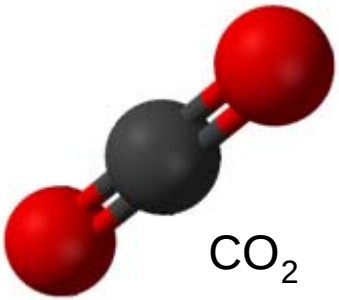
AVOCET for DISCOVER-AQ



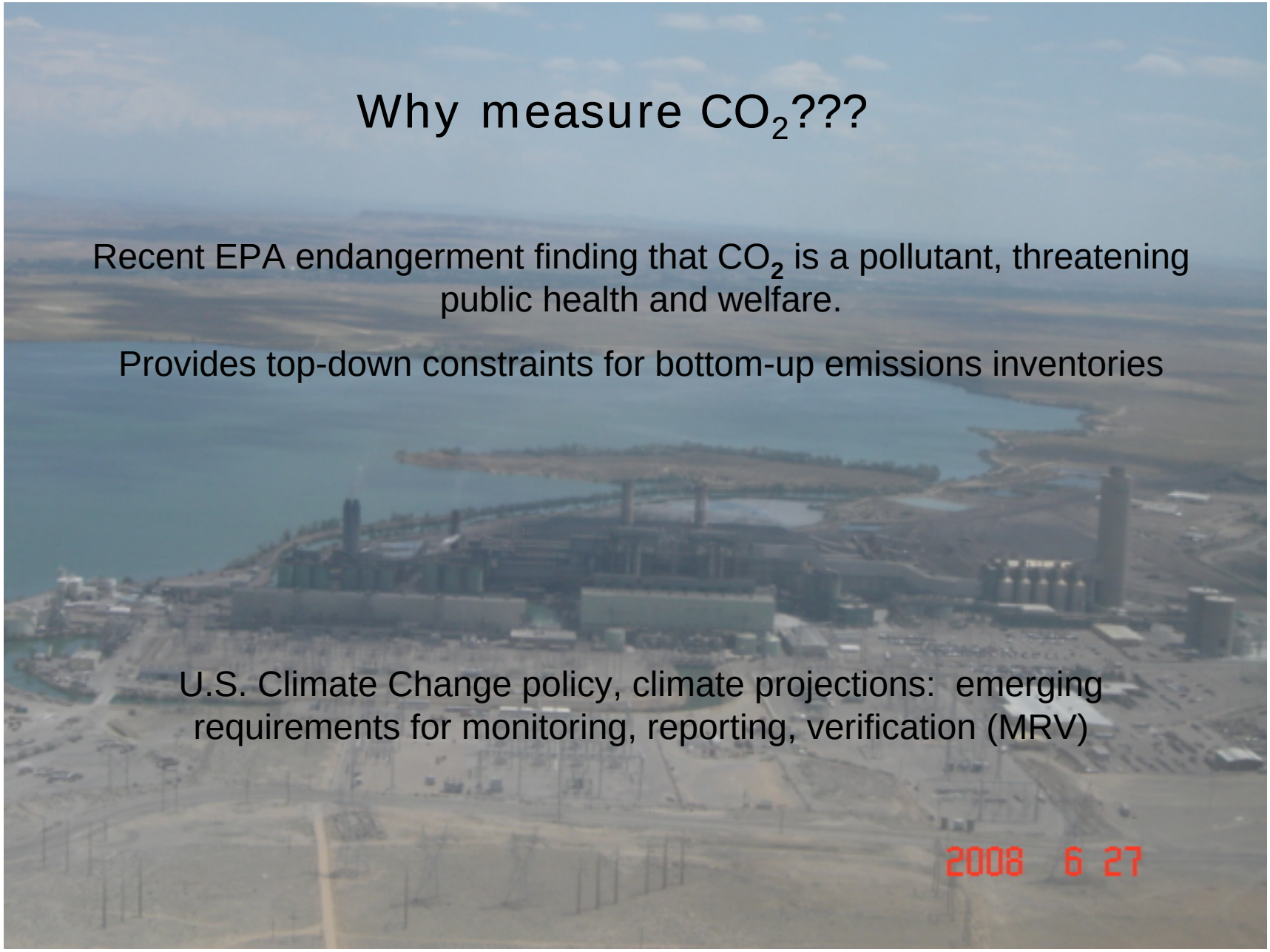
Stephanie Vay

Yonghoon Choi

Ali Aknan

Jimmy Geiger

Landsat image of DC



Why measure CO_2???

Recent EPA endangerment finding that CO_2 is a pollutant, threatening public health and welfare.

Provides top-down constraints for bottom-up emissions inventories

U.S. Climate Change policy, climate projections: emerging requirements for monitoring, reporting, verification (MRV)

Instrument Performance Characteristics

Accuracy ± 0.25 ppm relative to WMO CO_2 standards

Precision ≤ 0.1 ppm

Dynamic Range: 0 – 3000 ppm

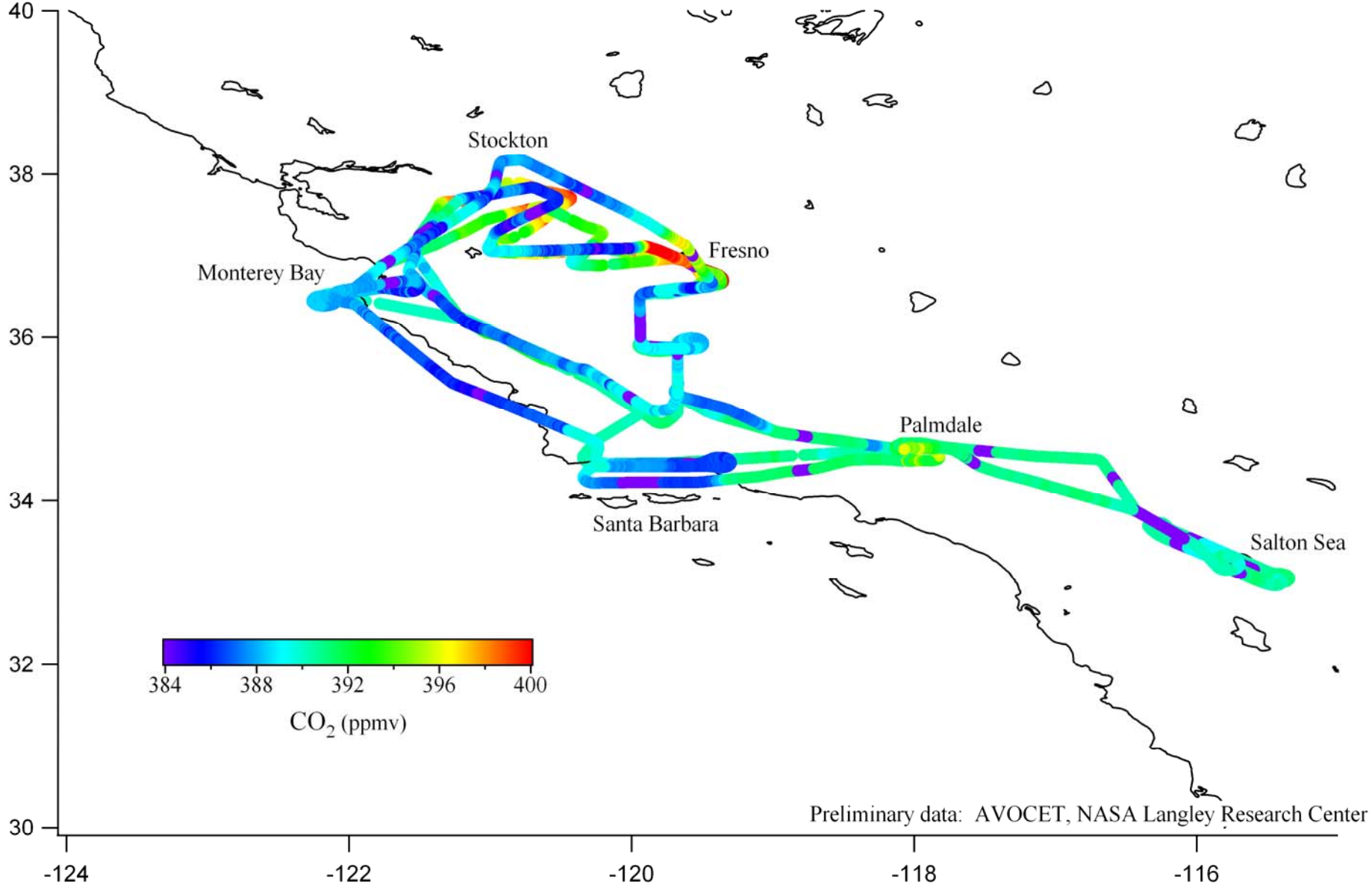
Data Reporting Interval: 1s

7”

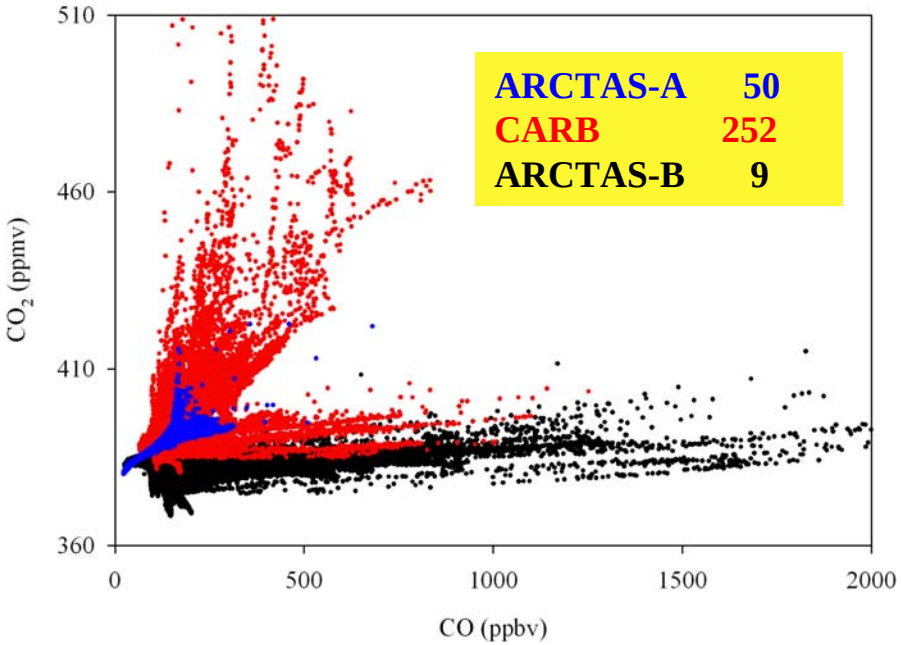
Upgrades

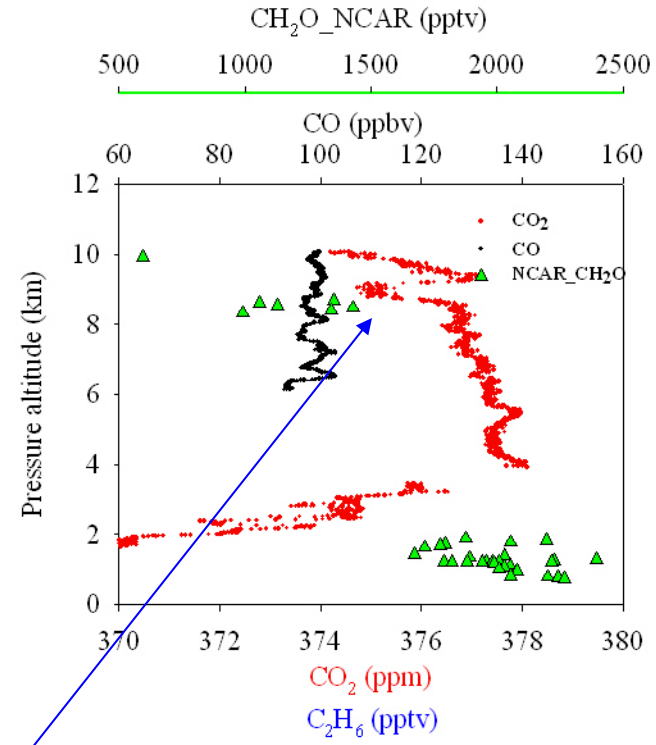
2”

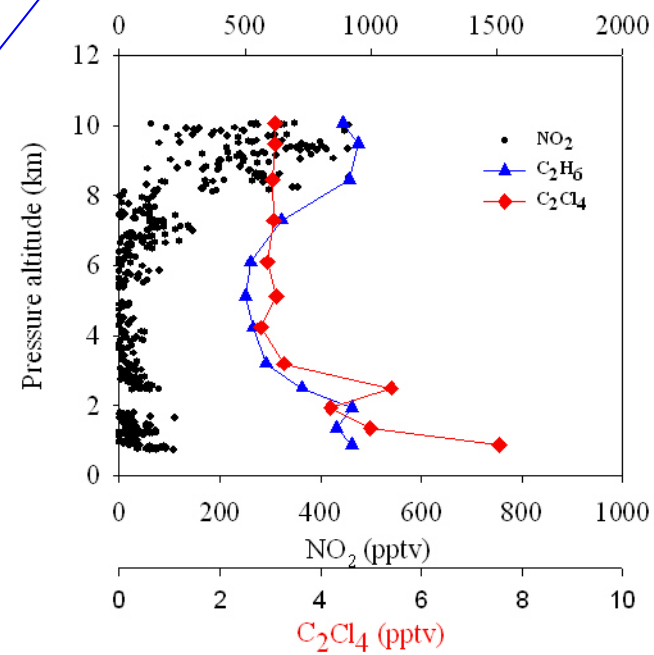
SARP Test & Locals, 28 June – 1 July 2010



Observationally based estimates of CO2:CO

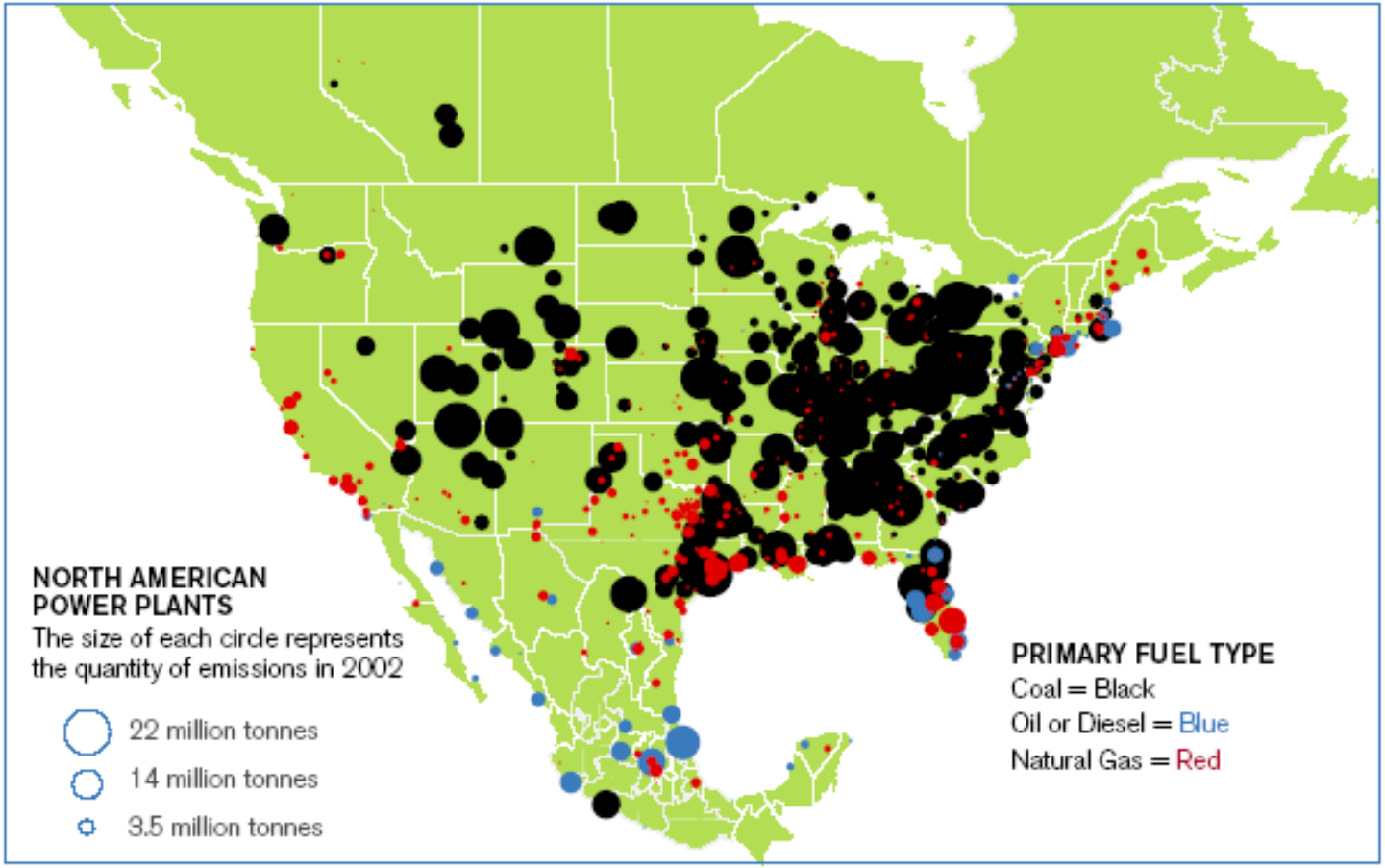






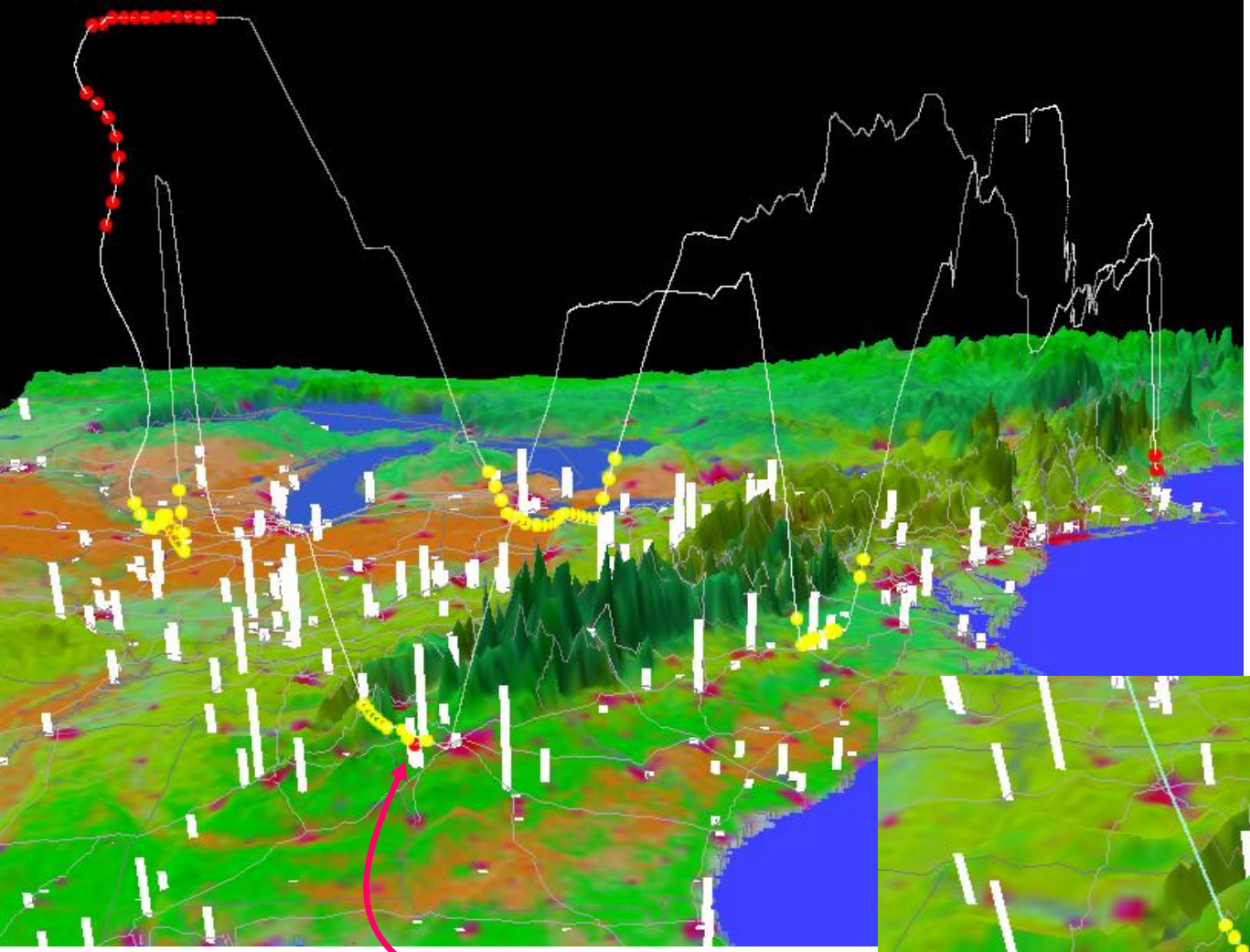
CO2 as a tracer of convection

GEOGRAPHIC DISTRIBUTION OF POWER PLANT CO_2 EMISSIONS*

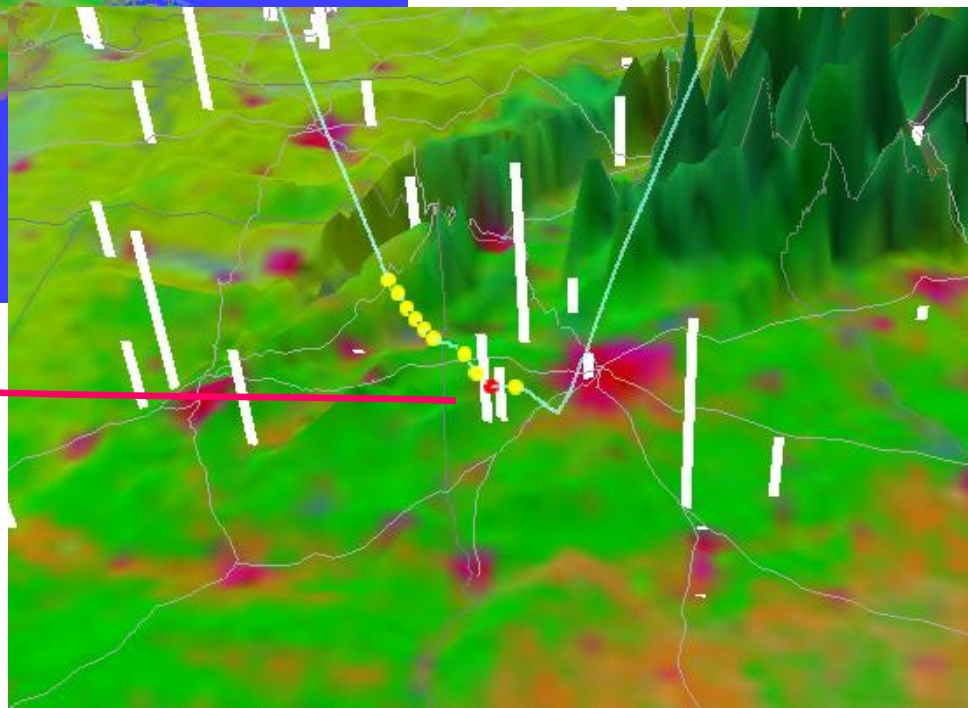


* In general, CO_2 emissions data were not available for individual Canadian power plants. Data were available for the major facilities in the Province of Ontario from Ontario Power Generation's *Towards Sustainable Development: 2002 Progress Report*. In Alberta, the map reflects only a subset of the major power plants in the province. CO_2 emissions data were only available for facilities included in ATCO Power's *Environment, Health and Safety Review 2002*. All other facilities without public CO_2 emissions data for 2002 are not shown on the map.

DC-8 (2004/07/20)



The white bar : Point sources extruded by July CO2 emissions.

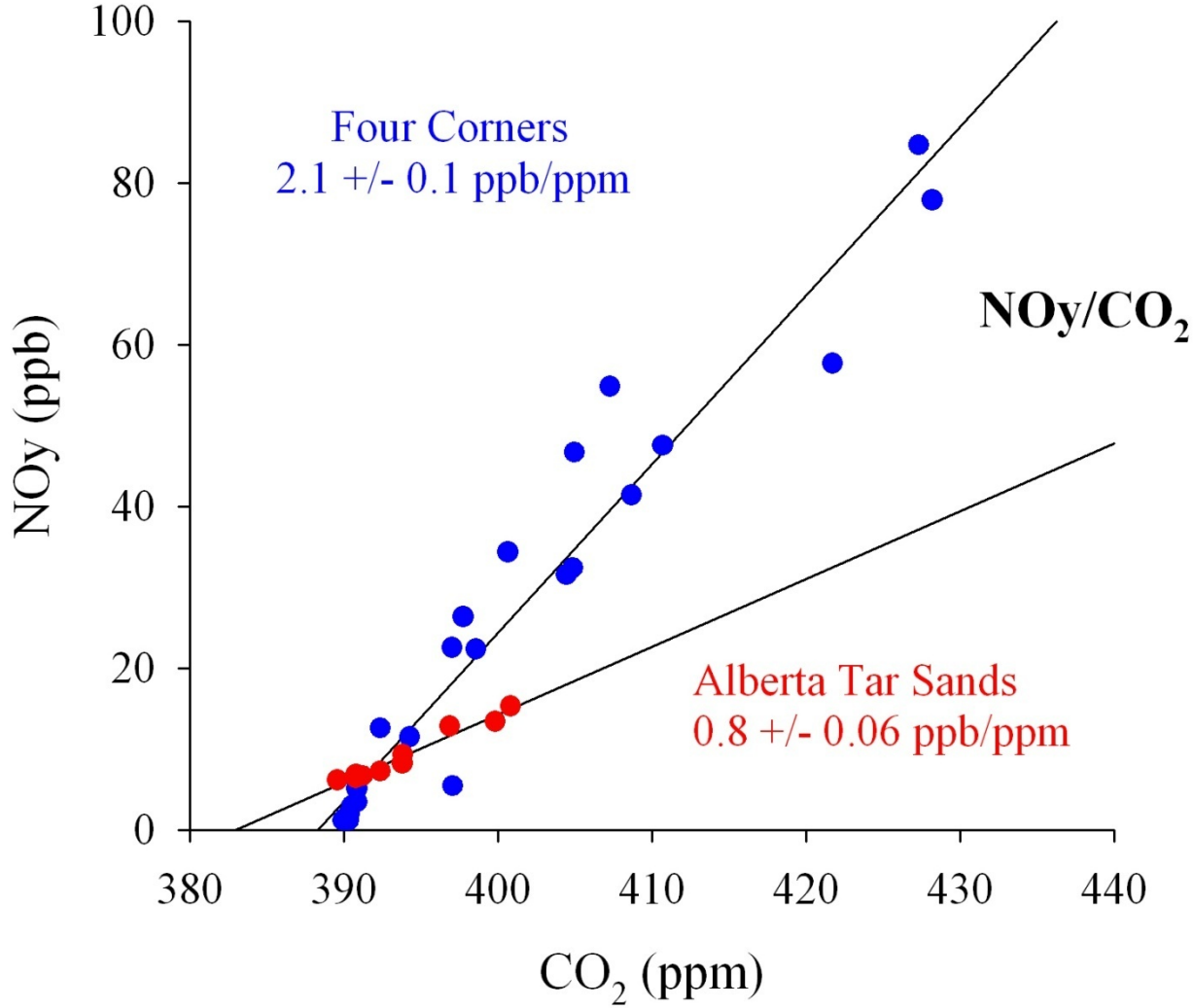


A narrow point source plume was captured by high resolution CO_2 sensor

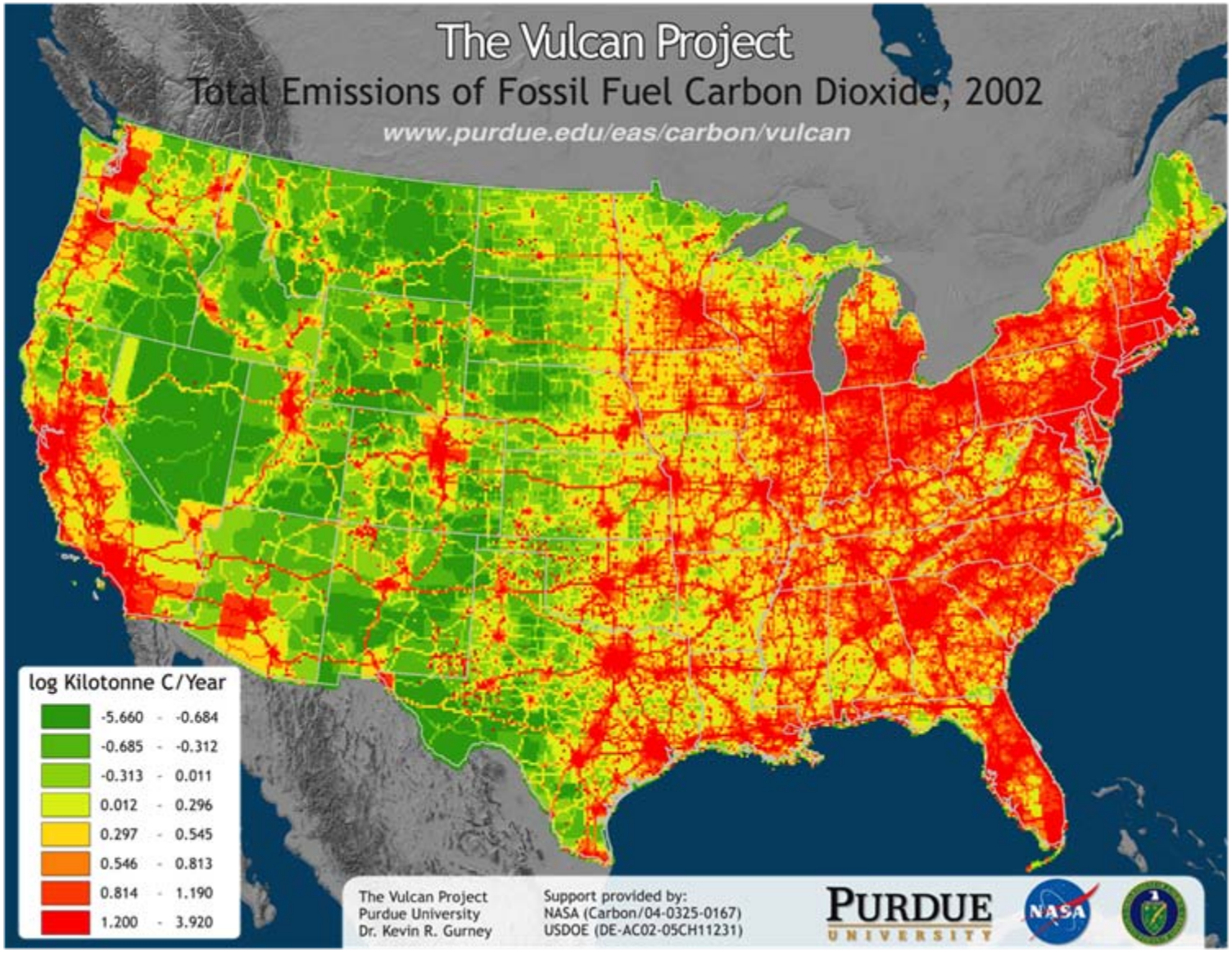
(403.15 ppm CO_2 @ 1Hz)

Determining Emission Ratios from Airborne Data

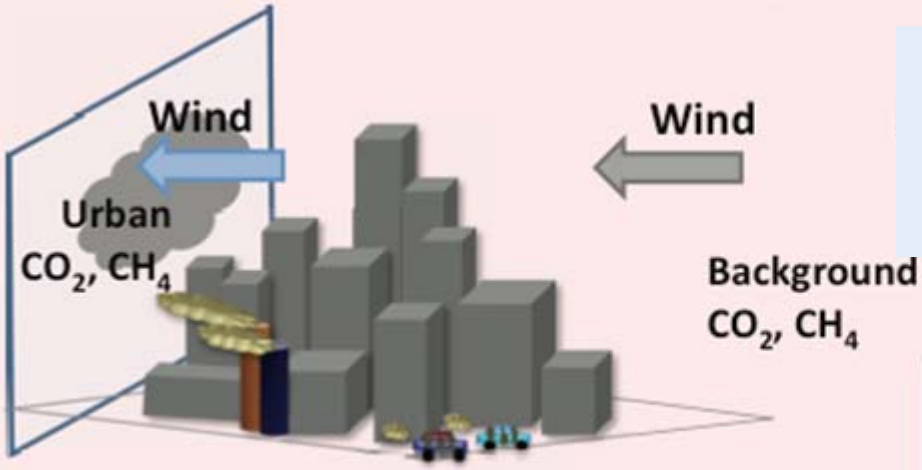
To compare these emission ratios to those calculated from Continuous Emission Monitoring Systems (CEMS) installed at power plants.



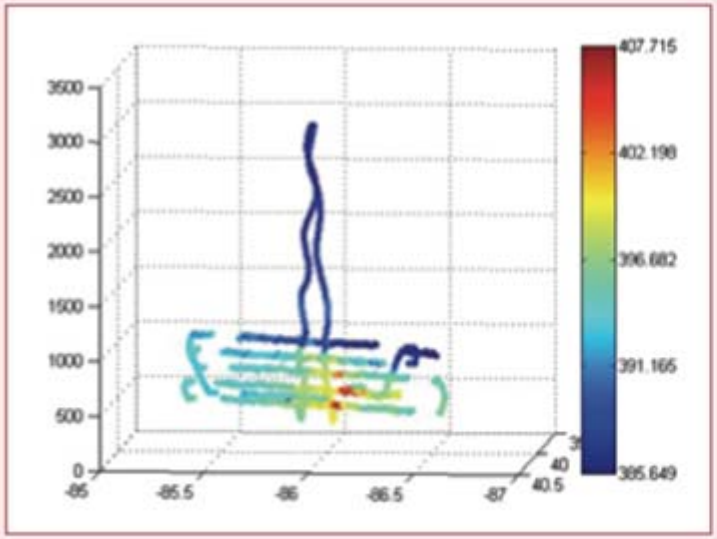
NOy data from Andy Weinheimer

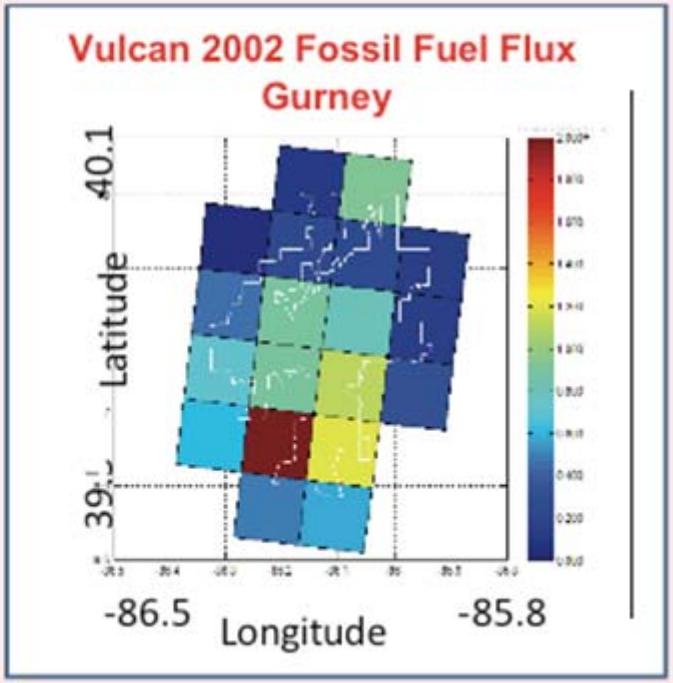

The Vulcan Project
Total Emissions of Fossil Fuel Carbon Dioxide, 2002
www.purdue.edu/eas/carbon/vulcan
log Kilotonne C/Year
-5.660 - -0.684
-0.685 - -0.312
-0.313 - 0.011
0.012 - 0.296
0.297 - 0.545
0.546 - 0.813
0.814 - 1.190
1.200 - 3.920
The Vulcan Project
Purdue University
Dr. Kevin R. Gurney
Support provided by:
NASA (Carbon/04-0325-0167)
USDOE (DE-AC02-05CH11231)
PURDUE
UNIVERSITY
NASA

INFLUX



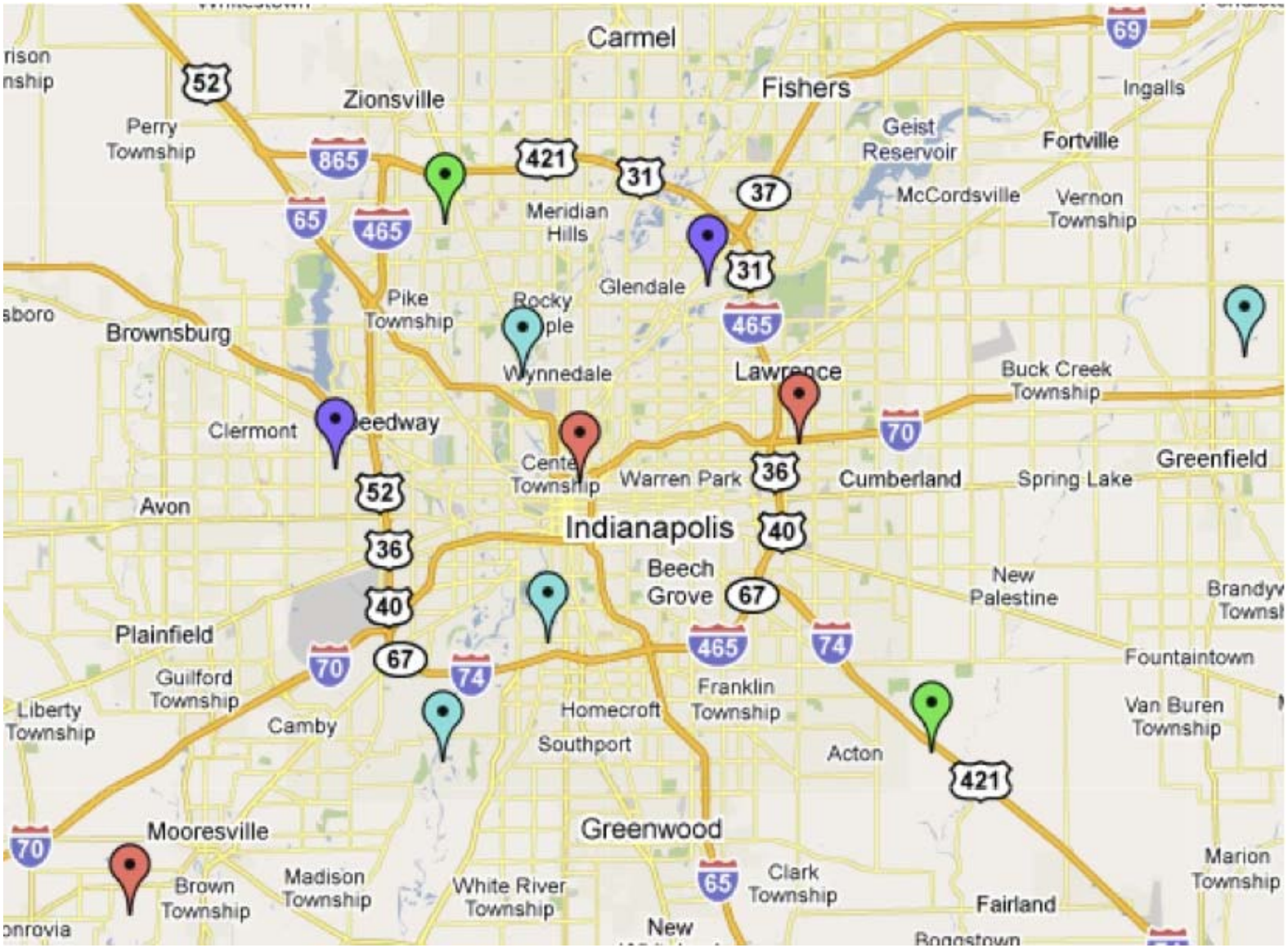
Aircraft
Cell towers
Fossil Fuel data

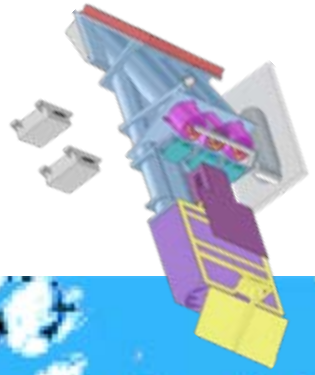




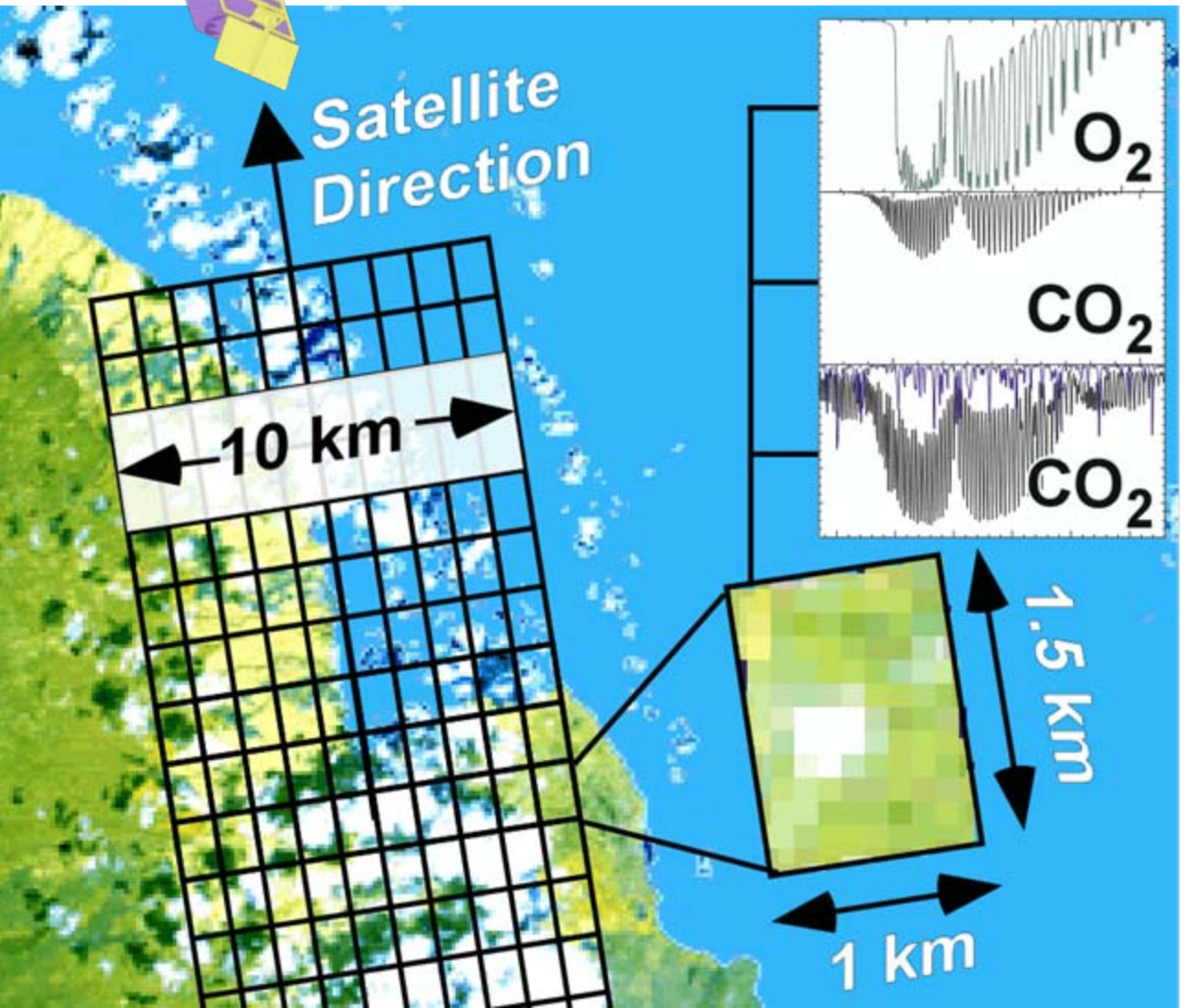
Paul Shepson & Kevin Gurney, Purdue University

Indianapolis Pilot Project "Etna"





CO2 from Space.....



GOSAT

Column concentration of atmospheric CO2 with FOV ~ 10 km and 3 day repeat cycle.

We look forward to the deployments and fruitful collaborations with you!!!

Chincoteague ponies