

Mid-Continent Intensive Synthesis

Update for NACP SSG, Aug. 2008

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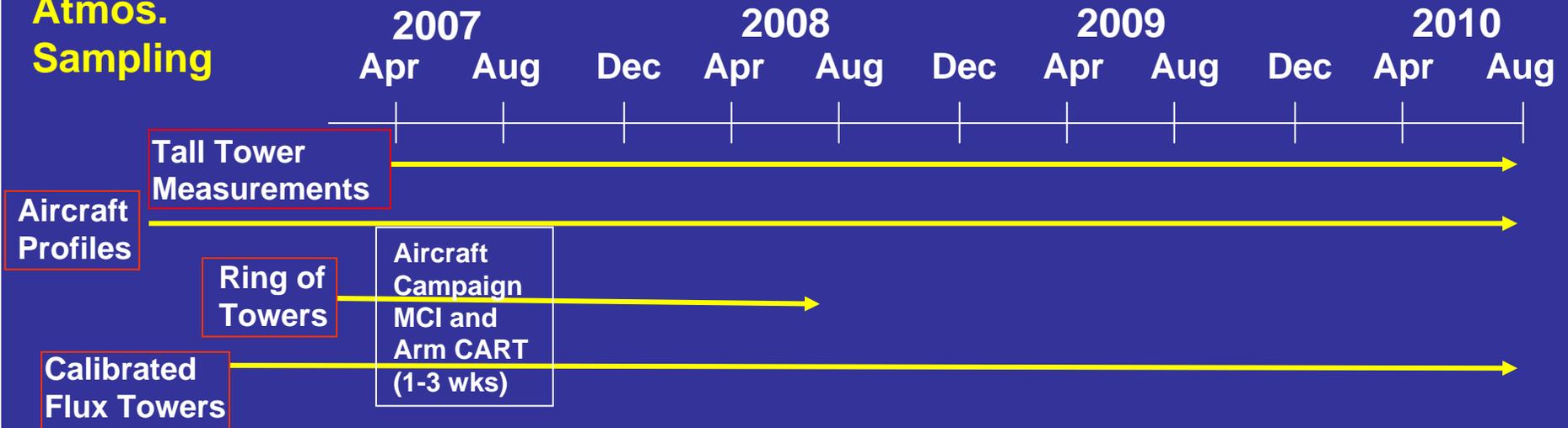
Ring Two Sites



- Kewanee, IL
- Centerville, IA
- Mead, NE
- Round Lake, MN
- Galesville, WI

Time Lines for MCI Campaign Activities

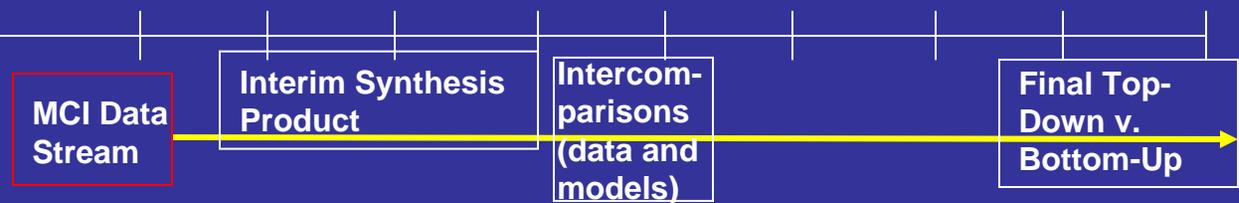
Atmos. Sampling



Other Sampling



Top-Down



Bottom-Up



MCI Synthesis: Two Phases

- **Interim Synthesis**
 - **Flux Tower Synthesis**
 - Shashi Verma, coordinator
 - **Regional Synthesis**
 - Stephen Ogle, Tris West, Scott Denning and Bob Cook, coordinators
- **2007-08 Synthesis for Campaign Years**
 - **Compile, diagnose and reconcile CO₂ fluxes from inventories and atmospheric inversions**
 - **Evaluate mechanistic understanding**

MCI Interim Synthesis: Flux Tower Sites

- Synthesis of CO₂ and water vapor flux measurements
- Focus on Corn and Soybeans
 - Ames, IA; Bondville, IL; Mead, NE; and Rosemount, MN
- Detailed comparison of magnitudes and seasonal distributions of Net Ecosystem CO₂ Exchange (NEE), Gross Primary Productivity (GPP), Ecosystem Respiration (Re), Water Vapor Flux (ET) and Water Use Efficiency (WUE)
- Currently, still compiling data
- Possibly report on findings at NACP Investigators meeting

MCI Interim Synthesis: Regional Analysis

- Initial Synthesis of CO₂ fluxes from atmospheric inversions and inventories
 - Serve as *benchmark* for evaluating improvement in quantifying CO₂ fluxes with intensive campaign sampling in the MCI region
 - Reducing uncertainties
 - Learning experience for compiling and comparing inversions and inventories
 - Improve 2007-08 synthesis

What is an inventory?

- In the context of the MCI, focus is on emission inventories determining the net flux of CO₂ over time
 - Analogous to concept of GHG inventories described by IPCC
- Methods can vary from those quantifying change in pools over time as a measure of flux, to those that only quantify the flux without determination of pools sizes
- Most contributions using advanced modeling techniques to estimate the flux
 - e.g., process-based simulation models

MCI Interim Synthesis: Regional Analysis (cont.)

- **Research Questions**
 - How consistent are inventory results and atmospheric inversions for the Mid-Continent Region prior to the MCI campaign?
 - Which inventory emission sources or C pools appear to be the primary sources of discrepancy with inversion results?

MCI Interim Synthesis: Regional Analysis (cont.)

- **Synergy with continental interim synthesis**
 - Participate in site level synthesis for sites in the MCI region
 - Inversions will be based on data compiled in the continental synthesis
- **Inventory Analysis**
 - Compare modeled cropland NPP to USDA-NASS based estimates of NPP
 - Compile complete inventory combining all CO₂ fluxes associated with carbon pools and other carbon emissions

MCI Interim Synthesis: Regional Analysis (cont.)

- **Diagnose differences between inventory and inversion results**
 - **Serve as benchmark for gauging improvement with measurements campaign in 2007-08**
- **Protocol developed for synthesis**
- **Submissions due by October 2008**
- **Report on results at NACP Investigators Meeting**