

A



of

*Scientists?!?*

Ankur Desai  
Park Falls, WI  
May 20, 2019



University of Wisconsin-Madison

# Department of Atmospheric and Oceanic Sciences

## Who We Are

Since 1948 we have grown into one of the leading departments in our field of Atmospheric and Oceanic Sciences. We have strong graduate and undergraduate programs which are nationally recognized. We graduate about 15 Ph.D. and M.S. students each year; our graduates are active in research labs and universities around the world. We graduate approximately 20 B.S. students each year; they choose options allowing a focus on weather systems or general atmospheric science.

Our faculty of 15 has long maintained breadth and special strength in three areas:

- Climate systems, including the ocean
- Satellite and remote sensing
- Weather systems, including synoptic dynamic



Space Science and Engineering Center  
University of Wisconsin-Madison



Center for Climatic Research  
NELSON INSTITUTE  
UNIVERSITY OF WISCONSIN-MADISON





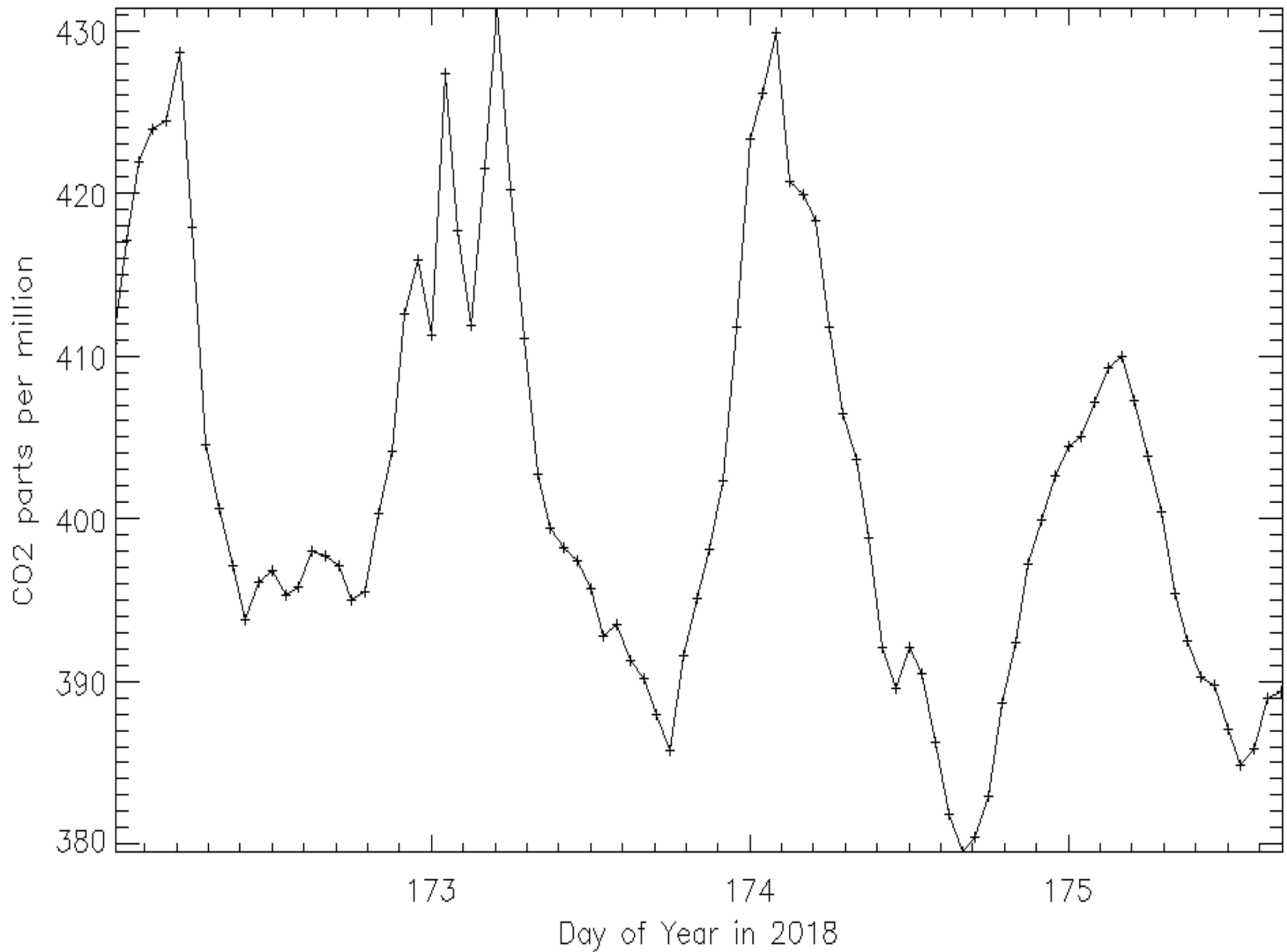


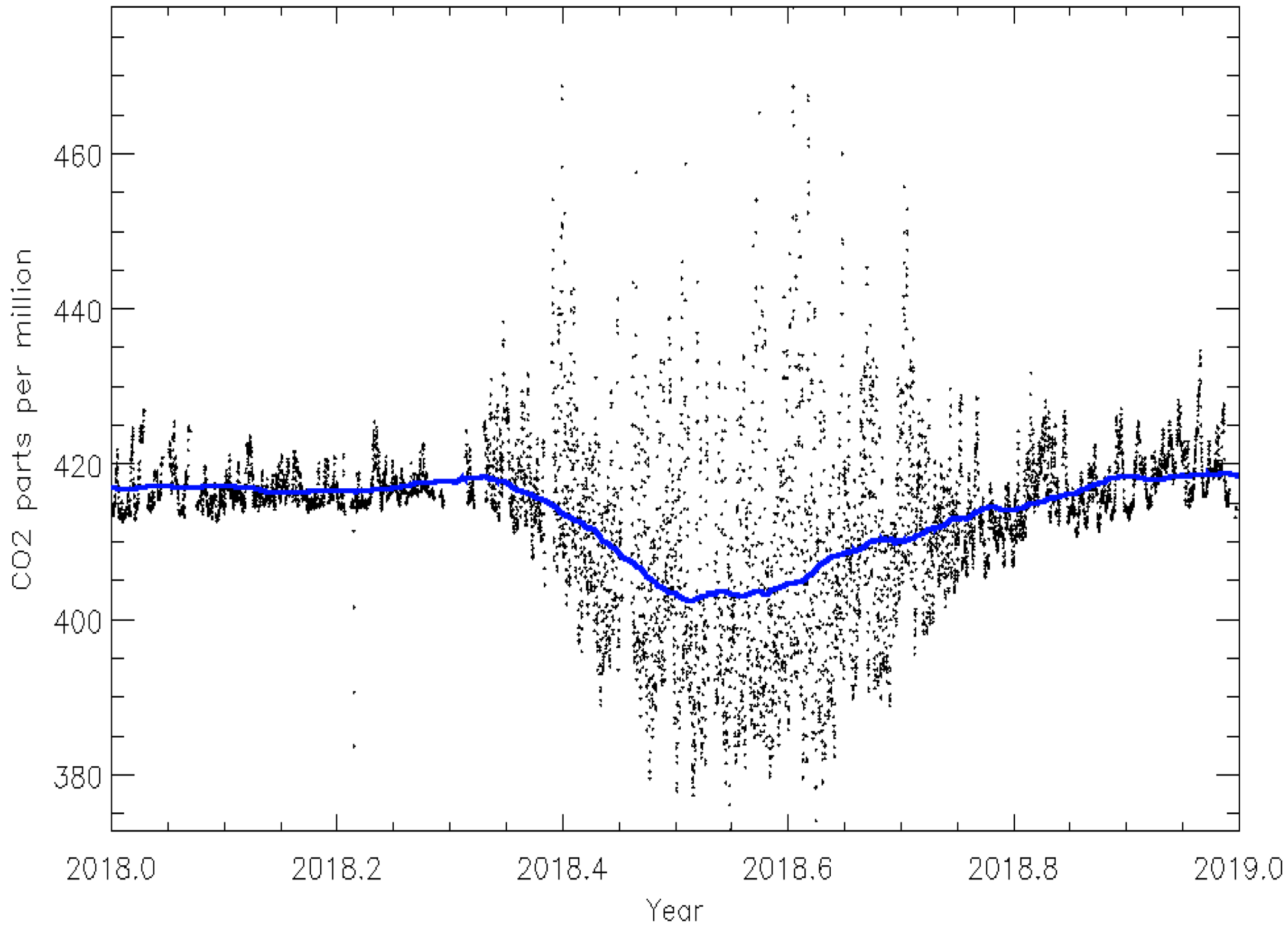


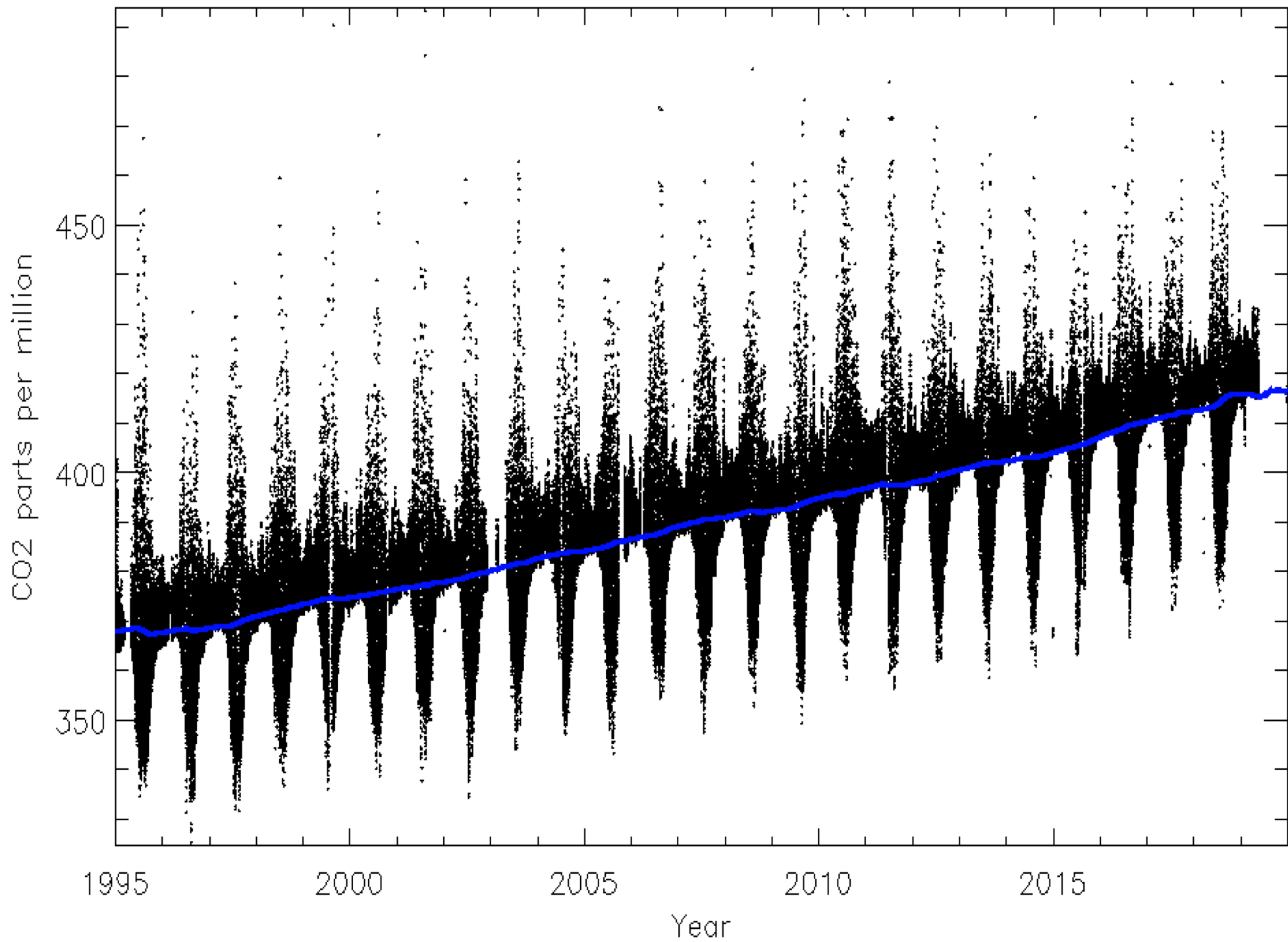




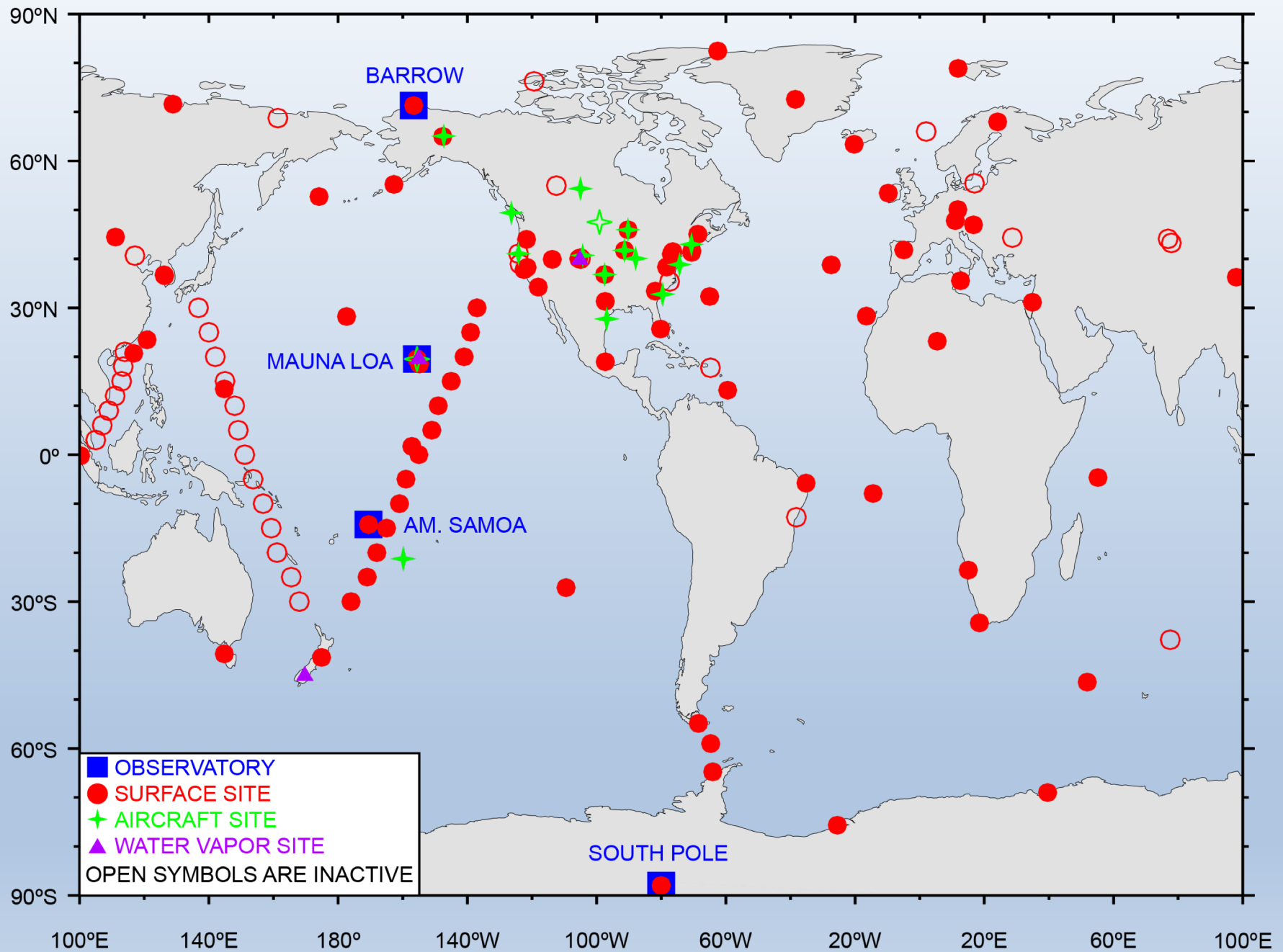




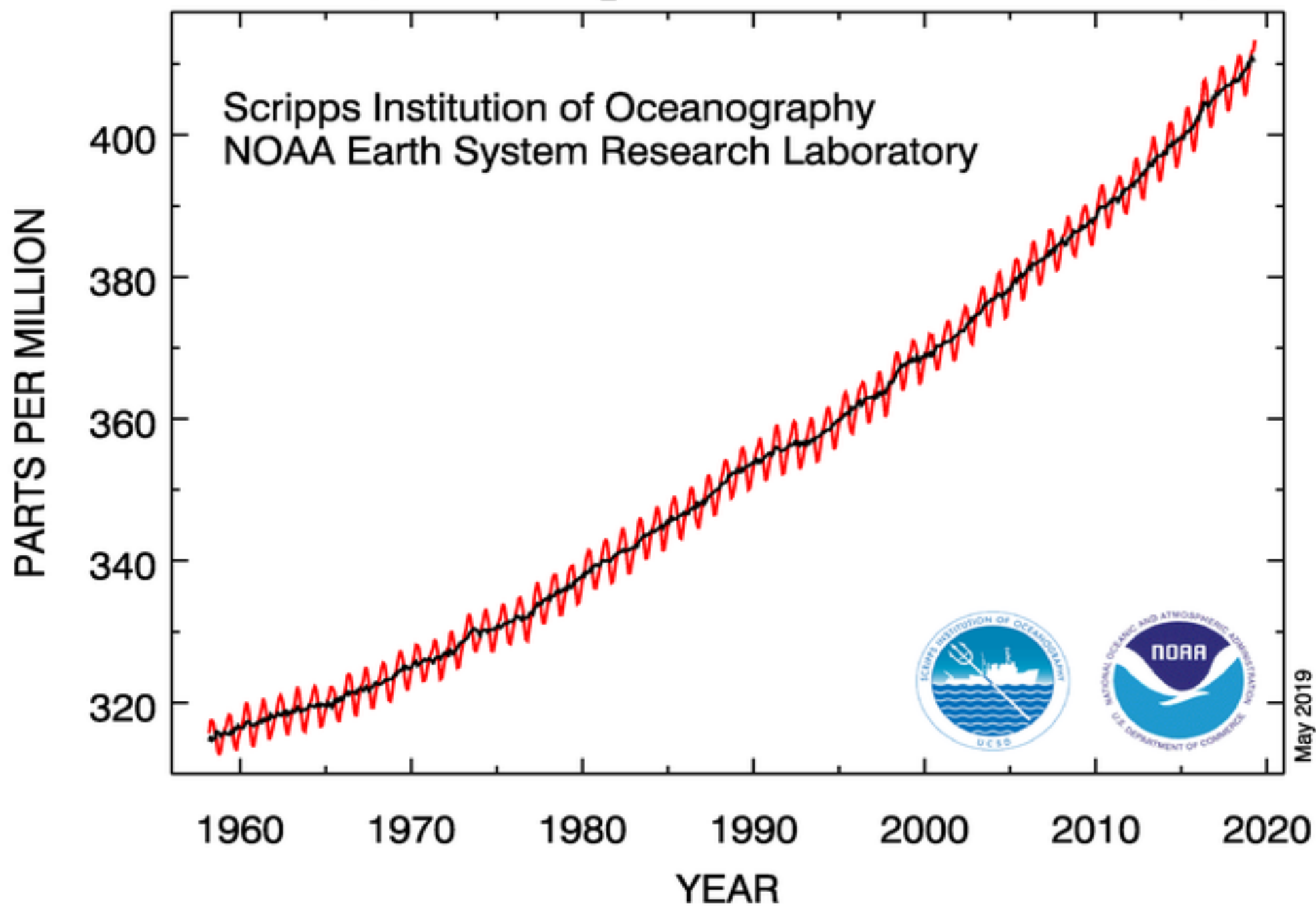




# Tracking Greenhouse Gases and Understanding Carbon Cycle Feedbacks



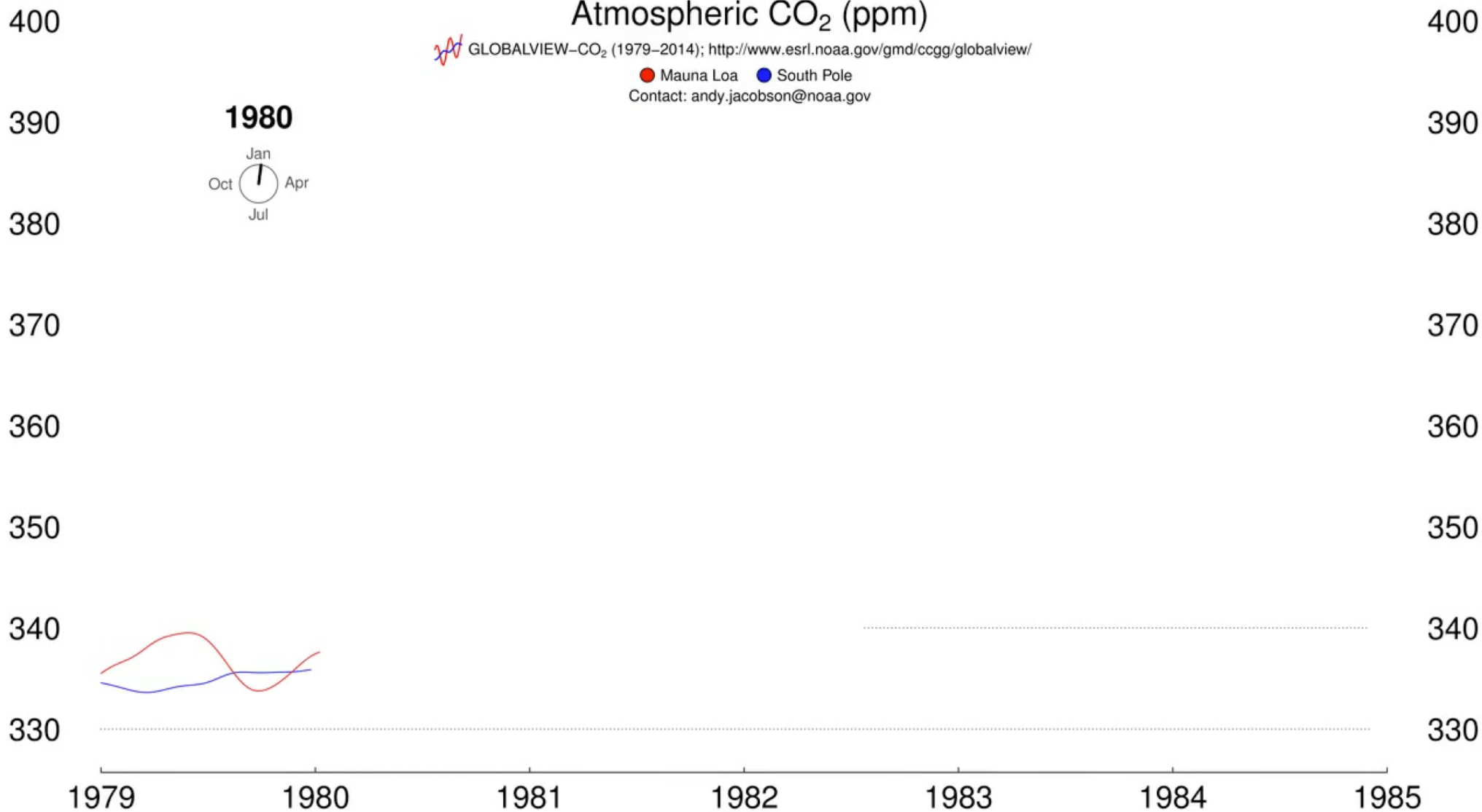
# Atmospheric CO<sub>2</sub> at Mauna Loa Observatory



# Atmospheric CO<sub>2</sub> (ppm)

GLOBALVIEW-CO<sub>2</sub> (1979–2014); <http://www.esrl.noaa.gov/gmd/ccgg/globalview/>

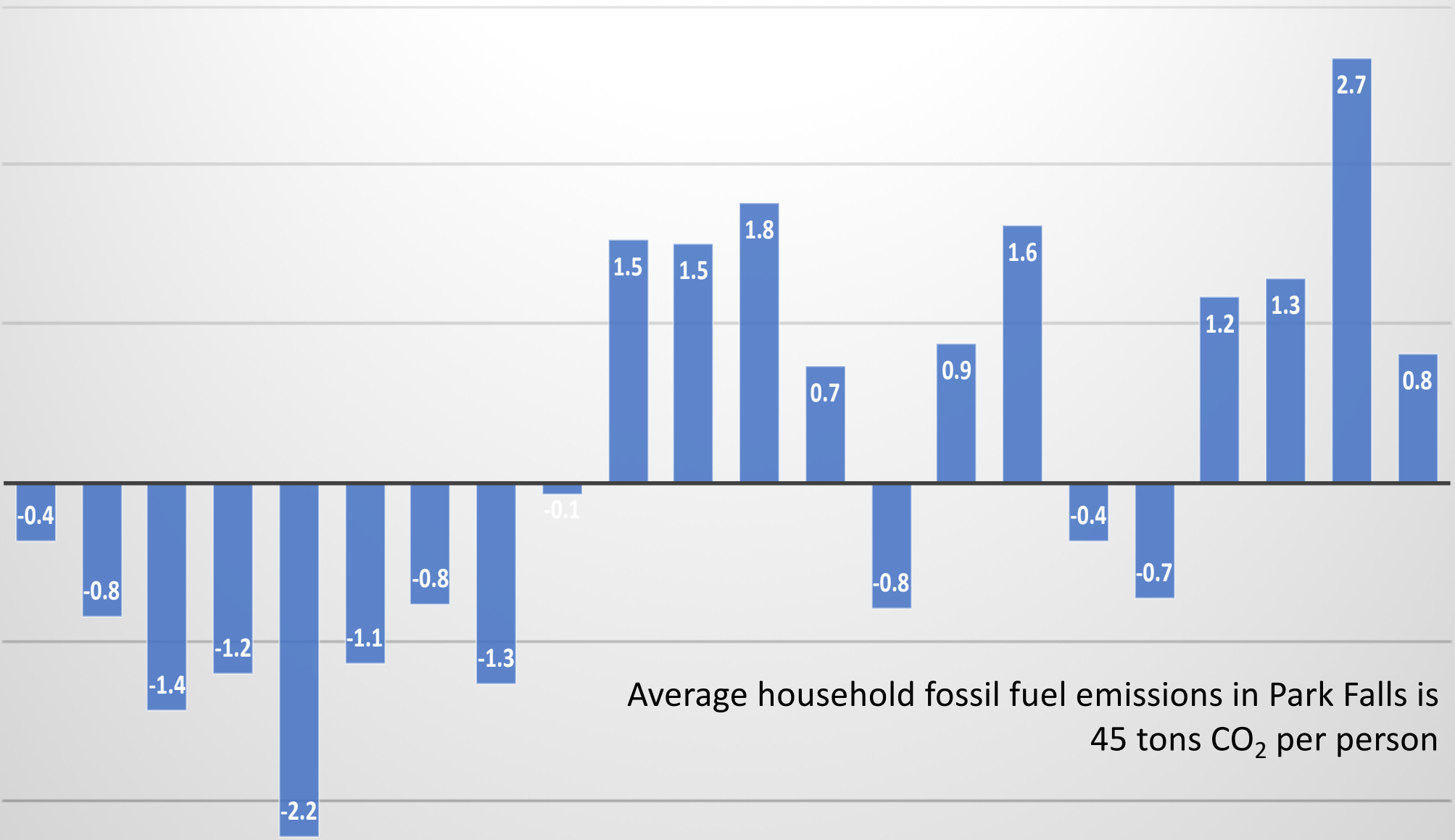
● Mauna Loa ● South Pole  
Contact: [andy.jacobson@noaa.gov](mailto:andy.jacobson@noaa.gov)





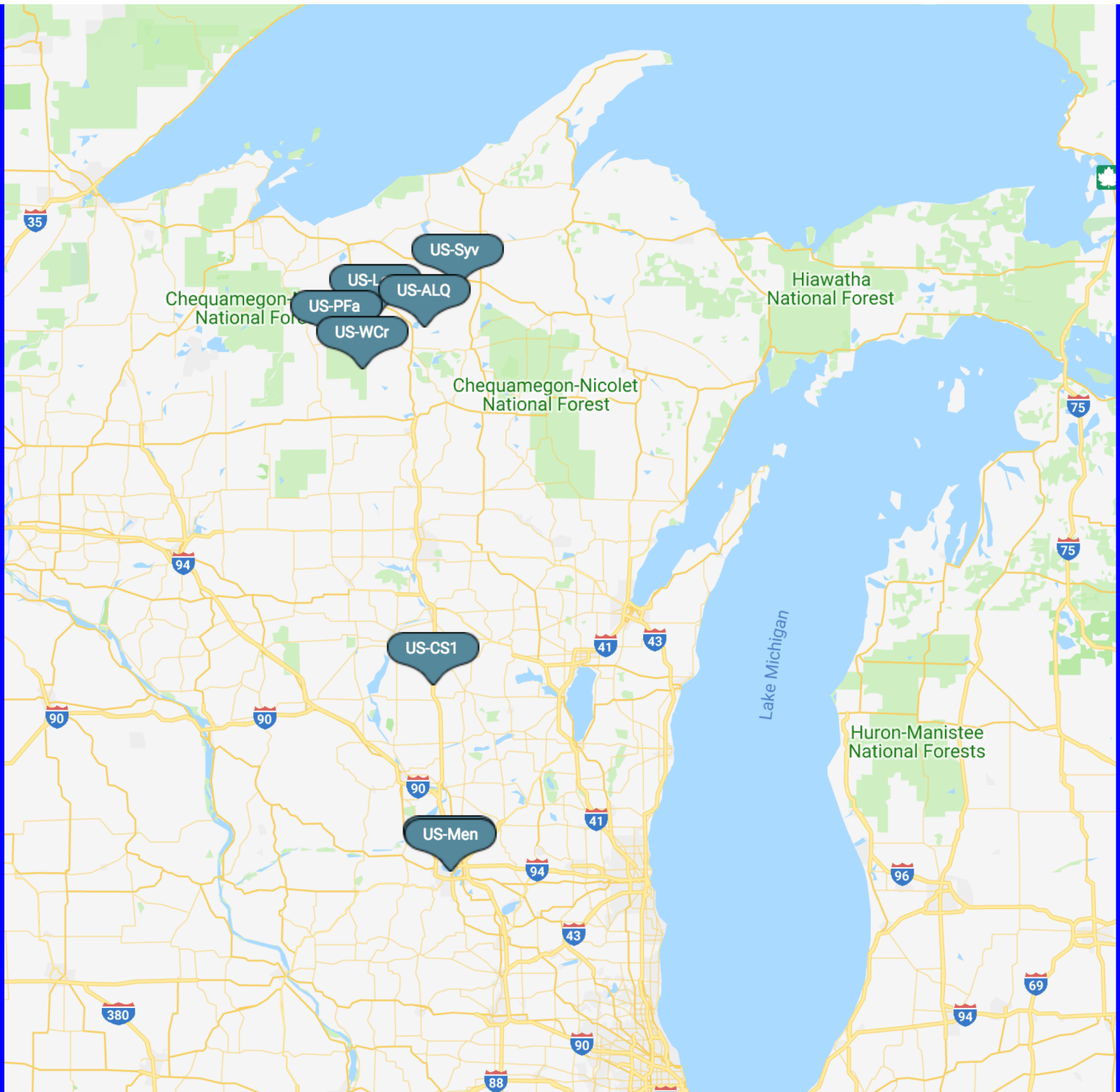
# Net CO2 Uptake (Tons per Acre)

1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018



Average household fossil fuel emissions in Park Falls is 45 tons CO<sub>2</sub> per person





Chequamegon National Forest

US-Syv

US-L

US-ALQ

US-PFa

US-WCr

Hiawatha National Forest

Chequamegon-Nicolet National Forest

US-CS1

Lake Michigan

Huron-Manistee National Forests

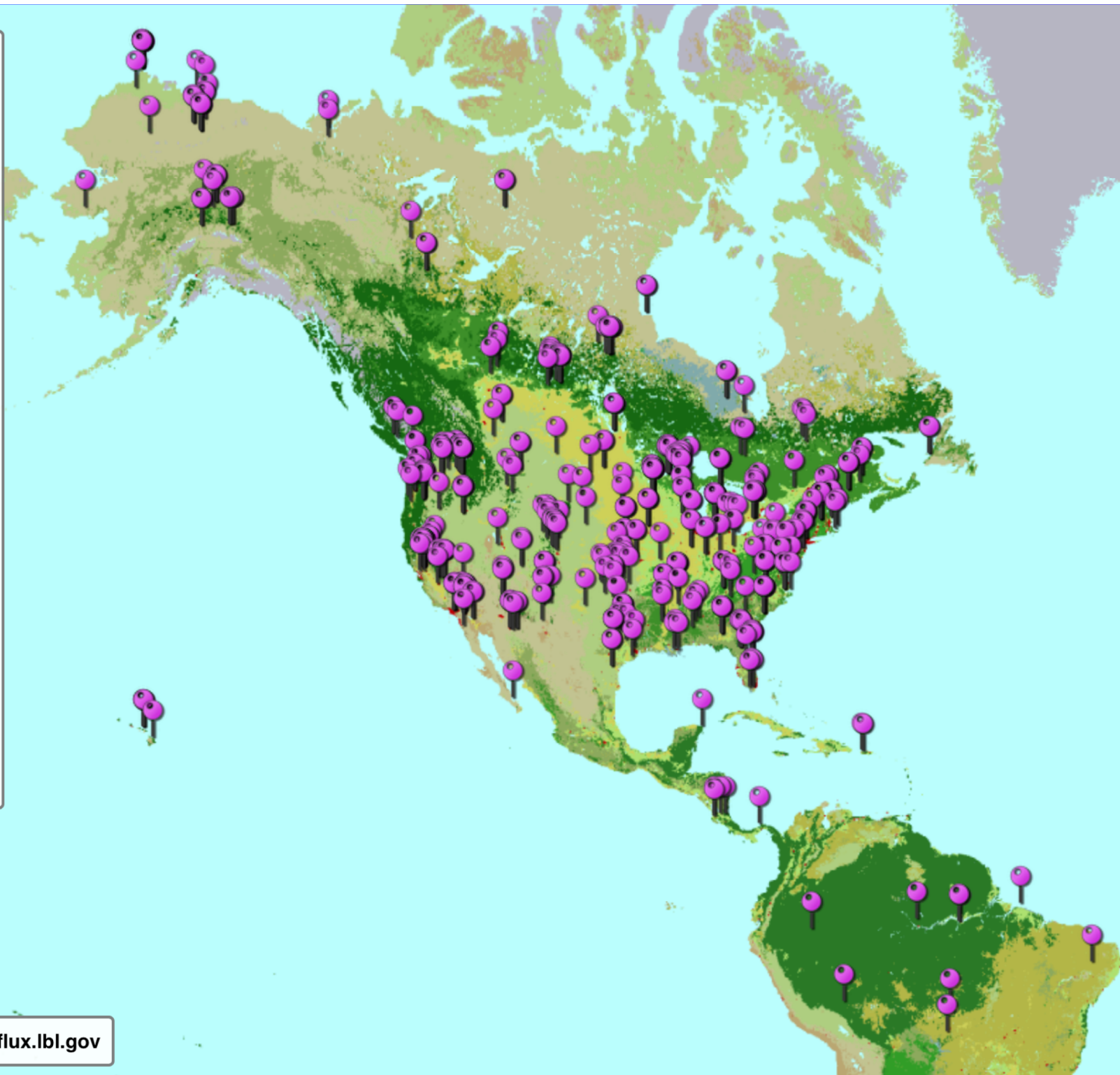
US-Men



## MODIS Land Cover Overlay Legend

- Water
- Evergreen Needle leaf Forest
- Evergreen Broadleaf Forest
- Deciduous Needle leaf Forest
- Deciduous Broadleaf Forest
- Mixed Forest
- Closed Shrublands
- Open Shrublands
- Woody Savannas
- Savannas
- Grasslands
- Permanent Wetland
- Croplands
- Urban and Built-up
- Cropland/Natural Vegetation Mosaic
- Snow and Ice
- Barren or Sparsely Vegetated

**Citation:** Broxton, P.D., Zeng, X., Sulla-Menashe, D., Troch, P.A., 2014a: A Global Land Cover Climatology Using MODIS Data. *J. Appl. Meteor. Climatol.*, 53, 1593-1605.  
doi:<http://dx.doi.org/10.1175/JAMC-D-13-0270.1>



So how does that lead to this?



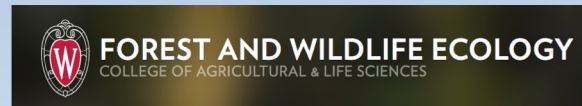
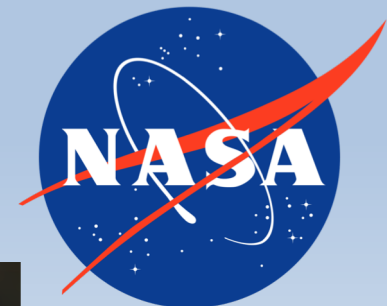
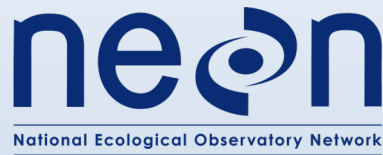
# The infinite flux tower project

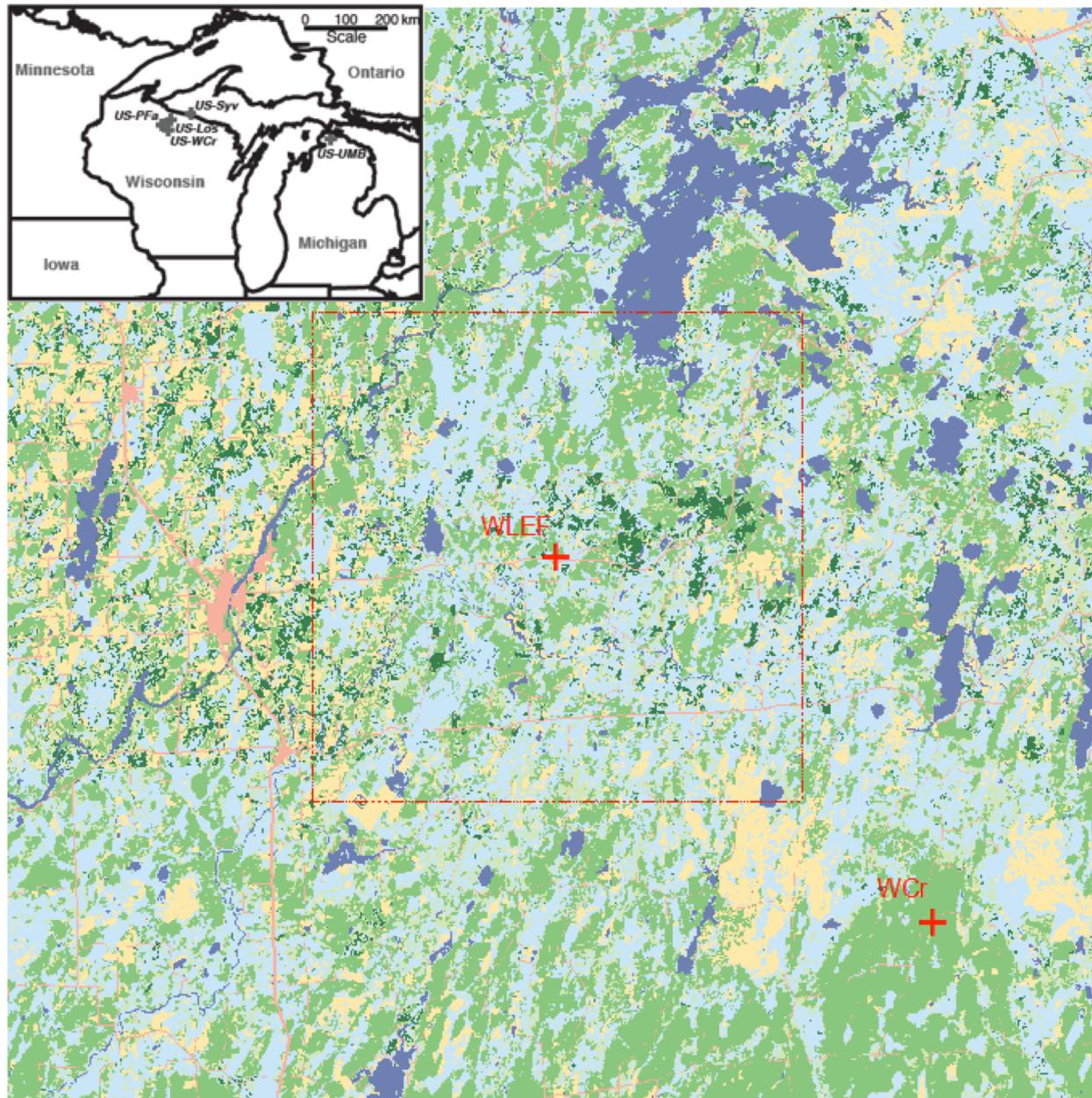


*Introducing the*  
Chequamegon Heterogeneous Ecosystem  
Energy-balance Study Enabled by a High-  
density Extensive Array of Detectors  
(CHEESEHEAD19)

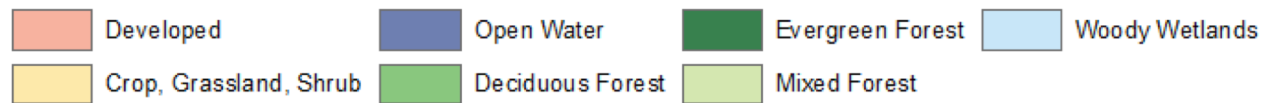
NSF #AGS-1822420, DFG (Germany), DOE Ameriflux



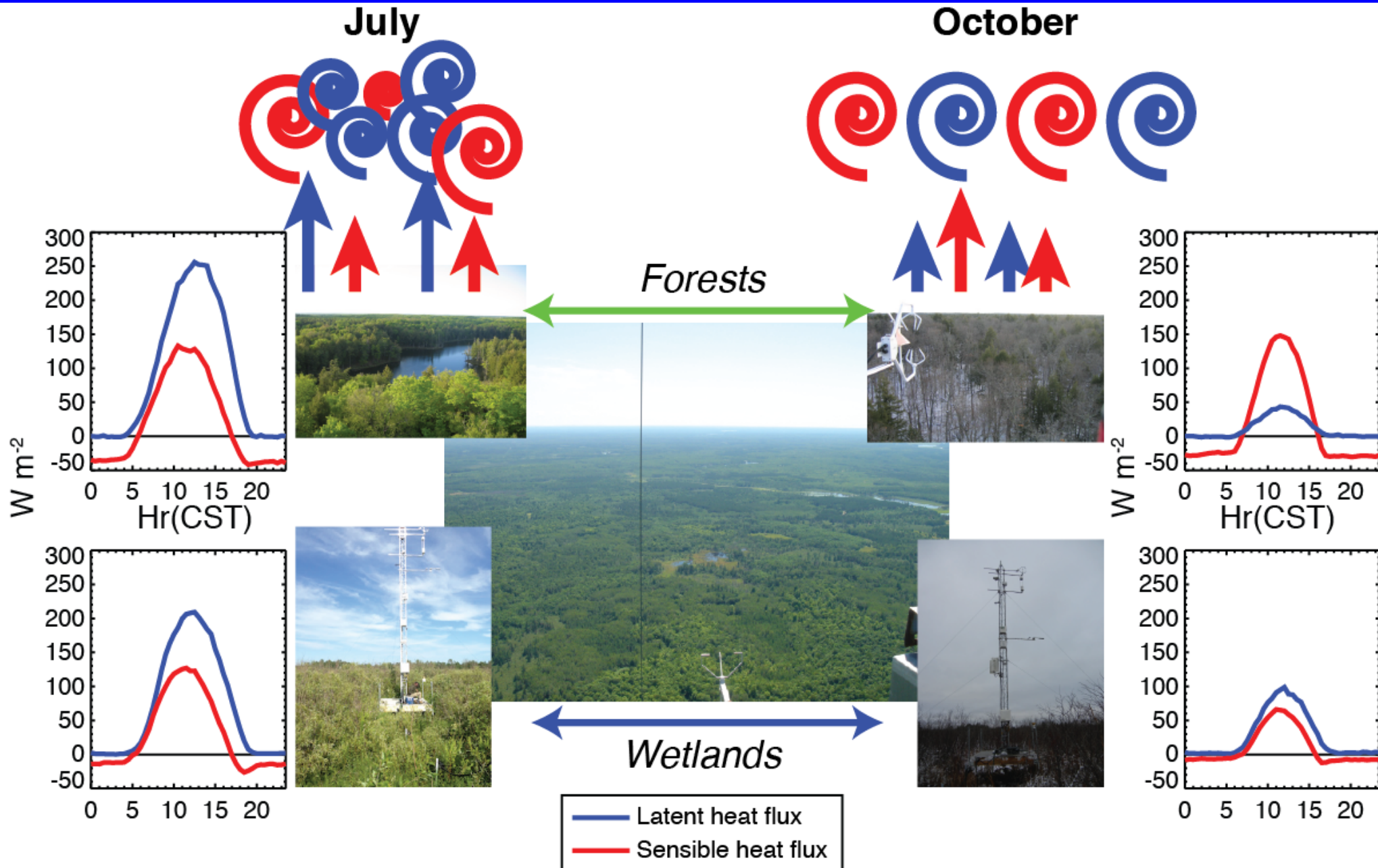




0 2 4 8 km

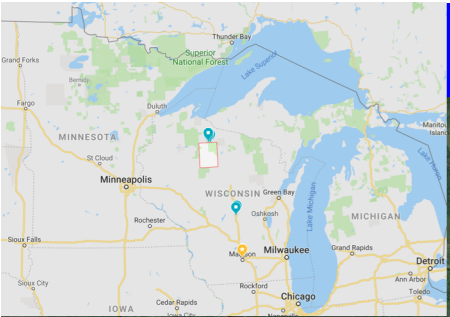


# Experiment runs from July to October 2019, to take advantage of the natural changes in vegetation that occur over the season









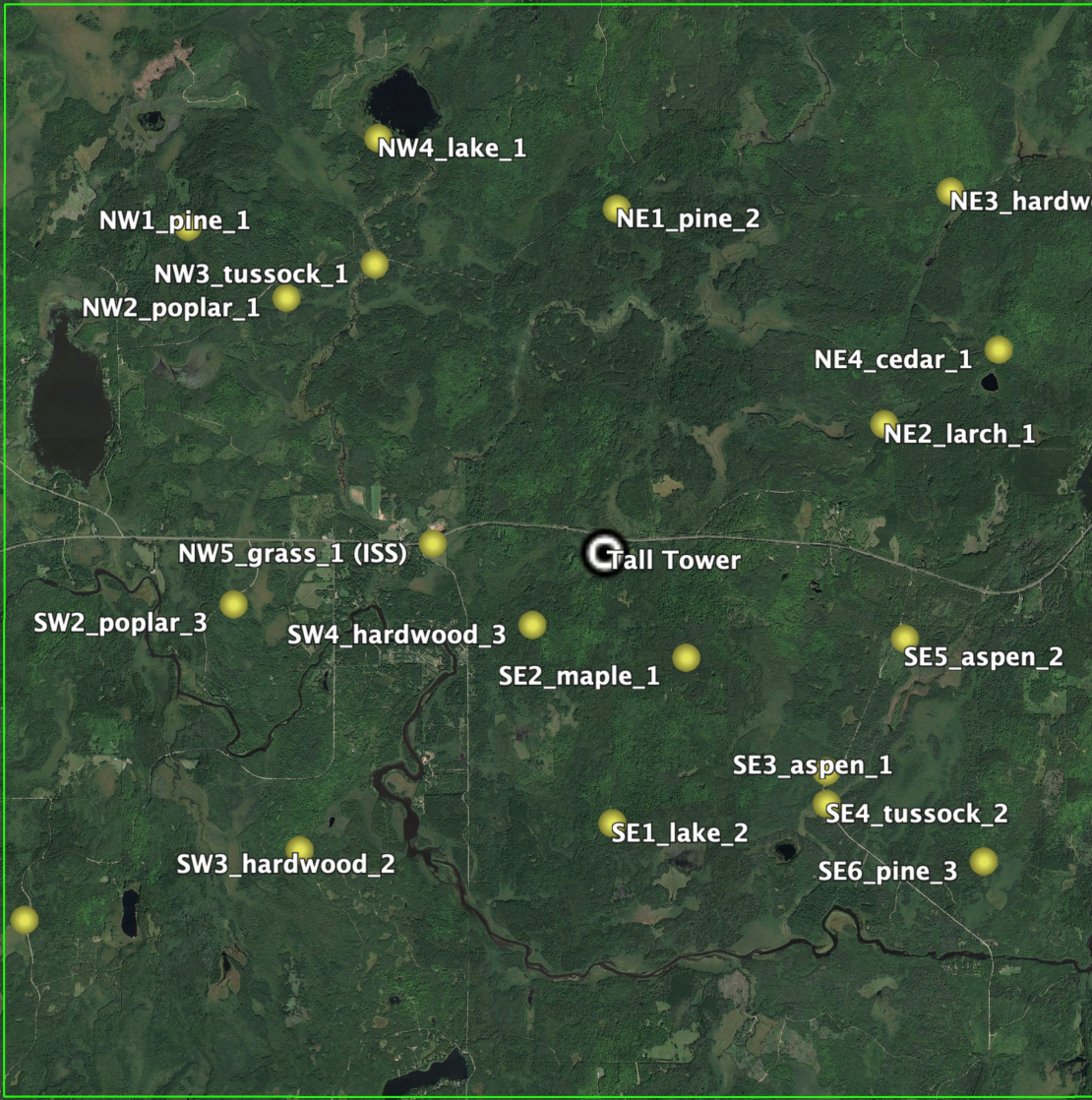
**Legend**

- EC towers
- 🌳 Study Area
- ⊙ Tall Tower

Park Falls

182

Google Earth



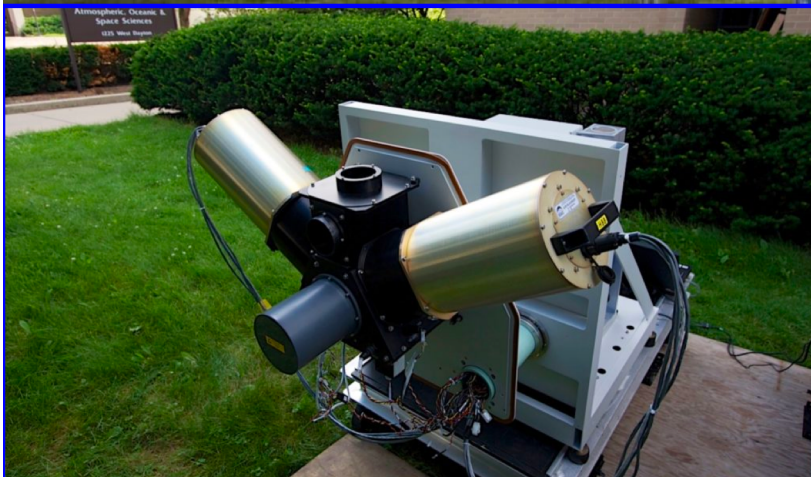
6 miles



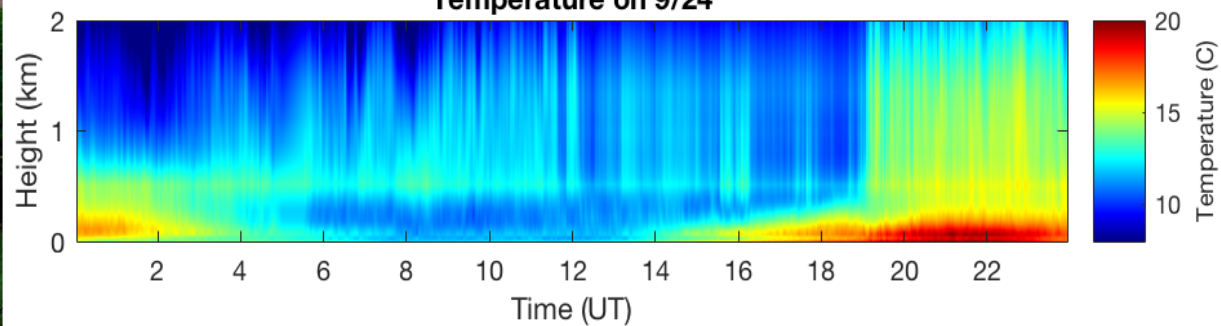




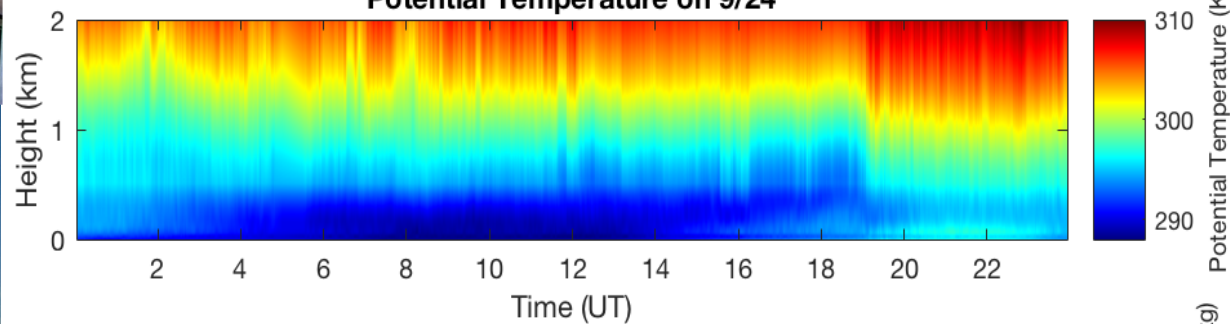




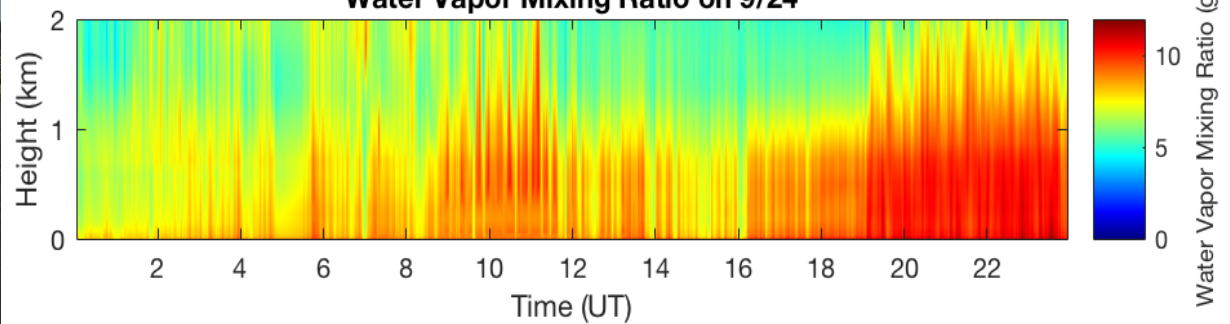
**Temperature on 9/24**



**Potential Temperature on 9/24**



**Water Vapor Mixing Ratio on 9/24**



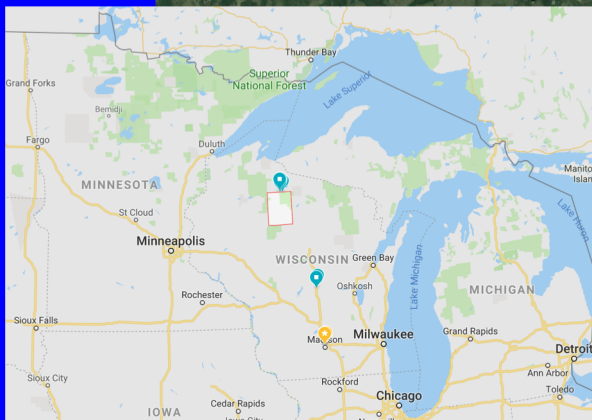




*Photograph courtesy of Vanda Gubisic, Desert Research Institute*







Legend

- EC towers
- Study Area
- Tall Tower



July 7-13  
August 18-24  
September 22-28





# *THANKS!!!*

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Photo: J Thom