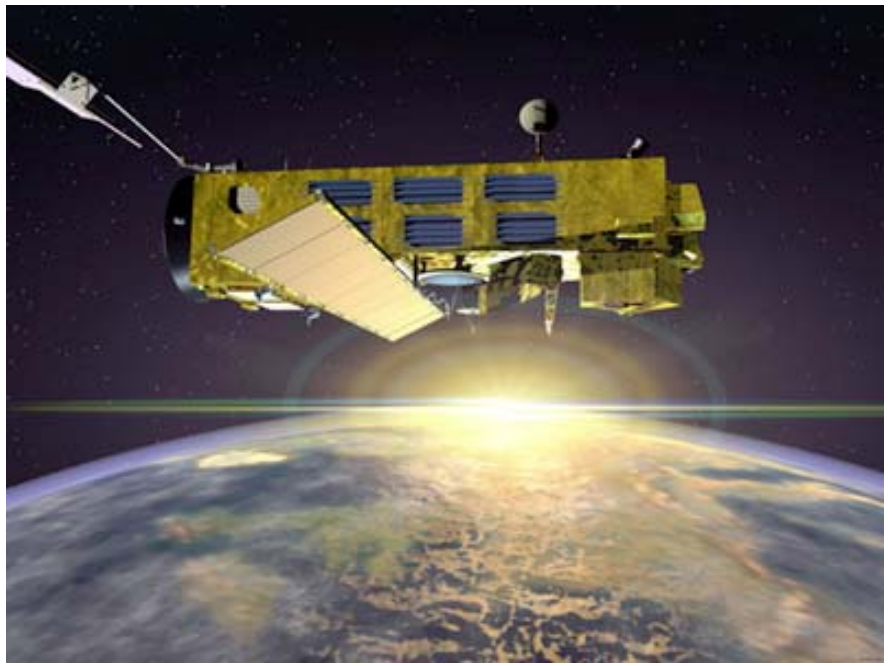
CCLRC Rutherford Appleton Laboratory

# Earth Observation

- Measuring the earth from a platform some distance away, e.g.
  - Satellite, Aircraft, Balloon
- Measure:
  - Atmosphere, Ocean, Land, Ice



# Earth Observation : science

Science Applications…

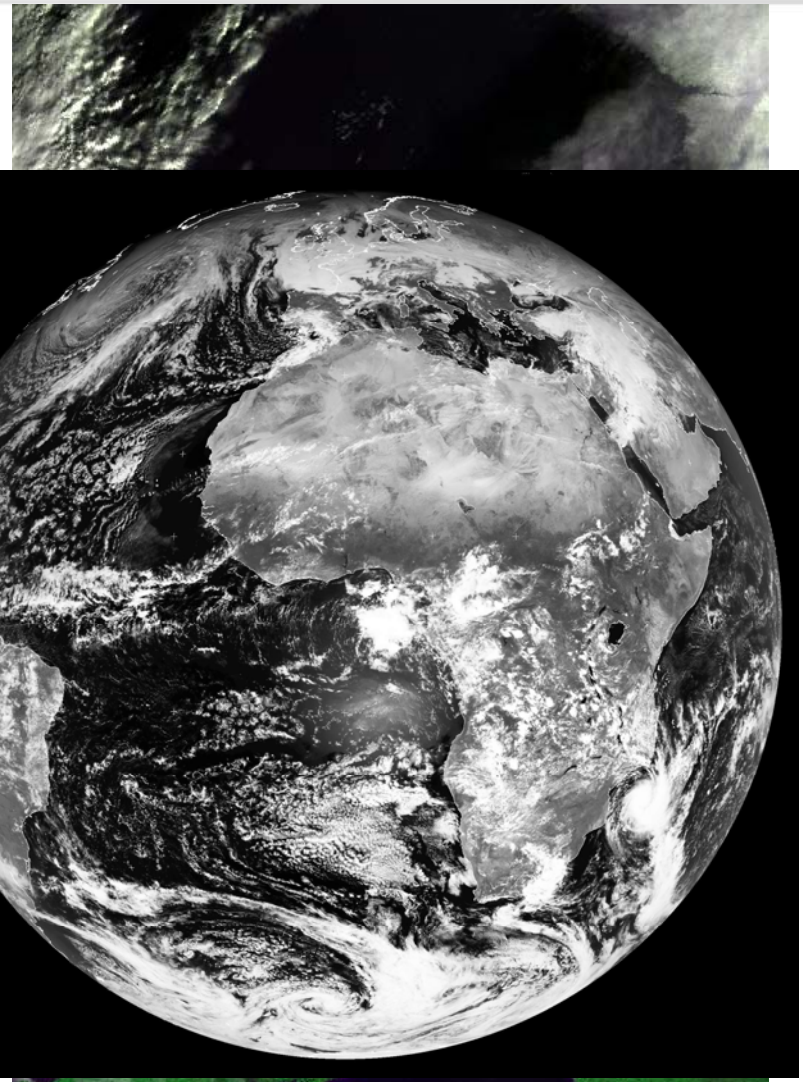
MERIS image: ESA

Monitor and better understand:

- Global warming
- Ozone layer
- Weather
- Ocean / atmosphere interaction
- Forests
- Sea level / ice changes
- Pollution
- Natural disasters
- Geology

# Visible Images

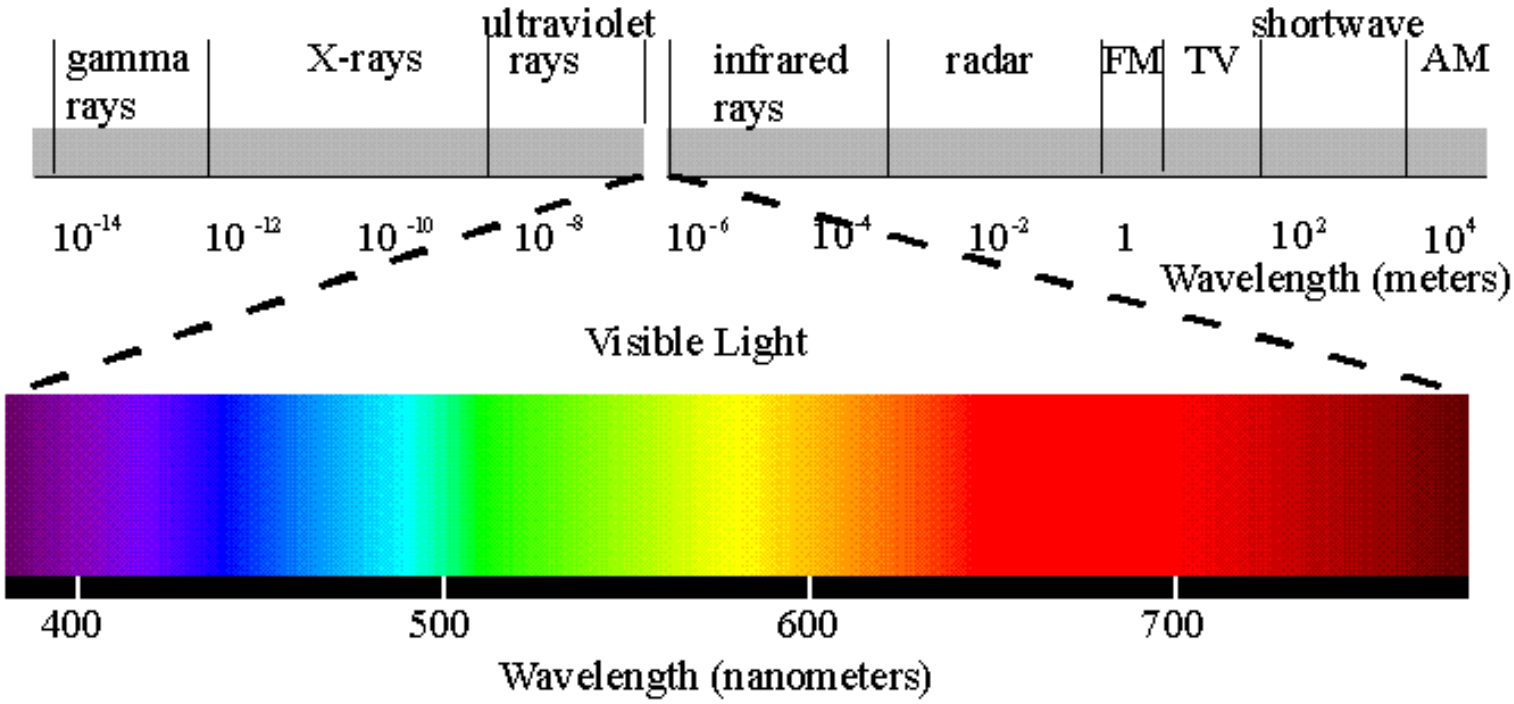
- High / low resolution
  - Meteosat
  - ATSR
  - TopSat



Dartford bridge over the Thames

Hemel Hempstead fire, December 2005

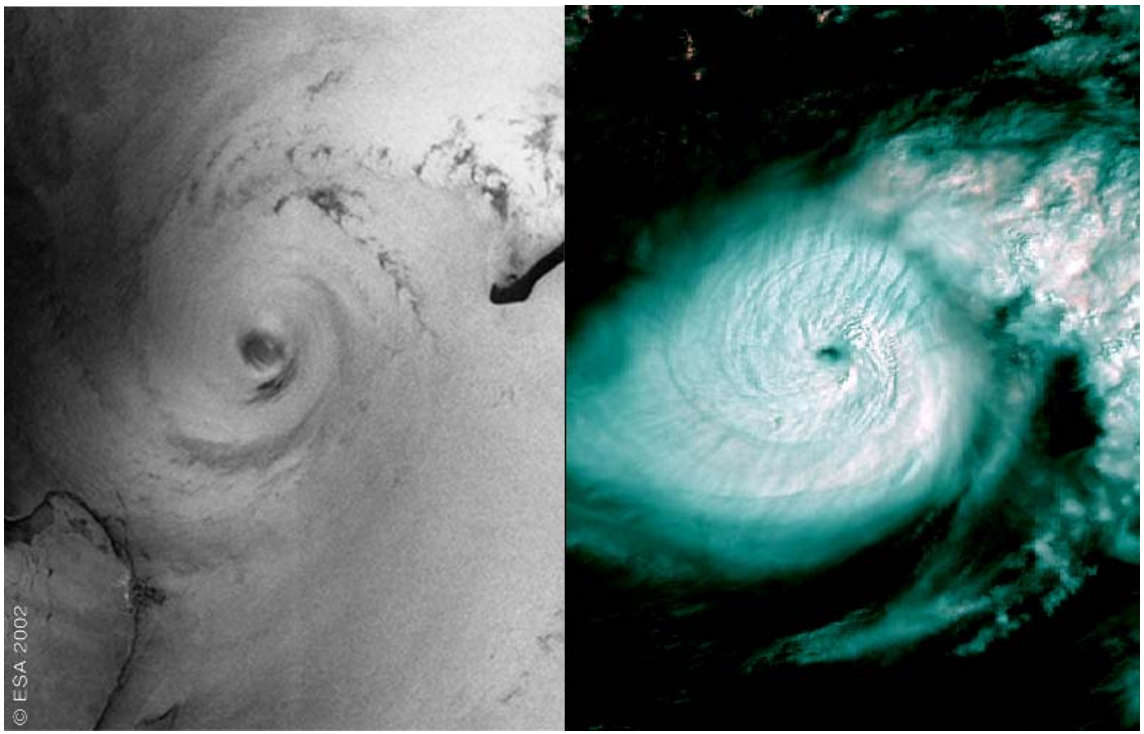
# Electromagnetic spectrum




- Different parts of spectrum provide information on different things, e.g. temperature, ozone in the atmosphere, vegetation, sea surface roughness…

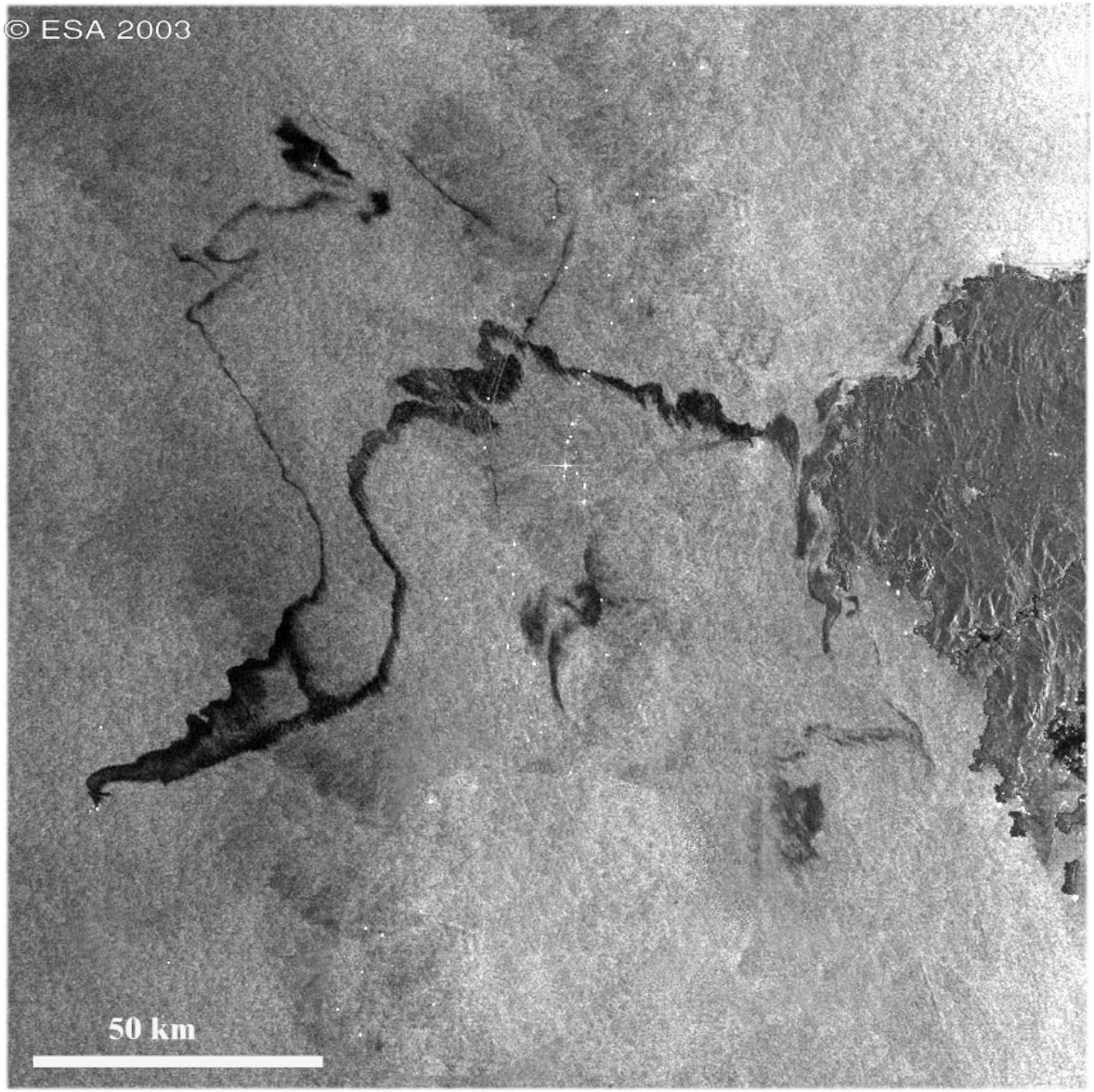
# Examples

- Hurricane Katrina in microwave and visible wavelengths




(image: ESA)

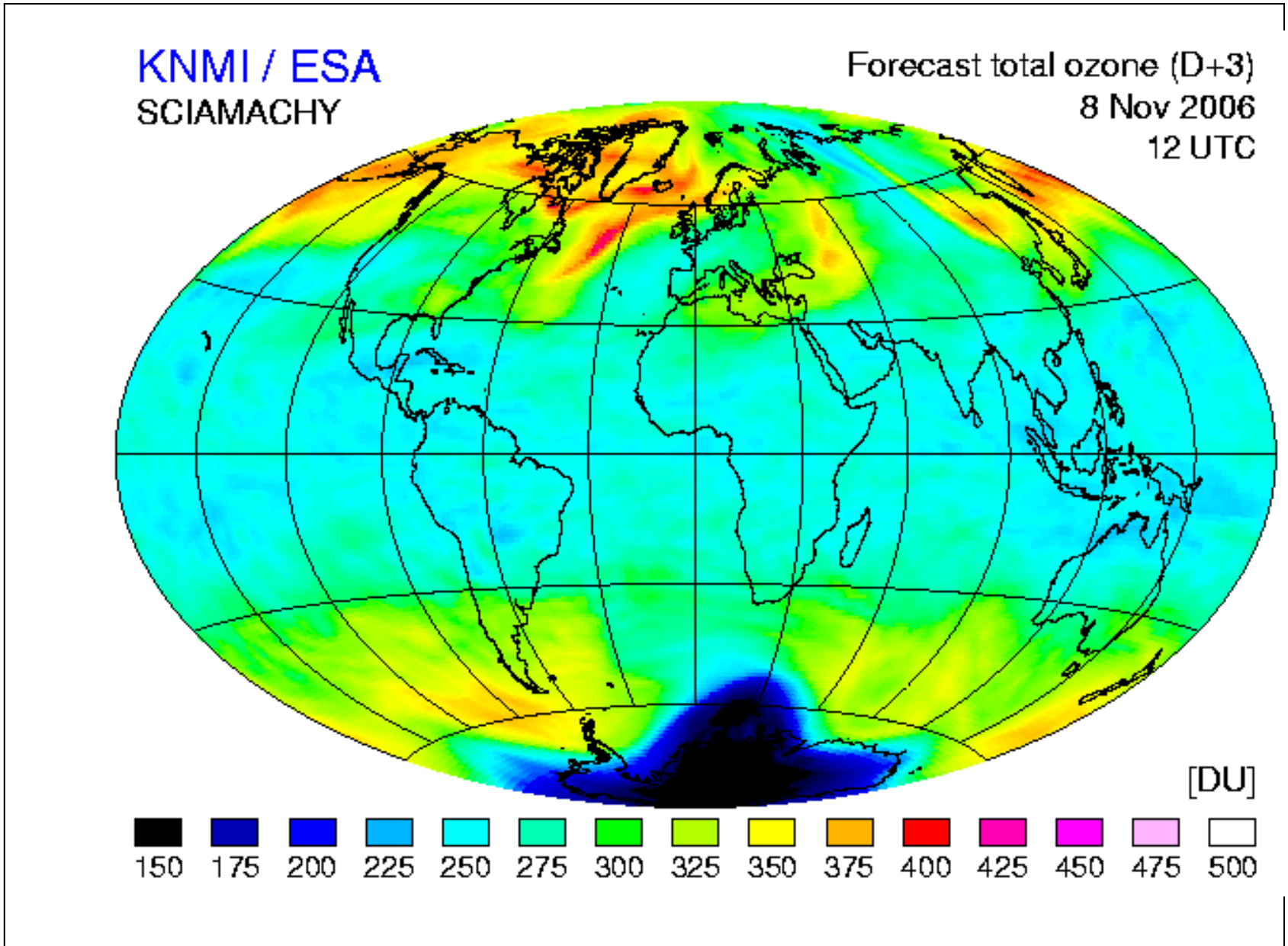
# Examples

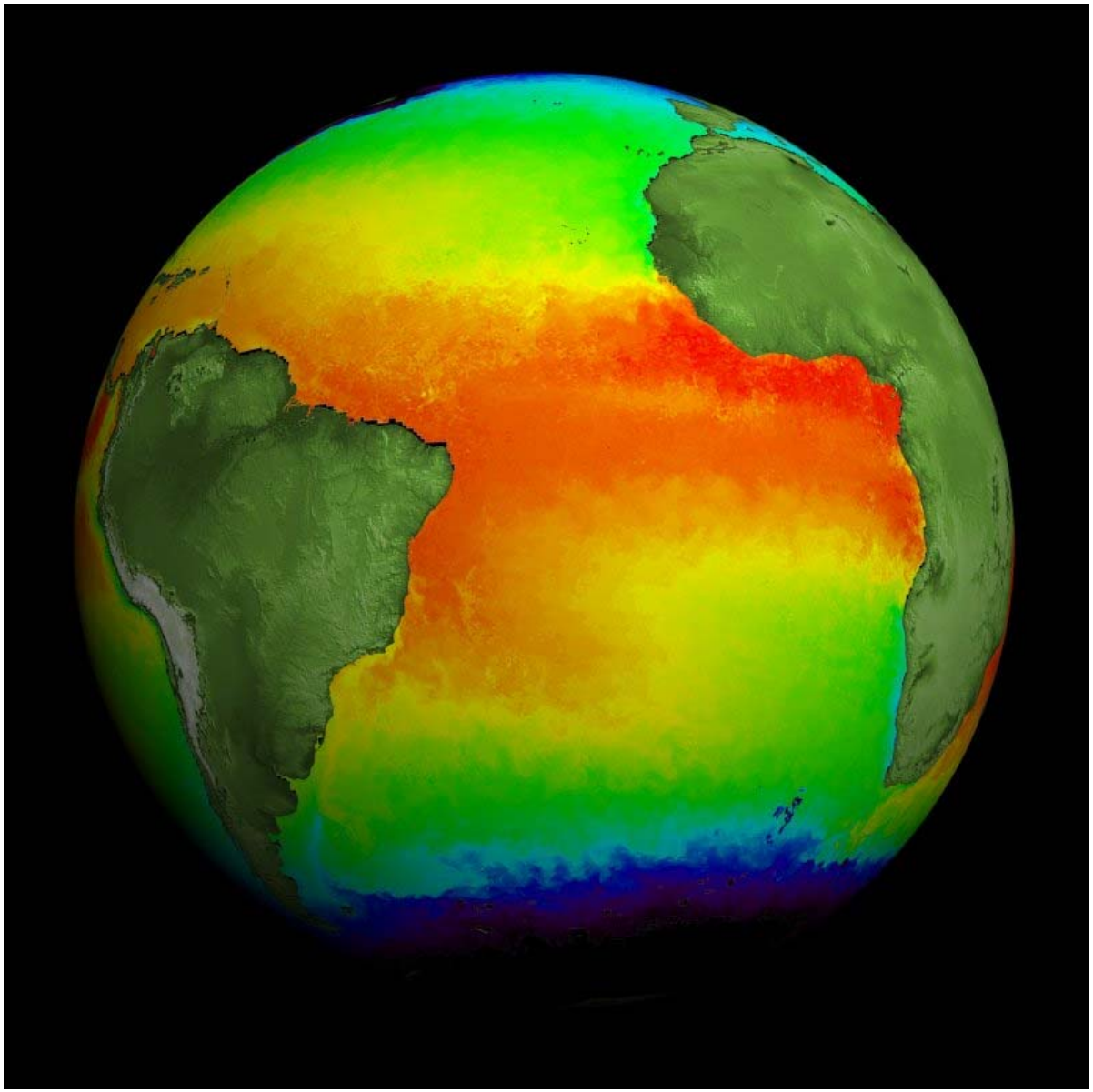



Oil spill off coast of Spain, November 2002

(Microwave)

# Ozone forecast for today
# Envisat/SCIAMACHY (Ultraviolet)





Atlantic Ocean
Sea Surface
Temperature,
Envisat/AATSR
(Infrared)

Last Updated: Tuesday, 25 July 2006, 08:52 GMT 09:52 UK

E-mail this to a friend Printable version

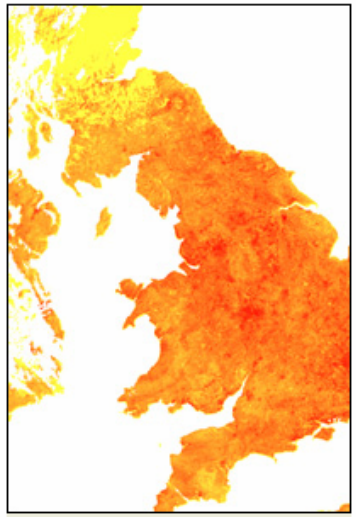
# Space images show UK sweltering

**Sensors in space have recorded the dramatic increases in land temperatures and air pollution as the UK swelters in record-breaking July heat.**

The images show major cities like London, Birmingham and Liverpool experiencing the highest levels of the air pollutant nitrogen dioxide (NO2).

Wisley in Surrey recorded an unprecedented 36.5C (97.3F) on 19 July.

The images were generated from data gathered by the European Space Agency's Envisat and Nasa's Aura satellites.



Satellite images showing sharp rises in temperatures and air pollution levels

OPEN In detail

John Remedios, head of Earth Observation Science at the University of Leicester, said: "The latest satellite data shows a perspective of the environment in which we live that can only be obtained from space.

"The images show temperature increases and increased pollution for every region in the UK."

Dr Remedios added: "It is particularly striking to see the extent of temperature and pollution increases in the large

UK HEATWAVE

TOP STORIES
- Hot staff 'at risk of accidents'
- Mixed harvests in heatwave
- Heatwave causes electricity surge
- Heatwave breaks record for July
- England's heatwave continues
- Heat advice as Scotland swelters

BACKGROUND AND FEATURES

**In pictures**
Elephants - and people - seek the best way of keeping cool

- Hot weather risks
- Watching the temperature rise
- How to keep your cool
- Water calculator

HAVE YOUR SAY
- What are your summer plans?

WATCH/LISTEN
VIDEO TV coverage

BBC WEATHER
- How to cope in hot weather

RELATED INTERNET LINKS
- University of Leicester
- European Space Agency
- Nasa

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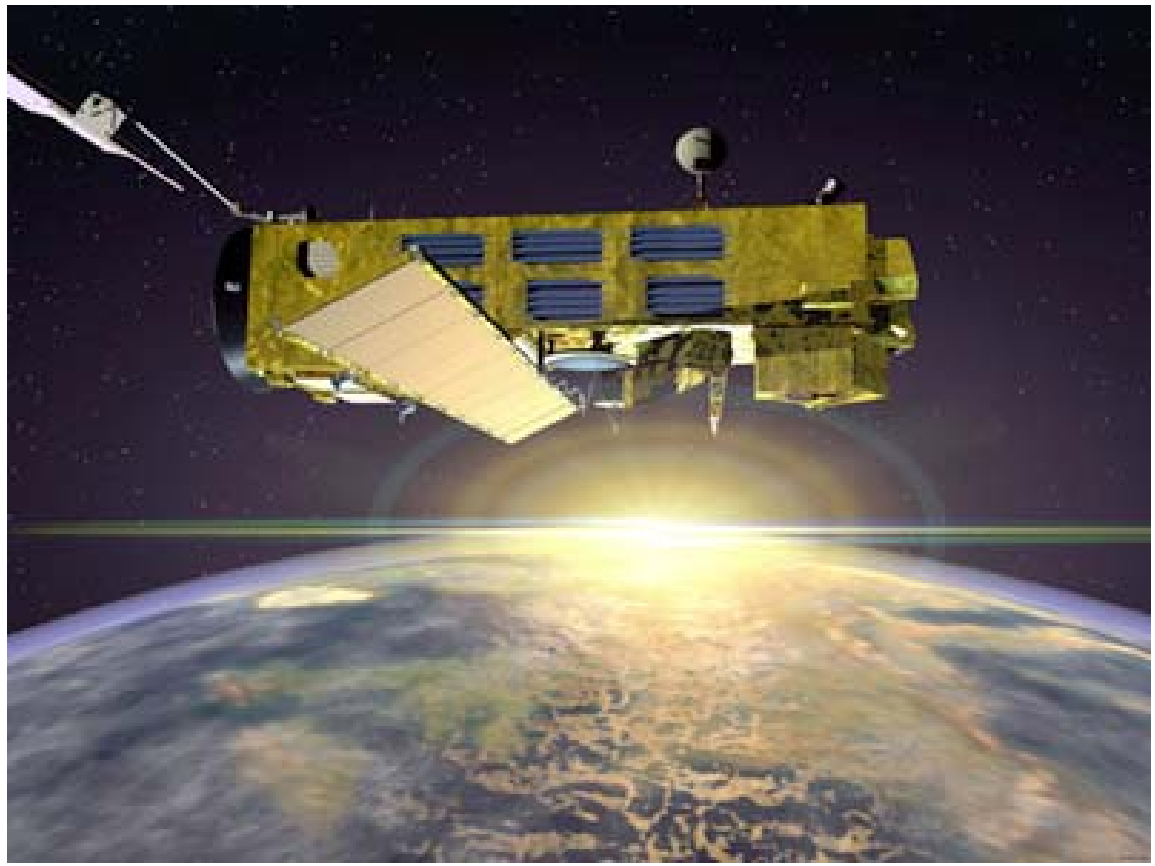
TOP SCIENCE/NATURE STORIES
- Housing threat to green belt land
- Environmental 'crisis' in Lebanon
- Thousands of microbes in one gulp

# Envisat

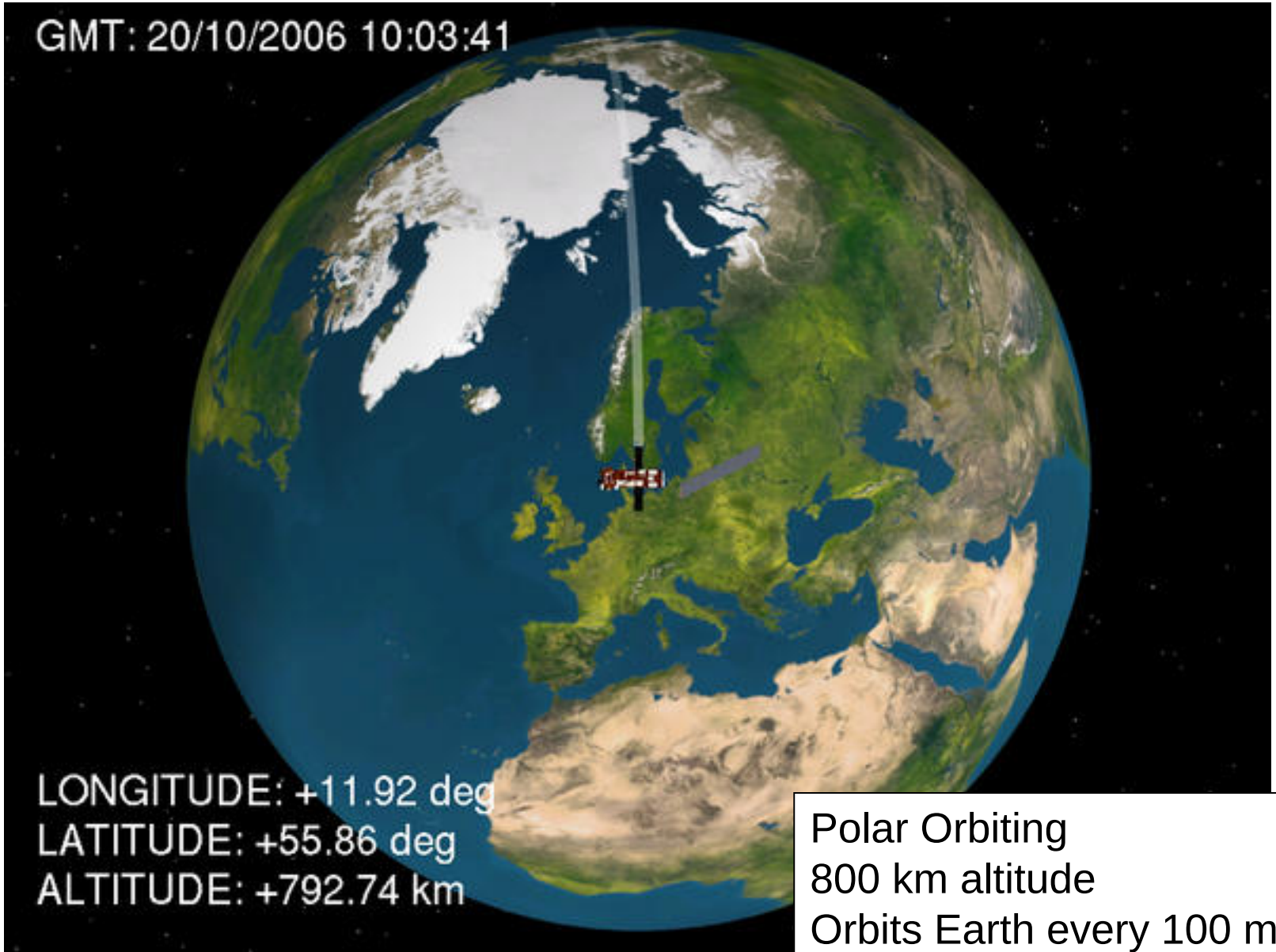
European Space Agency Earth Observation Satellite

BIG!

- 10 m × 4 m × 4 m
- 25 m × 7 m × 10 m
  (with solar panel and ASAR deployed)
- 8200 kg at launch



Launched 1st March 2002




Polar Orbiting
800 km altitude
Orbits Earth every 100 minutes
Global coverage every 3 days

# Latest News : Met-Op

- Launch 19 Oct 2006
- Europe's first polar orbiting satellite for meteorology

Image: EUMETSAT

Image: ESA – AOES Medialab

First image from Microwave Humidity Sounder, 31 Oct 2006.

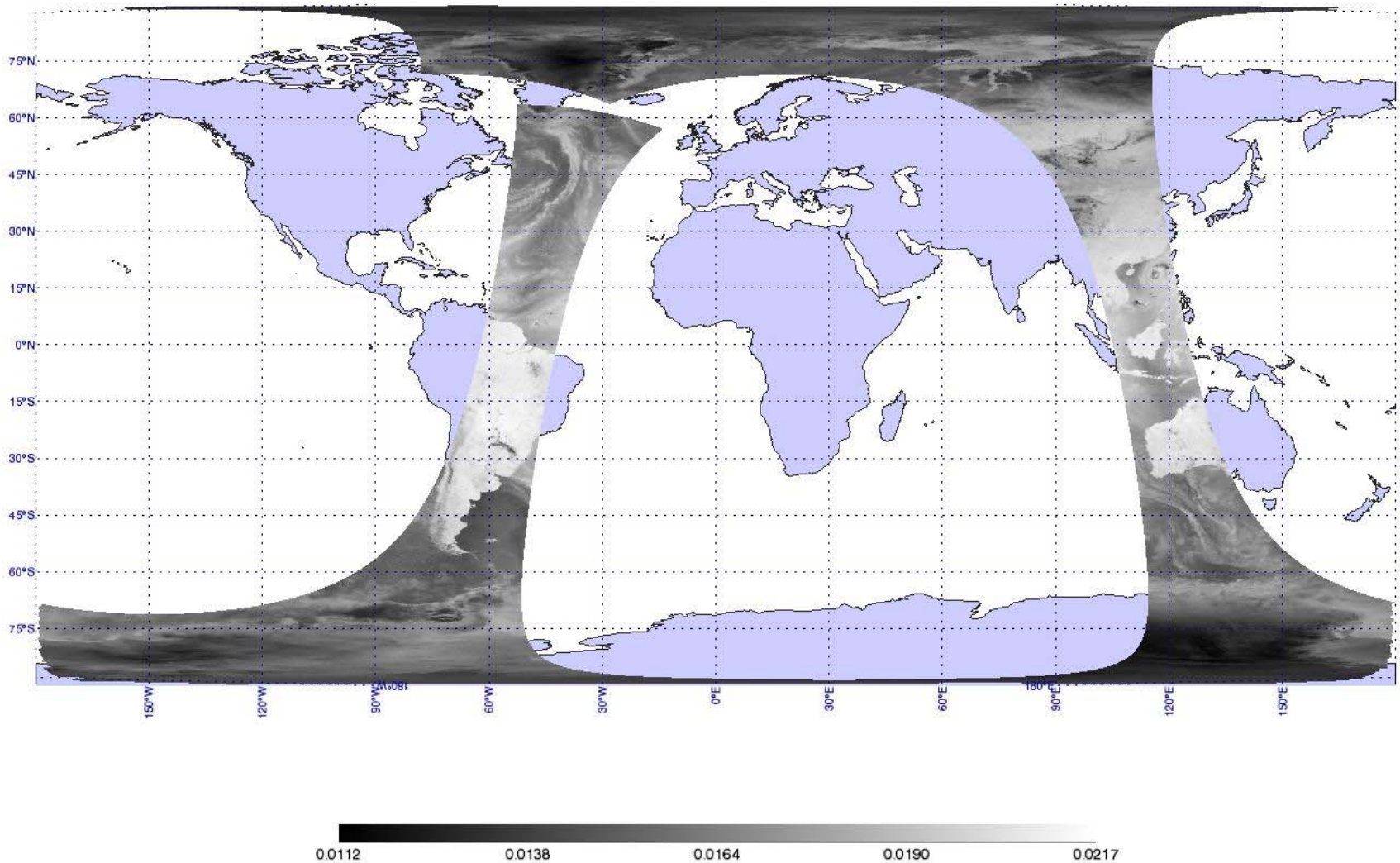



Image: EUMETSAT