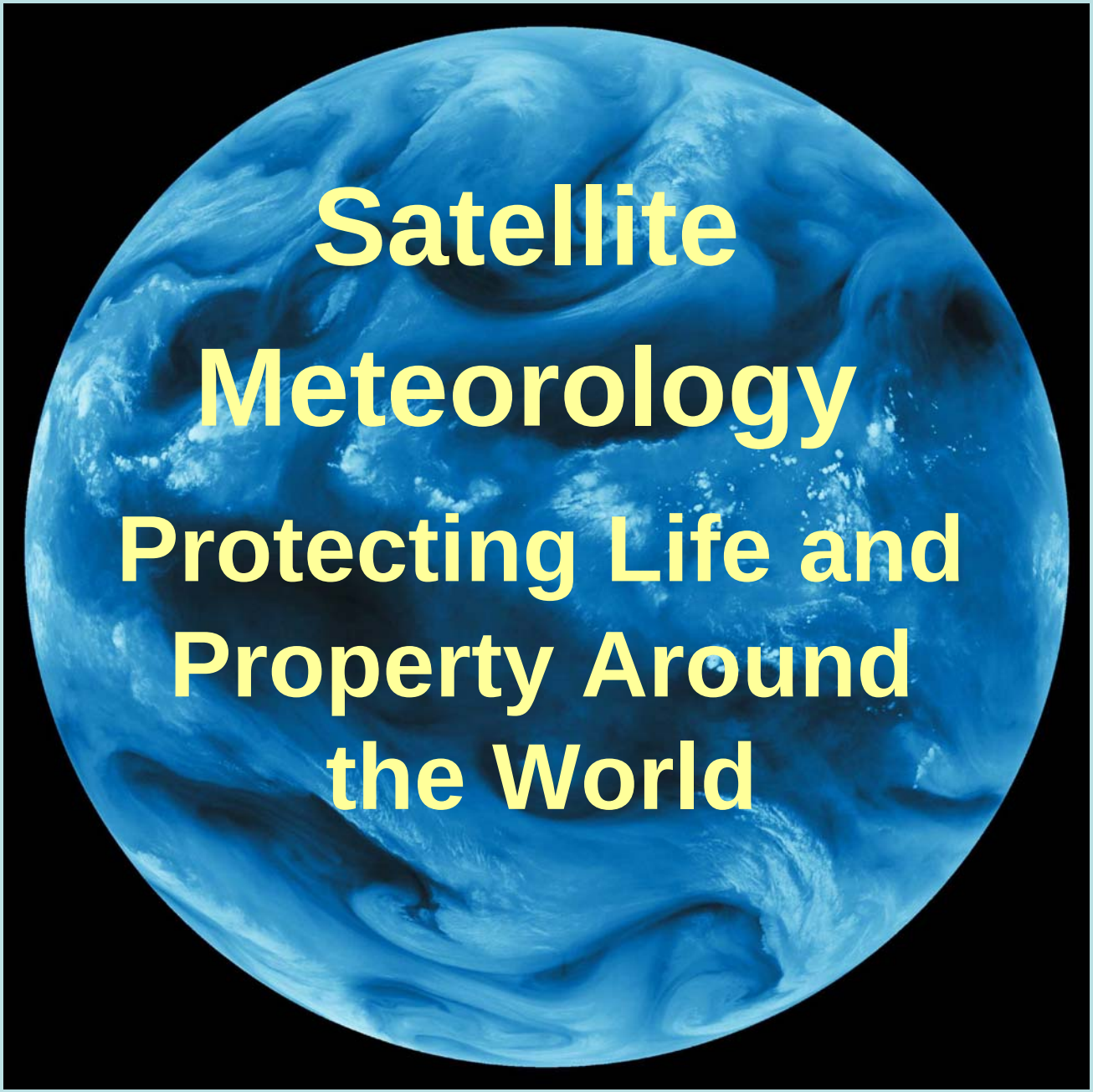
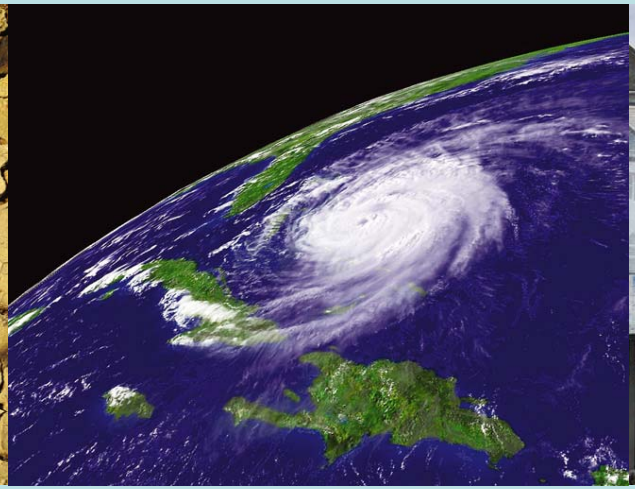

Satellite
Meteorology
Protecting Life and
Property Around
the World

The Value of Forecasting Severe Weather

- Flooding events across Europe in August 2002 cost in the region of €20 billion;
- 20,000 people died as a result of the summer heat wave in Europe in 2003;
- In summer 2004 annual monsoons left 5 million homeless and more than 1,800 dead in India, Nepal, and Bangladesh;
- An unusual number a major hurricanes struck the US between August and September in 2004 and 2005 killing a large number of people and causing $bns of damage.

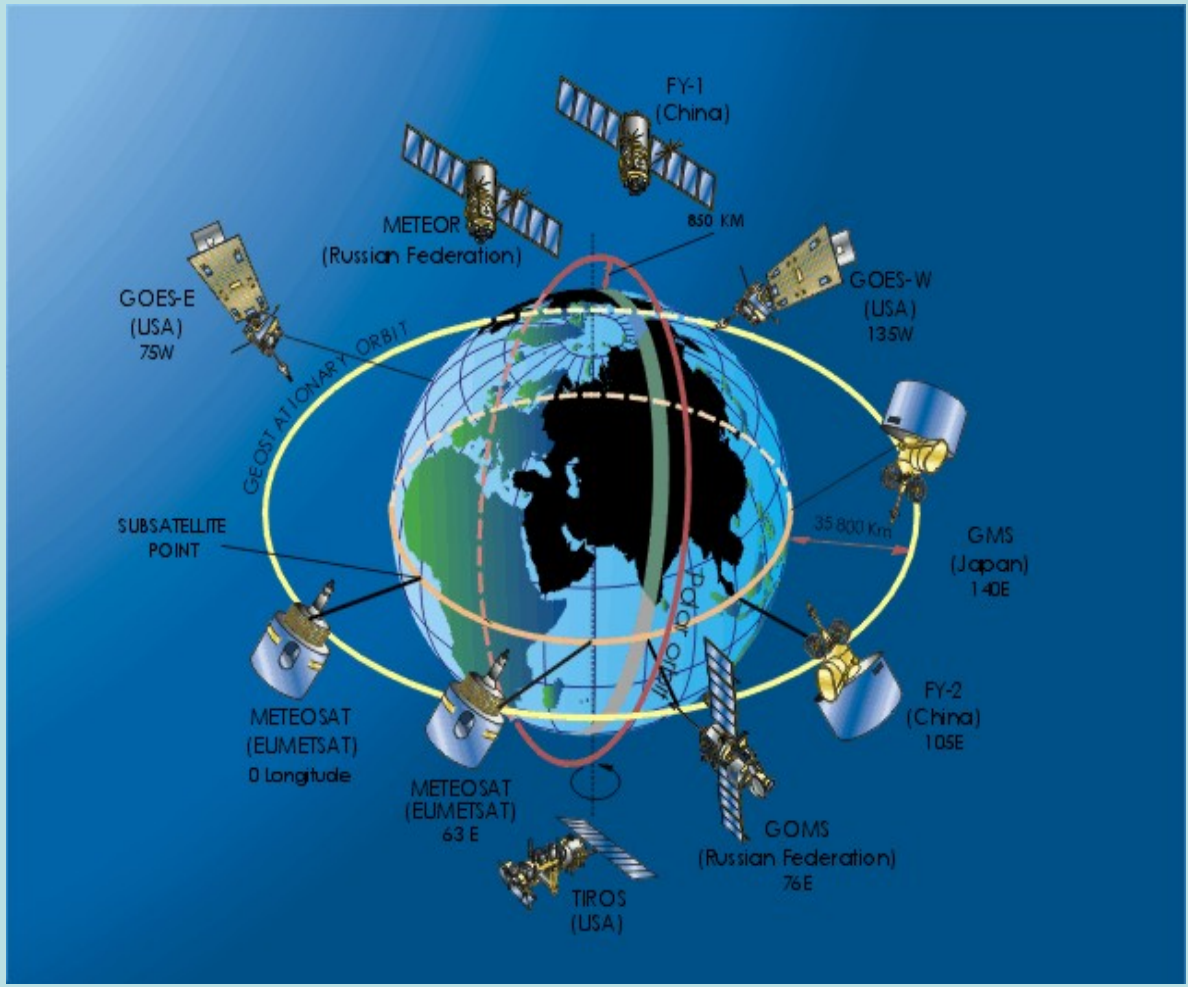




Using Satellites to Observe the Earth

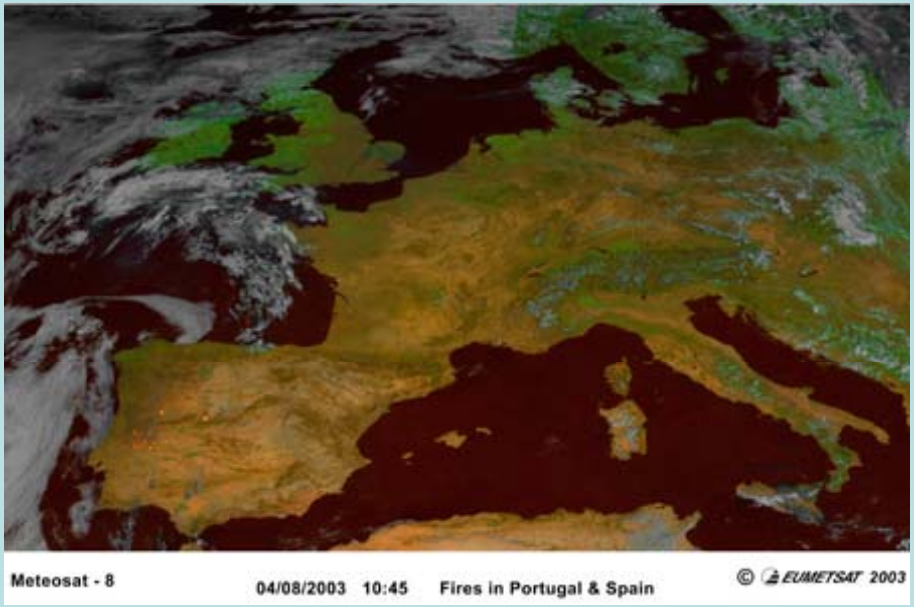
- Satellite observations are vital if we are to mitigate such disasters in future;

- Unique vantage point, continuous global coverage;

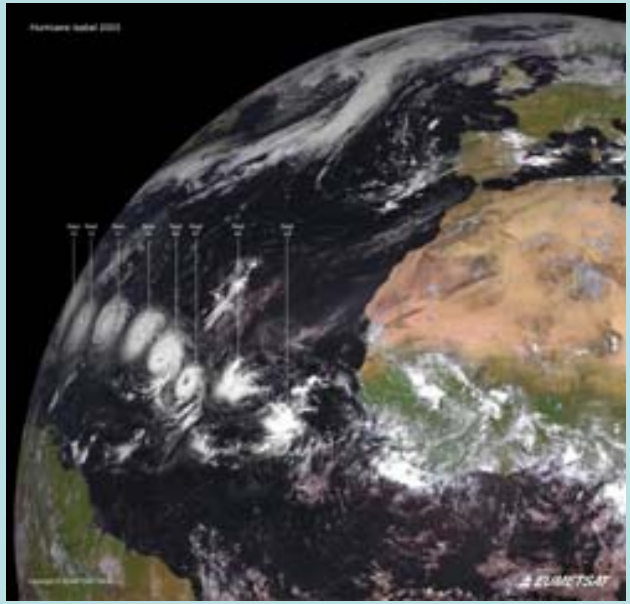
- EUMETSAT alone spends more than €300m on satellite programmes every year – international collaboration is therefore essential.



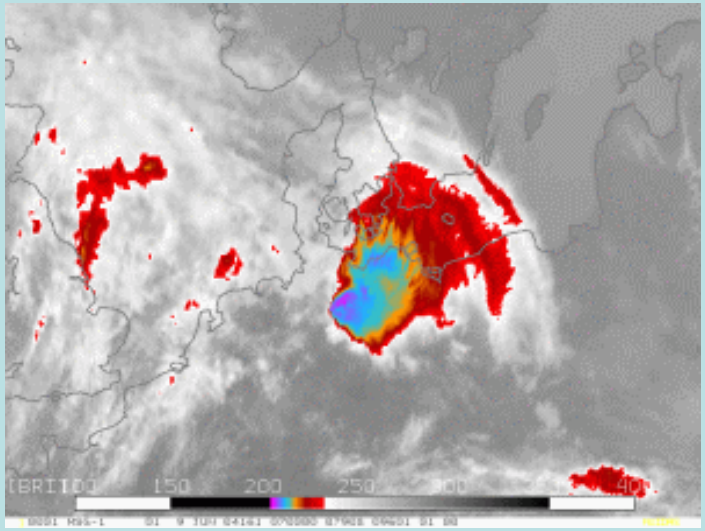
Applications of Satellite Meteorology



Heat Wave and Forest Fires

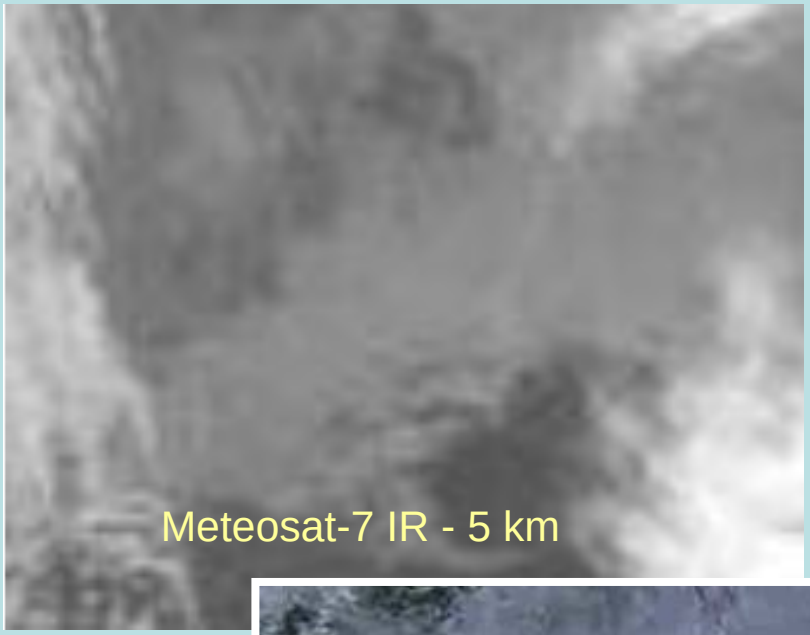


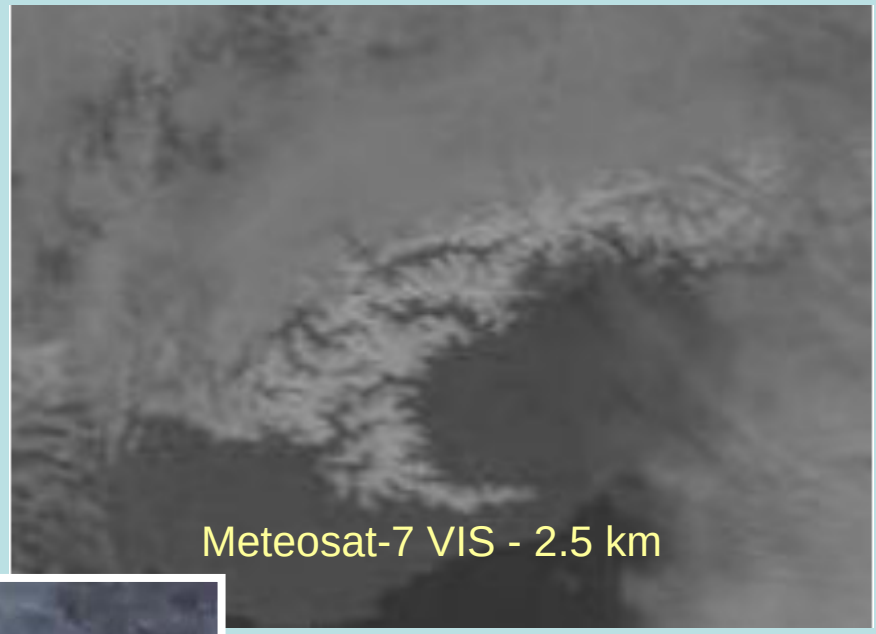
Hurricane Track Forecasting



Severe Storms in Europe

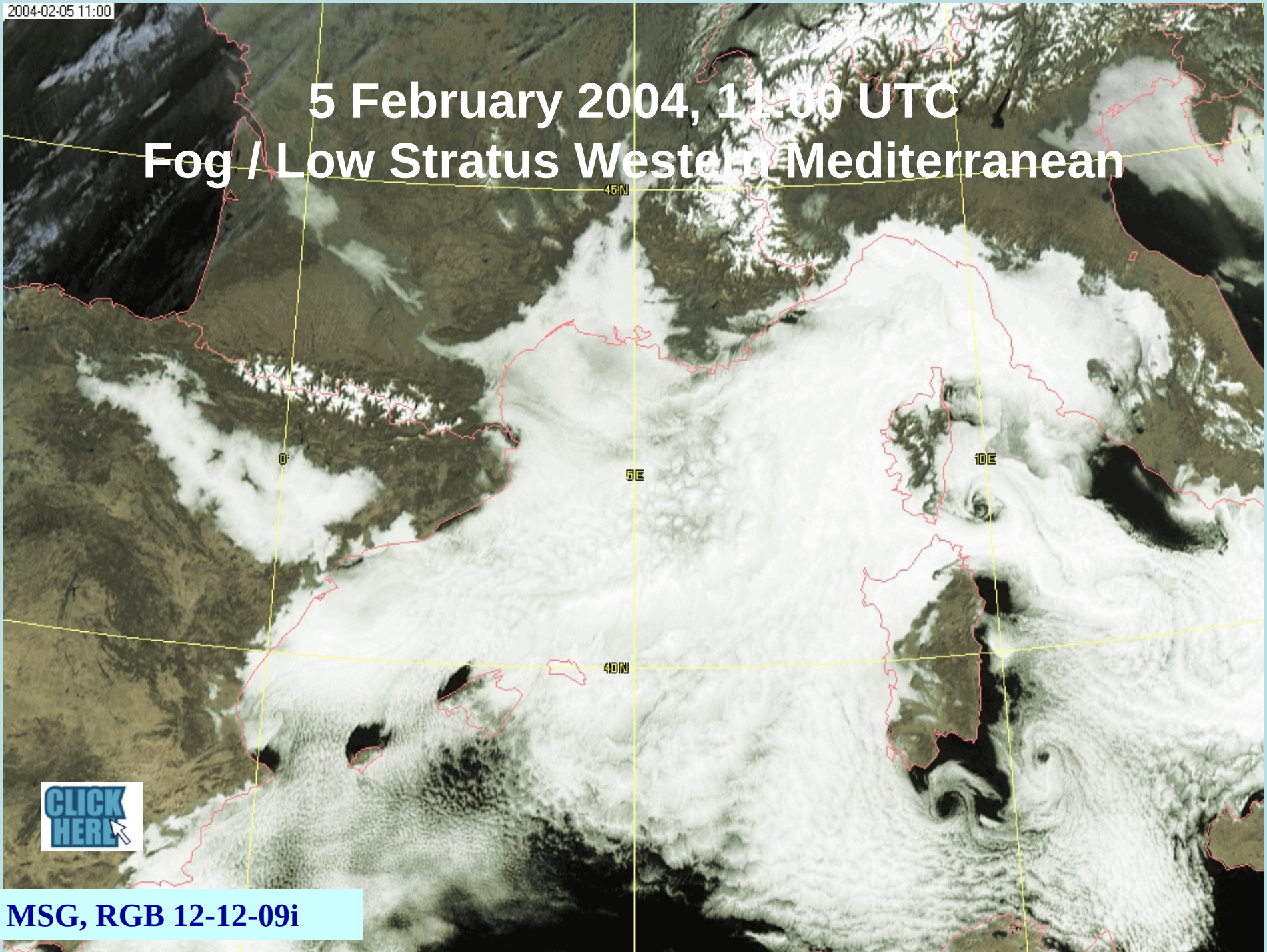
Applications of Satellite Meteorology - a better view





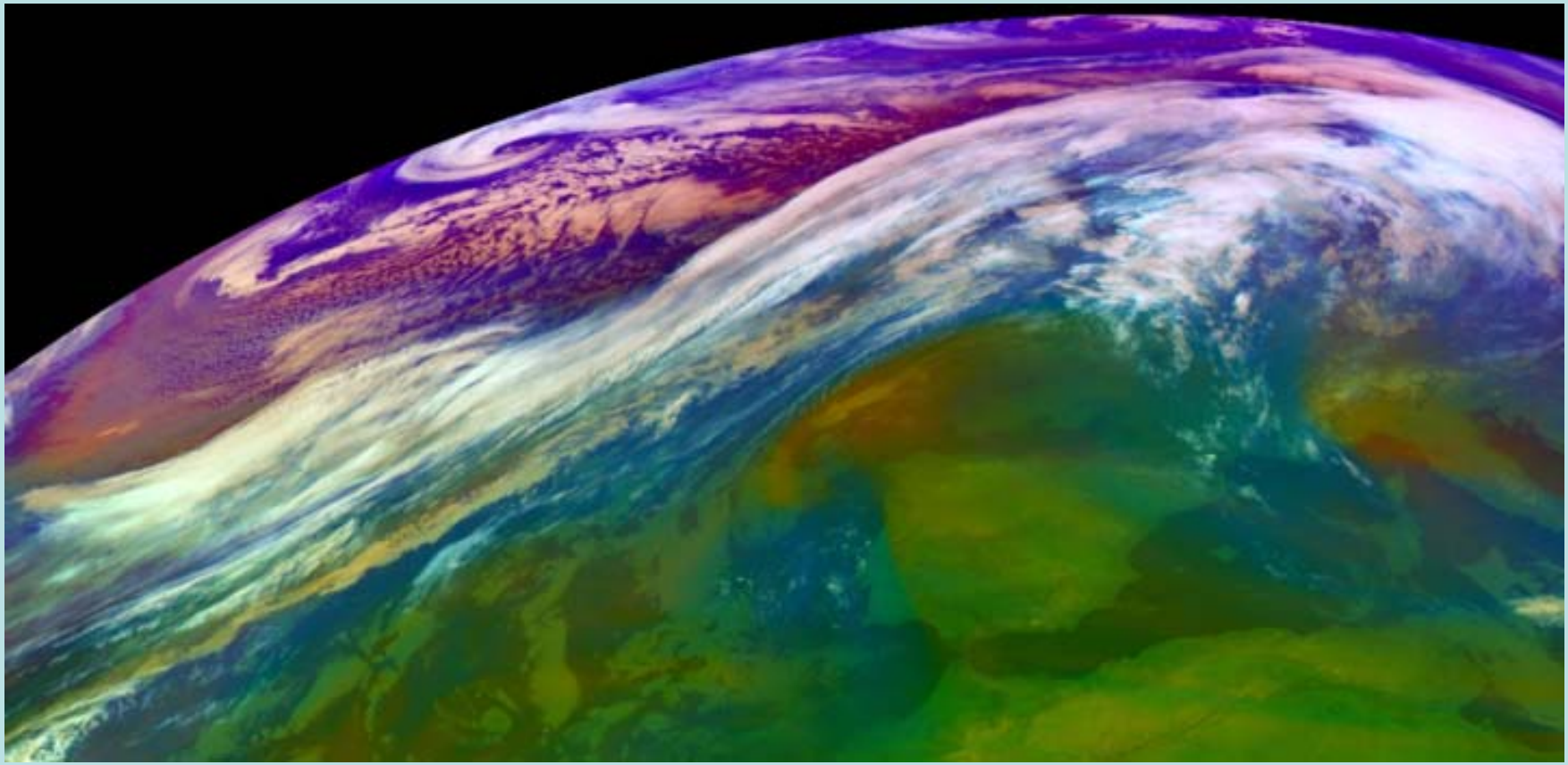
HRV over Europe.


FOG


2004-02-05 11:00
5 February 2004, 11:00 UTC
Fog / Low Stratus Western Mediterranean
45N
0°
5E
10E
40N
CLICK HERE
MSG, RGB 12-12-09i

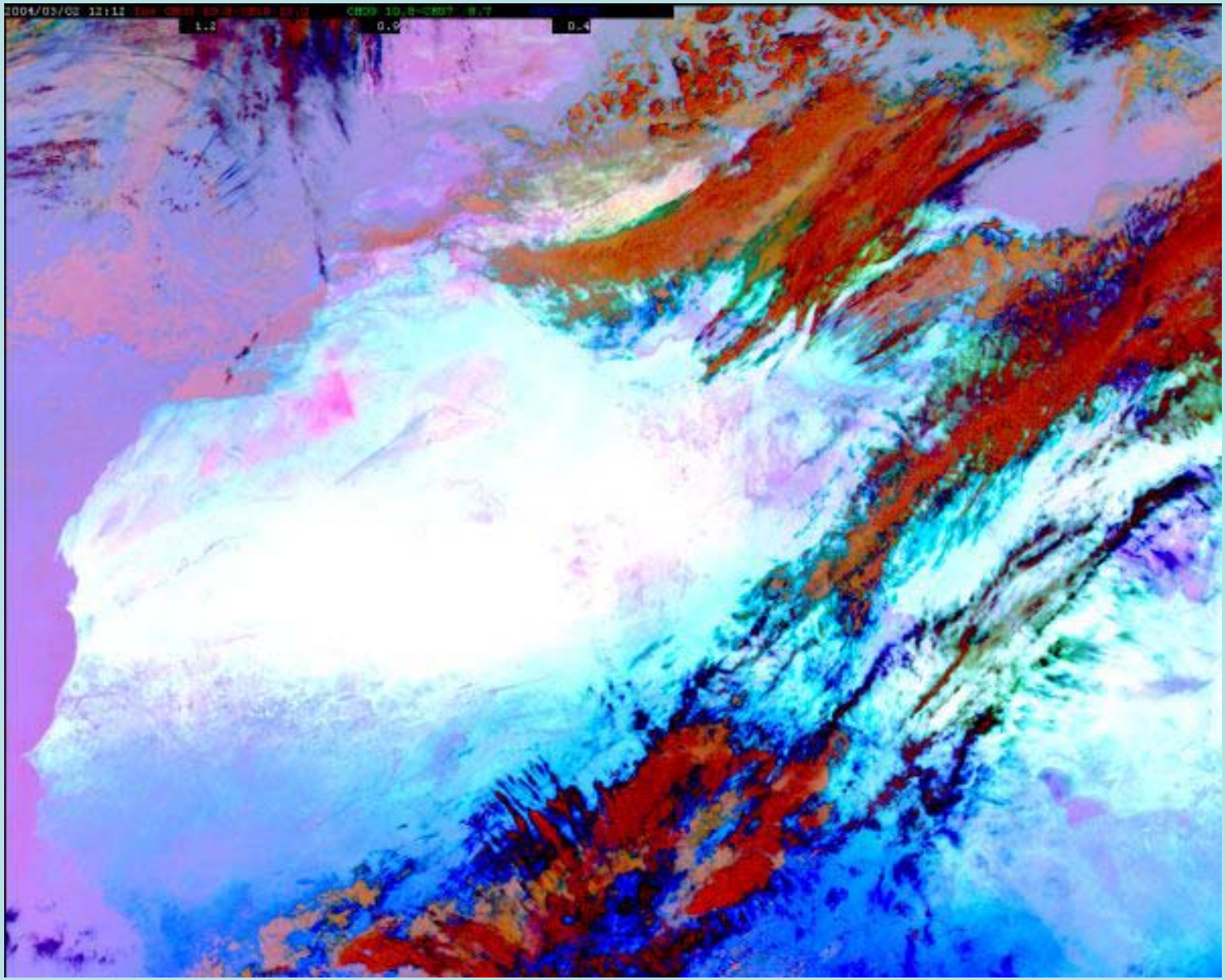
Detecting Storm Development

Colour composite of two WV channels, the ozone channel and the window channel enables early detection of storm development. This is a Storm that developed over the Atlantic early January 2005



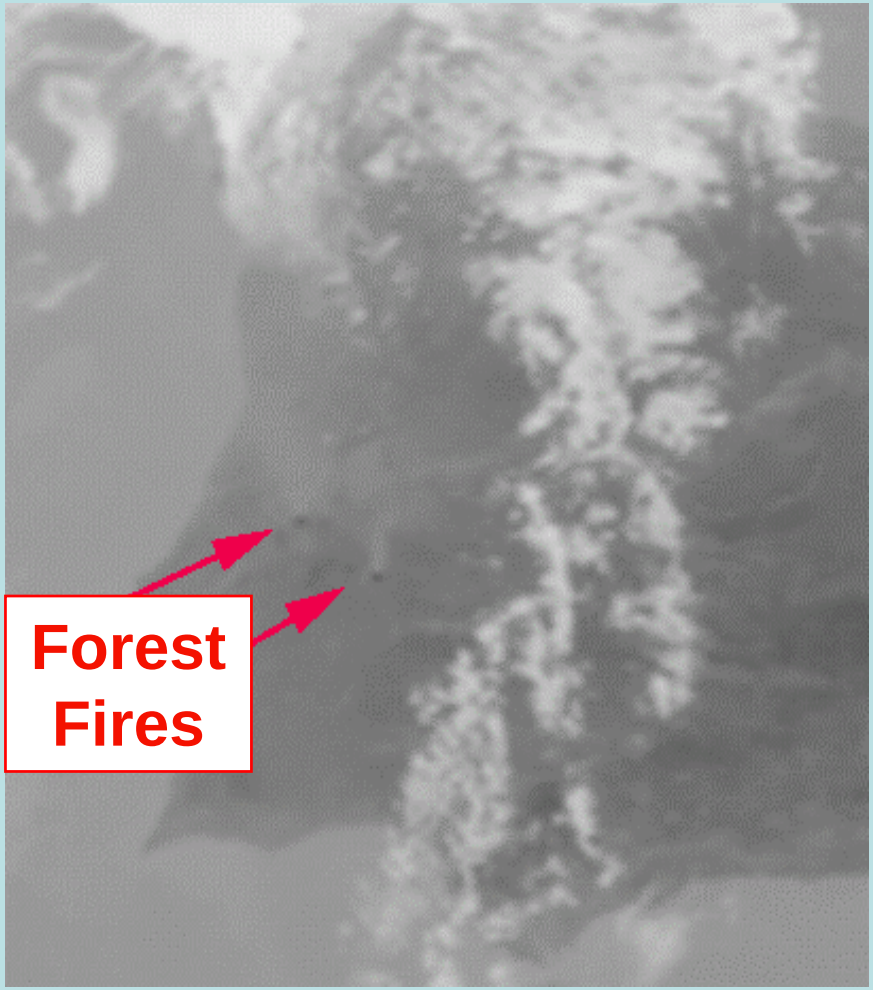

DUST STORMS

Dust Storm Detection

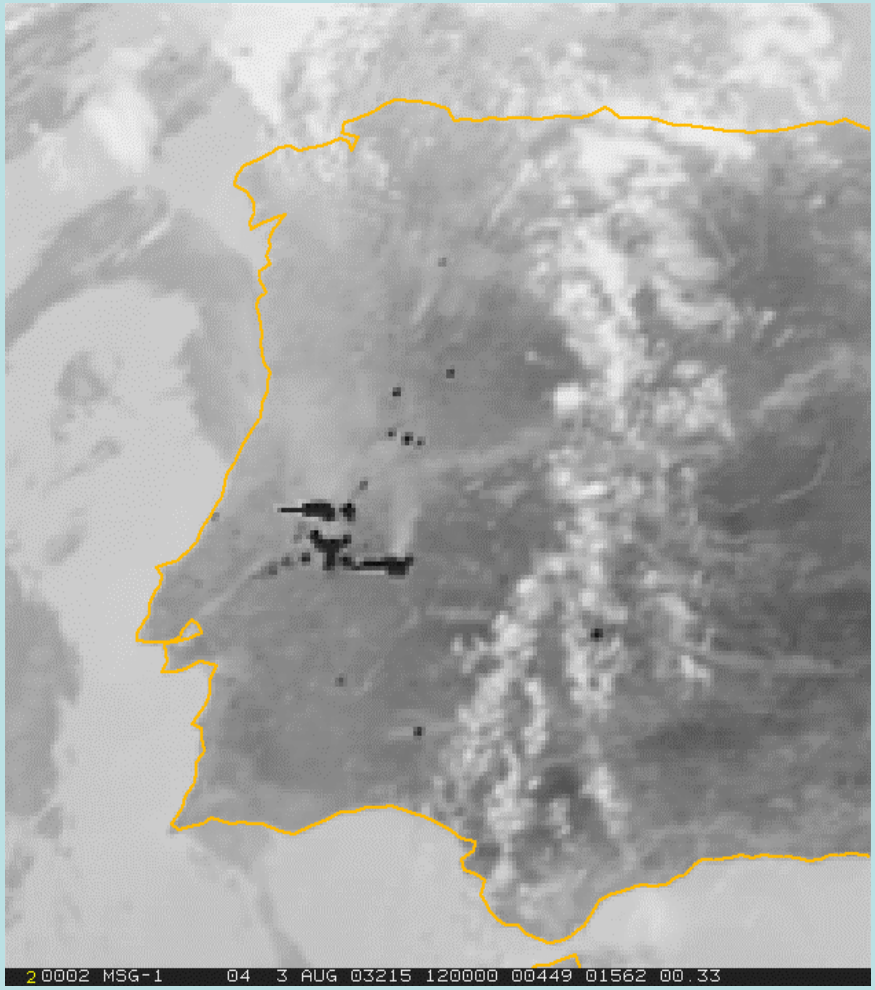



FIRES

3 August 2003, 12:00 UTC
Forest Fires Portugal & Spain



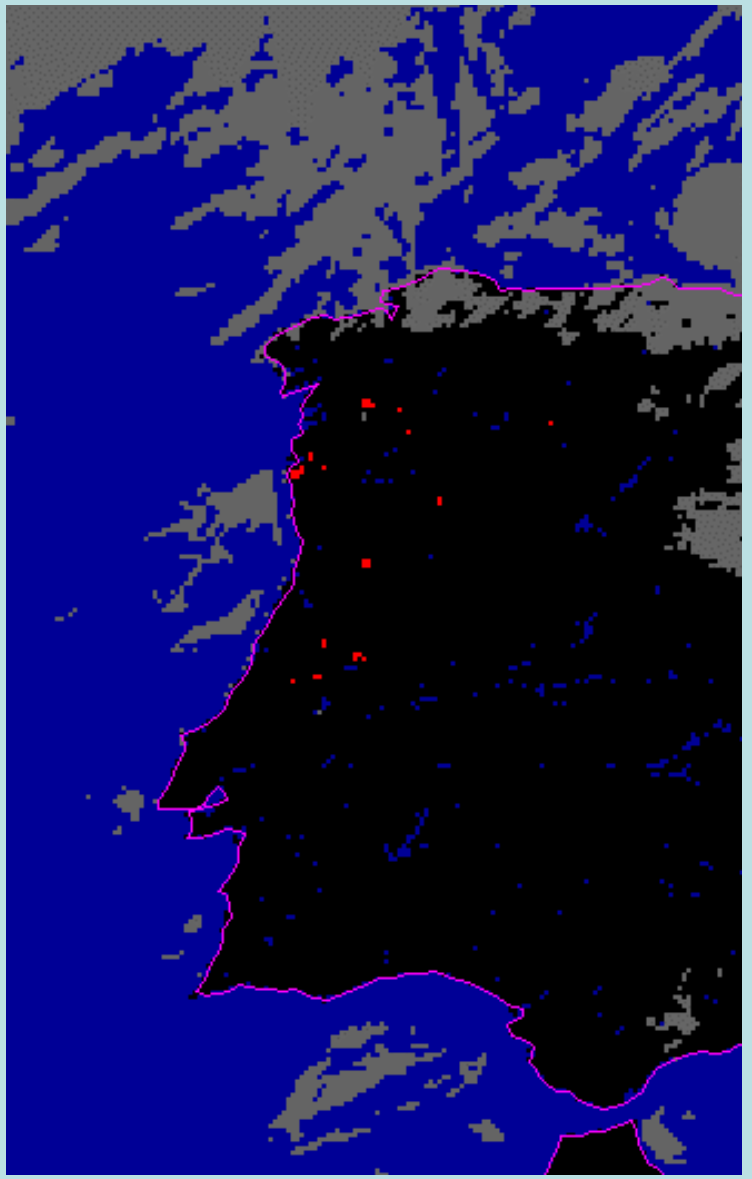
MFG IR Channel i



MSG Channel IR3.9i

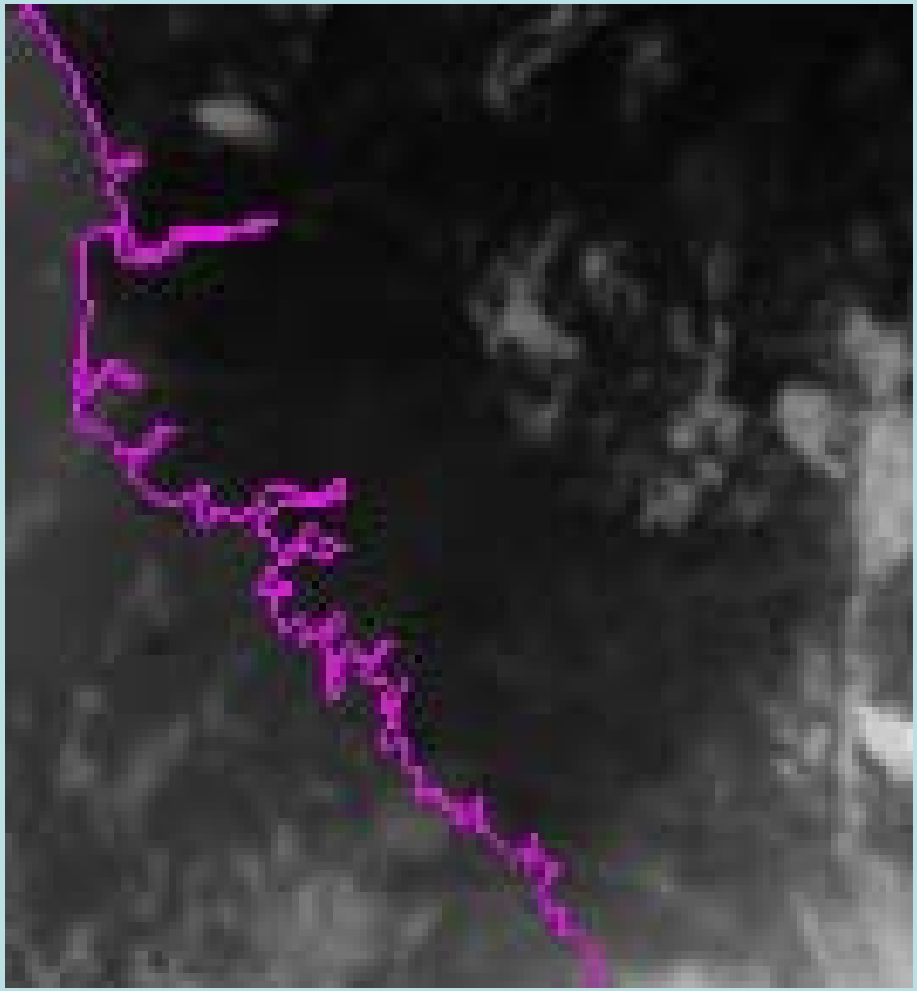
Wild Fires: Example from Portugal / August 2005

IR3.9 image



Result of objective fire detection

27 April 2004, 14:15 UTC
Fires over Guinea

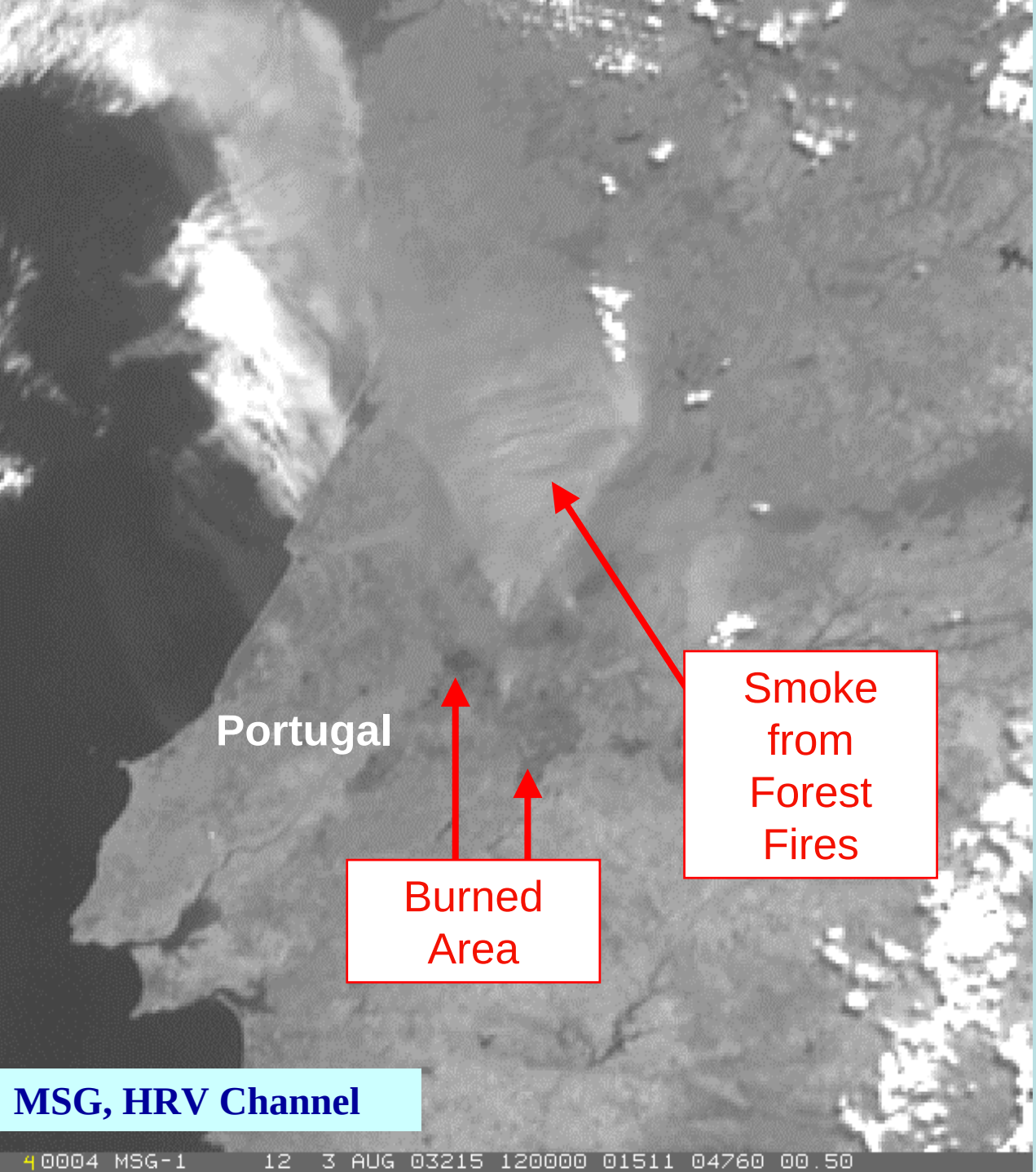


MFG IR Channel i

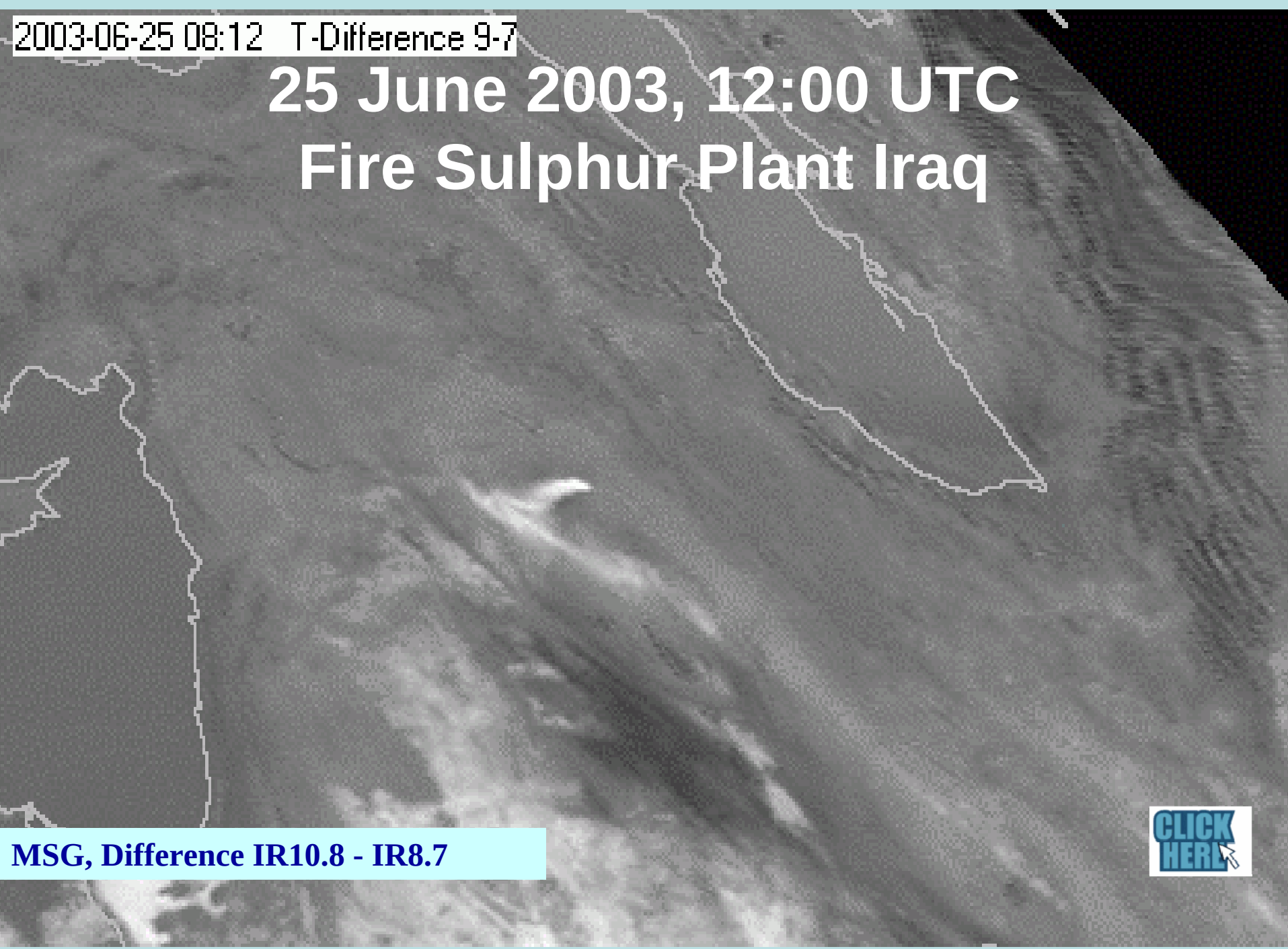
MSG RGB Composite
IR3.9r, NIR1.6, VIS0.6


SMOKE

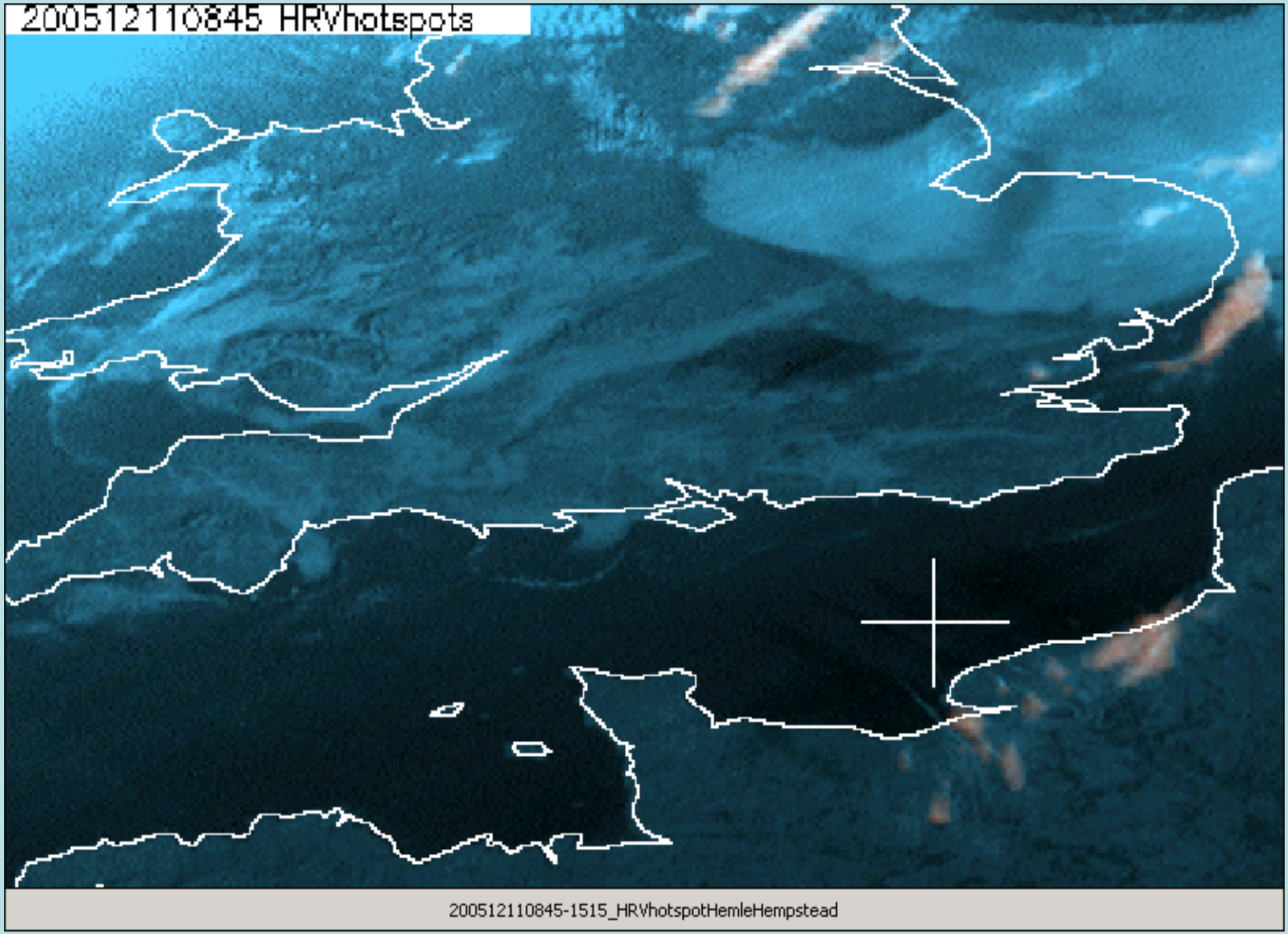
3 Aug 2003 Forest Fires Portugal & Spain



CLICK HERE

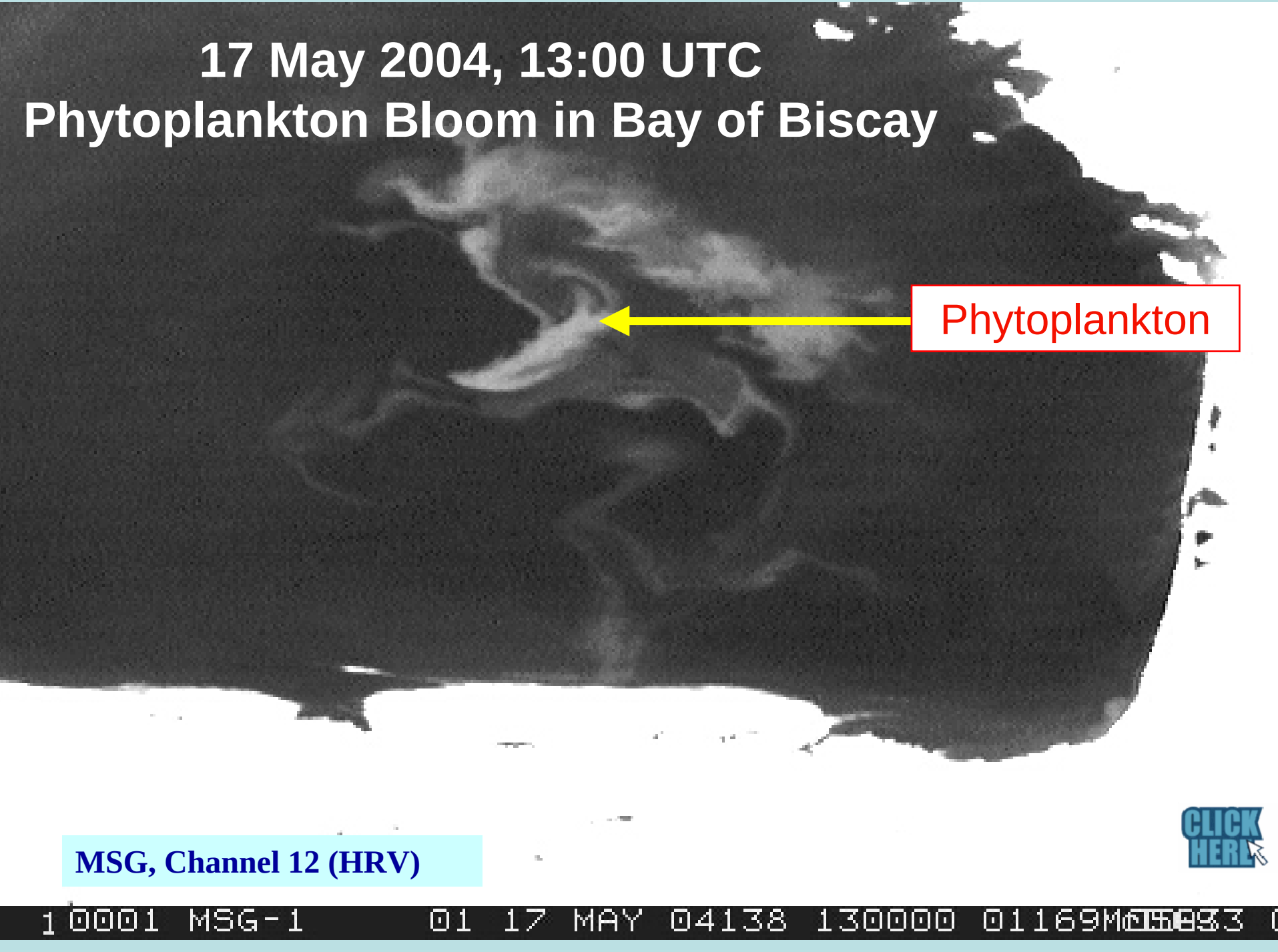

2003-06-25 08:12 T-Difference 9-7
25 June 2003, 12:00 UTC
Fire Sulphur Plant Iraq
MSG, Difference IR10.8 - IR8.7
CLICK HERE

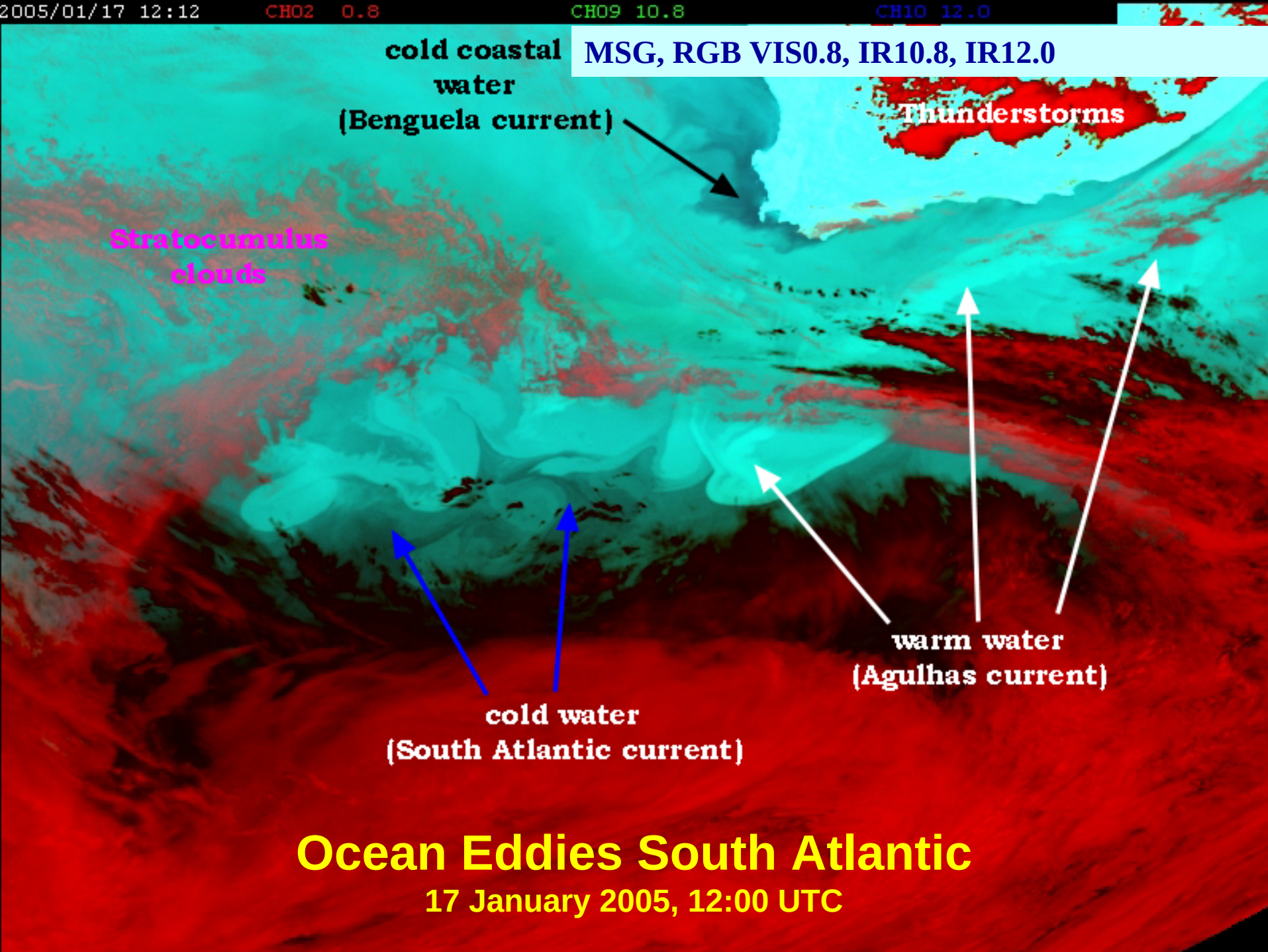
Smoke Tracking from Buncefield Oil Refinery, UK (note hot spot detection)



Enhancing the Fishery Business

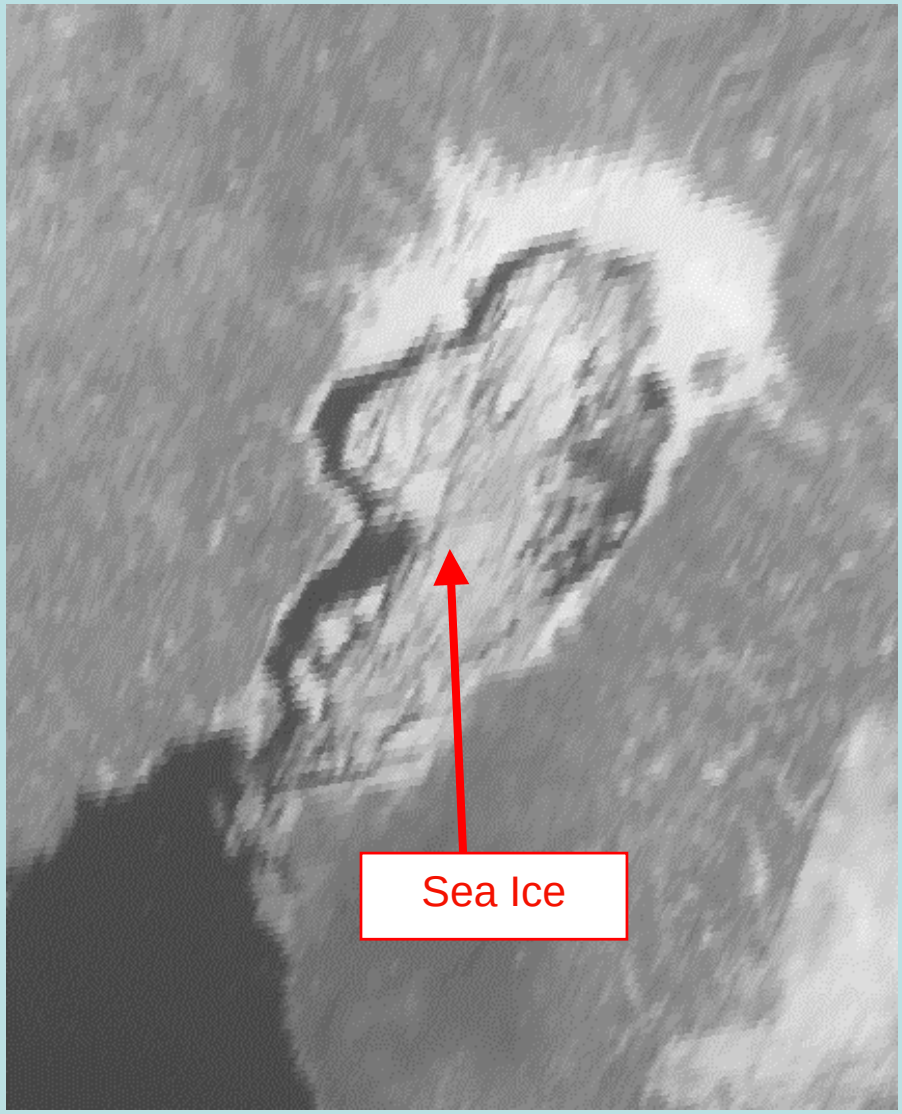
By Plankton Monitoring


17 May 2004, 13:00 UTC
Phytoplankton Bloom in Bay of Biscay
Phytoplankton
MSG, Channel 12 (HRV)
CLICK HERE
1 0001 MSG-1 01 17 MAY 04138 130000 01169M


2005/01/17 12:12 CH02 0.8 CH09 10.8 CH10 12.0
MSG, RGB VIS0.8, IR10.8, IR12.0
cold coastal water (Benguela current)
Thunderstorms
Stratocumulus clouds
warm water (Agulhas current)
cold water (South Atlantic current)
Ocean Eddies South Atlantic
17 January 2005, 12:00 UTC

2 April 2004, 11:00 UTC
Sea Ice Gulf of Bothnia

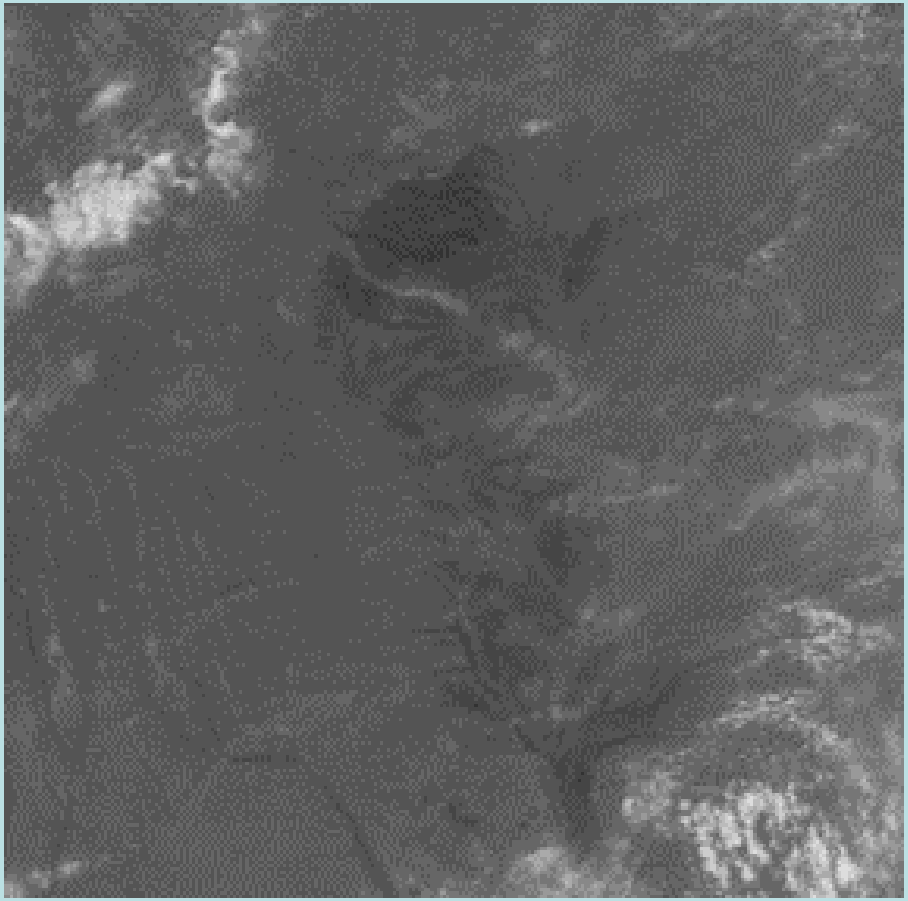
MFG VIS Channel



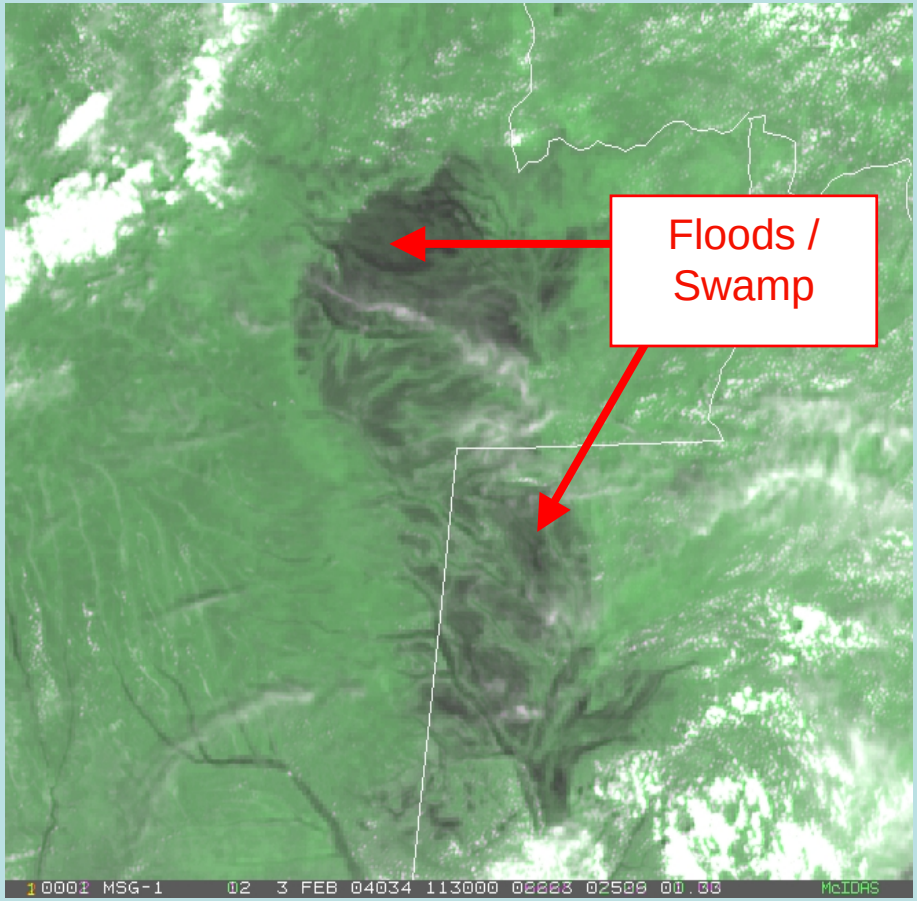
MSG Channel 12 (HRV)

FLOODS

3 February 2004, 11:30 UTC
Floods Angola-Zambia



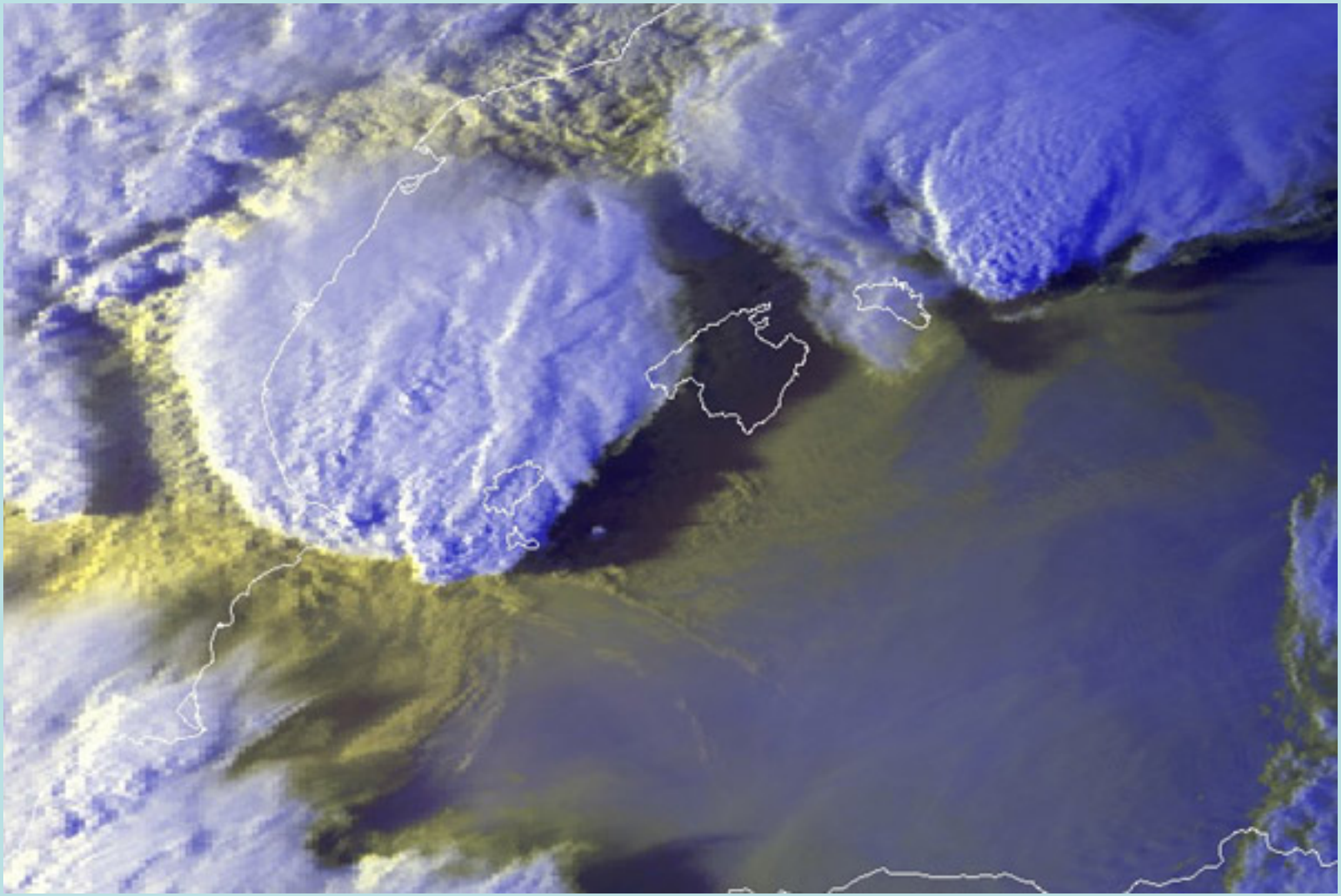
MFG VIS Channel



MSG RGB 12,02,12

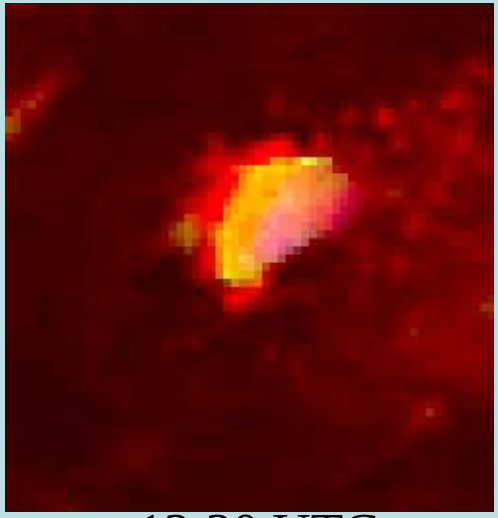

Severe Storms

Satellite view of a tornadic supercell

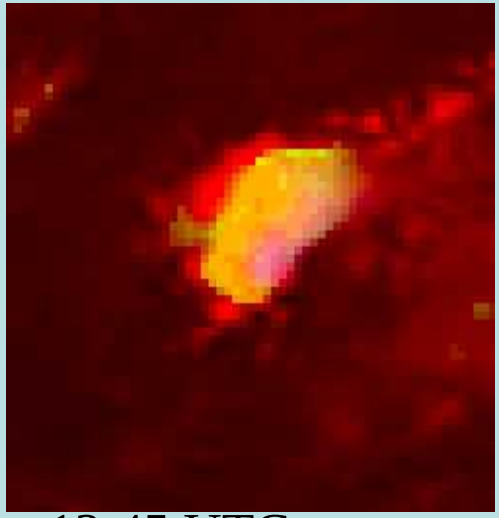


11 September 1996 1724 UTC NOAA 12, Spain, Balearic Islands (Ibiza)

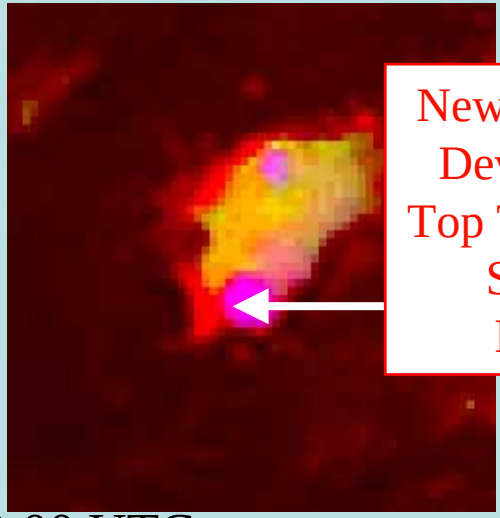
Thunderstorm Growth - Northern Cameroon (avoiding severe aviation hazards)



12:30 UTC

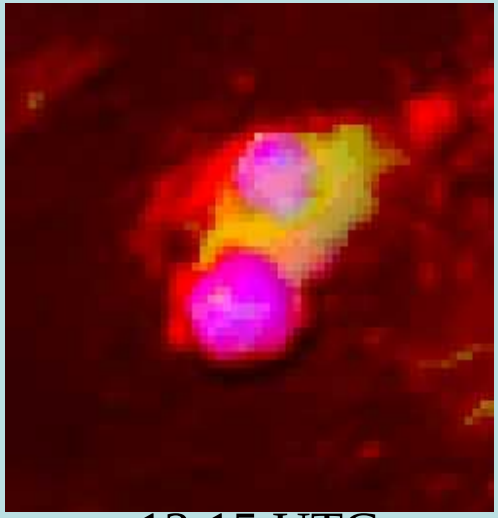


12:45 UTC

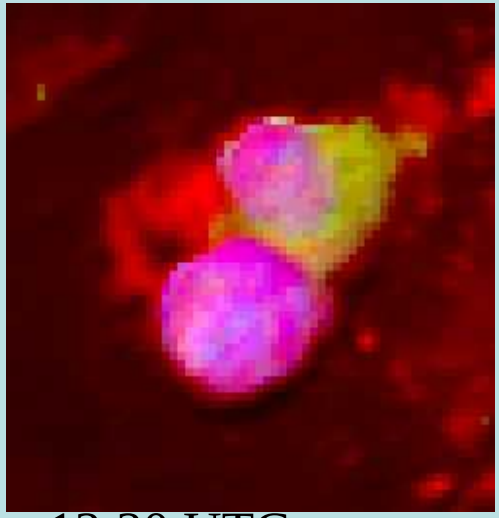


13:00 UTC

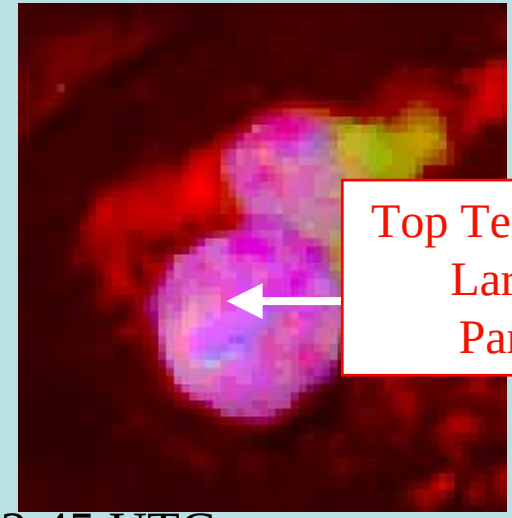
New Convective Developments
Top Temp. -78°C
Small Ice Particles



13:15 UTC



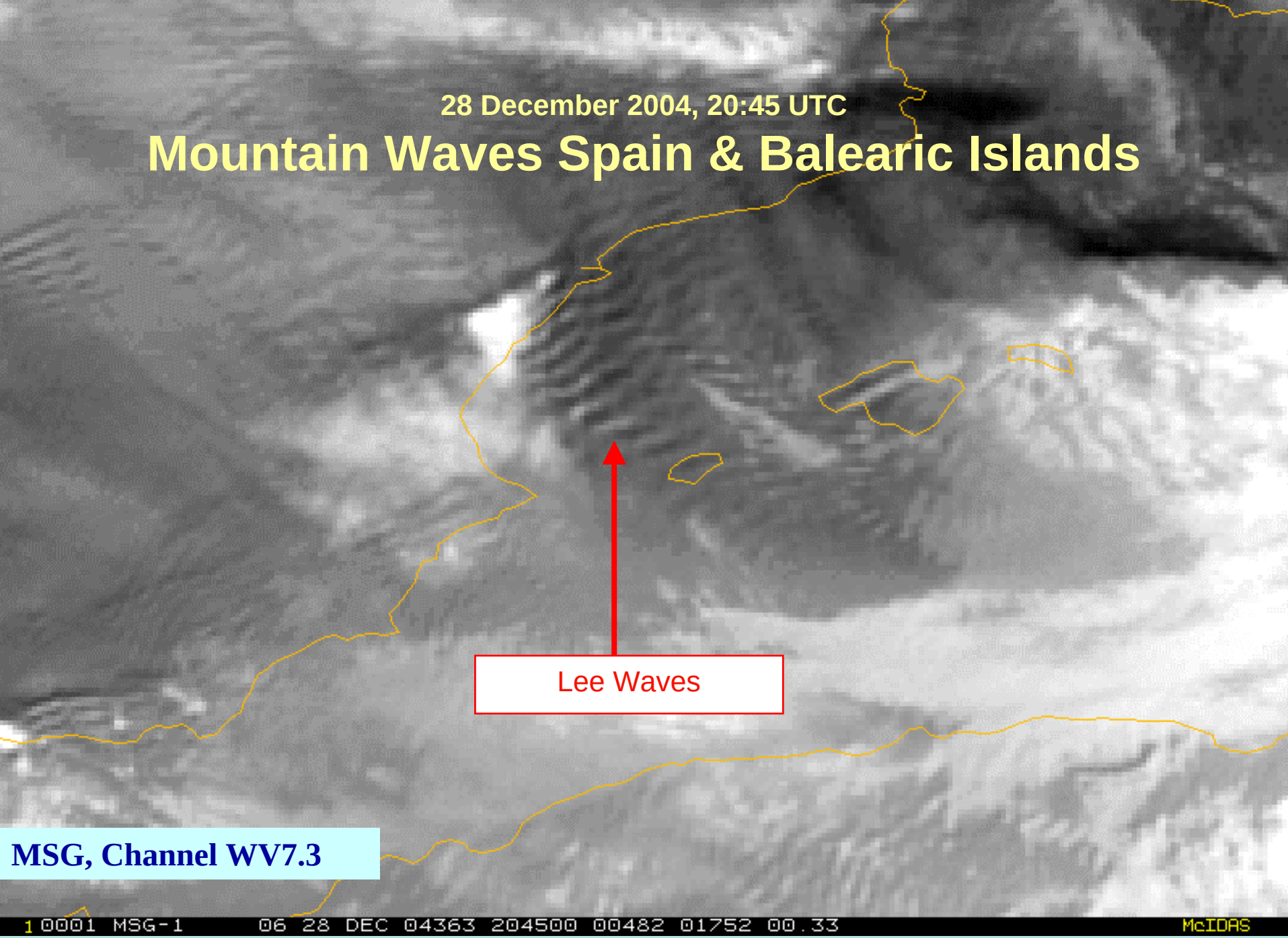
13:30 UTC



13:45 UTC

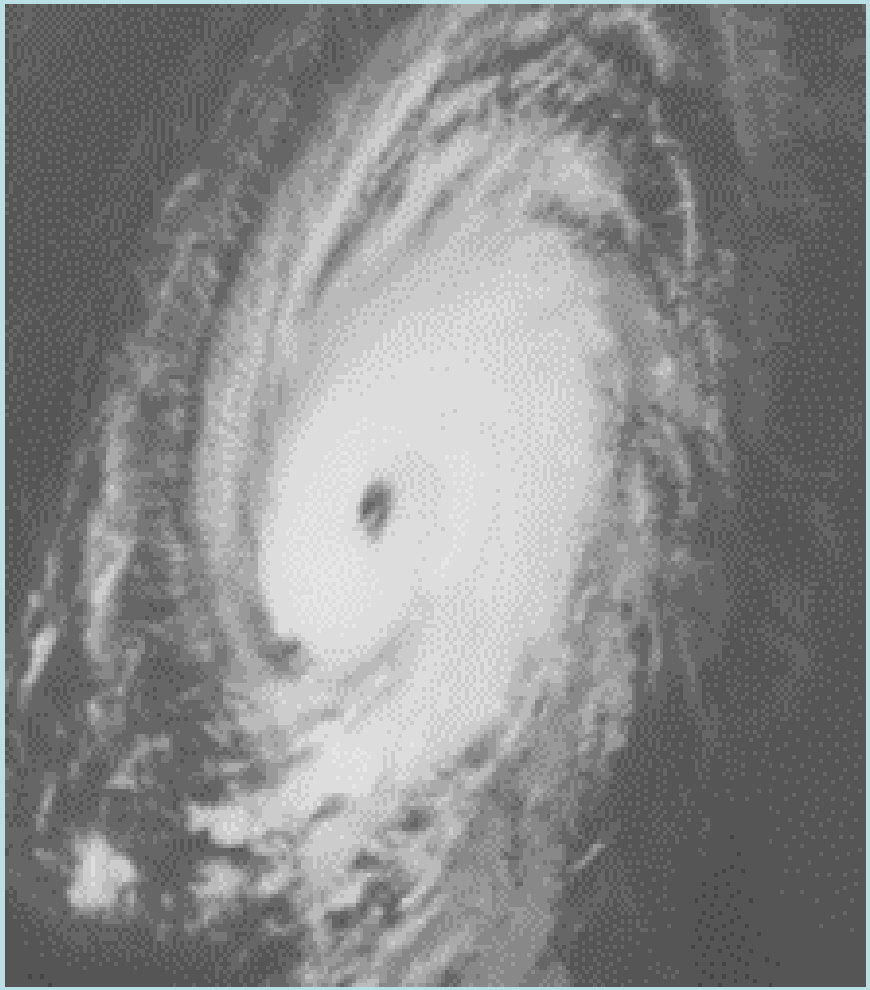
Top Temp. -83°C
Large Ice Particles

MSG, RGB VIS0.6, IR3.9i, IR10.8i

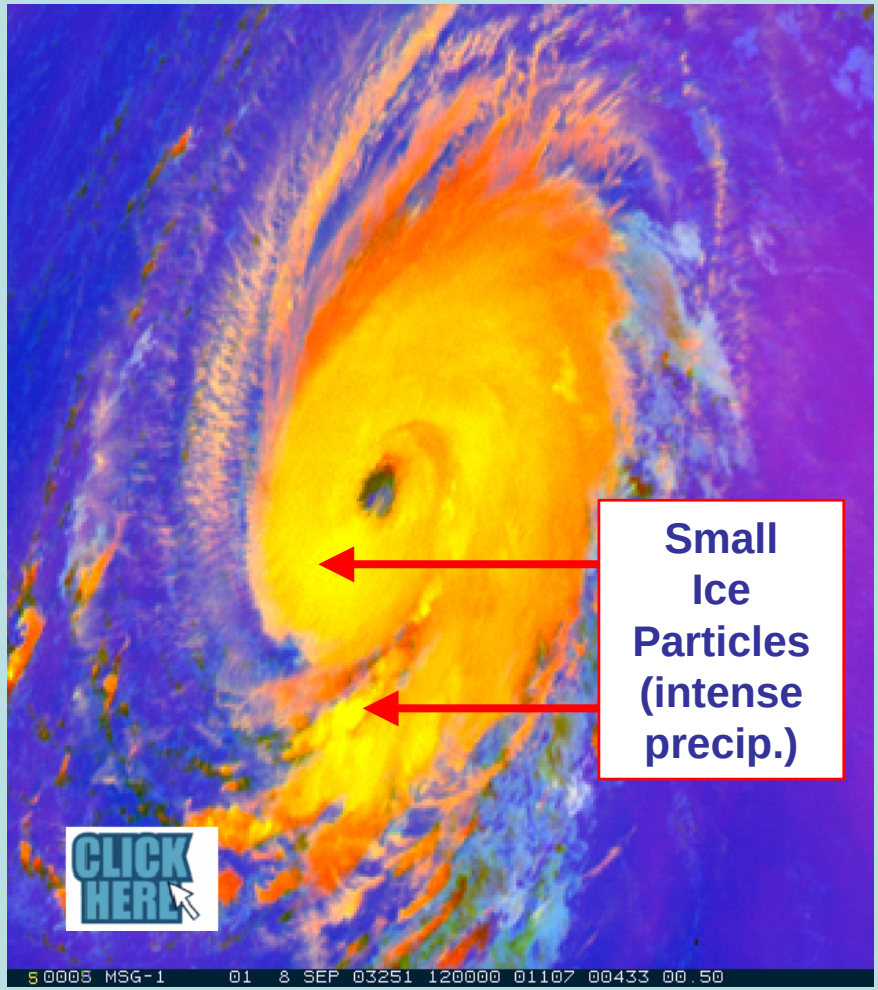

28 December 2004, 20:45 UTC
Mountain Waves Spain & Balearic Islands
Lee Waves
MSG, Channel WV7.3
1 0001 MSG-1 06 28 DEC 04363 204500 00482 01752 00.33 McIDAS


HURRICANES

8 September 2003, 12:00 UTC
Hurricane "Isabel"



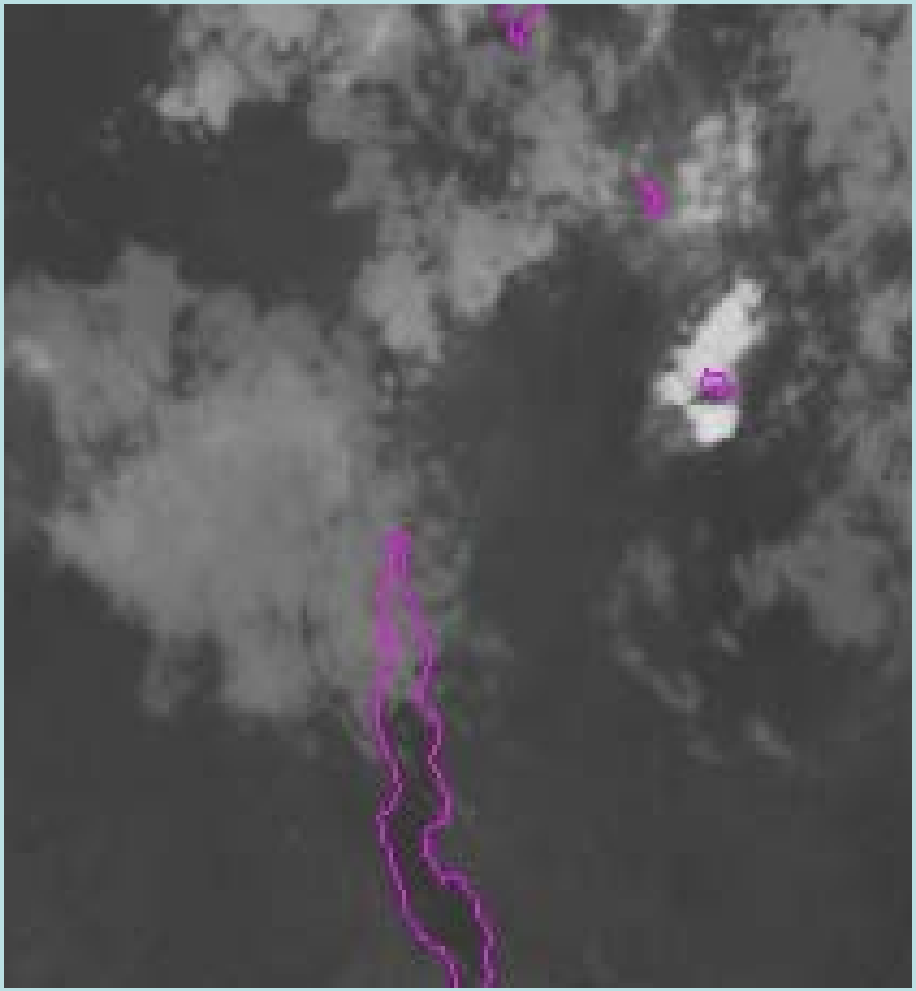
MFG IR Channel i



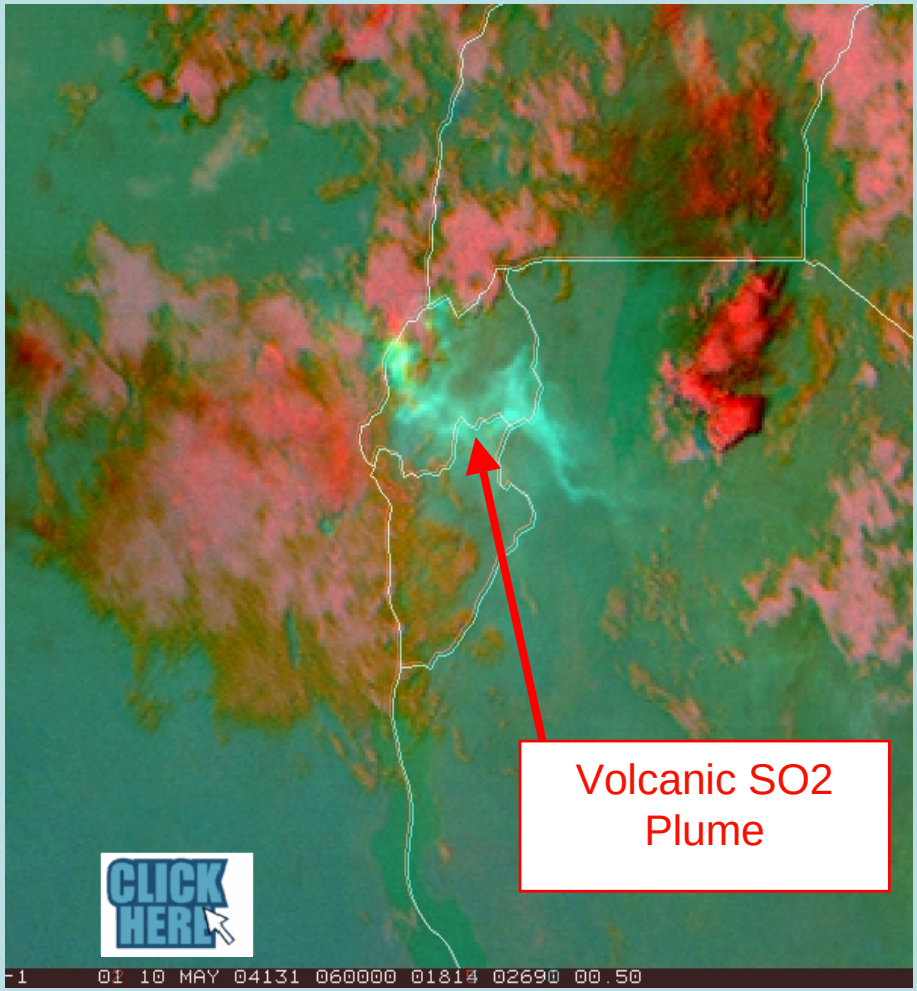
MSG RGB 05-06,04-09,03-01

VOLCANIC ASH

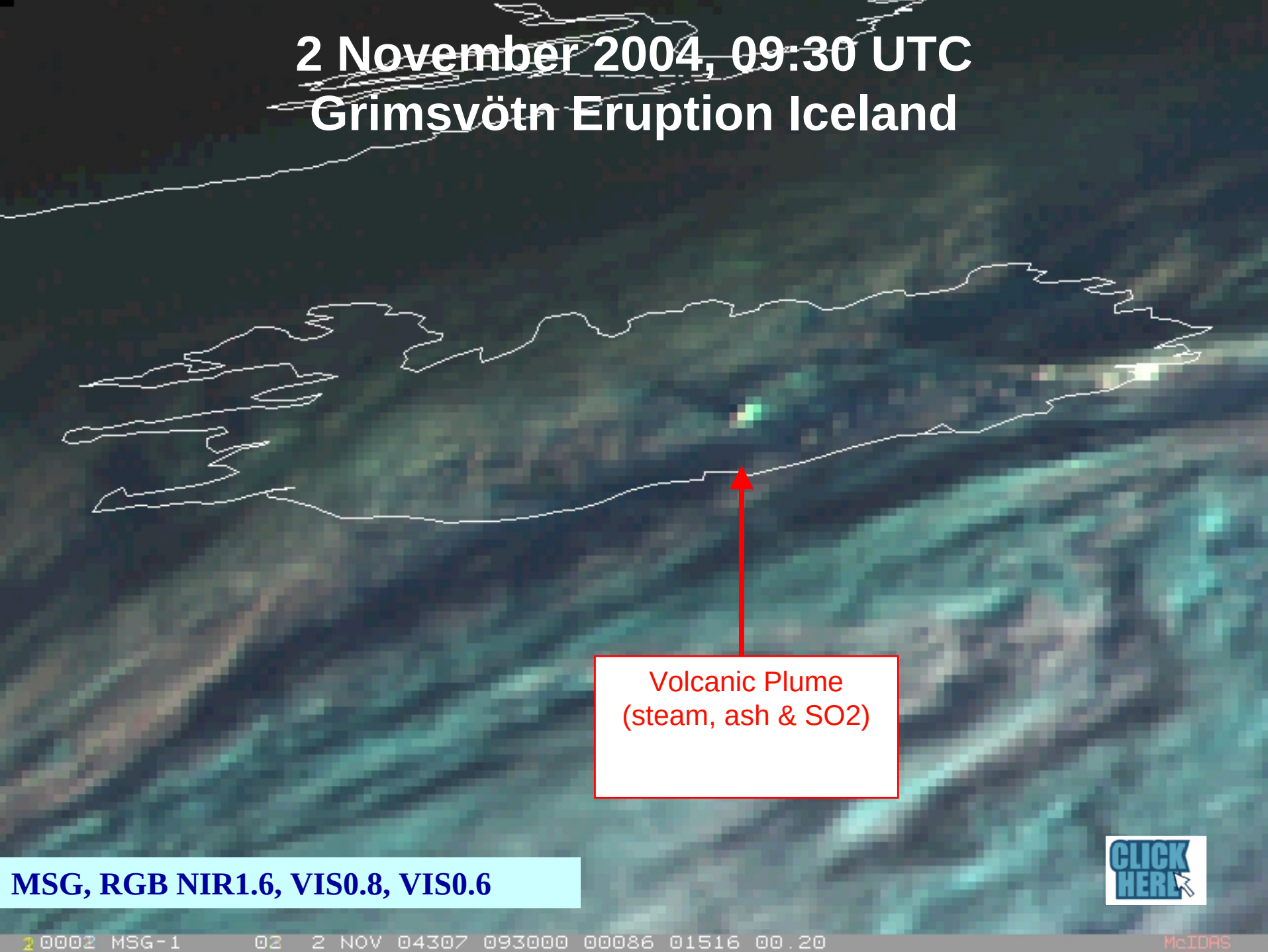
10 May 2004, 06:00 UTC
Nyamuragira Eruption Eastern Kongo

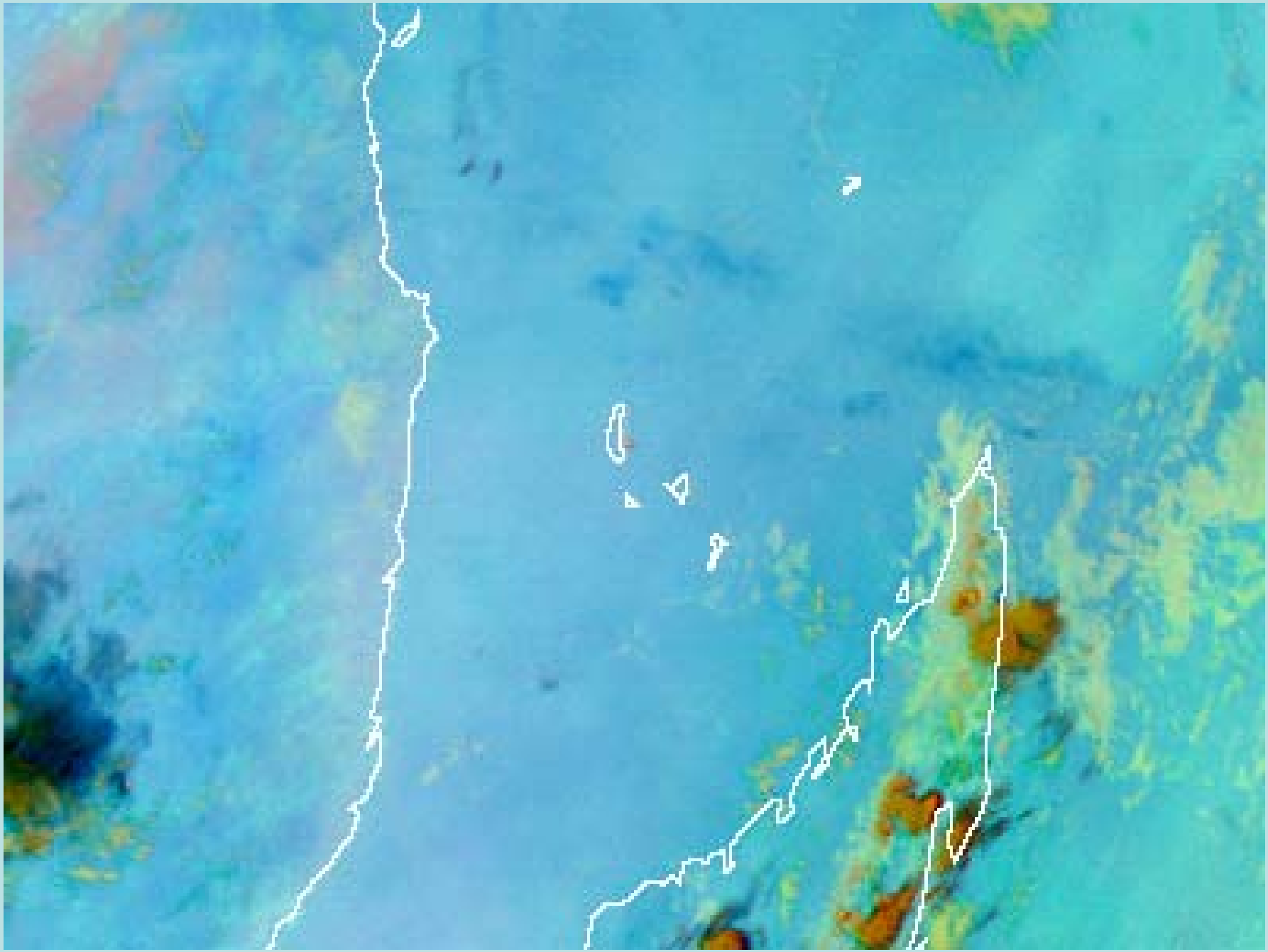


MFG IR Channel i



MSG RGB Composite
VIS0.8, IR10.8-IR8.7, IR12.0-IR8.7


2 November 2004, 09:30 UTC
Grimsvötn Eruption Iceland
Volcanic Plume
(steam, ash & SO2)
MSG, RGB NIR1.6, VIS0.8, VIS0.6
CLICK HERE
20002 MSG-1 02 2 NOV 04307 093000 00086 01516 00.20
McIDAS



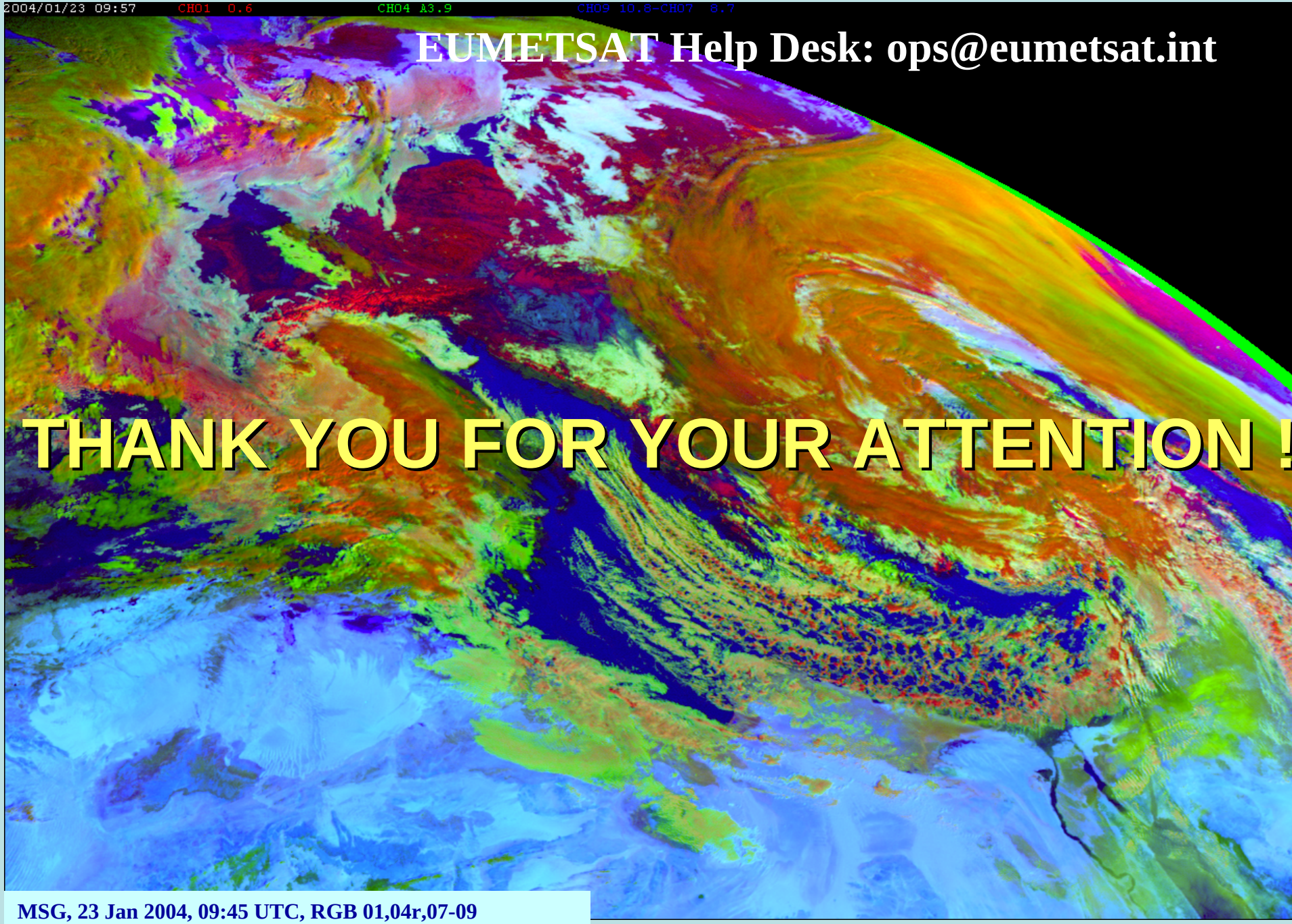
We have seen that Meteosat Second Generation and other satellites provide a wealth of observational data which can be used in a number of ways.

An important development is the possibility to use data to provide early warning and alerting systems, based on the higher resolution, accuracy and timeliness of, e.g. the new satellite Systems

Mitigating Disaster: more than a forecast

- It is clear that meteorological satellites make a significant contribution to forecasting severe weather and its impacts on life and property;
- A forecast is useless if there is no capability to mitigate the predicted impact;
- This is the next major challenge for the environmental and disaster mitigation communities.





MSG, 23 Jan 2004, 09:45 UTC, RGB 01,04r,07-09