



UK Measurements of Greenhouse Gases by GGLES, RHUL

Dave Lowry, Euan Nisbet, Rebecca Fisher, Giulia Zazzeri, Mathias Lanoisellé

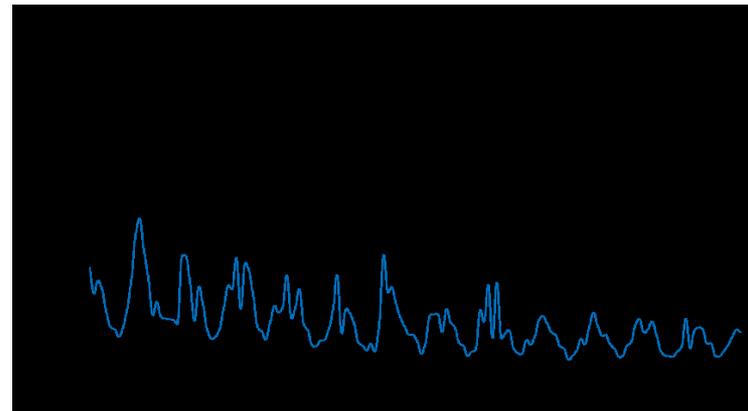
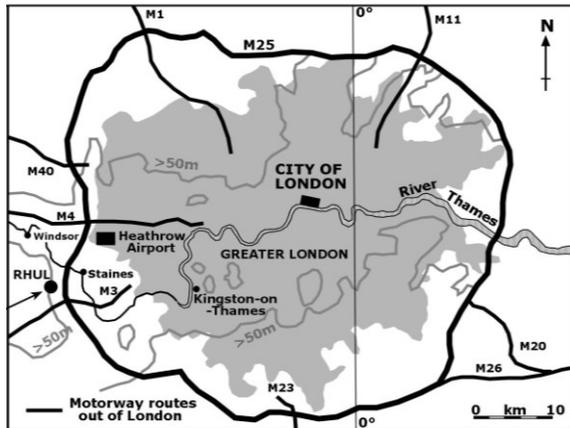
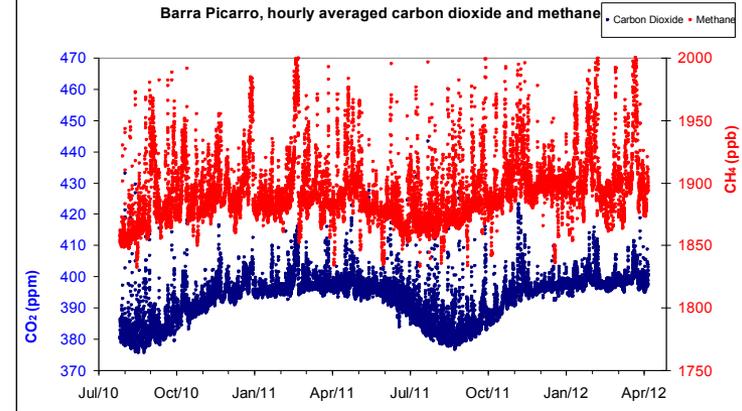
Long-Term continuous measurement sites:

RHUL (Egham) – CH₄ (CRDS, OA-ICOS) since 1996, CO (PP1, OA-ICOS) since 1997, CO₂ (CRDS, OA-ICOS) since 2000, H₂ (PP1) since 2007, N₂O (OA-ICOS) since 2014, ²²²Rn since 2003, δ¹³C of CH₄ (GC-IRMS) since 1995.

Standardised using calibration gases: NOAA and MPI-Jena

Barra, Outer Hebrides – CH₄, CO₂ (CRDS) since 2010

Jersey, Channel Islands – CH₄, CO₂ (OA-ICOS) since 2013



Source studies of Methane

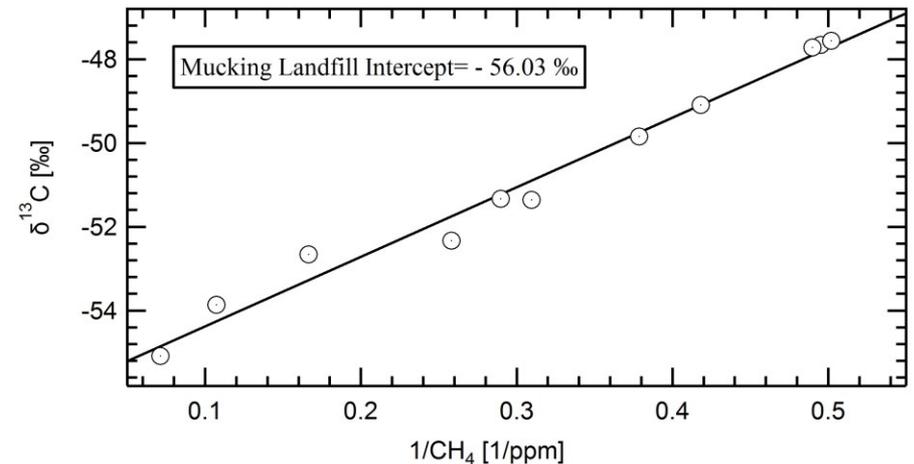
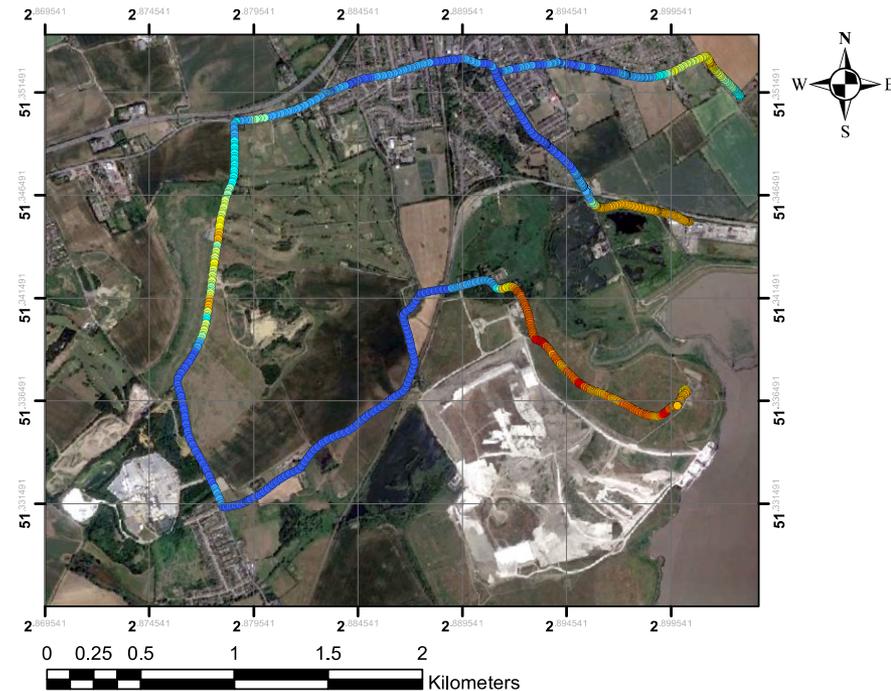
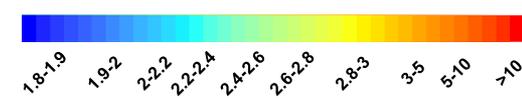
- Landfill sites (with NPL for DEFRA) – isotopic analysis to calculate % CH₄ oxidation
- Mobile measurements of methane source plumes and sample collection for isotopic characterisation

- Gas leaks
- Landfill sites
- Coal mines
- Waste water



- Airborne sampling for $\delta^{13}\text{C}$ – FAAM research aircraft over North Sea
 - Aids distinction of depth of gas field production / leak (Elgin) – shallow is less thermogenic
 - Distinguishes gas rig emissions (-36‰) from UK land plume outflow (-58‰)

Methane Concentrations (ppm)



London Region Studies

- Continuous $\delta^{13}\text{C}$ measurement at the RHUL site (20 minute intervals)
- Campaigns on King's College Roof – continuous CRDS measurement and bag sampling
- Isotopic inventory maps
- Mobile campaigns by London Borough (Hounslow, Runnymede)

