



Koninklijk Nederlands
Meteorologisch Instituut
Ministerie van Infrastructuur en Milieu

Early Results from TROPOMI on the Copernicus Sentinel 5 Precursor


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SENTINEL 5 PRECURSOR

Launch	13 October 2017
Launcher	Rockot from Plesetsk Russia
Orbit	Polar Sun synchronous, altitude 824 km
Overpass time	13:30 local time
Mission duration	7 year
Satellite	Airbus Astrobuss-M, height 3,55 m, 5,63 m diameter, mass 820 kg
Payload	Tropospheric Monitoring Instrument (TROPOMI)
Ground stations	Spitsbergen (Norway), Inuvik (Canada) and Kiruna (Sweden)
Data processing	DLR Oberpfaffenhofen (Germany) KNMI De Bilt, The Netherlands



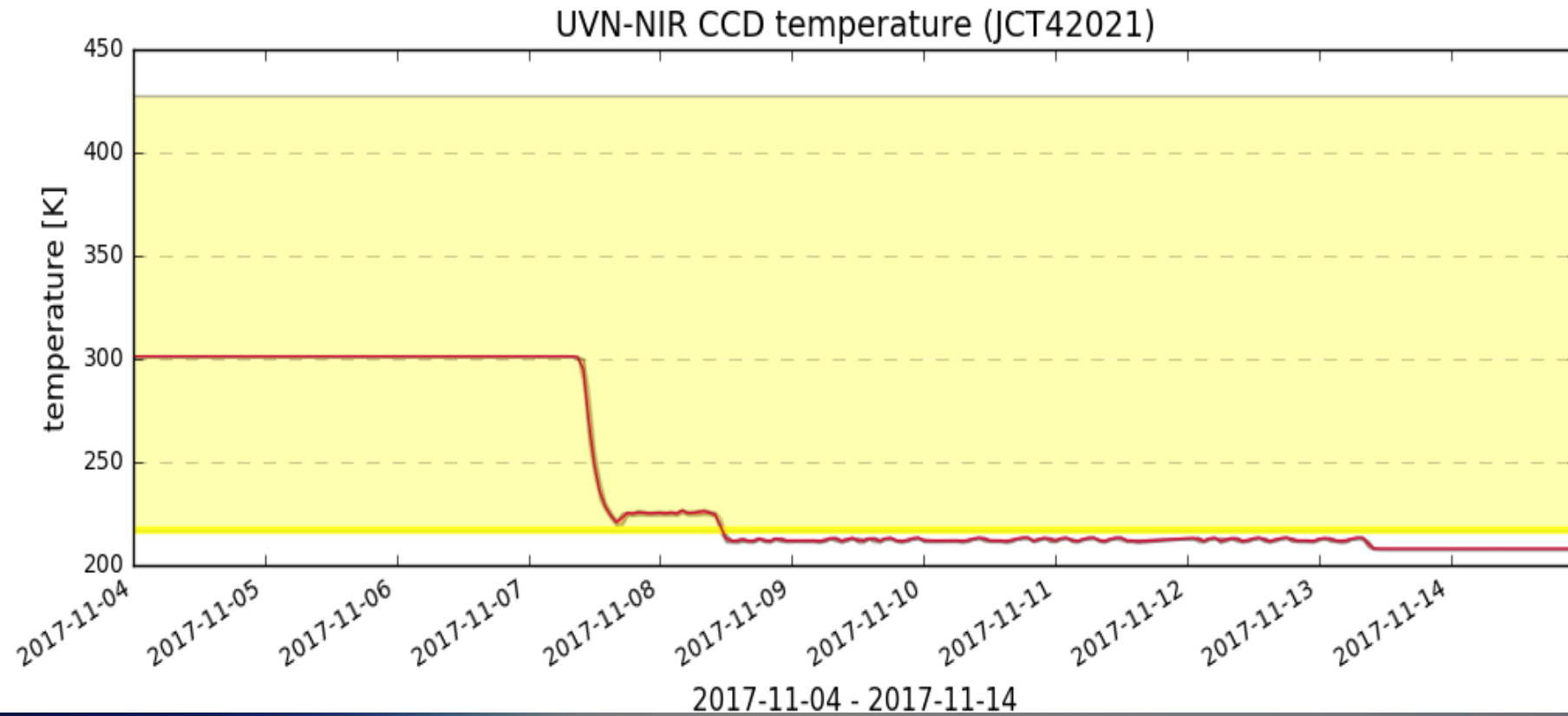


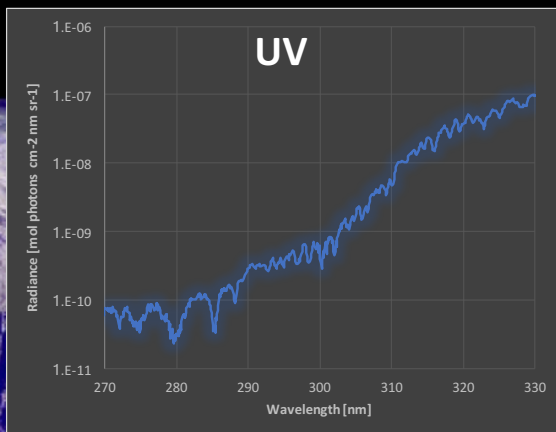


	UV		UVIS		NIR		SWIR	
Band	1	2	3	4	5	6	7	8
Spectral coverage [nm]	270 – 320		320 – 495		675 - 775		2305 – 2385	
Full spectral coverage [nm]	267 - 332		303 - 499		660 - 784		2299 - 2390	
Spectral resolution [nm]	0.49		0.54		0.38		0.25	
Spectral sampling ratio	6.7		2.5		2.8		2.5	
Spatial sampling [km ²]	7 x 28	7 x 3.5				7 x 3.5	7 x 7	

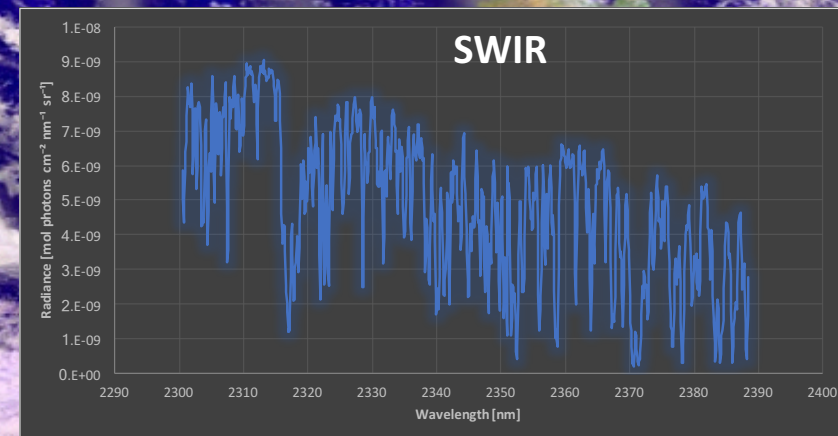
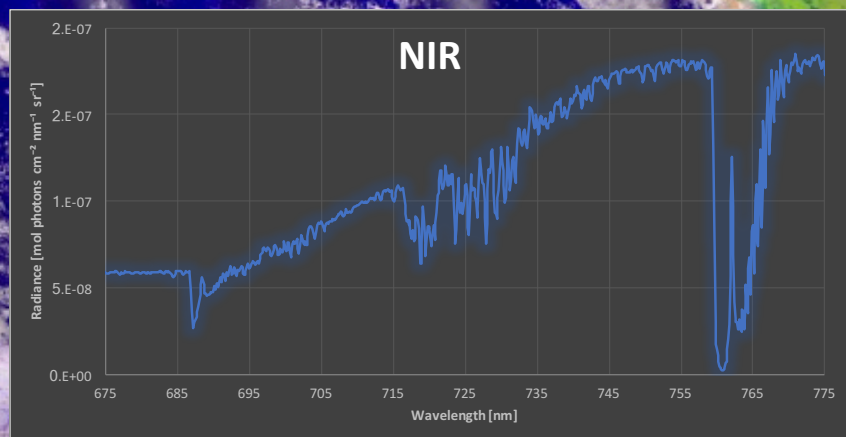
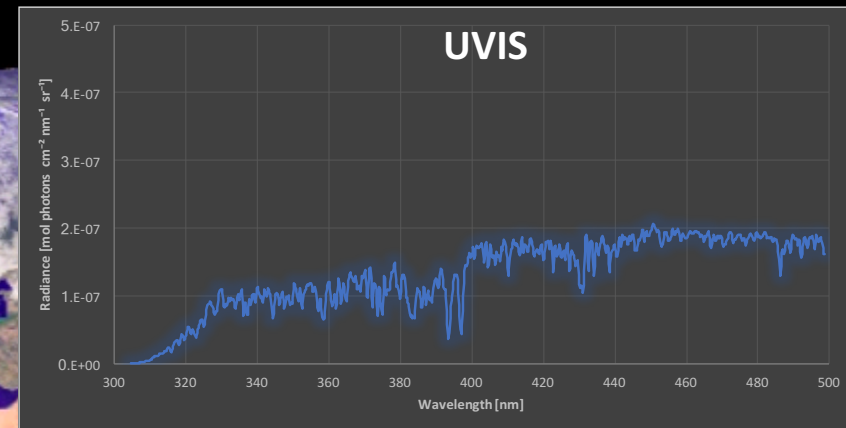
TROPOMI is developed by The Netherlands in cooperation with ESA

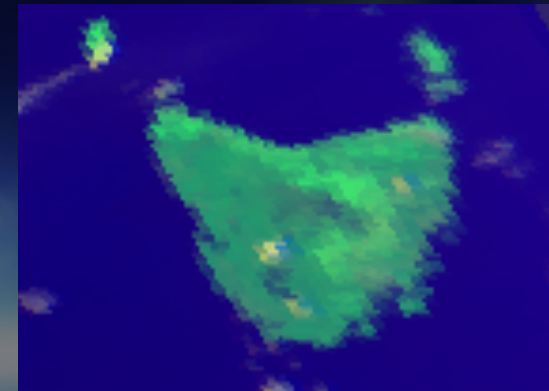
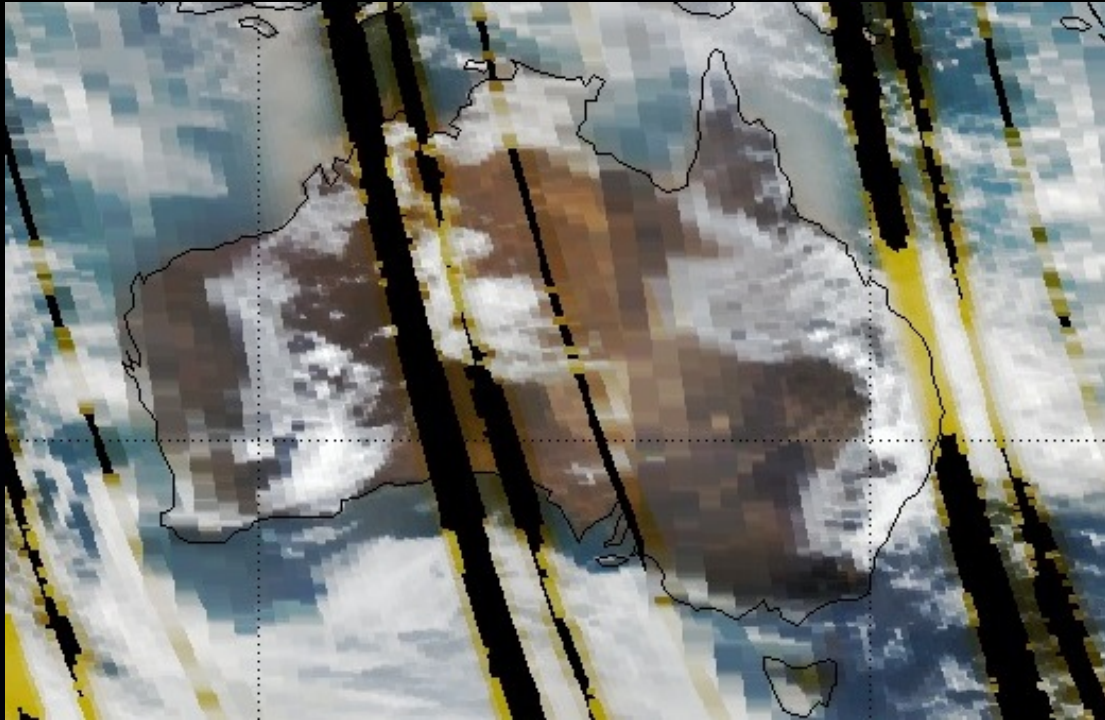
Commissioning Phase





- 1 scanline per second
- 440 spectra per scanline
- 3000 scanlines per orbit
- 15 orbits per day
- 20 million groundpixels per day
- 225 Gbyte raw data per day
- 1 Tbyte L1b data per day





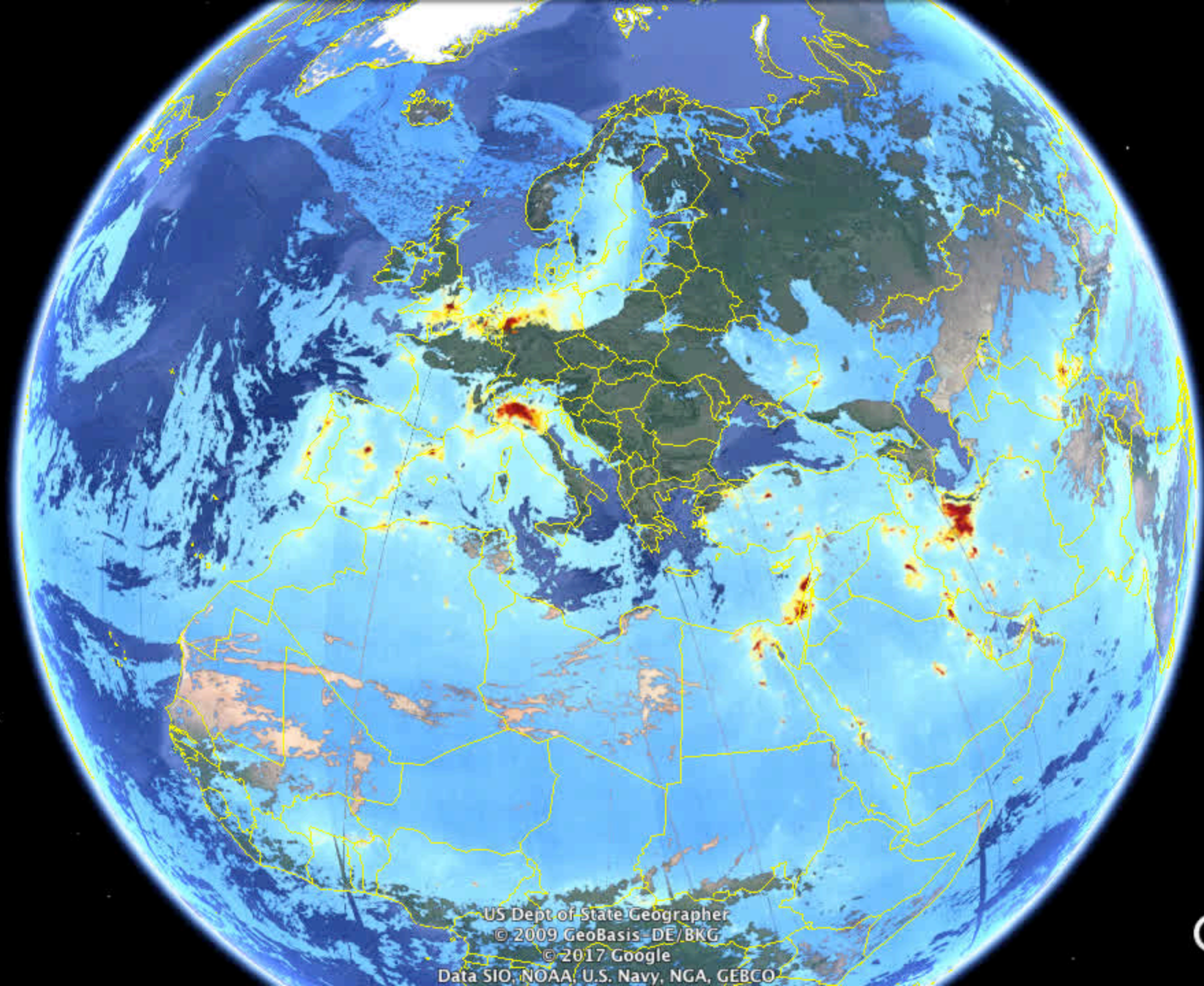
OMI

TROPOMI

Level 2 Data Products

Product	Spectrometer	Application
Ozone	UV, UVIS	Ozone layer monitoring, UV-index forecast, Climate monitoring
NO ₂	UVIS	Air quality forecast and monitoring
CO	SWIR	Air quality forecast and monitoring
CH ₂ O	UVIS	Air quality forecast and monitoring
CH ₄	SWIR	Climate monitoring
SO ₂	UVIS	Air quality forecast and monitoring, Climate monitoring, Volcanic plume detection
Aerosol	UVIS, NIR	Air quality forecast and monitoring, Climate monitoring, Volcanic plume detection
Clouds	UVIS, NIR	Climate monitoring
UV-Index	UVIS	UV index forecast

KNMI | DLR | BIRA-IASB | SRON | RAL | IUP-Bremen | MPIC | FMI

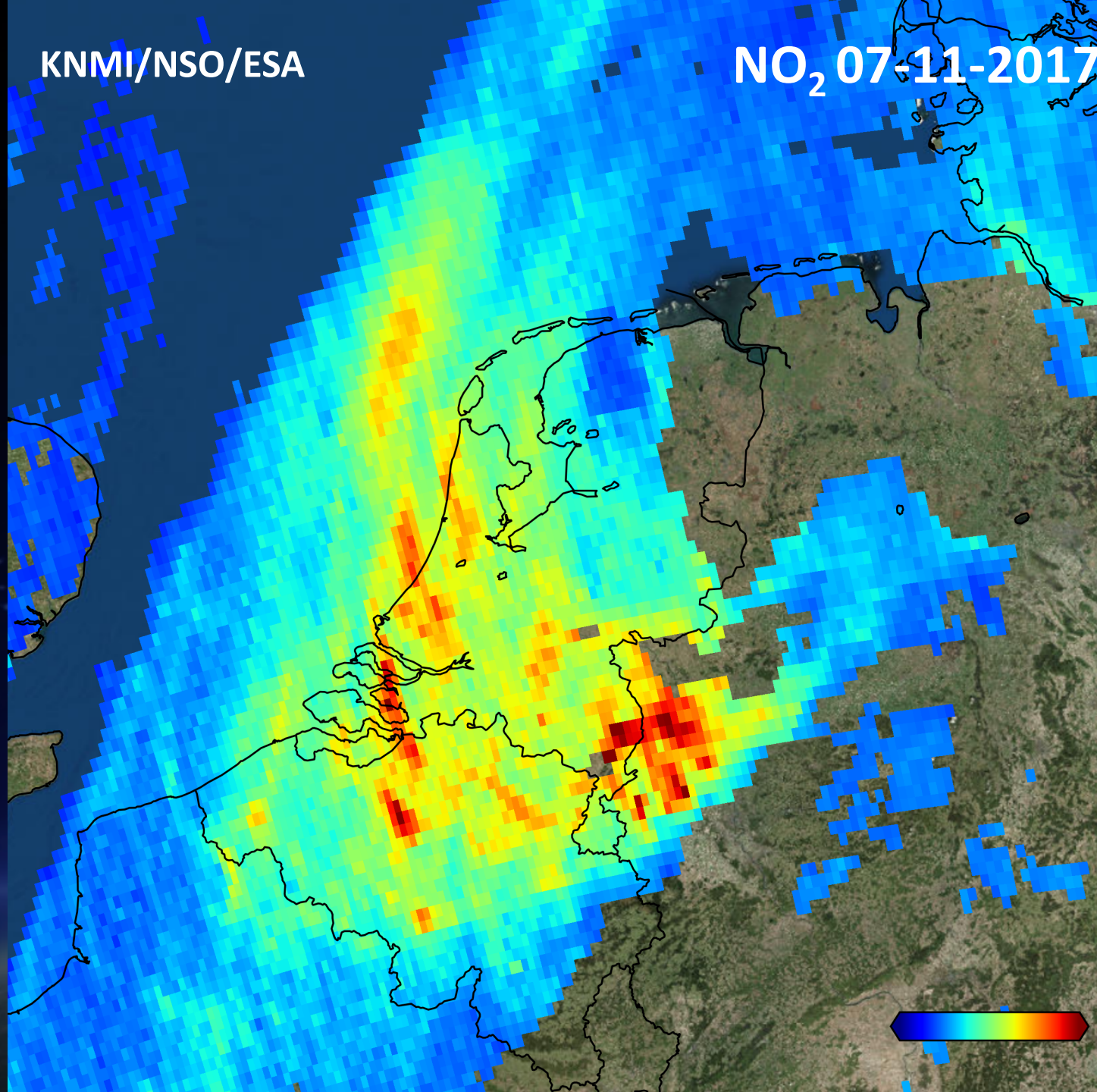


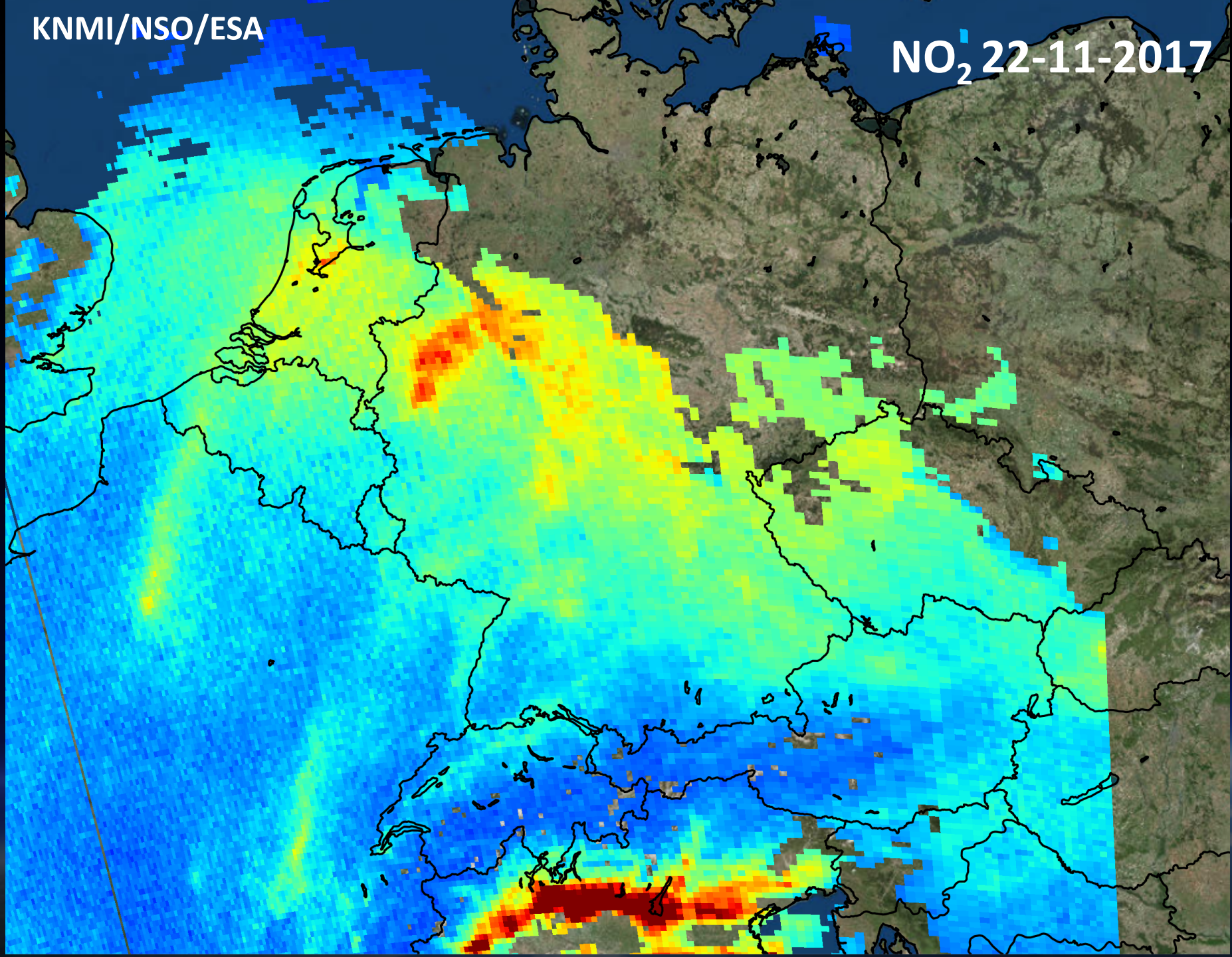
US Dept of State Geographer
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth

KNMI/NSO/ESA

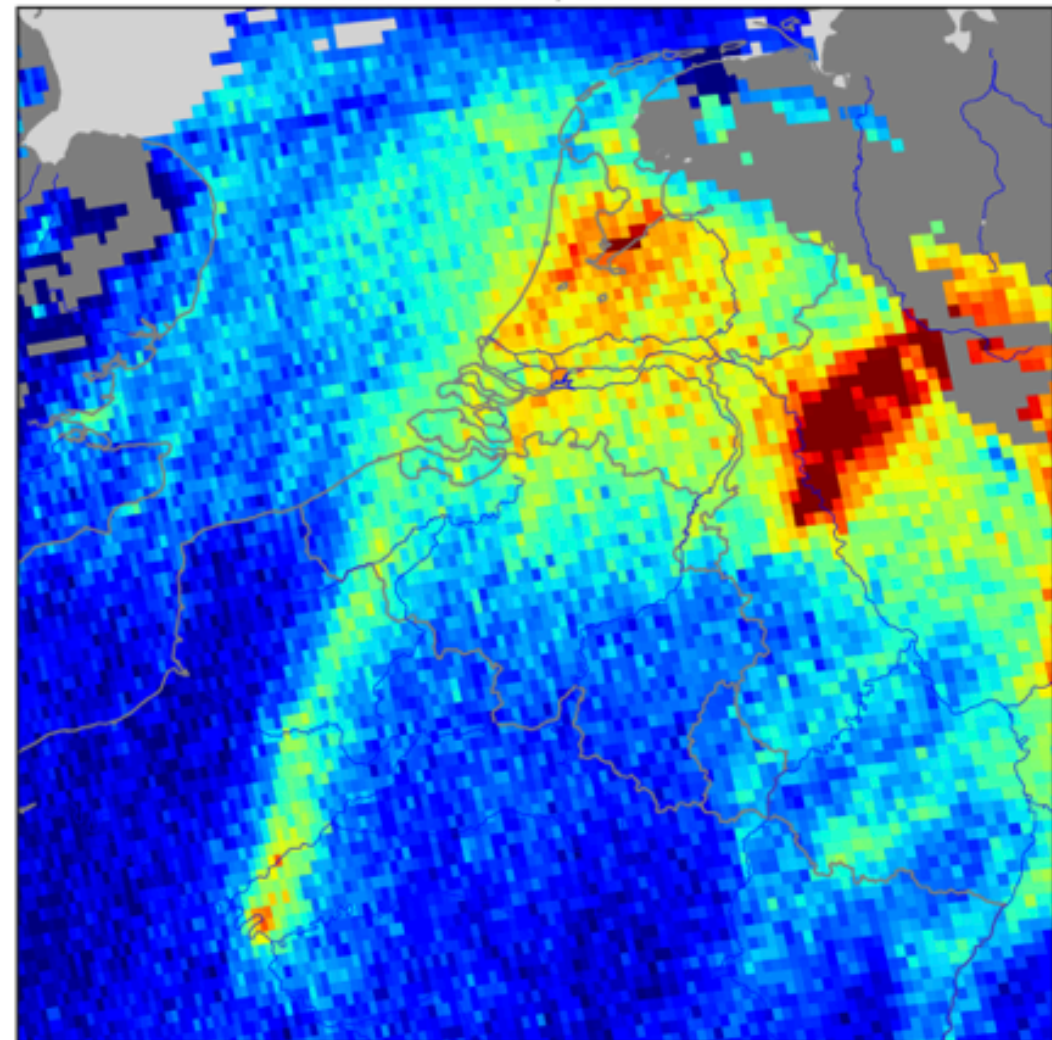
NO₂ 07-11-2017





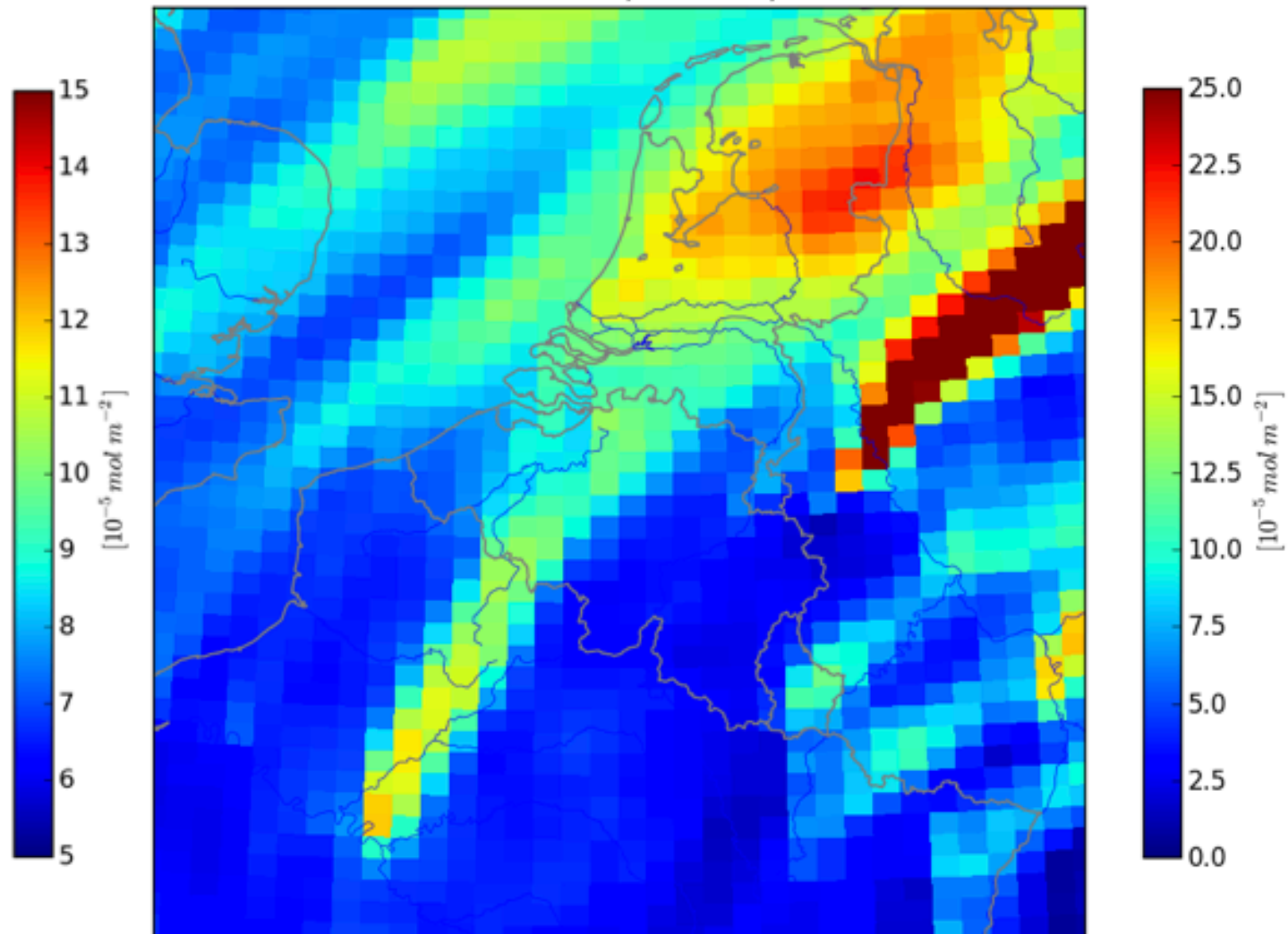
TROPOMI

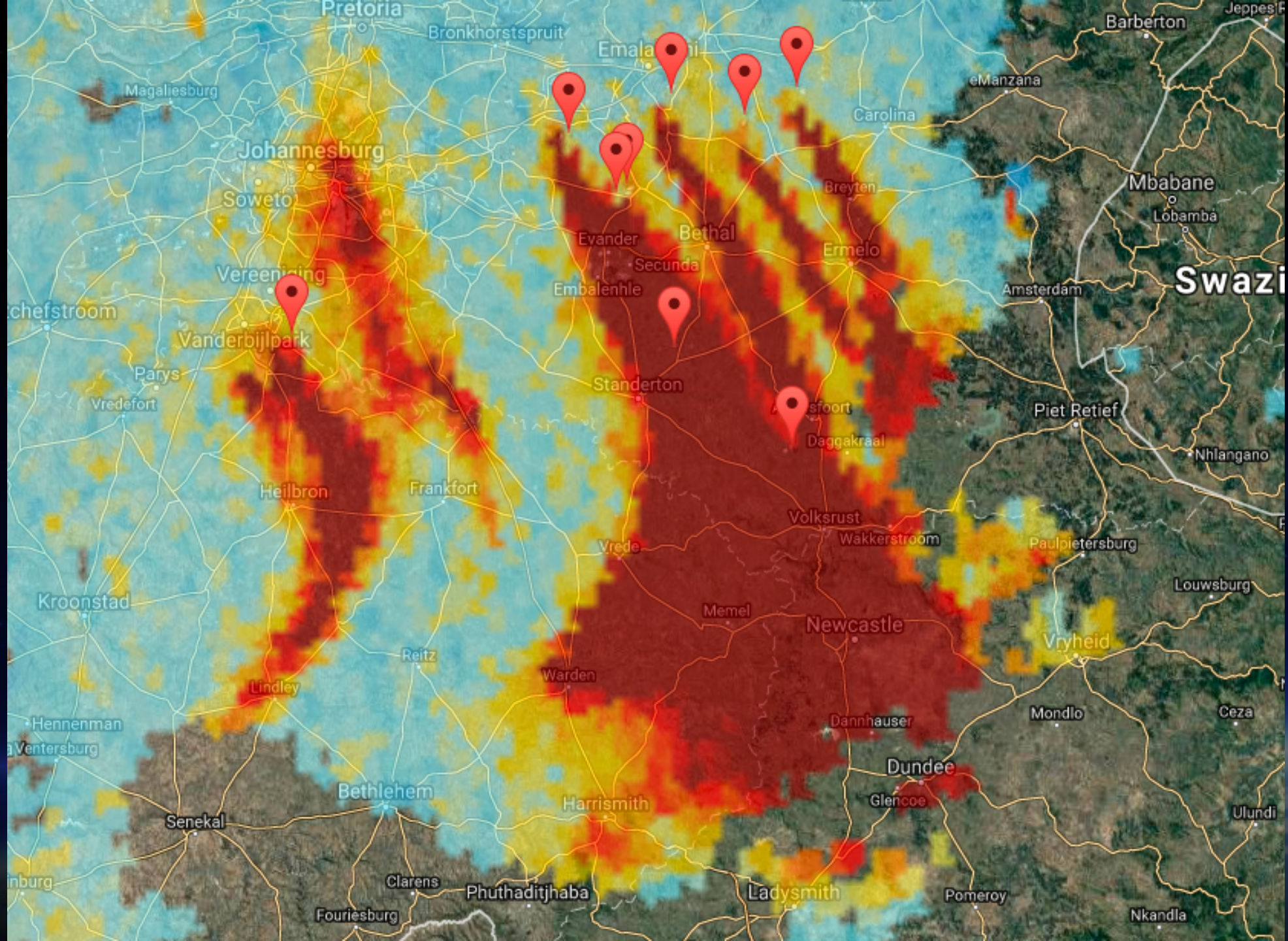
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EUROS-LOTOS MODEL

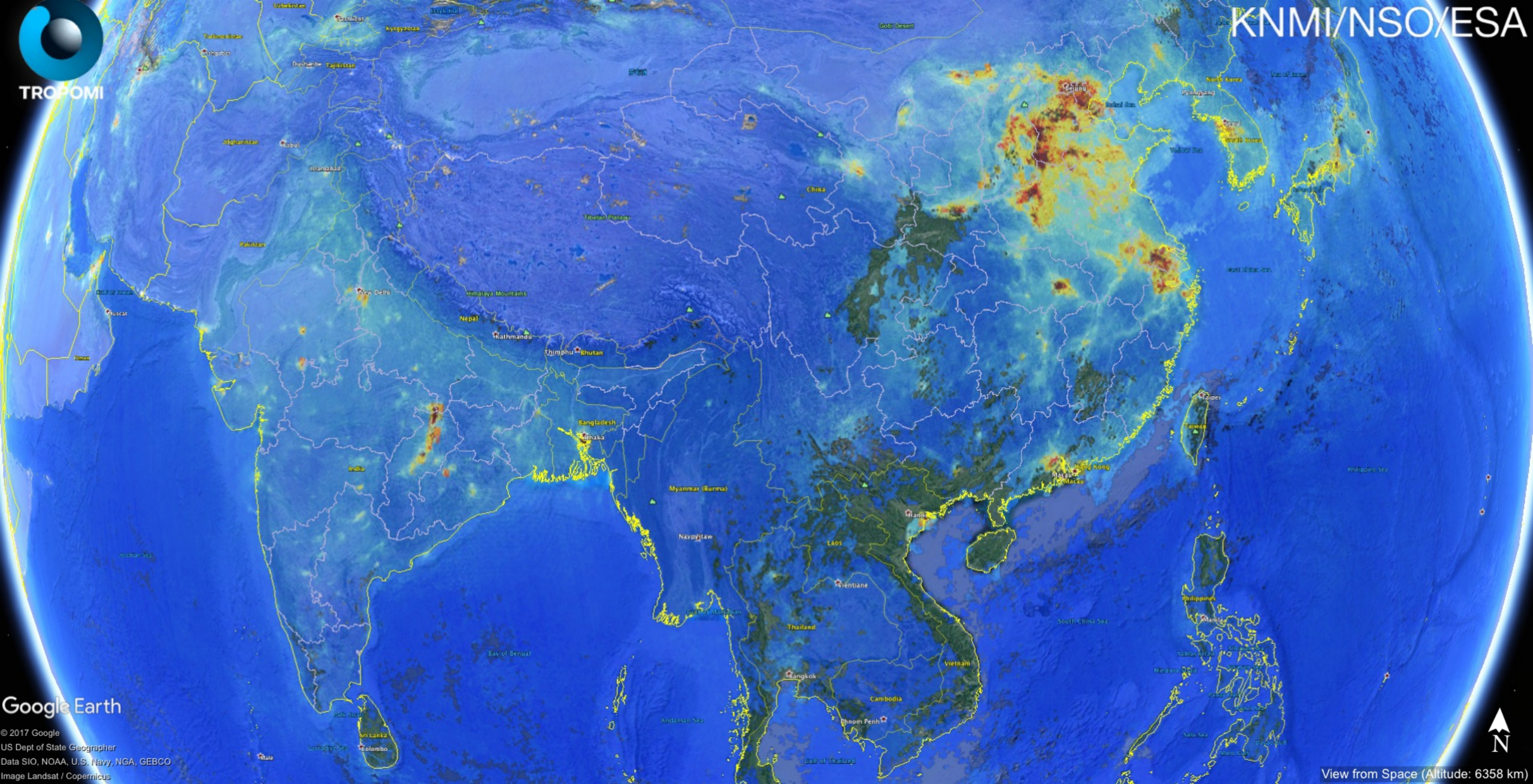
LOTOS-EUROS NO₂, 20171122, 12utc







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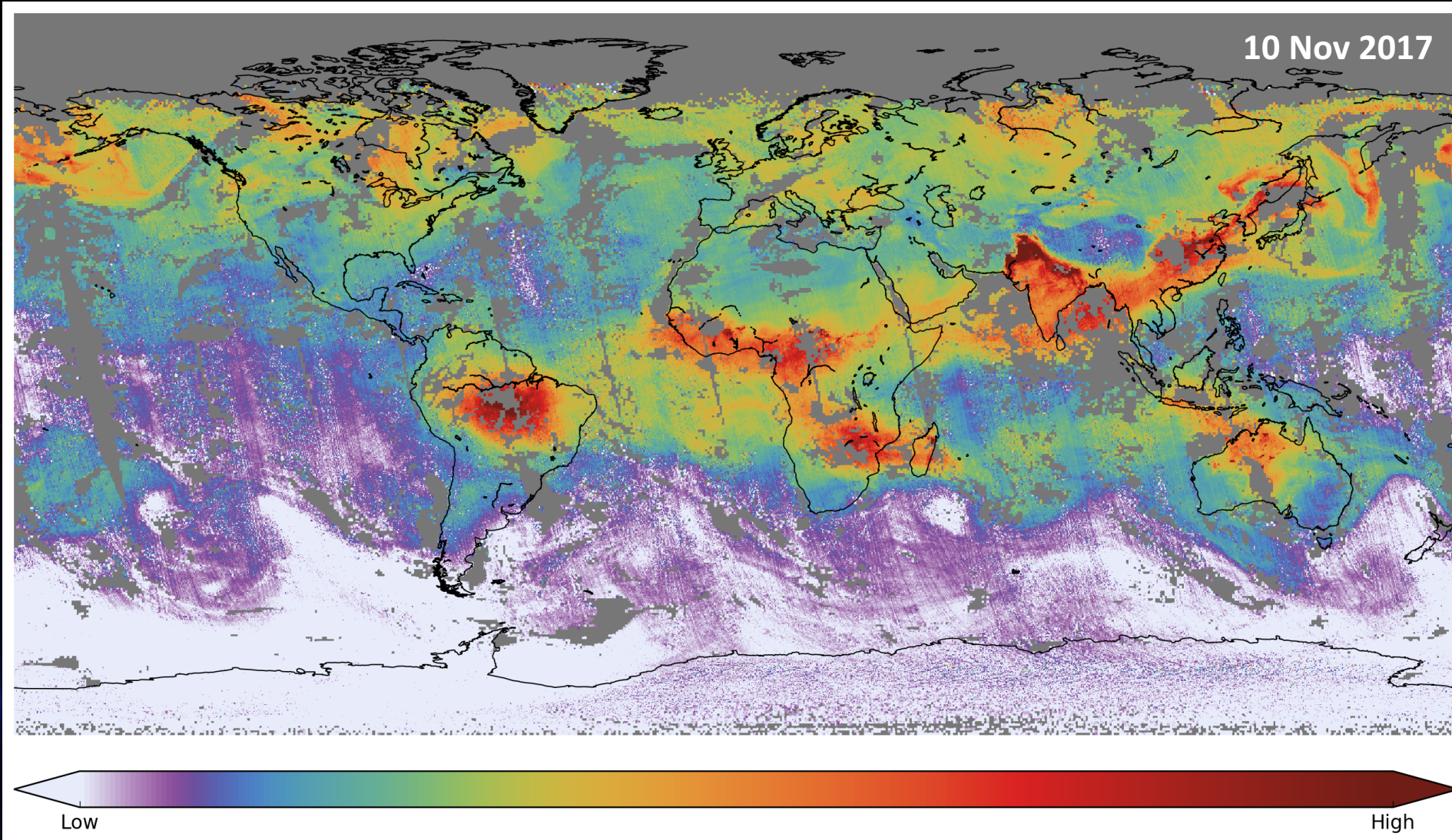
Google Earth

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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus



View from Space (Altitude: 6358 km)

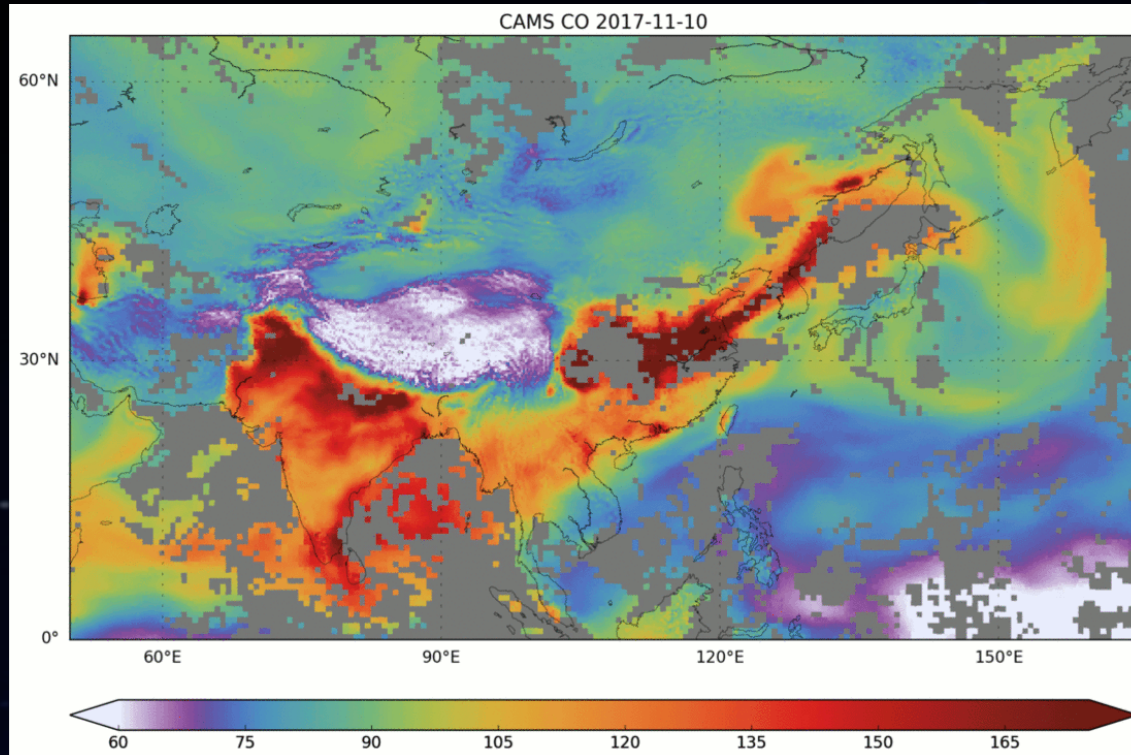
Carbon Monoxide



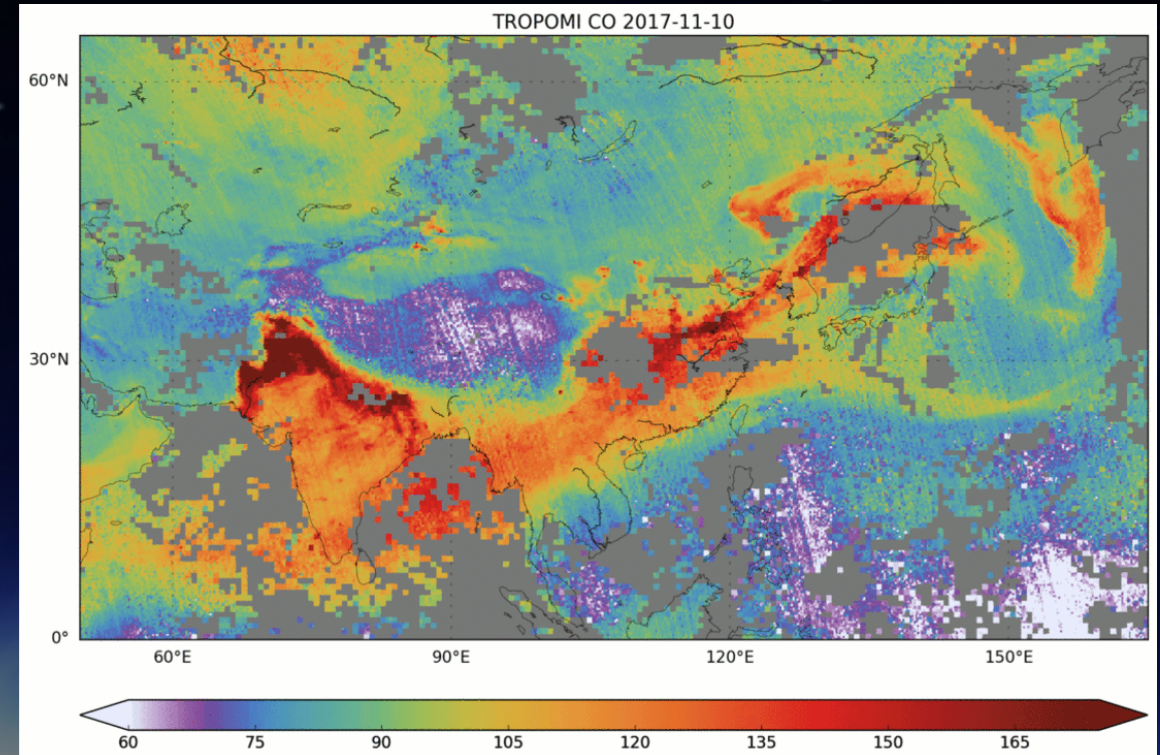
Credits: SRON

Carbon Monoxide: comparison to CAMS

CAMS



TROPOMI



CAMS includes:

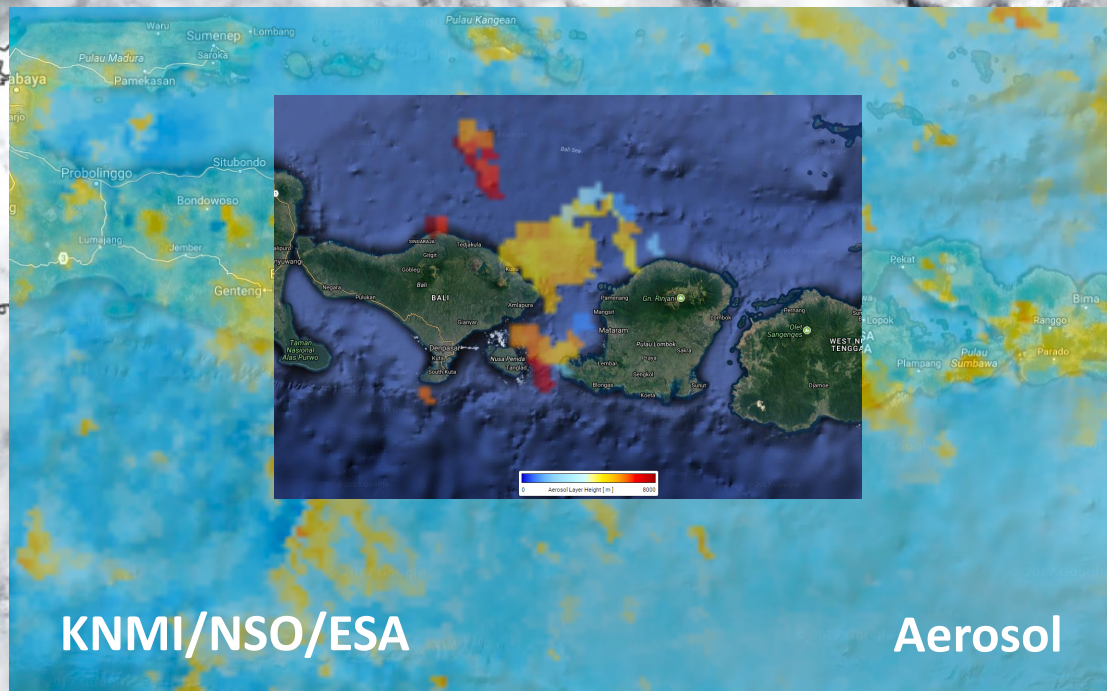
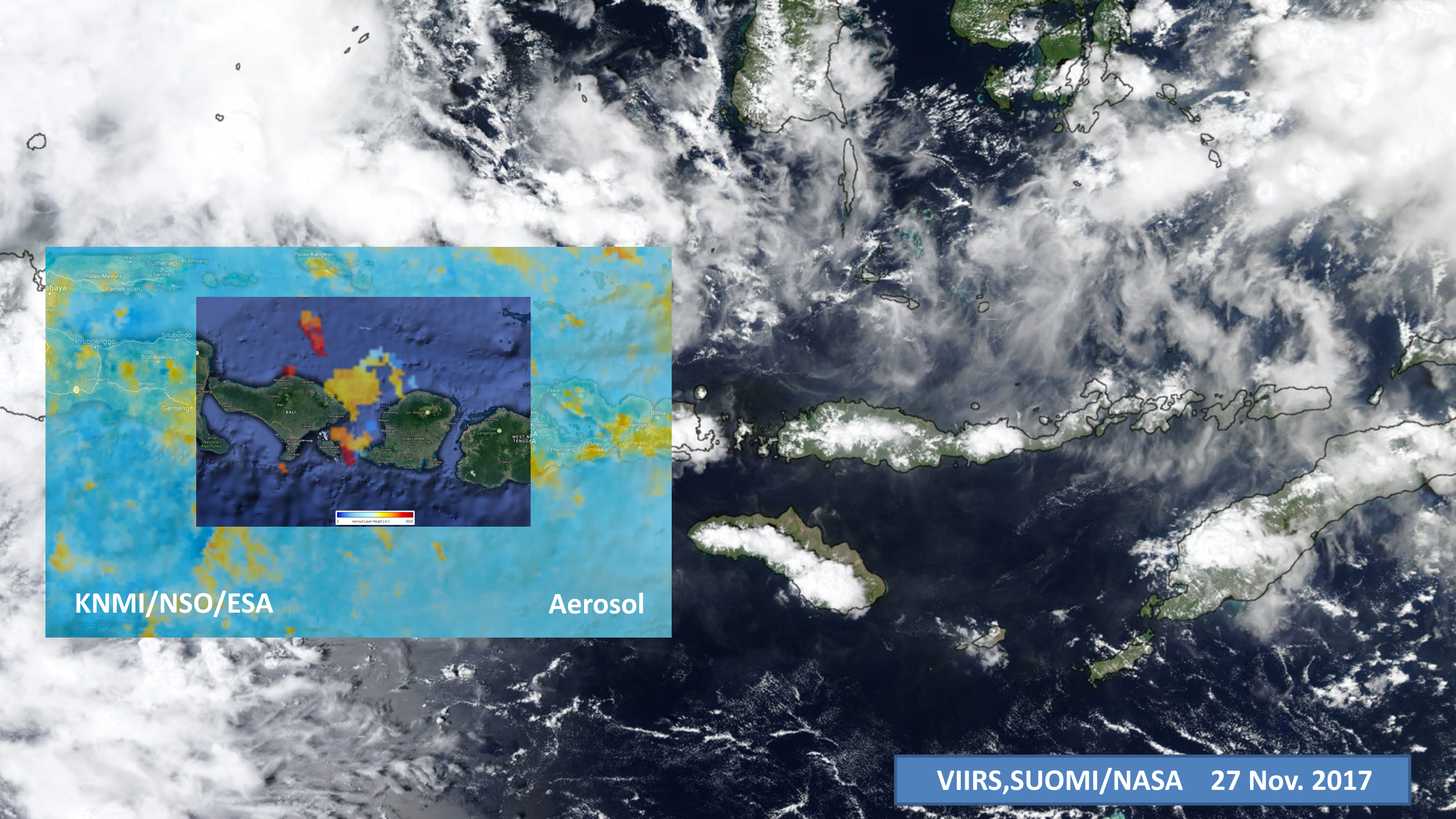
- GFAS actual fires
- MOPITT, IASI satellite data

Credits: SRON



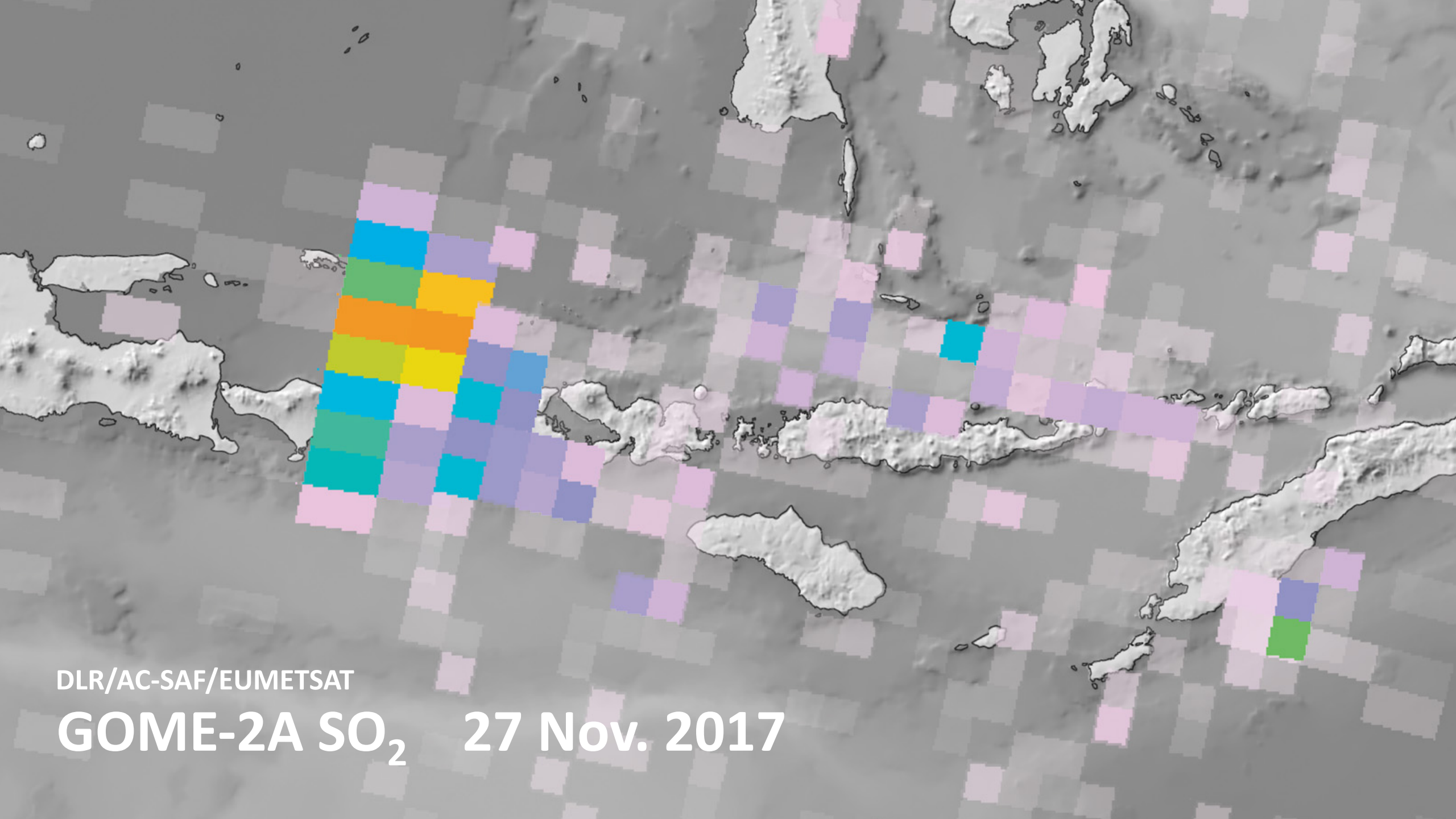
MOUNT AGUNG

REUTERS



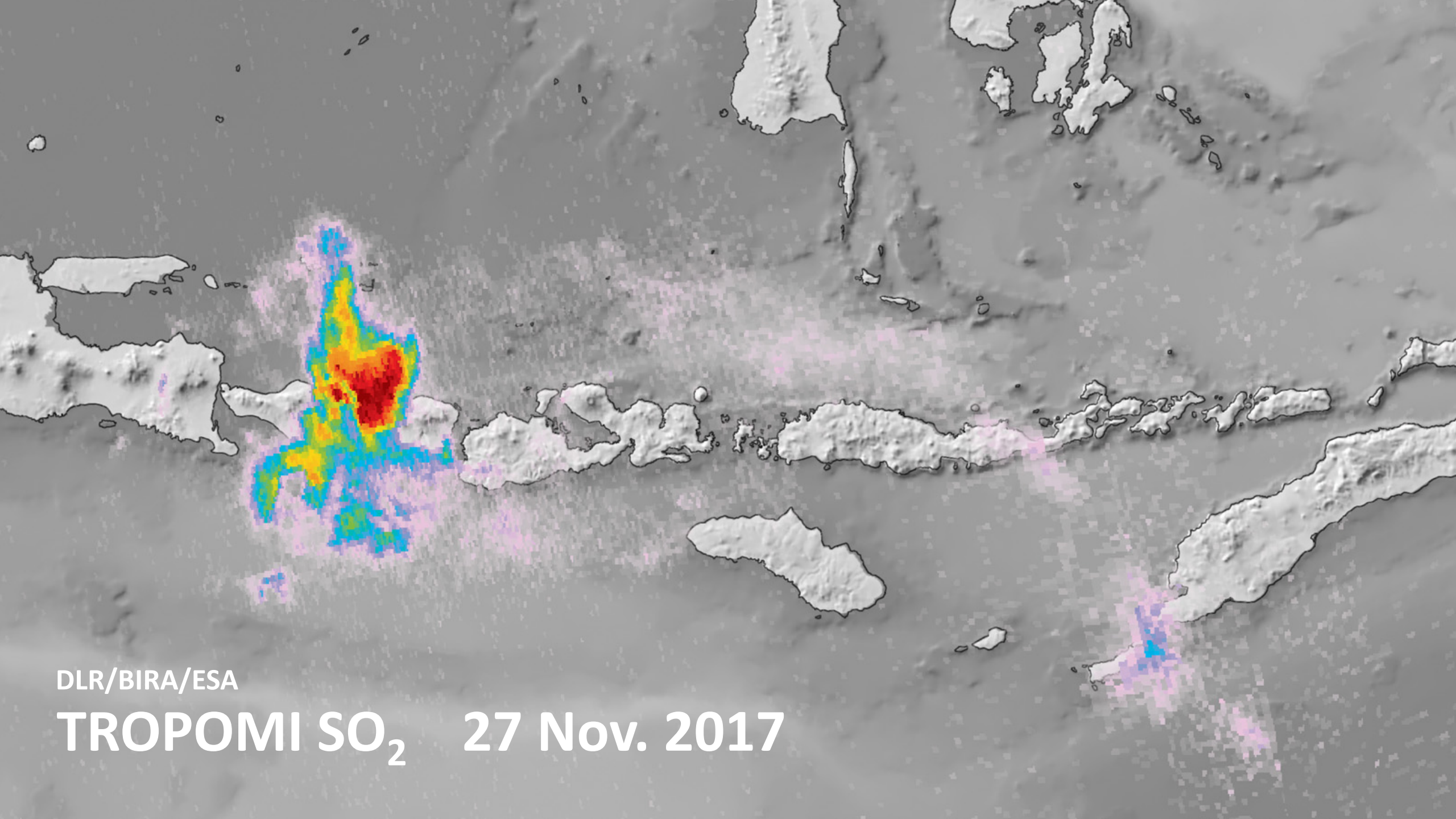
KNMI/NSO/ESA

Aerosol



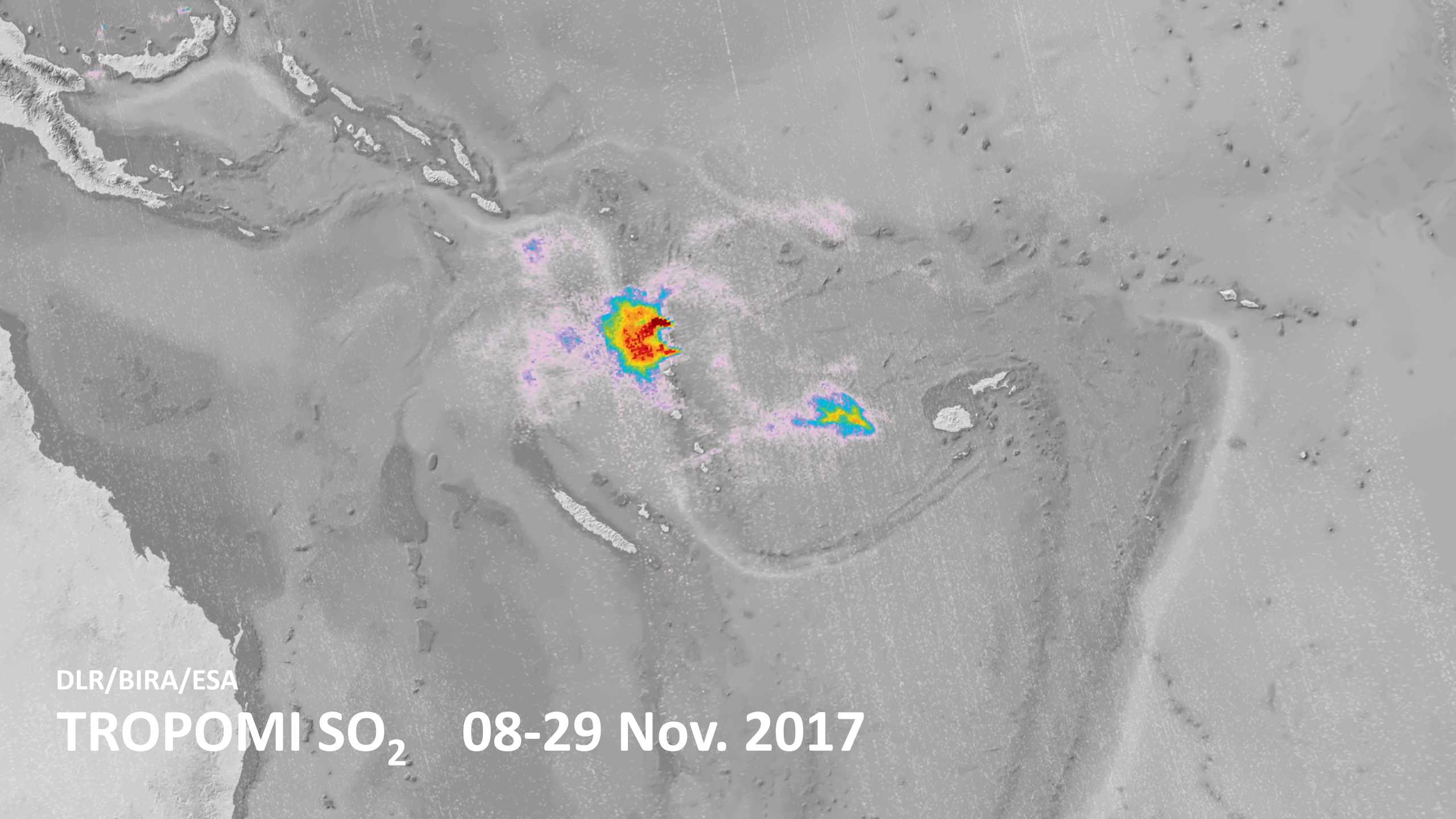
DLR/AC-SAF/EUMETSAT

GOME-2A SO₂ 27 Nov. 2017



DLR/BIRA/ESA

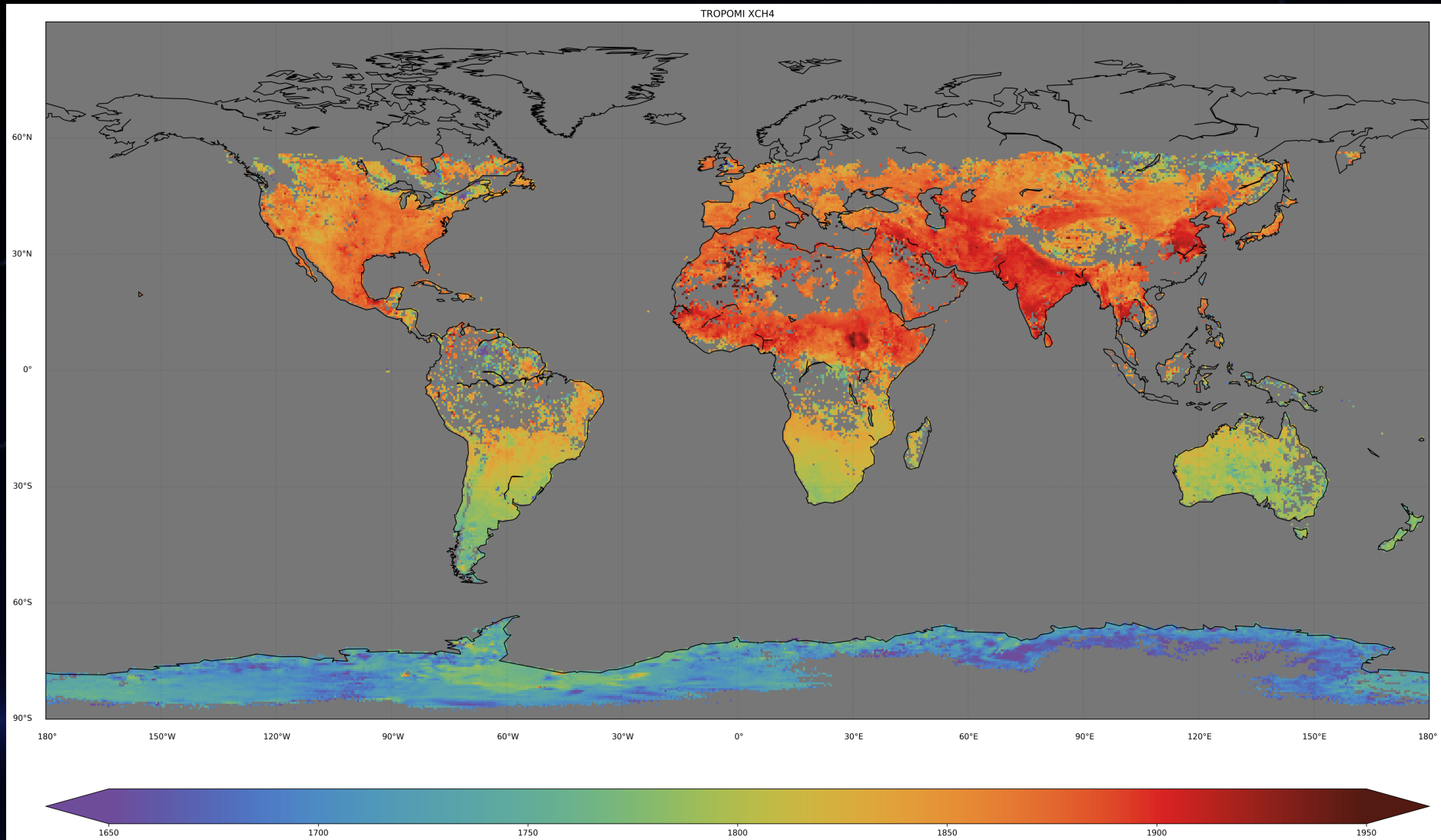
TROPOMI SO₂ 27 Nov. 2017



DLR/BIRA/ESA

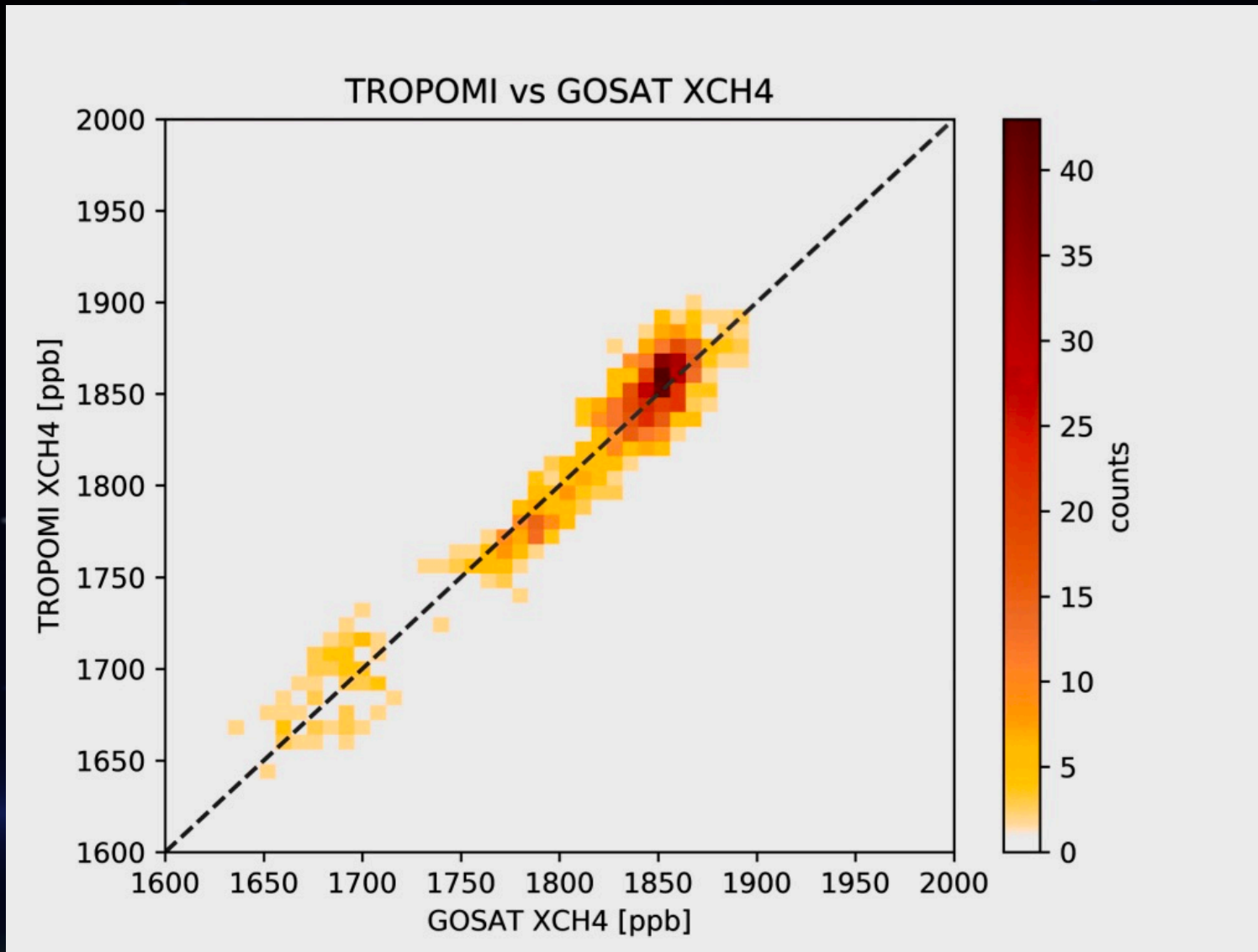
TROPOMI SO₂ 08-29 Nov. 2017

Methane XCH4



Credits: SRON

Methane: Comparison to GOSAT



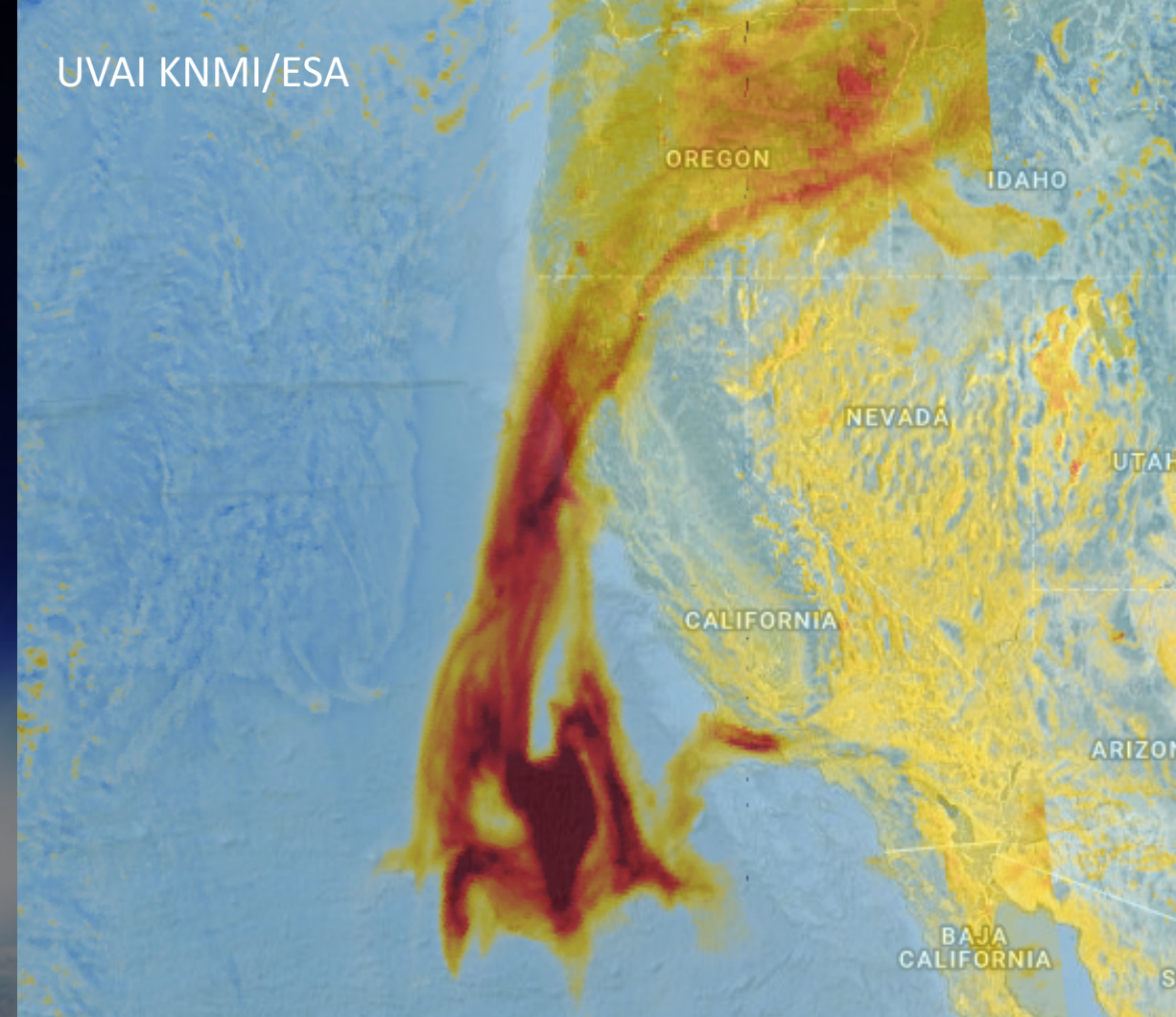
Credits: SRON

Forest Fires California 12-12-2017

MODIS

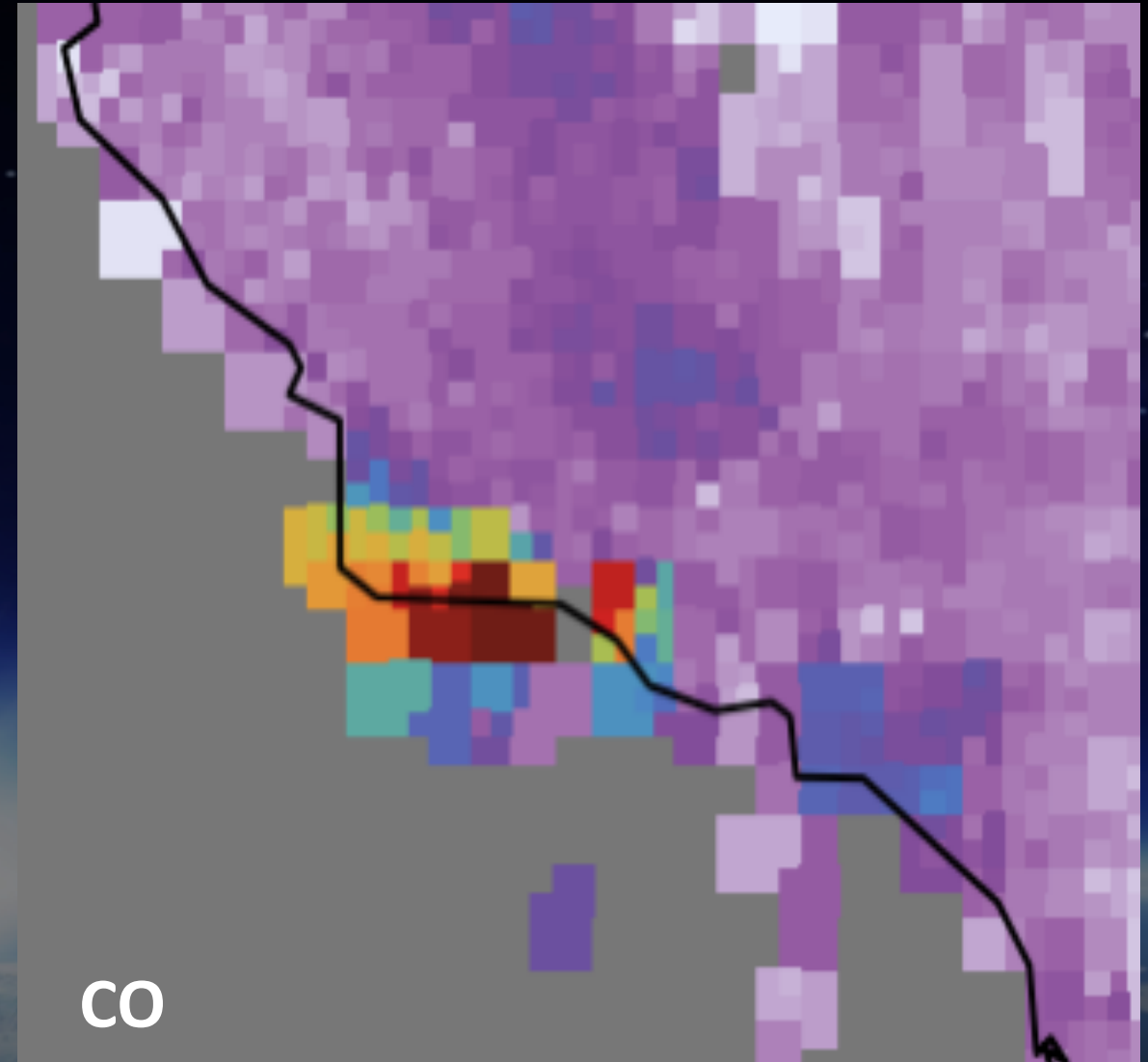
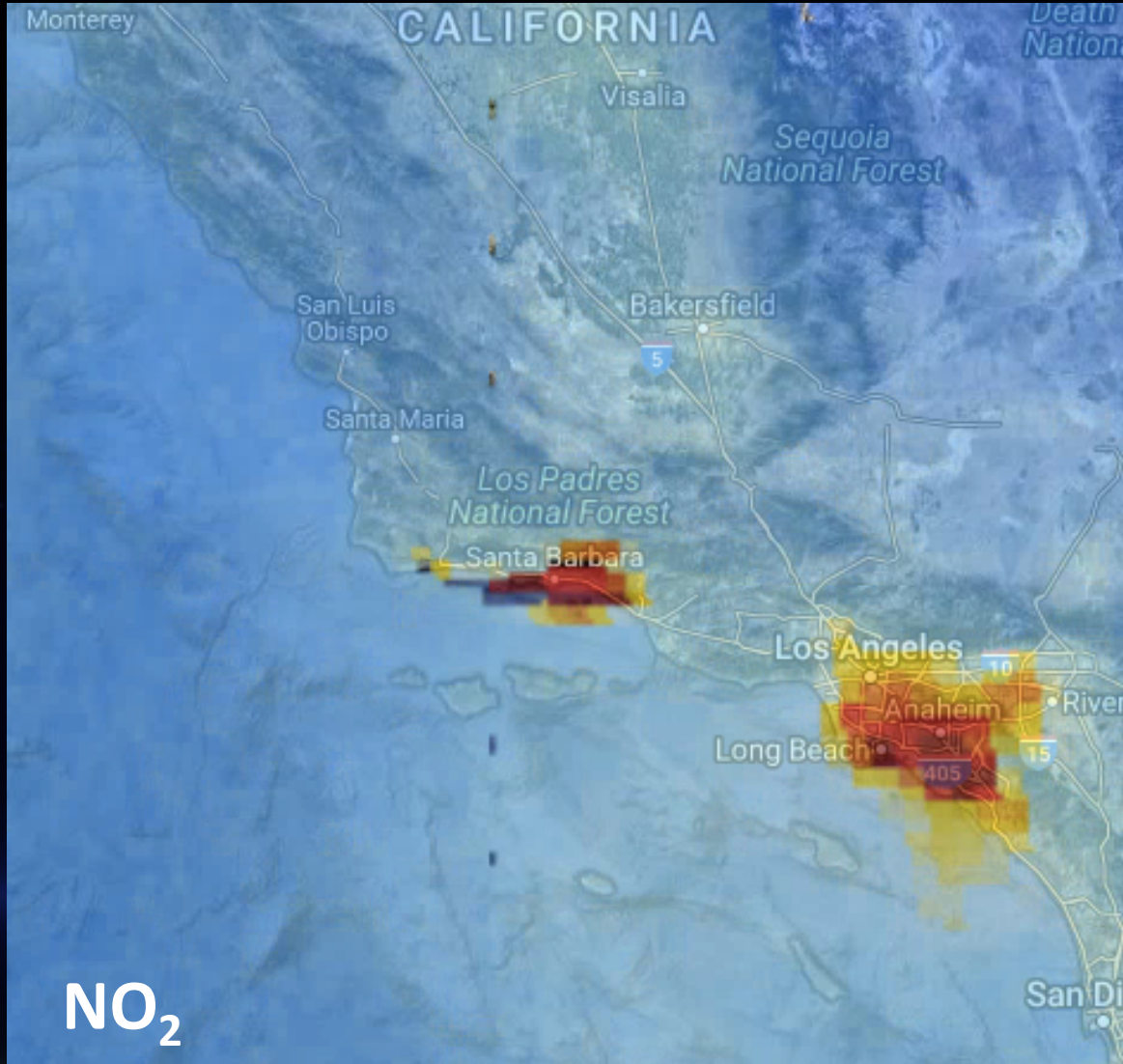


UVAI KNMI/ESA



Forest Fires California 12-12-2017

KNMI/SRON/ESA



Summary



- The TROPOMI performance is excellent.
- Commissioning activities are on schedule.
- Data release will start in May 2018.
- We are looking forward to work with the validation teams and users.

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[#tropomi](https://twitter.com/tropomi)

We thanks ESA, NSO, Airbus, TNO, DLR, TriopSys, S[&]T and NLR

