End-to-End Design and Objective Evaluation of Sensor Web Modeling and Data Assimilation System Architectures

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Objective

This project will: (i) design a sensor web architecture that couples current and future Earth observing systems with atmospheric, chemical, and oceanographic models and data assimilation systems; and (ii) build an end-to-end sensor web simulator (SWS) based upon the proposed architecture that would objectively assess the scientific value of a fully functional model-driven meteorological sensor web. The SWS will serve as a necessary trade studies tool to evaluate the impact of selecting different types and quantities of remote sensing and in situ sensors, to characterize alternative platform vantage points and measurement modes, and to explore rules of interaction between sensors and with weather forecast/data assimilation components to reduce model error growth and forecast uncertainty.

Sample graphical user interface for the sensor web simulator.

Approach

The proposed Sensor Web Simulator will be a large software system comprised of several large Subsystems:
- User Interface
- Simulation Control
- Simulation Analysis
- Sensor Web Model
- Simulated Observation Generator

Co-I's/Partners

- Stephen Talabac / GSFC
- Brice Womack, Robert Burns / Northrop Grumman TASC
- Joe Terry, Joseph Ardizzone / SAIC
- Lars Peter Riishojgaard / UMBC

Key Milestones

Milestone	Date
• Complete detailed design	02/2007
• Acquire GEOS5 & GSI codes from the GMAO	02/2007
• Complete re-engineering of OSSE	09/2007
• Command and Control / External Control components preliminary design review	02/2008
• Design and implement software coupling from Targeting component to External Control	09/2008
• Conduct OSSE for lidar instrument	09/2008
• Execute use case scenario with simulator	09/2009

Entry TRL = 2; Exit TRL = 4