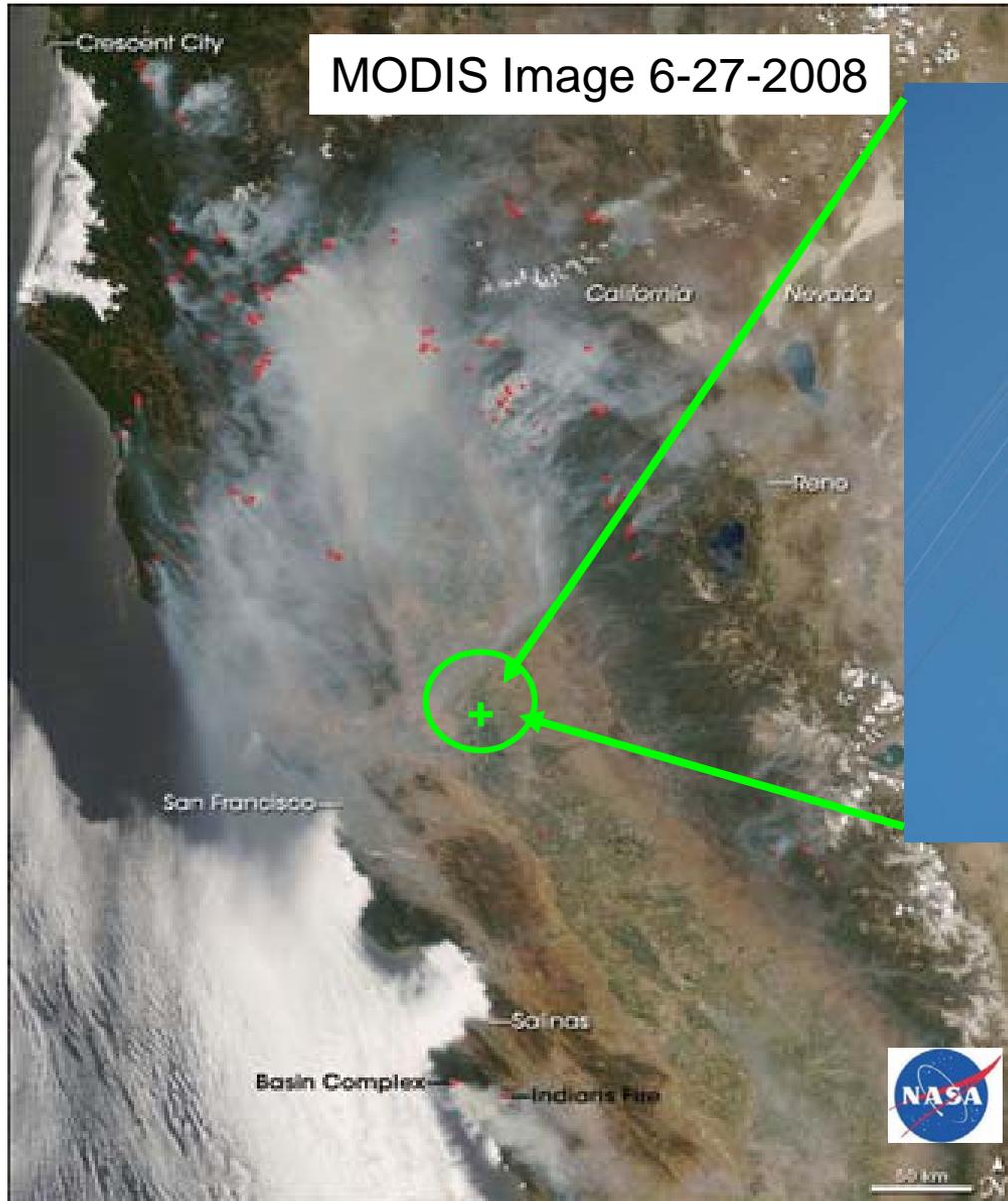


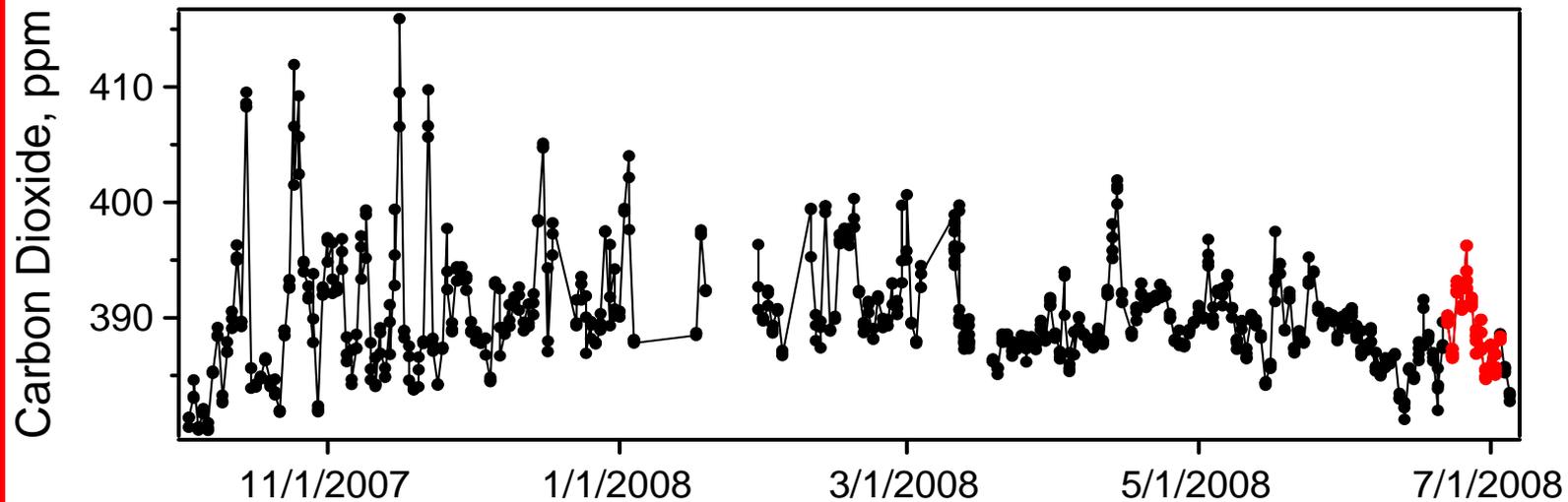
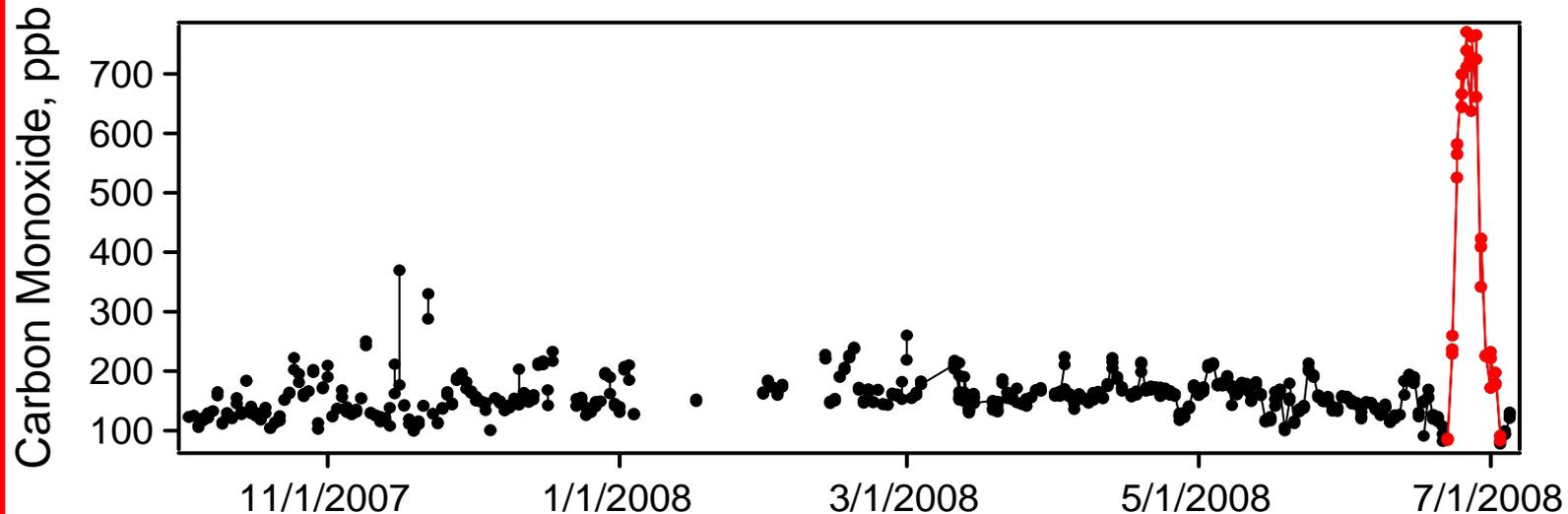
Take-home messages

- Goal of ESRL Carbon Cycle effort: measure carbon budget and provide timely, societally relevant information, e.g., independent verification of emissions reductions

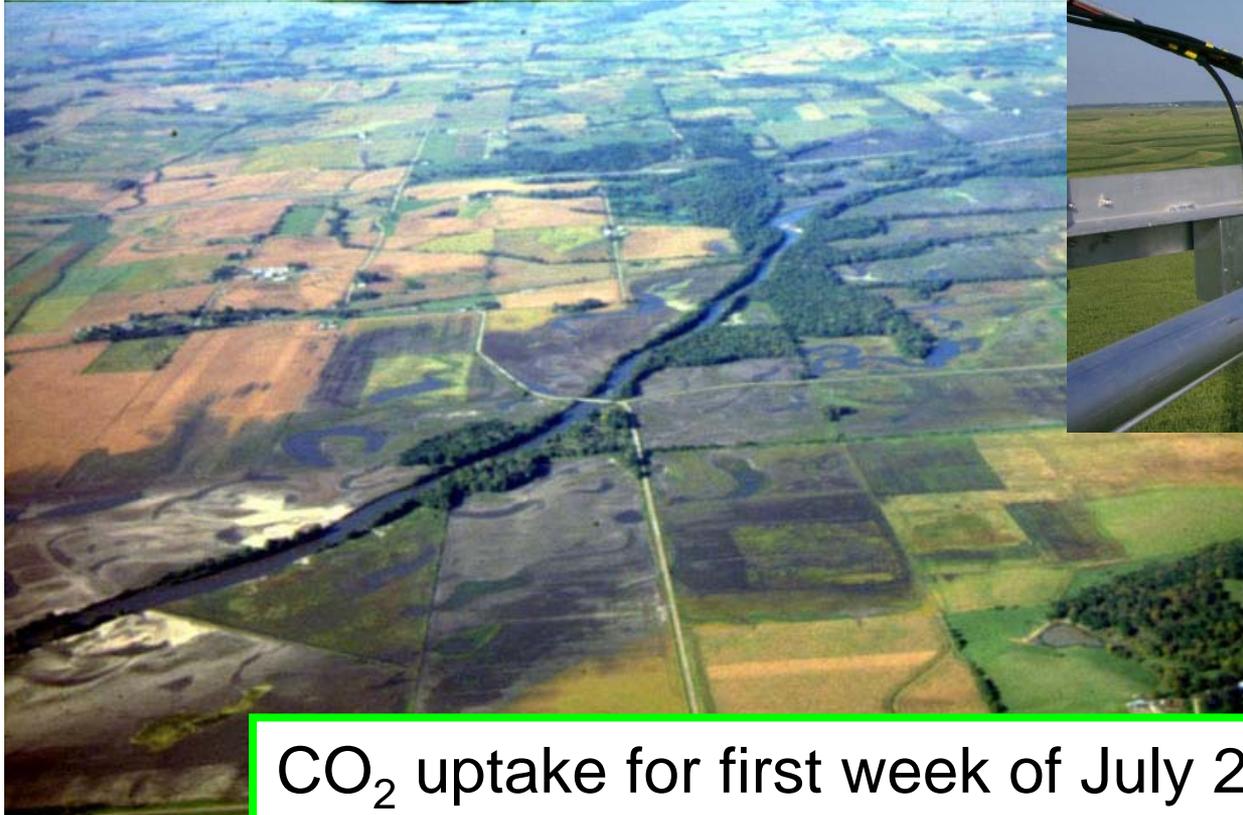
Fires in California: June/July 2008



Fires in California: June/July 2008



Flooding in Iowa: June 2008

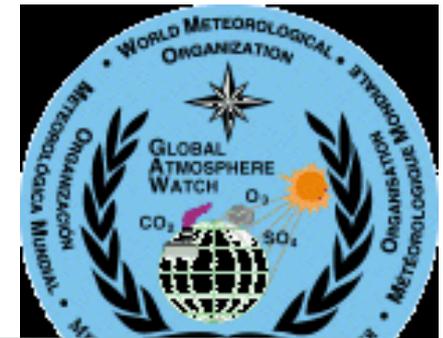


ESRL tall tower site in West Branch, Iowa

CO₂ uptake for first week of July 2008 is only 40% of uptake for same period last year.

Take-home messages

- Goal of ESRL C-Cycle effort: measure carbon budget and provide timely, societally relevant information, e.g., independent verification of emissions reductions
 - ESRL C-Cycle group plays a leadership role in global measurement efforts → Data, Calibration, Training



Take-home messages

- Goal of ESRL Carbon Cycle effort: measure carbon budget and provide timely, societally relevant information, e.g., independent verification of emissions reductions
- Efforts to understand carbon cycle are data-limited
 - NA: more towers, aircraft
 - Arctic: potential early detection of feedback
 - Global: vertical data in the tropics and southern hemisphere

Take-home messages

- Goal of ESRL Carbon Cycle effort: measure carbon budget and provide timely, societally relevant information, e.g., independent verification of emissions reductions
- Efforts to understand carbon cycle are data-limited
 - NA: more towers, aircraft (off to a good start)
 - Arctic: potential early detection of feedback (starting to develop plans)
 - Global: vertical data in the tropics and southern hemisphere (not on the radar)

Take-home messages

- Goal of ESRL Carbon Cycle effort: measure carbon budget and provide timely, societally relevant information, e.g., independent verification of emissions reductions
- Efforts to understand carbon cycle are data-limited
- Currently ESRL C-Cycle effort involves model users and model evaluators---Not model developers
 - Great opportunity for cross-ESRL collaboration!

Opportunities for Cross-ESRL Collaboration

- **Linkages with meteorology**
 - Better connections between “model users” and “model developers”
 - Observation System Simulation Experiments – network evaluation and design
 - Need for accurate meteorological data – e.g., mixed layer height
 - **Not typical NWP timescale – weeks to months to years**
 - **No real-time requirement**

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 - **Historical disconnect between “monitoring” mode and “campaign mode” → Are we headed toward a merger?**
- **Potential for Shared infrastructure**
 - GMD resources: light aircraft network, tall tower network, observatories, **established relationships with international partners**
 - CSD, PSD, GSD resources: BAO tower, profiler network, NOAA P-3, Ron Brown, computing resources, etc.



- **Process Models**

- **Atmospheric Transport**

- Opportunity for direct link between model users and developers within ESRL (FIM, WRF)

- **Land Surface / Vegetation modeling**

- Future in-house work could benefit ESRL modeling efforts



- **Ocean Flux Model**

- **Data**

- **Oceans**

- **Fires**

- **Fossil Fuels**

- **Additional Observations of CO₂ and related species**



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Opportunities for Future Cross-NOAA collaboration

- Improved representation of Carbon Cycle in climate models (GFDL)
- Closer relationship with ocean data and modeling efforts (PMEL and AOML)
- Access to and interpretation of satellite data (NESDIS)
- Shared needs for archived, high-quality meteorological datasets (NWS, ARL and NCDC)
- Information about ocean acidification (National Marine Fisheries Service and NOS)
 - NOAA could do end-to-end analysis of impact of ocean acidification on marine food web