

NASA Giovanni Workshop

Applicant Visit Day 2018

Environmental Science



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Satellite Observations

Pass overhead
once per day

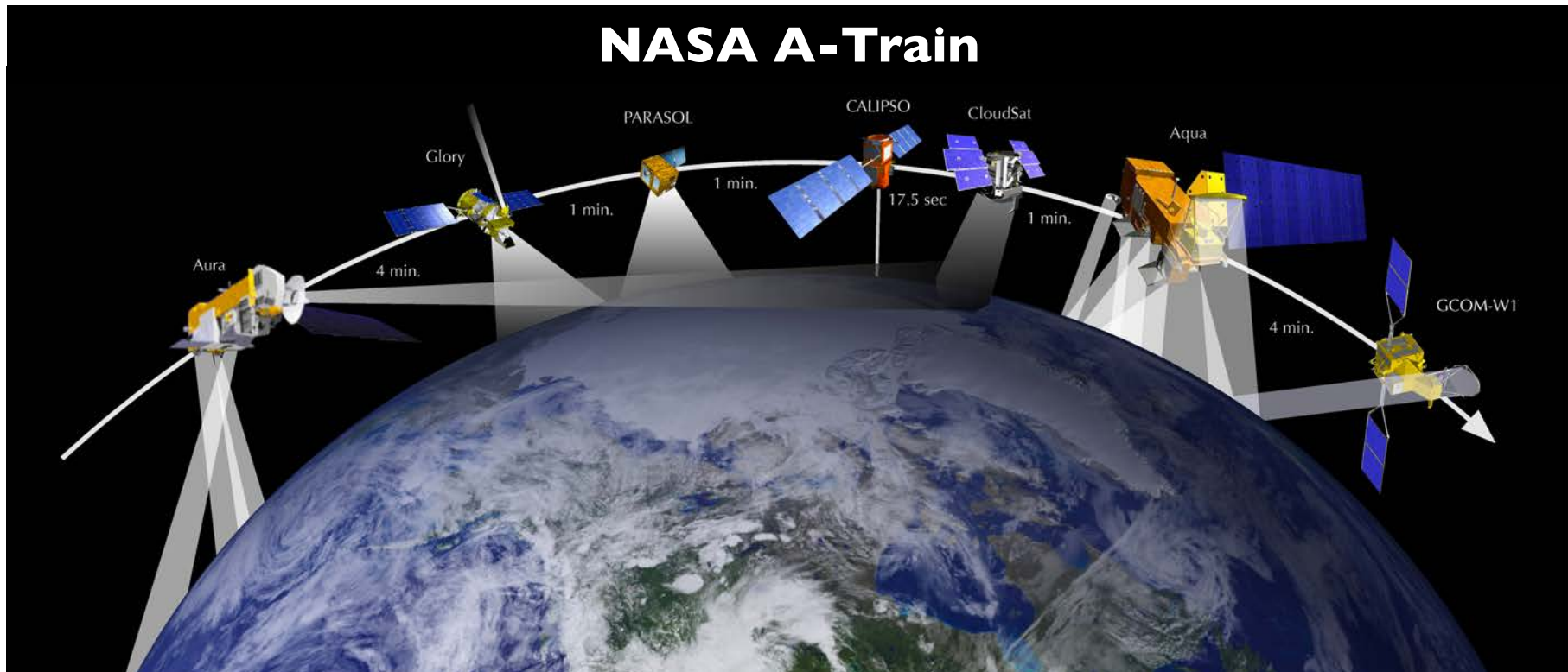
About 2000 km above
the Earth's surface



Global coverage

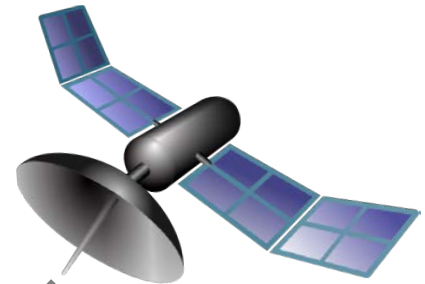
Earth observations of
the atmosphere,
cryosphere, land,
ocean

NASA A-Train



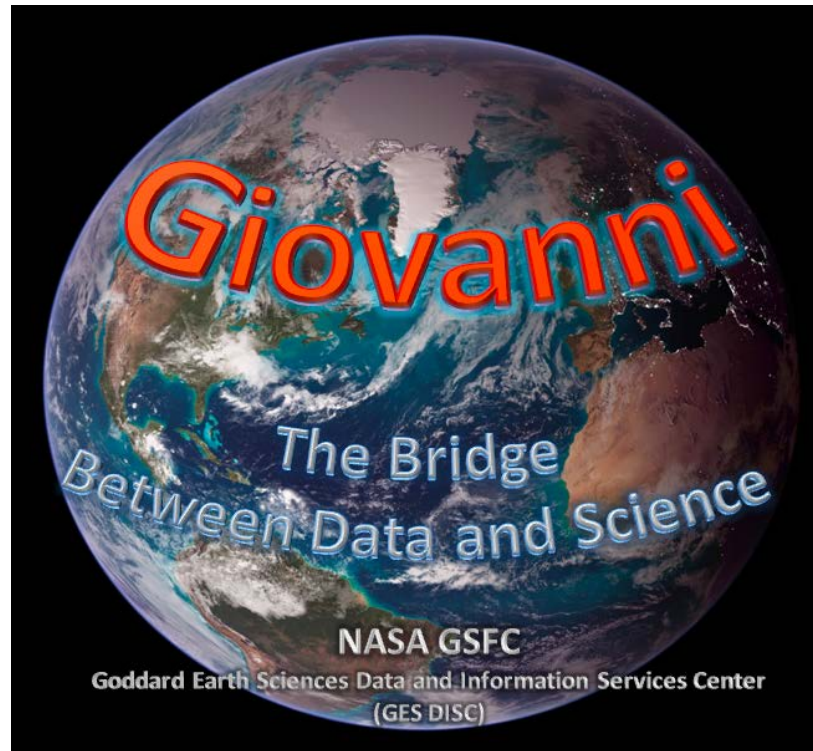
Use Satellite Observations in this Workshop to...

...look at the change in pollution in Europe from 2005 to 2015.



Giovanni Visualization Software


Online data processing portal to visualize NASA satellite observations and model output



Use the handout to generate maps of satellite observations of NO₂ in summer (June-August) **2005** and summer **2015**

Giovanni Visualization Software

Online interface

 **EARTHDATA**

Data Discovery ▾ DAACs ▾ Community ▾ Science Disciplines ▾

GIOVANNI The Bridge Between Data and Science v 4.24 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#) [Earthdata Login](#)

Time series area statistics temporarily unavailable ... [1 of 1 messages] [Read More](#)

Select Plot

☒ Maps: Time Averaged Map ▾ ☐ Comparisons: Select... ▾ ☐ Vertical: Select... ▾ ☐ Time Series: Select... ▾ ☐ Miscellaneous: Select... ▾



Select Date Range (UTC)

YYYY-MM-DD. HH:mm

- to -

Select Region (Bounding Box or Shape)

Format: West, South, East, North

Valid Range: 1948-01-01 to 2018-02-01

Select Variables

▼ Disciplines

☐ Aerosols (187)
☐ Atmospheric Chemistry (92)
☐ Atmospheric Dynamics (415)
☐ Cryosphere (13)
☐ Hydrology (1083)
☐ Ocean Biology (72)
☐ Oceanography (75)
☐ Water and Energy Cycle (1155)

▼ Measurements

☐ Aerosol Index (5)
☐ Aerosol Optical Depth (87)
☐ Air Pressure Anomaly (1)
☐ Air Pressure (53)
☐ Air Temperature Anomaly (2)
☐ Air Temperature (96)
☐ Albedo (24)
☐ Altitude (8)
☐ Angstrom Exponent (20)
☐ Atmospheric Moisture (117)
☐ Black Carbon (5)
☐ Buoyancy (2)
☐ CH4 (17)
☐ CO (30)
☐ CO2 (2)
☐ Canopy Water Storage (6)
☐ Chlorophyll (18)

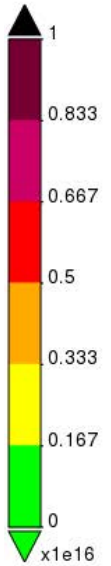
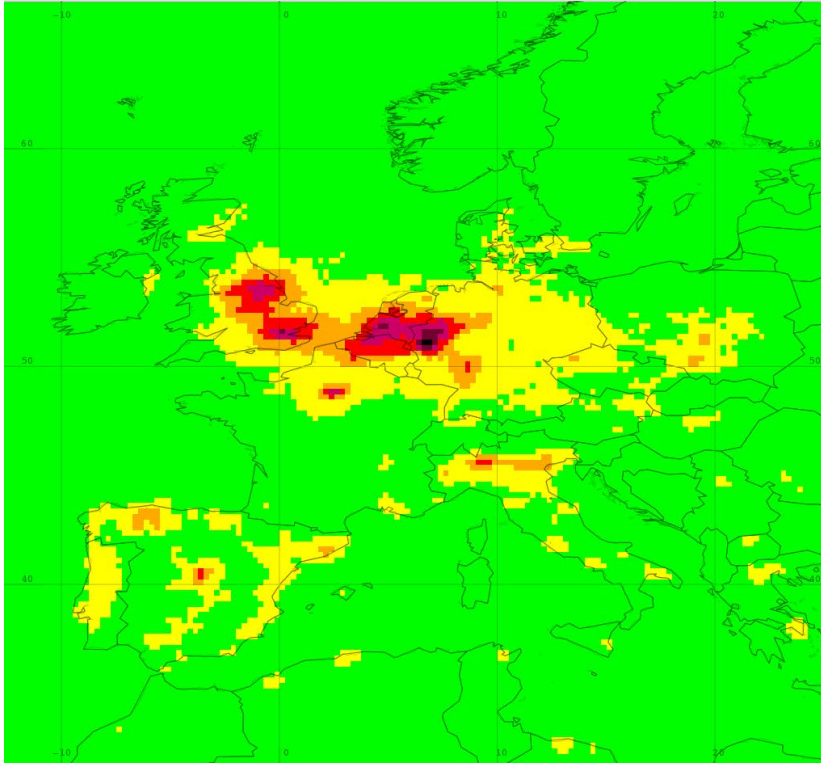
Number of matching Variables: 0 of 1896 Total Variable(s) included in Plot: 0

Keyword :

Giovanni generated maps of NO₂

NO₂ in June-August 2005

Time Averaged Map of NO₂ Tropospheric Column (30% Cloud Screened) daily 0.25 deg. [OMI OMNO2d v003] 1/cm²
over 2005-06-01 - 2005-08-30, Region 12.6562W, 31.6406N, 25.3125E, 66.7969N

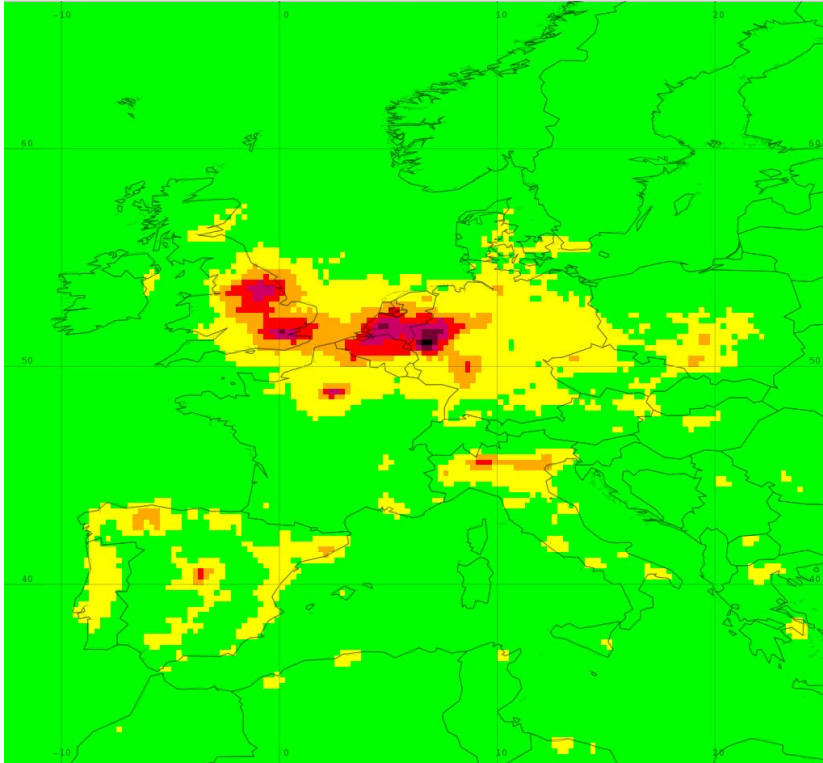


Units: molecules cm⁻²

Giovanni generated maps of NO₂

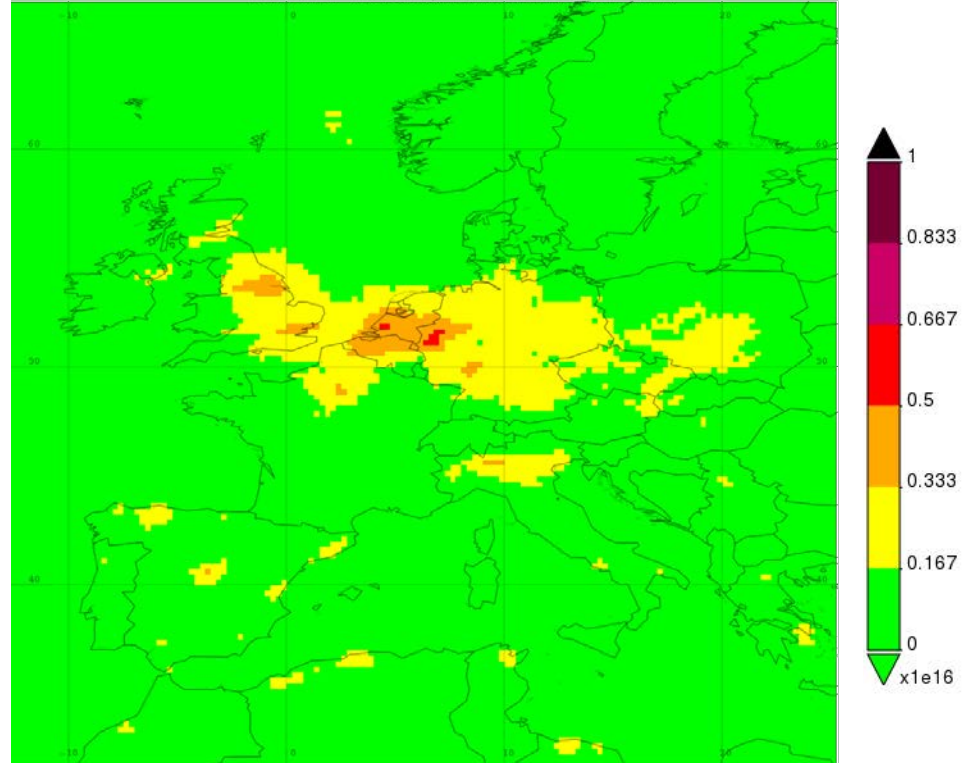
NO₂ in June-August 2005

Time Averaged Map of NO₂ Tropospheric Column (30% Cloud Screened) daily 0.25 deg. [OMI OMNO2d v003] 1/cm²
over 2005-06-01 - 2005-08-30, Region 12.6562W, 31.6406N, 25.3125E, 66.7969N



NO₂ in June-August 2015

Time Averaged Map of NO₂ Tropospheric Column (30% Cloud Screened) daily 0.25 deg. [OMI OMNO2d v003] 1/cm²
over 2015-06-01 - 2015-08-30, Region 12.6562W, 31.6406N, 25.3125E, 66.7969N



Units: molecules cm⁻²

What features are clear in the map on the left?

What are the differences?

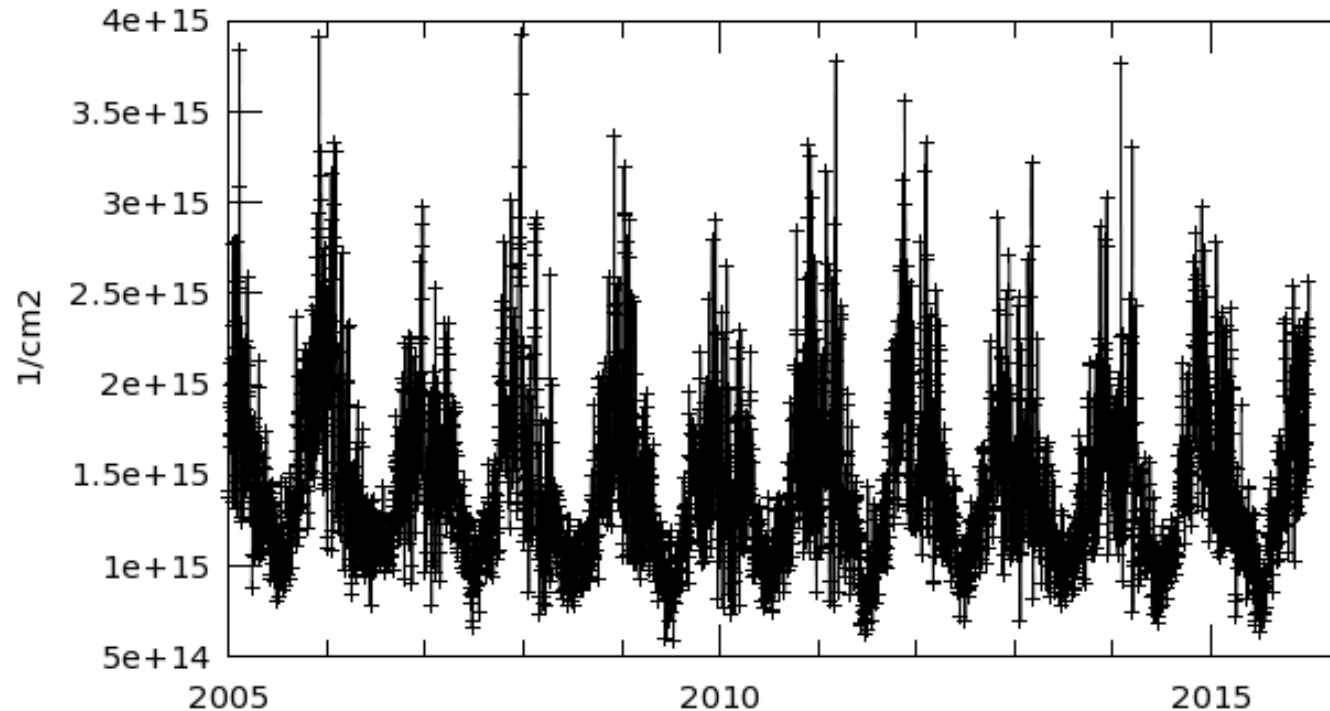
Which year had worse air quality (air pollution)?

Do you think pollution controls are working in Europe?

Also output time series

Time series of daily mean NO₂

(The same European domain as in the handout)



Time consuming: took over 2 hours to generate this plot

Not able to customize the plot after it's generated

Also use Giovanni to generate animations and compare different datasets

Giovanni can also be used to visualize other pollutants and greenhouse gases

AEROSOLS

CARBON DIOXIDE
(CO₂)

CARBON MONOXIDE
(CO)

FORMALDEHYDE
(HCHO)

METHANE
(CH₄)

OZONE
(O₃)

SULFUR DIOXIDE
(SO₂)