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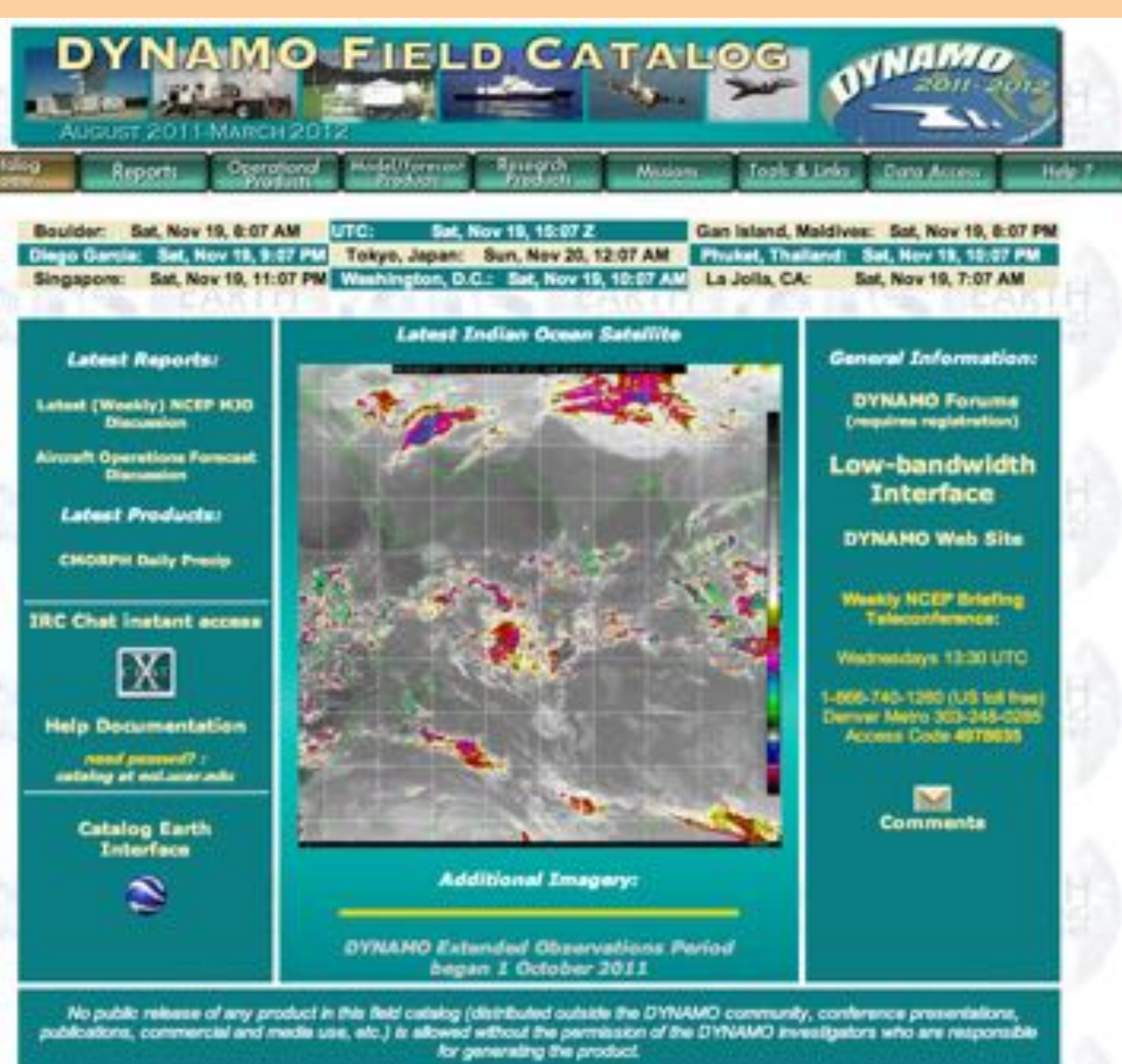
Introduction

Near real-time information is critical for mission management of atmospheric observing systems. Advances in satellite communications and Internet distribution have allowed the Earth Observing Laboratory (EOL) of NCAR to provide data, information and imagery to research scientists during evolving weather situations. **Real-time** data provide interactive displays of weather forecast models and a variety of observation systems, including satellite, soundings, surface radars and instrumented aircraft. At the same time, network-based collaborative tools such as Internet Relay Chat (IRC), web conferencing and the Field Catalog facilitate interactive participation between groups of scientists, engineers, operations centers and observing platforms that can be thousands of miles apart.

Objectives

- **Communications:** allow people anywhere in the world to communicate in real-time with the aircraft, other remote facilities and participants.
- **Develop Remote Instrument Monitoring and Control:** increase aircraft payload by decreasing number of people onboard or at remote field sites.
- **Improve situational awareness of real-time weather conditions and opportunities for mission-critical flight planning.**
- **Support a real-time data catalog as a central repository for all imagery and products, flight plans, project and instrument status.**
- **Provide flight planning information to enable timely adjustments & improve mission targeting (NASA Waypoint Tool).**

Ground-based Field Catalog



Field Catalog:

- All products of the Mission Coordinator Display and other Google Earth kmls
- Extensive repository of project-wide Operational, Model and Research products
- Mission Reports, Instrument Status and Field Data Access
- Serves as the Internet Hub for Field Projects
- Mission playback capability
- Low-bandwidth accessible

Real-time Field Campaign Example



NSF Gulfstream V with satellite communications capability

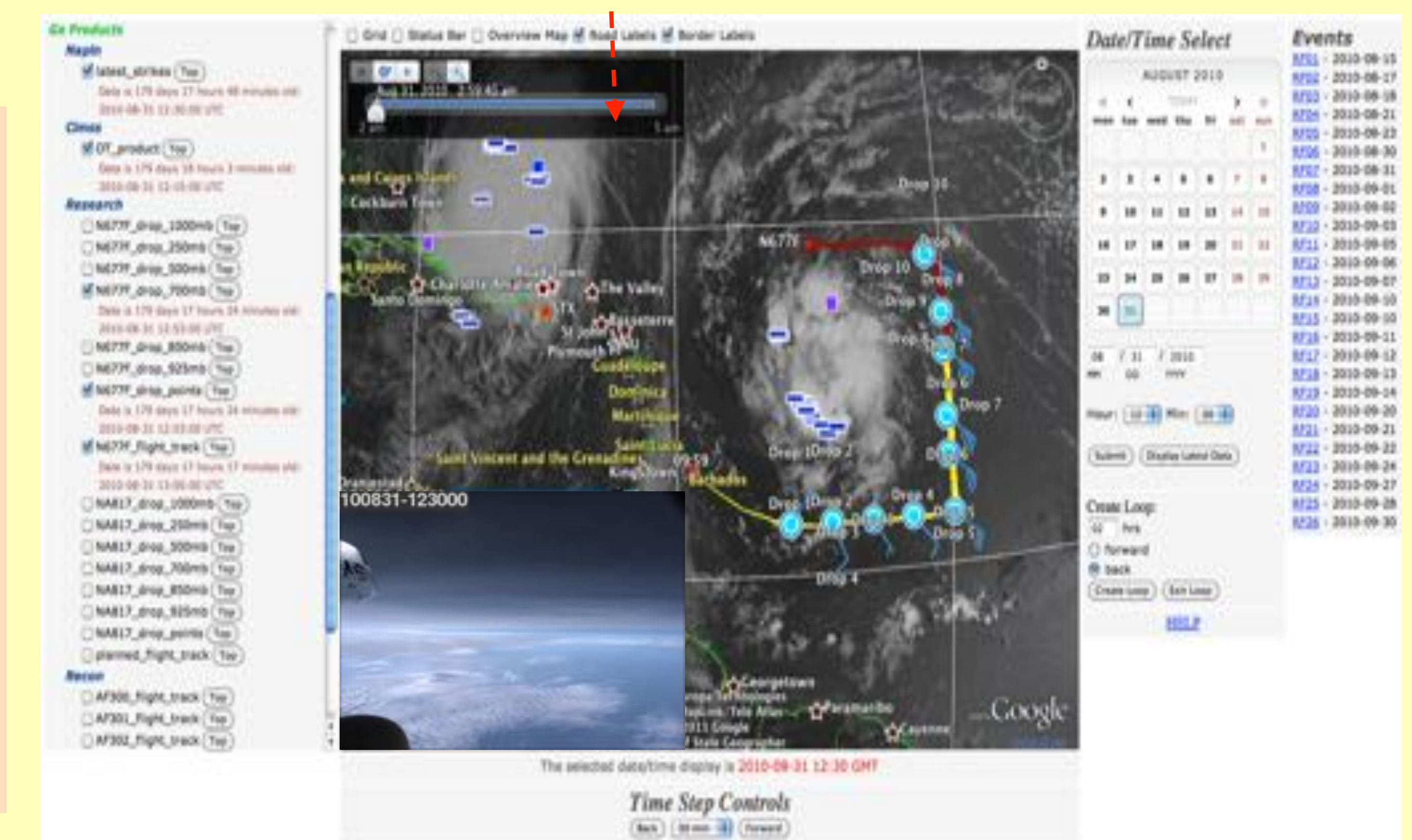
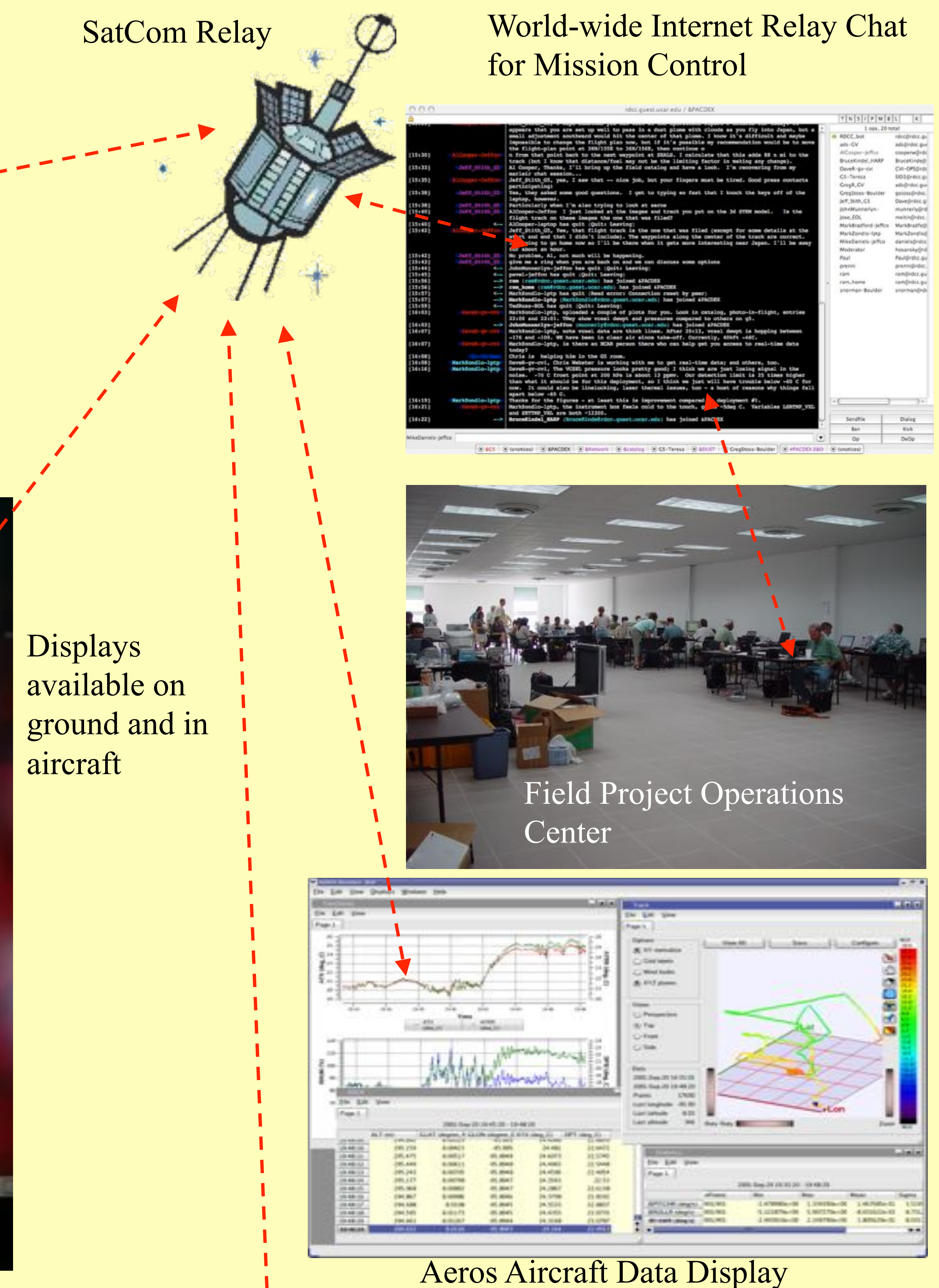


Web-based Mission Coordinator Display

Mission Coordinator and Catalog Displays of real-time overlays:

- satellite information (visible and infrared)
- model forecast (grey streamlines on right)
- overshooting cloud-tops (squares)
- lightning (small rectangles)
- planned flight track with dropsonde release positions
- aircraft flight track (red and yellow curve)
- current aircraft position (airplane symbol)
- forward camera view from the aircraft.

Using a web browser, this live display is available simultaneously in the aircraft and world-wide on the ground.



Catalog Real-time Display via Google Earth overlays (available on ground only)

Future Needs

- Advanced features for remote instrument control and remote monitoring of systems.
- Generate and distribute real-time modifications to the flight plan.
- Build real-time weather radar, lidar, temperature, pressure, wind speed grids from aircraft and point measurements.
- Display and management of additional kml products processed through the Field Catalog ingest system
- Develop or adopt standards for the above through inter-agency and international collaborations. → IWGADTS

