Decision Support System for Situational Awareness, Analysis, and Planning

Large-scale Oceanographic Experiments are Complex

Oceanographic field experiments are interdisciplinary; involving multiple platforms, collaborators, and science goals. Deployments can occur over long durations and involve frequent planning updates and asset re-tasking driven by observations of dynamically changing phenomena (e.g. harmful algal blooms, anoxic zones, coastal ocean eddies, etc).

To increase science return from complex, multi-PI field experiments, the Monterey Bay Aquarium Research Institute (MBARI) and USC are collaborating to build a Decision Support System (DSS). The goal is to enable situational awareness, planning, and collaboration; before, during, and after large-scale collaborative exercises.

We showcase a Prototype DSS being used for a month-long, multi-institutional field experiment: Controlled Agile Novel Observation (CANON) and BIO optical Studies of Predictability and Assimilation for the Coastal Environment (BIOSPACE), in short, CANON/BIOSPACE 2010.

Goals of a Decision Support System (DSS)

- **Before an experiment:** Planning of asset deployment based on models and forecasts obtained through statistical analysis of past data.
- **During the experiment:** Situational awareness thorough real-time monitoring of assets in the field.
- **After the experiment:** Collaborative analysis of data through playback of the experiment and efficient visualizations.

DSS Prototype Architecture

- **Planning and data analysis server**
- **Science data repository**
- **DSS Web Server**
- **Asset tracking database**
- **Dashboard:** Real time asset status (locations, data rates, velocities).
- **Data products:** Scientific data products can be layered on asset map.
- **Mission plans:** Layer planned mission for assets on the map.
- **Asset tracking:** Tracking of assets as they move.
- **Playback:** Analysis of experiment through animated view of past experiments.

Prototype Decision Support System (on screen) being used to plan asset deployment for CANON/BIOSPACE 2010.

Image courtesy: MBARI