIRE** S3B\_SL\_2\_FRP\_\_\_\_20200422T160958\_20200422T161458...  
Download URL: [https://codata.eumetsat.int/odata/v1/Products\('49d3...](https://codata.eumetsat.int/odata/v1/Products('49d3...)  
Mission: Sentinel-3; Instrument: SLSTR; Sensing Date: 2020-04-2

**S3A** **NO FIRE** S3A\_SL\_2\_FRP\_\_\_\_20200422T160925\_20200422T161...  
Download URL: [https://codata.eumetsat.int/odata/v1/Products\('8e75...](https://codata.eumetsat.int/odata/v1/Products('8e75...)  
Mission: Sentinel-3; Instrument: SLSTR; Sensing Date: 2020-04-2

**S3A** **NO FIRE** S3A\_SL\_2\_FRP\_\_\_\_20200422T153925\_20200422T154...  
Download URL: [https://codata.eumetsat.int/odata/v1/Products\('42df...](https://codata.eumetsat.int/odata/v1/Products('42df...)  
Mission: Sentinel-3; Instrument: SLSTR; Sensing Date: 2020-04-2

**S3A** **NO FIRE** S3A\_SL\_2\_FRP\_\_\_\_20200422T155925\_20200422T160...  
Download URL: [https://codata.eumetsat.int/odata/v1/Products\('4694...](https://codata.eumetsat.int/odata/v1/Products('4694...)  
Mission: Sentinel-3; Instrument: SLSTR; Sensing Date: 2020-04-2

25 << < page: 2 of 17 > >> CLOSE

Pan Box Polygon Clear

21:25  
22/04/2020



# Access to Sentinel-3 NRT Fire & aerosol products from EUMETSAT

- > 1 year: EUMETSAT Data Centre

<https://archive.eumetsat.int/usc>

**USER SERVICES CLIENT**

SEARCH AND ORDER | ORDER STATUS | HELP | FEEDBACK | MY PROFILE | LOGOUT | KNOWN ISSUES | DATA CENTRE INFO

SELECT PRODUCT > FILTER > DATE/TIME > ROI > FORMAT > DELIVERY METHOD > CHECK OUT

**SELECT PRODUCT**

Search Term:

**Products** | **Sentinel 3 DataSets**

- ☐ Rapid Scan Multi-sensor Precipitation Estimate (JPEG) - MSG
- ☐ Rapid Scan Regional Instability Index - MSG
- ☐ RapidScat Winds at 25 km Swath Grid, 3 Hours Latency - ISS
- ☐ RapidScat Winds at 50 km Swath Grid, 3 Hours Latency - ISS
- ☐ Reference Evapotranspiration
- ☐ Regional Instability Index - MSG - 0 degree
- ☐ SEM GDS Level 0 - Metop
- ☐ SLSTR Level 1B Radiances and Brightness Temperatures in NRT - Sentinel-3
- ☐ SLSTR Level 1B Radiances and Brightness Temperatures in NTC - Sentinel-3
- ☐ SLSTR Level 2 Aerosol Optical Depth in NRT - Sentinel-3
- ☐ **SLSTR Level 2 Fire Radiative Power in NRT - Sentinel-3**
- ☐ SLSTR Level 2 Product, Sea Surface Temperatures (sgl, dual view)
- ☐ SLSTR Level 2 Sea Surface Temperature (SST) in NRT Sentinel-3
- ☐ SLSTR Level 2 Sea Surface Temperature (SST) in NTC Sentinel-3
- ☐ SRAL Level 1A Unpacked L0 Complex echos in NTC - Sentinel-3
- ☐ SRAL Level 1A Unpacked L0 Complex echos in STC - Sentinel-3
- ☐ SRAL Level 1B in NRT - Sentinel-3
- ☐ SRAL Level 1B in NTC - Sentinel-3
- ☐ SRAL Level 1B in STC - Sentinel-3
- ☐ SRAL Level 1B stack echoes in NTC - Sentinel-3
- ☐ SRAL Level 1B stack echoes in STC - Sentinel-3
- ☐ SRAL Level 2 Altimetry Global in NRT - Sentinel-3
- ☐ SRAL Level 2 Altimetry Global in NTC - Sentinel-3

**Thematic Filter**

- Marine
- Land
- Atmosphere
- Aerosol
- Analysis
- Cloud
- Fire
- Forecast
- Humidity
- Model
- Observation
- Ocean
- Precipitation
- Pressure
- Radar Backscatter NRCS
- Radiation
- Soil Moisture Index
- Sea Ice
- Sea Surface Temperature
- Snow and Ice
- Temperature
- Vegetation
- Wave
- Wind

[CLEAR THEMATIC FILTER](#)

**FOLLOW US ON** | **MEMBER STATES**

CONTACT US | TERMS OF USE



# All Copernicus Sentinel-3 NRT Atmospheric Websites

- NRT Fire algorithm:
  - <https://www.eumetsat.int/website/home/Data/ScienceActivities/OperationalAlgorithms/CopernicusSentinel3NRTFireRadiativePowerFRP/index.html>
- NRT Aerosol algorithm:
  - <https://www.eumetsat.int/website/home/Data/ScienceActivities/OperationalAlgorithms/CopernicusSentinel3NRTAerosolOpticalDepth/index.html>
- List of all NRT Atmospheric products, documentation & data access guidance:
  - <https://www.eumetsat.int/website/home/Satellites/CurrentSatellites/Sentinel3/AtmosphericComposition/index.html>
  - **Please read carefully Product Notices!**
- Public visualisation:
  - <http://metis.eumetsat.int/frp/#>
- NRT Data access < 1 year:
  - <https://coda.eumetsat.int/#/home>
- NRT Data access > 1 year:
  - <https://archive.eumetsat.int/usc>
- Questions:
  - **EUMETSAT helpdesk: [ops@eumetsat.int](mailto:ops@eumetsat.int)**

# Conclusion

Sentinel-3, an operational Marine, Land and Atmospheric mission!  
=> Portfolio extended to NRT Atmospheric applications in 2020 by EUMETSAT

EUMETSAT is autonomous & entrusted by EC, member states, and Copernicus services for S3 NRT Atmosphere products

Evolutions to be released during Spring 2021.

**Julien.Chimot@eumetsat.int**



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