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<http://sacs.aeronomie.be>

Volcanic eruptions can eject large amounts of ash (aerosols) and trace gases, such as sulphur dioxide (SO₂), into the atmosphere. These can have a considerable impact on air traffic safety (ash clogs sensors, melts in engines) and on human health.

The Support to Aviation Control Service (**SACS**) delivers in near-real time data and images of SO₂ and aerosol (ash) emissions to monitor volcanic clouds. In case of an exceptional concentration of SO₂, an alert is sent by email to Users, pointing them to a web page with relevant information on the plume related to a volcanic eruption. **SACS is a free service available through a single user-friendly web portal** (hosted by BIRA).

Key Users of the service:

The Volcanic Ash Advisory Centres (**VAACs**): official organisations issuing advices and alerts to airlines and air traffic control organisations on hazardous volcanic clouds.

Others Users:

- volcanic observatories
- atmospheric monitoring institutes
- flight captains

System operation: synergistic use of UV-visible and infrared polar-orbiting satellites data



Figure 1: Polar-orbiting satellites equatorial overpass solar local times

Instruments	Data type	Overpass time	Resolution (km ²)	Data products	Participants	Units	Delay
SCIAMACHY (ENVISAT)	UV/visible	10:00 am	30x60	SO ₂ vertical columns Absorbing aerosol index	BIRA KNMI	DU -	2-3 h 2-3 h
OMI (Aura)	UV/visible	01:30 am	13x24	SO ₂ vertical columns Absorbing aerosol index	NASA/KNMI/FMI KNMI	DU -	2-3 h (EU: 45') 2-3 h
GOME-2 (MetOp-A)	UV/visible	09:30 pm	40x80	SO ₂ vertical columns SO ₂ plume height Absorbing aerosol index	DLR BIRA KNMI	DU km -	1-2 h off-line 2-3 h
IASI (MetOp-A)	Infrared	09:30 am 09:30 pm	12x12	SO ₂ index (and columns) Ash indicator	ULB ULB	K (DU) K	1-2 h 1-2 h
AIRS (Aqua)	Infrared	01:30 am 01:30 pm	15x15	SO ₂ index	JPL	K	1-2 h

Table 1: List of data products available from SACS.

Global multi-sensor satellite monitoring of volcanic SO₂ and ash

A multi-sensor alert system based on 5 instruments (available since April 2012) :

- Alerts only focus on volcanic eruptions (avoid false alerts)
- One email is sent to Users
per 12 hours
and
per predefined
30°x30° region
- Alert web page with interpolated plot and google earth files

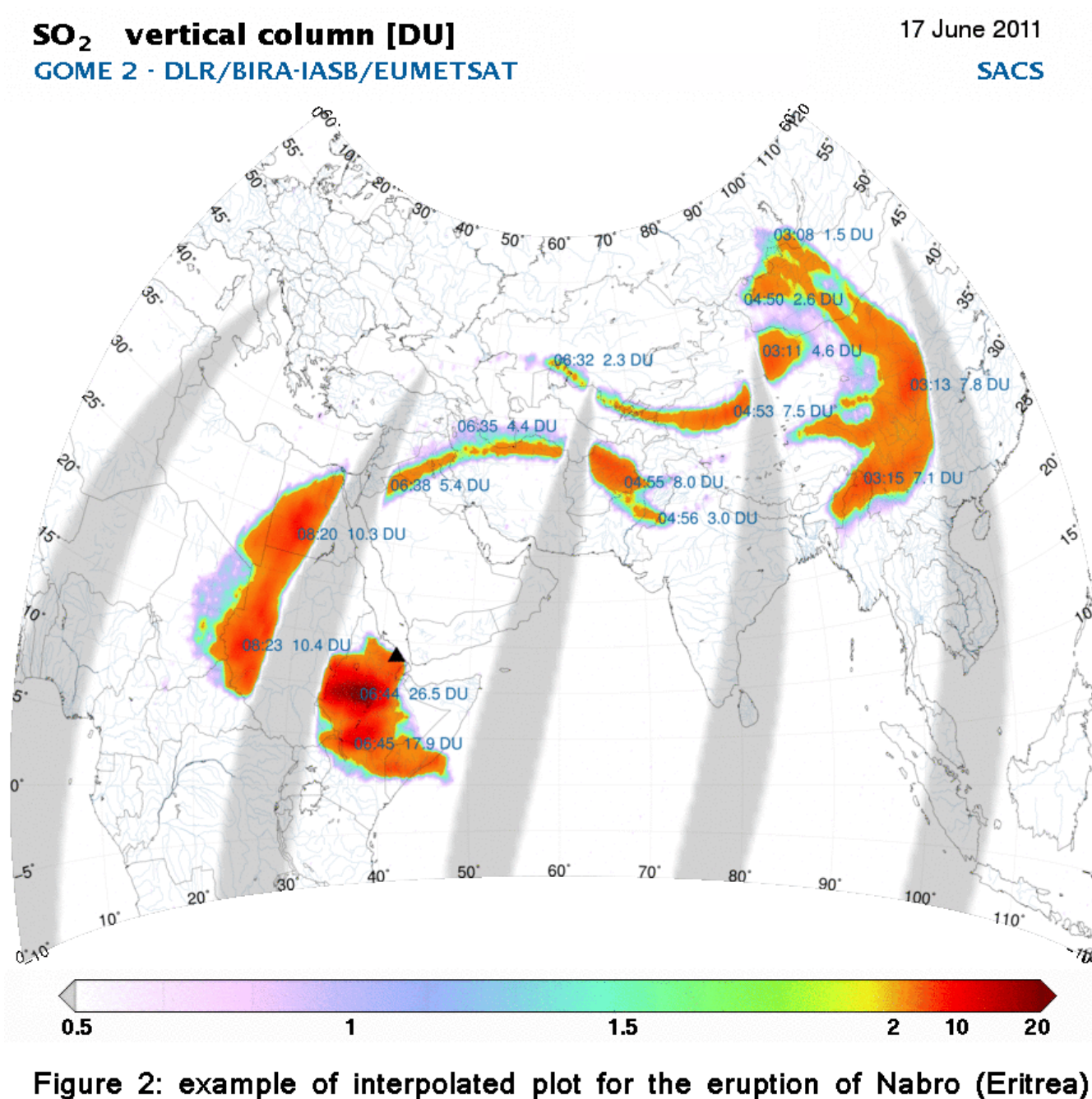


Figure 2: example of interpolated plot for the eruption of Nabro (Eritrea)

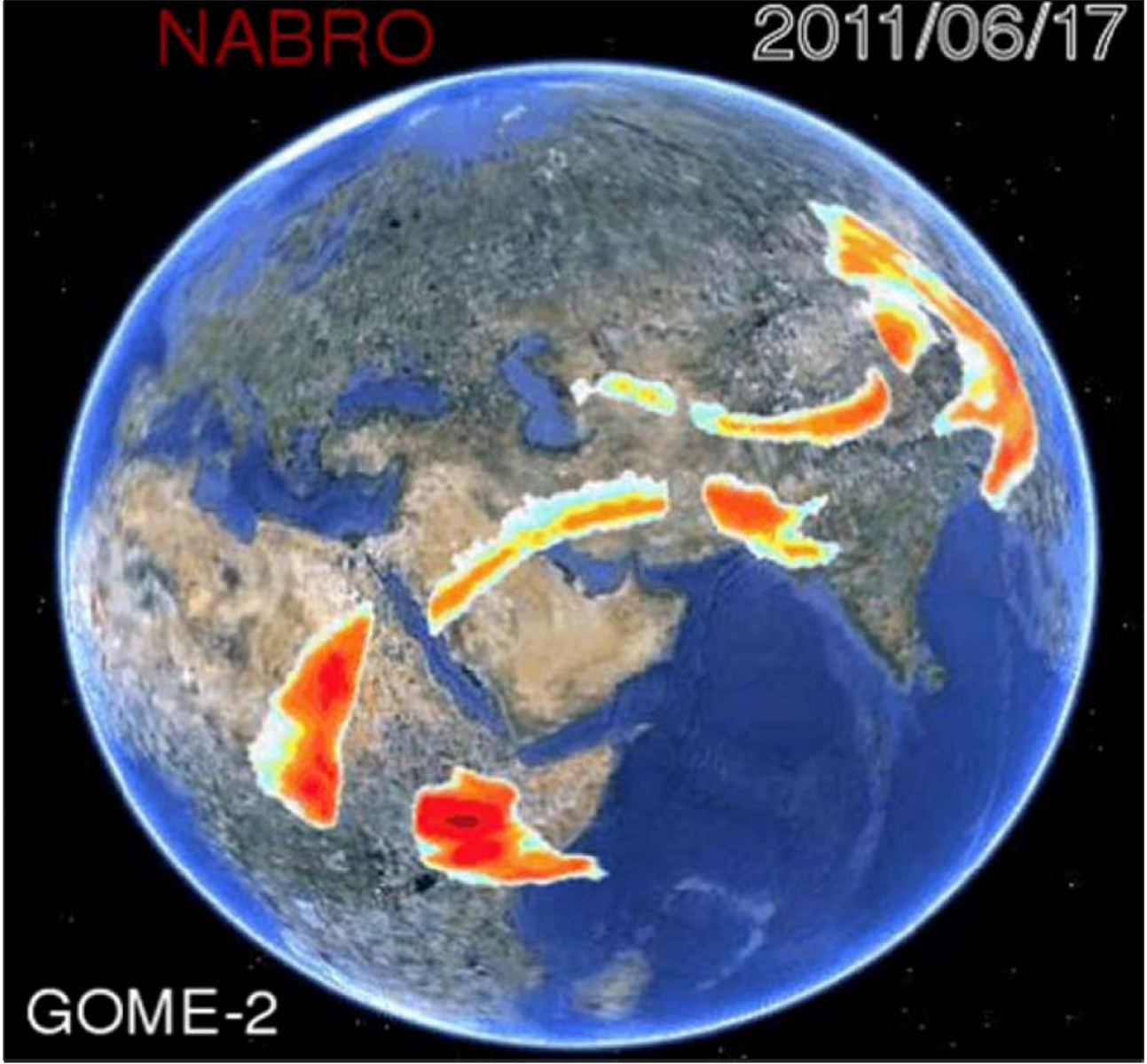


Figure 3: example of google earth image (Nabro eruption)

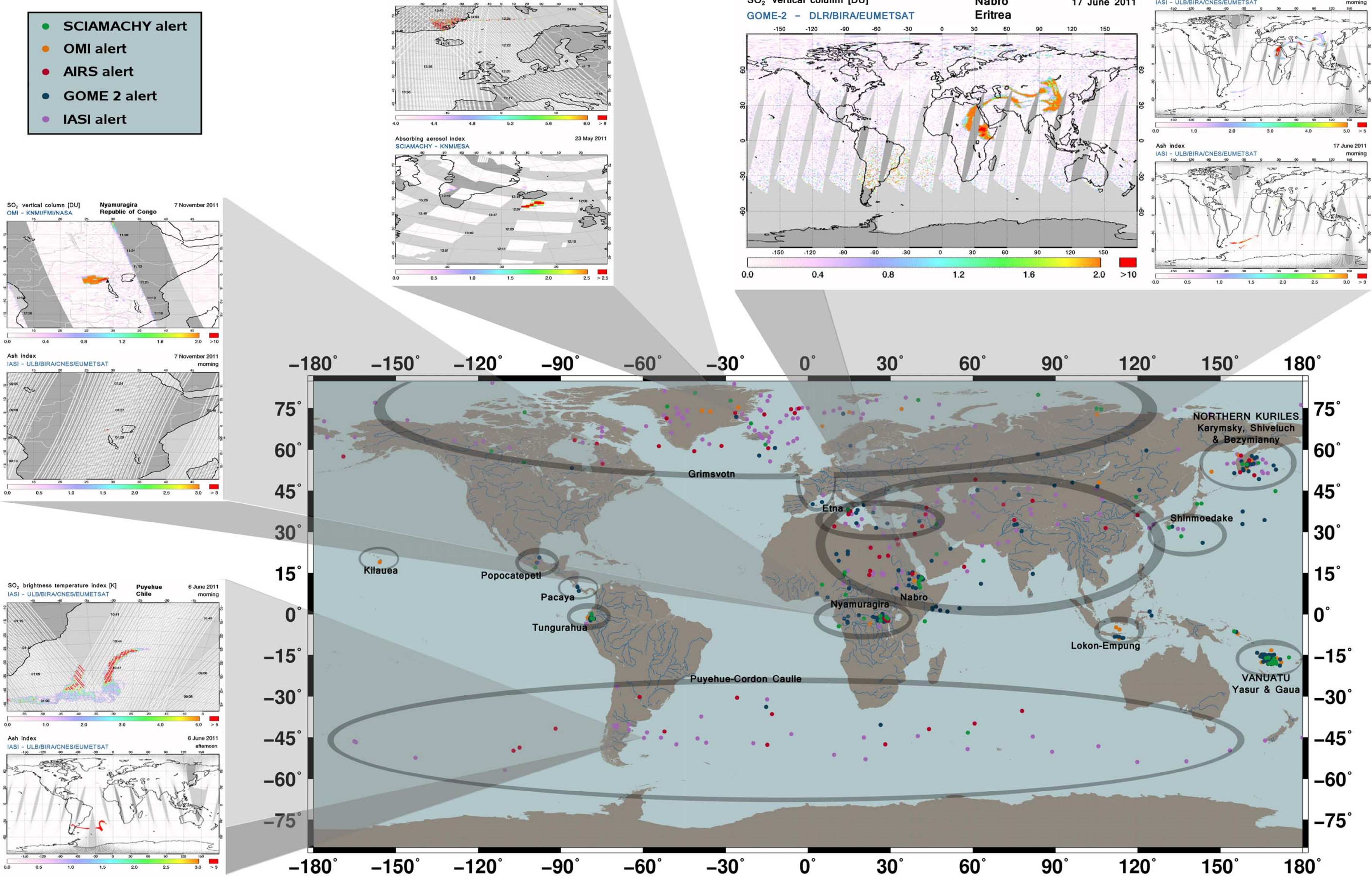


Figure 4: SO₂ alerts identified by a multi-sensor approach for year 2011

- After a notification, all subsequent alerts within the next 12 hours are made available through the web portal