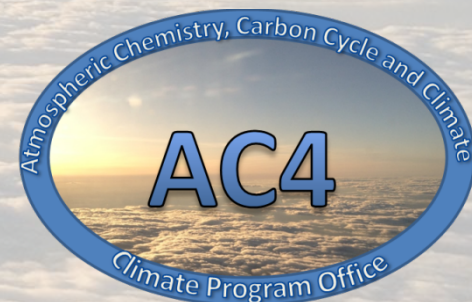


# NOAA Perspective Atmospheric Chemistry, Carbon Cycle and Climate (AC4) Program

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Program Managers

November 6,  
2017



# Program Overview

## What is AC4?

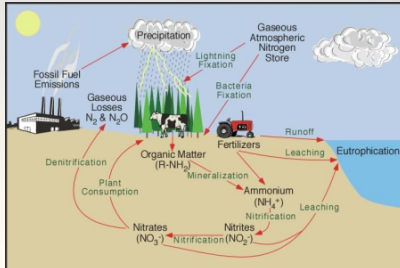
**AC4** is a competitive research program which manages a portfolio of multi-year projects

**AC4 Goal:** Determine the processes governing atmospheric concentrations of trace gases and aerosols in the context of the Earth System



# 2013-2018 AC4 Research Portfolio

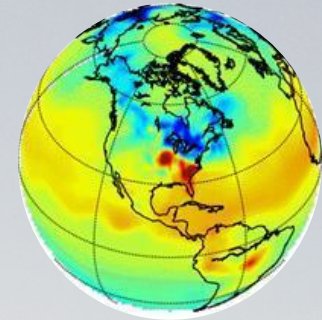
## Nitrogen Cycle



## Atmospheric composition from space



## CarbonTracker



## Urban Emissions



## Field Campaigns (FIREX, SENEX)



## Emissions and Chemistry of Wildfires



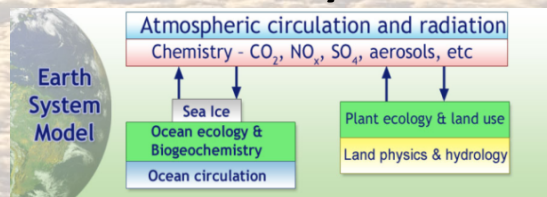
## Oil & Gas Emissions



## Sustained Observations



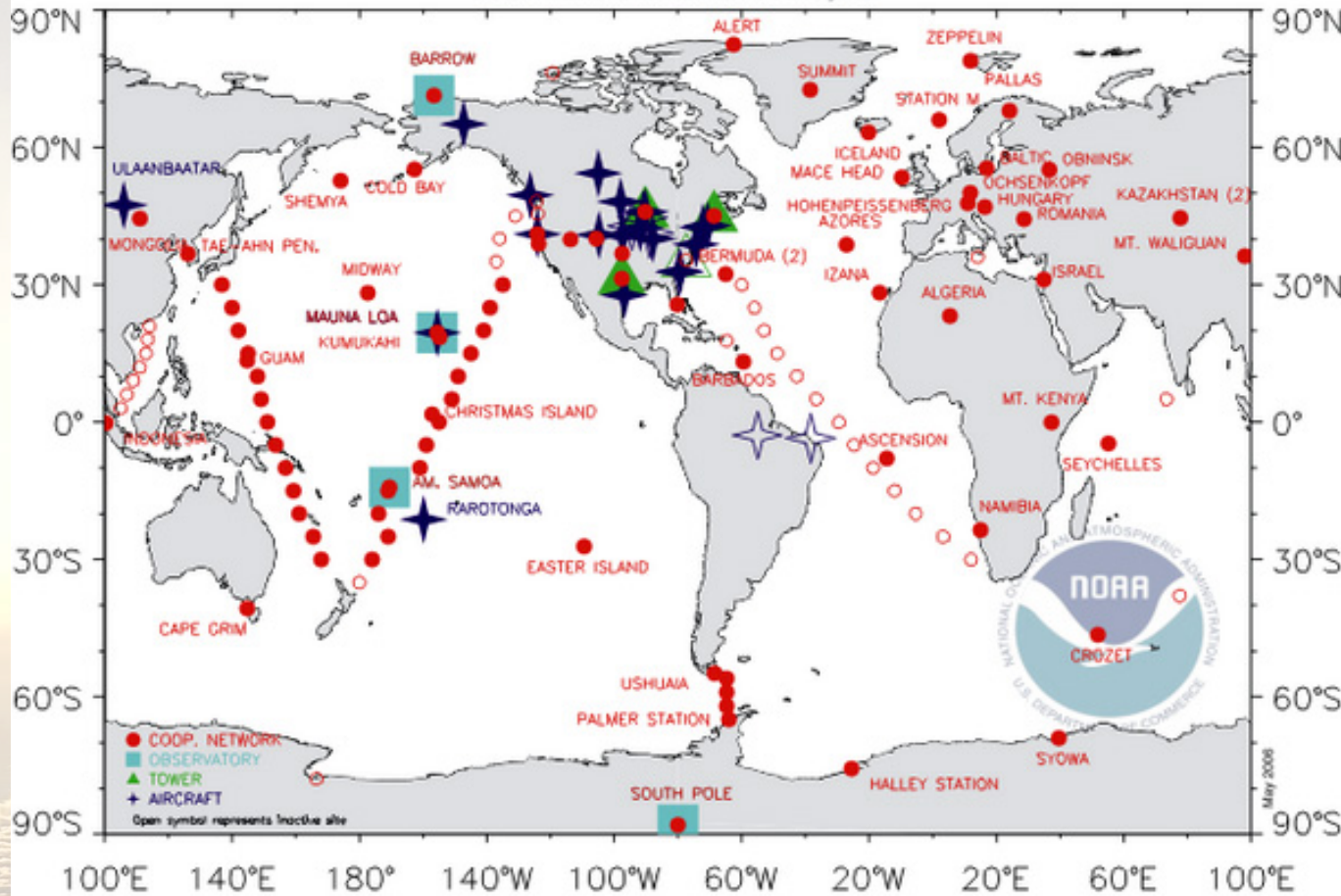
## Process and Earth System Modeling





# How did we get here?

## Measurement Programs NOAA ESRL GMD Carbon Cycle



GMD Carbon Cycle operates 4 measurement programs. Semi-continuous measurements are made at 4 GMD baseline observatories and from tall towers. Discrete samples from the cooperative air sampling network and aircraft are measured at GMD. Presently, atmospheric carbon dioxide, methane, carbon monoxide, hydrogen, nitrous oxide, sulfur hexafluoride, and the stable isotopes of carbon dioxide and methane are measured. Contact: Dr. Pieter Tans, NOAA ESRL GMD Carbon Cycle, Boulder, Colorado, (303) 497-6678 (pieter.tans@noaa.gov, <http://www.cmdl.noaa.gov/ccgg>).

50+ years:  
NOAA's  
**global**  
carbon  
monitoring  
network

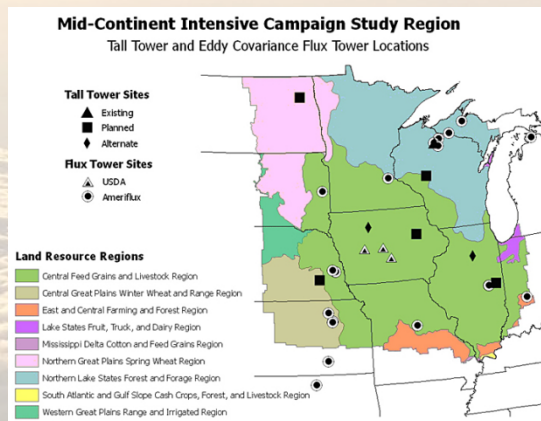
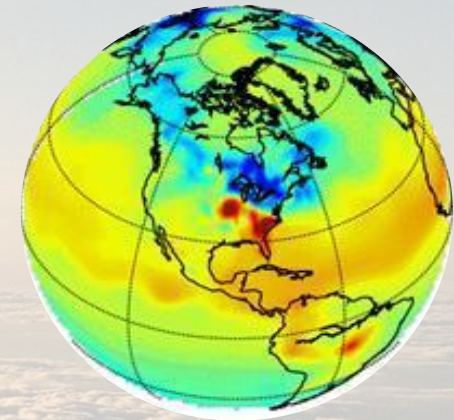


# How did we get here?



Tall tower and aircraft measurements

2002 -  
North American  
Carbon Program

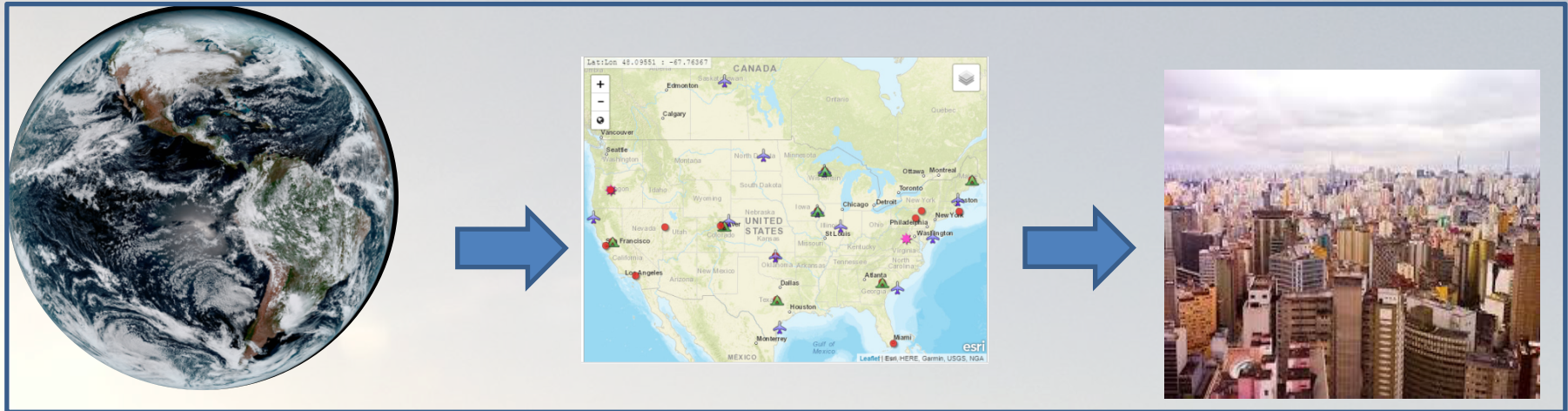


Midcontinent  
Intensive  
(flights?)

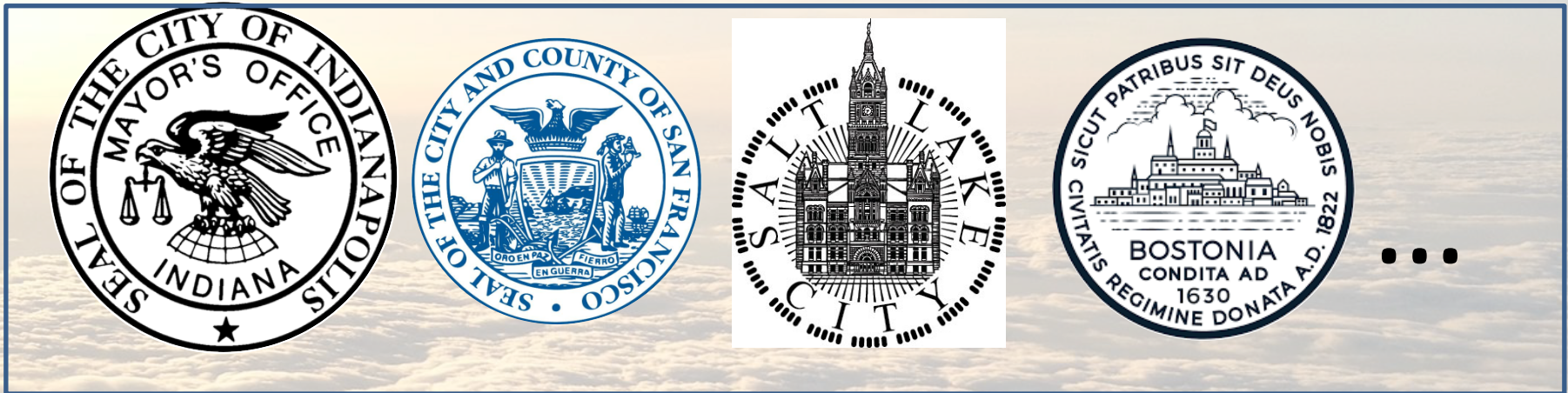
CarbonTracker CO<sub>2</sub>  
data assimilation  
system



# Increasingly regional perspective



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