

**Answers in the Wind:
Atmospheric
Monitoring at Royal
Holloway**

**Srimathy Sriskantharajah
Dept. Earth Sciences**

ATMOSPHERIC MONITORING LABORATORY

**Monitoring the concentration of
greenhouse - related gases in air
arriving at Royal Holloway.**

**These gases can contribute to
climate change, so their
concentrations in the atmosphere
needs to be monitored.**

Climate Change

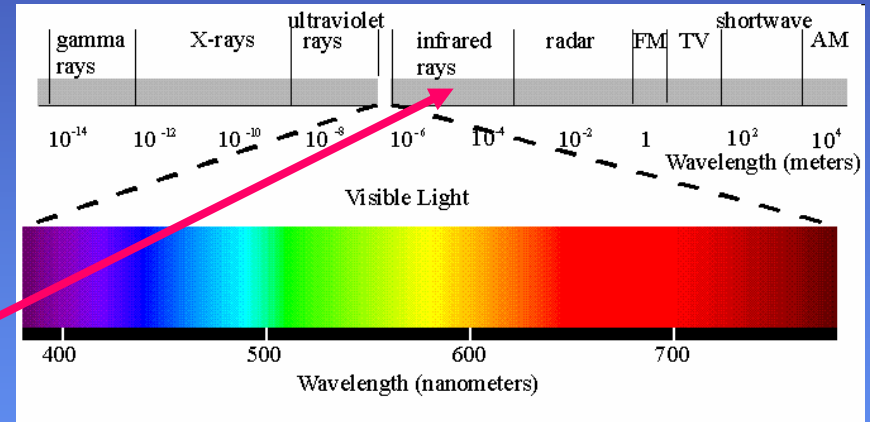
- CLIMATE CHANGE is the long term change in the 'normal' or 'average' weather.
- The term can be applied to the weather of any region or indeed the whole planet.

Causes of Climate Change

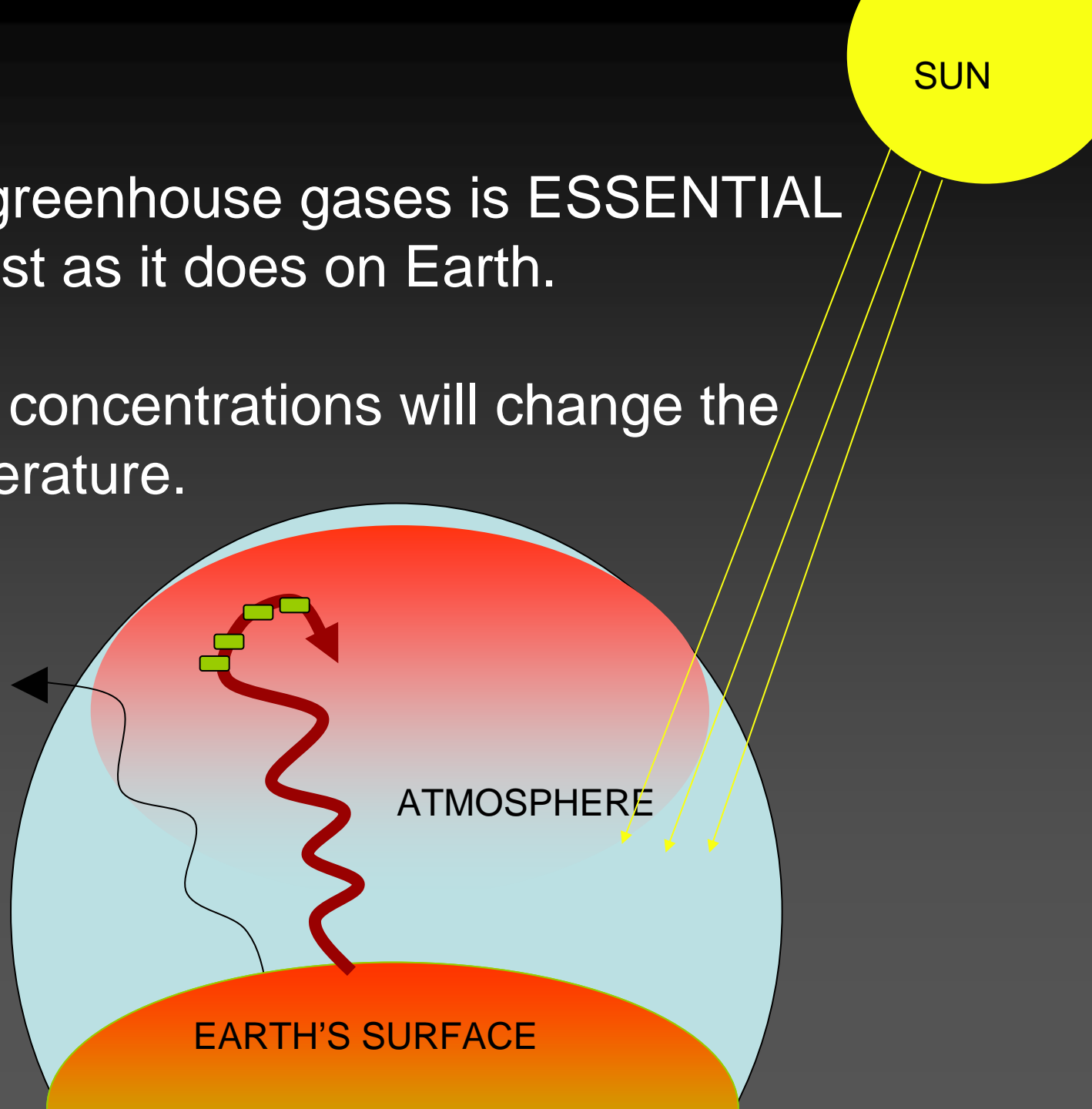
- Climate change can be caused by many factors:
 - » Glaciation
 - » Oceans
 - » Solar variations
 - » Earth's own orbit
 - » Geological processes
 - » Historical meteorology
 - » Changes to greenhouse gas composition in the atmosphere

Greenhouse gases

- Are responsible for the Greenhouse Effect
- A greenhouse gas absorbs and emits radiation in the infrared part of the electromagnetic spectrum



- Actions of greenhouse gases is **ESSENTIAL** for life to exist as it does on Earth.
- But excess concentrations will change the global temperature.



The Gases Involved

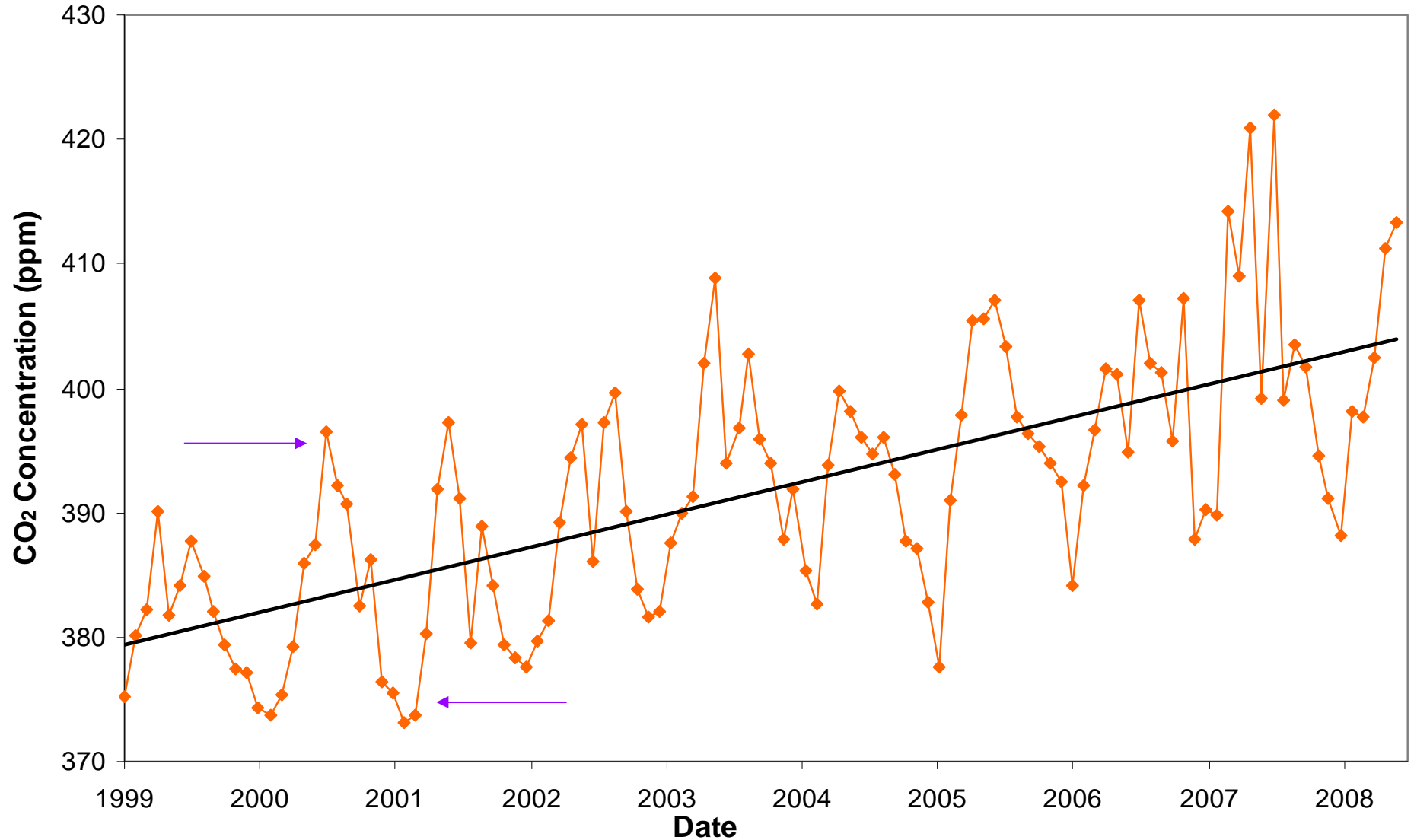
- Examples of greenhouse gases
 - Water vapour (36 -70%)
 - **Carbon dioxide (9-26%)**
 - **Methane (4-9 %)**
 - Ozone (3-7%)
 - Nitrous oxide
 - CFCs
- Gases also measured in the Atmospheric Monitoring Laboratory
 - » Carbon monoxide
 - » Hydrogen

Location of the Royal Holloway air monitoring site

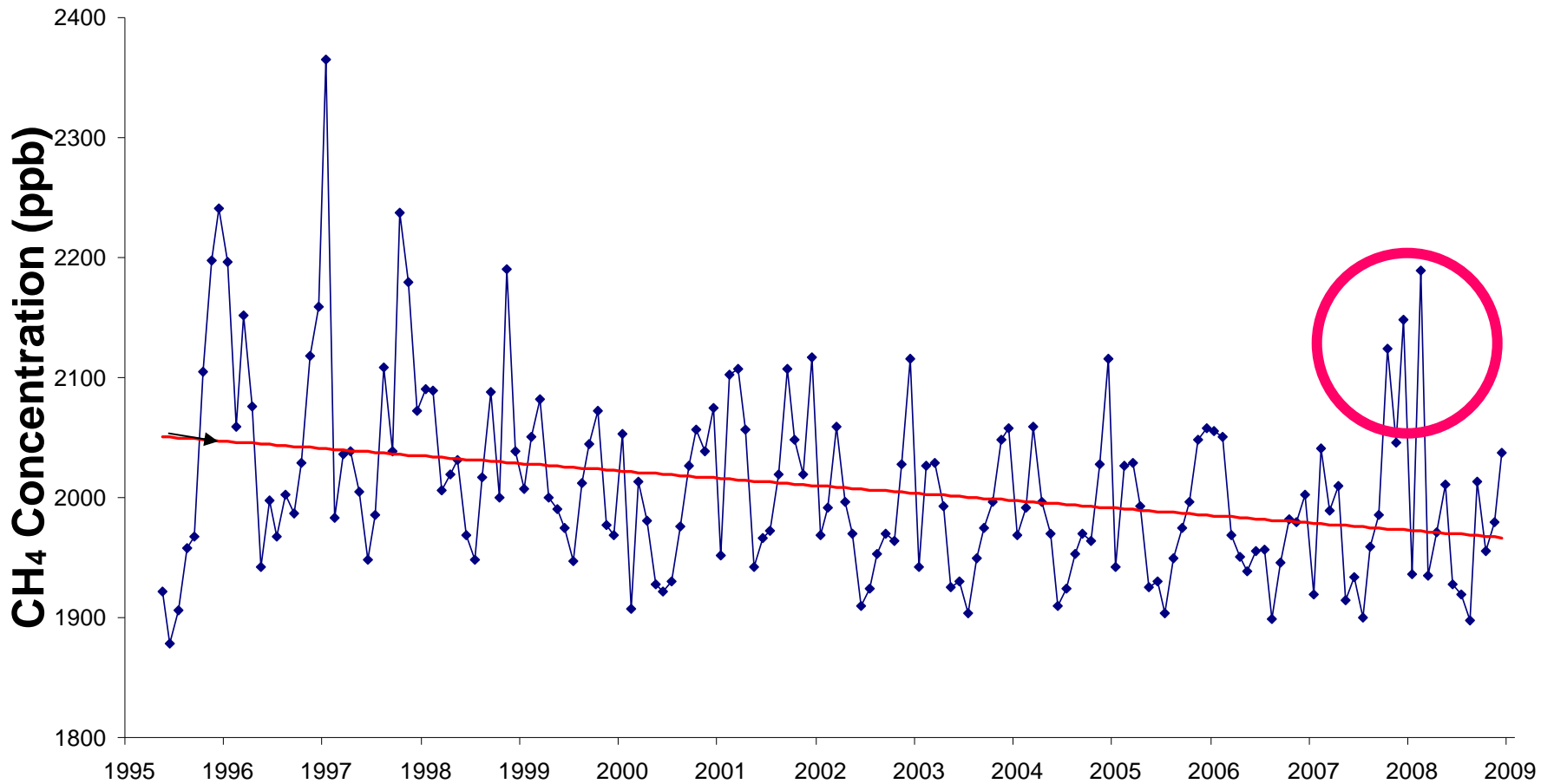
- 30 km WSW of centre of London, in Egham
- Air inlet 15 m above local ground, 45 m above London basin



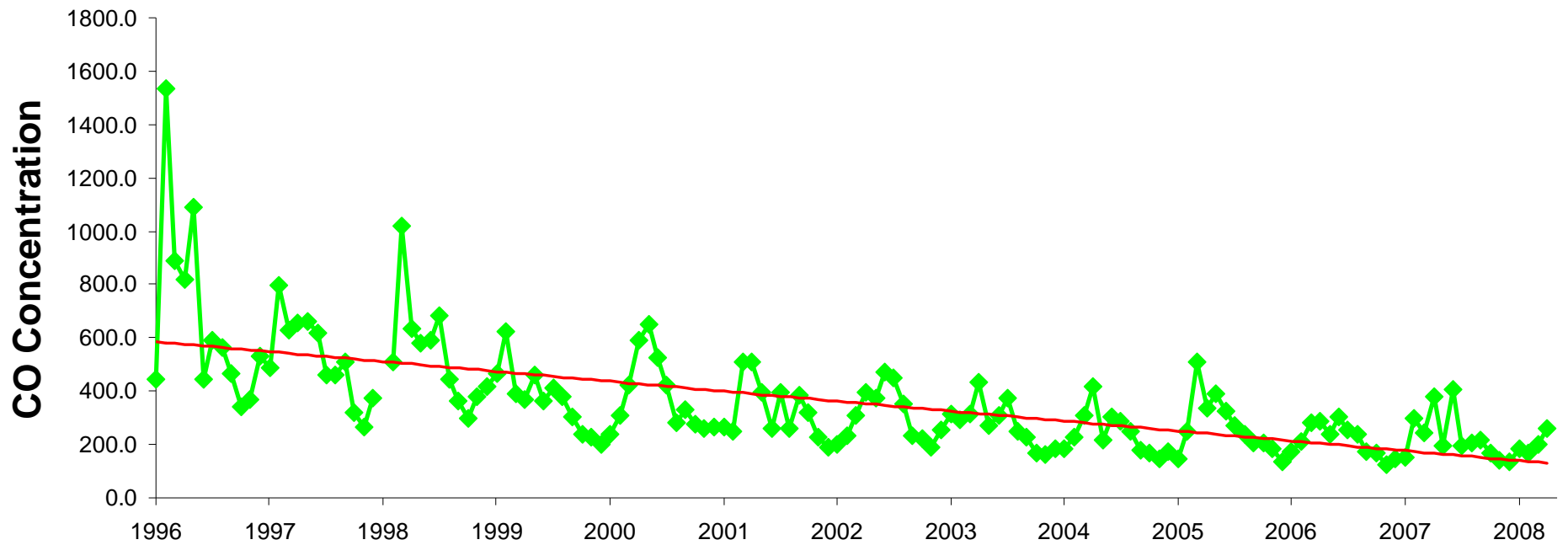
CO₂ measured at RHUL



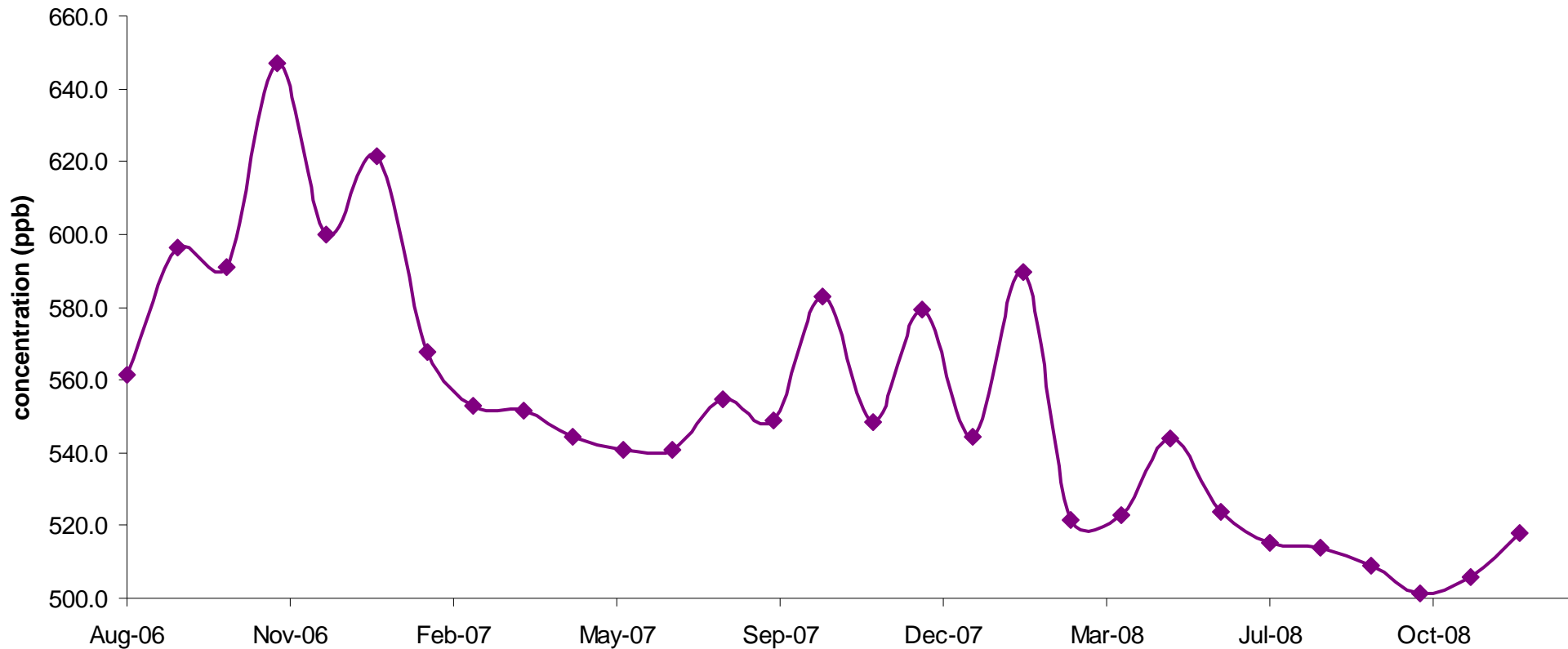
Methane at RHUL since 1995



CO at RHUL since 1996

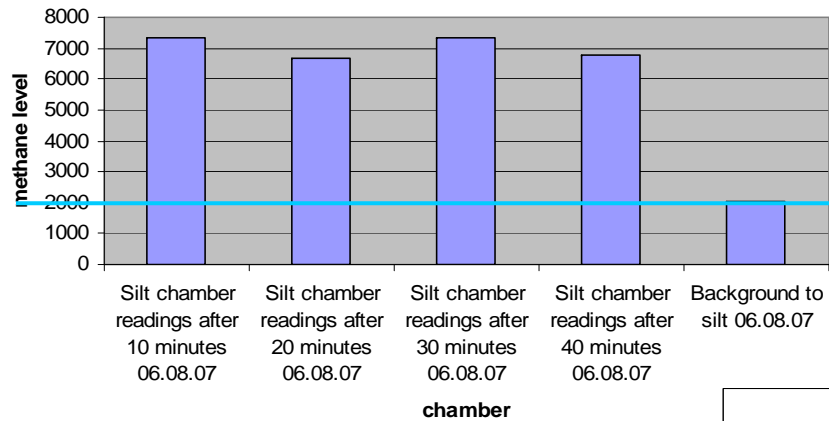


Hydrogen at RHUL since 2006



EXPERIMENTS ON CAMPUS

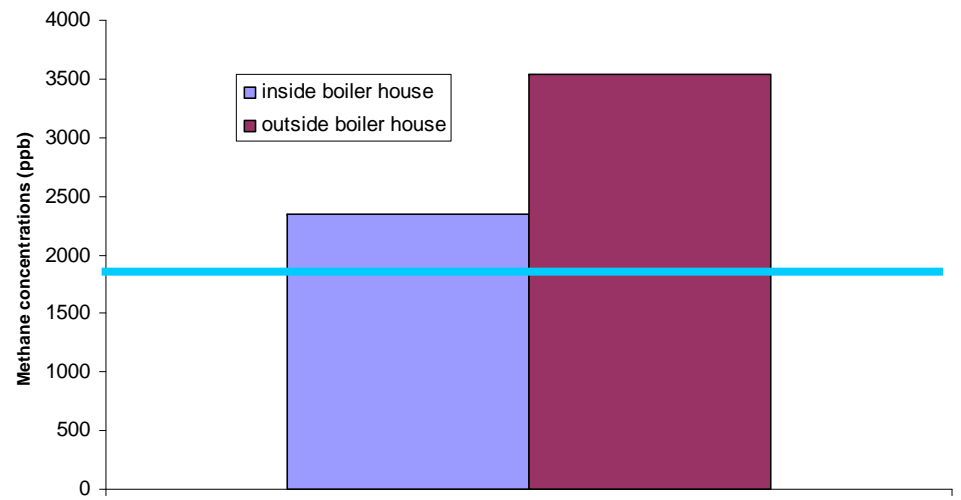
methane level in silt chamber on 06.08.07



Methane emissions from the pond on campus

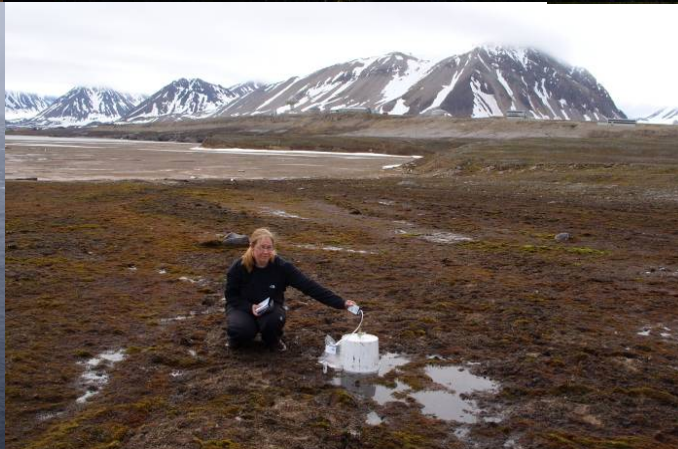
Emissions from the boiler house

Boiler house emissions?

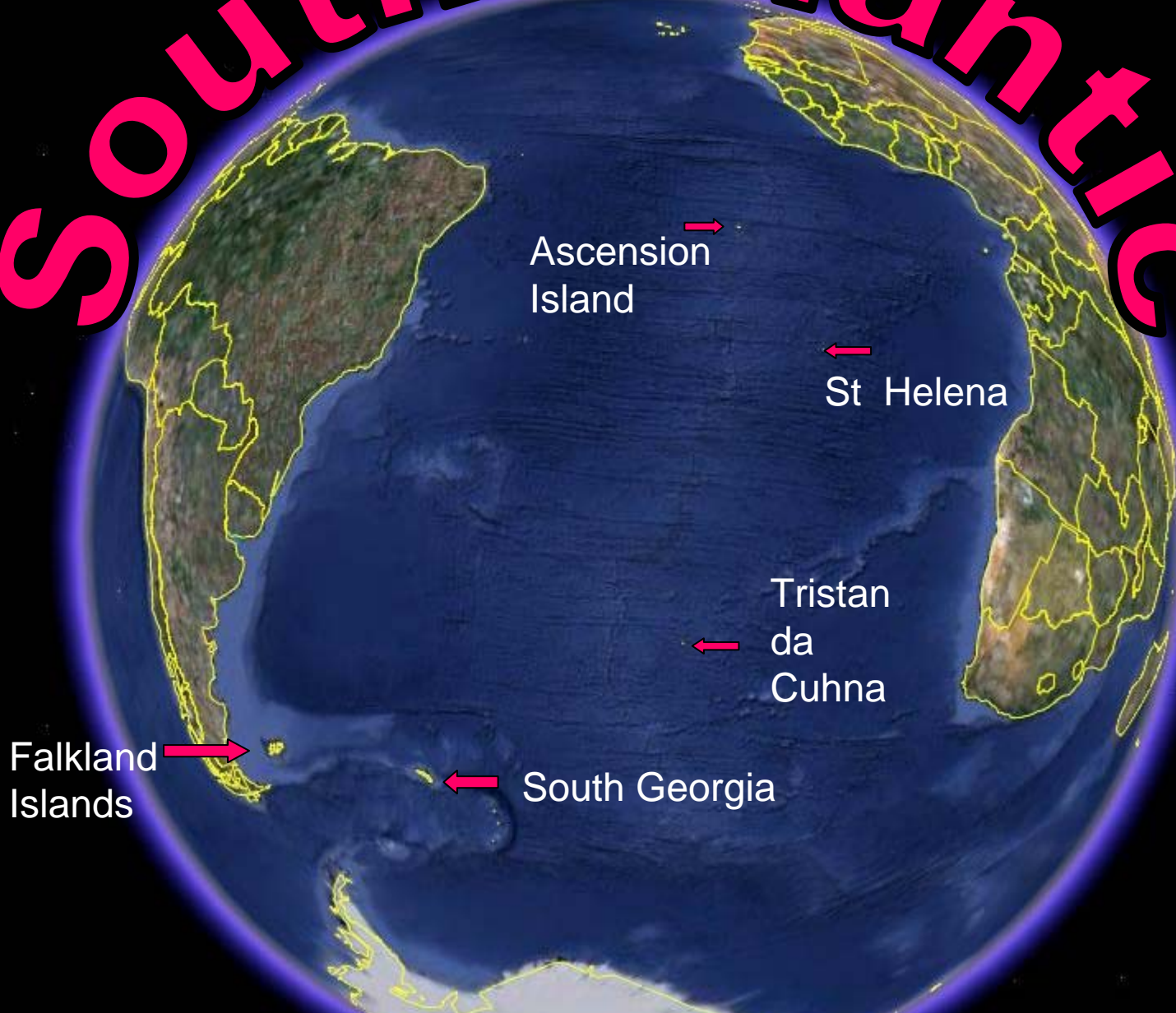


BEYOND ROYAL HOLLOWAY

The Arctic



South Atlantic



Ascension
Island

St Helena

Tristan
da
Cuhna

Falkland
Islands

South Georgia

IMPORTANCE OF MONITORING

- SEE TRENDS IN GREENHOUSE CONCENTRATIONS
- SEE EFFECTS OF CLIMATE CHANGE MITIGATION POLICIES
- TO GAIN A BETTER UNDERSTANDING OF ATMOSPHERIC SYSTEMS



Acknowledgements

- **Colleagues in the Atmospheric Monitoring Group at Royal Holloway: Euan Nisbet, Dave Lowry, Rebecca Fisher and Mathias Lanoisellé**