Airborne Oceanic and Atmospheric Measurements For Coastal Observing: The UNOLS Perspective

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UNOLS has established SCOAR:
Scientific Committee for Oceanographic Aircraft Research

1. SCOAR will provide recommendations and advice to the operators and supporting funding agencies of the UNOLS-designated National Oceanographic Aircraft Facilities (*e.g.* CIRPAS) regarding:
   - Operations
   - Sensor development
   - Fleet composition
   - Utilization
   - Data services as appropriate

2. SCOAR will provide the ocean science user community with information and advice concerning research aircraft facilities:
   - Experiment design
   - Facility usage
   - Scheduling
   - Platform and instrumentation capabilities

3. SCOAR will promote collaborations and cooperation between facility operators, funding agencies and the scientific community to improve the availability, capabilities and quality of aircraft facilities supporting the ocean sciences

4. By promoting collaboration between the ocean science, atmospheric science, and other science communities using aircraft in support of their research, SCOAR will work to improve utilization and capabilities for all of these communities

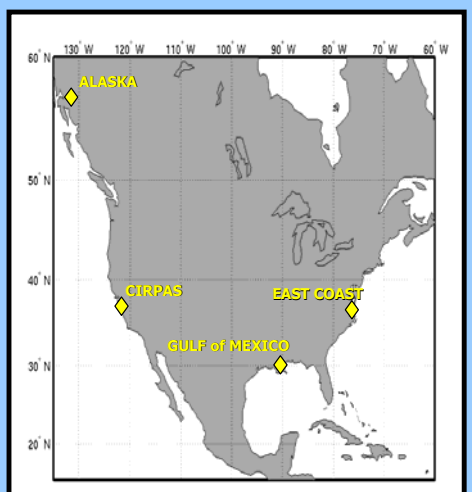
Aircraft will be used in ocean observatory activities for:

- **Routine observations in areas that do not have fixed *in situ* instrumentation (*e.g.*, to obtain initialization or verification data for oceanic and atmospheric models)**
- **Observations surrounding observatory sites to provide more complete, 3-D views of the environment**
- **Intense observations for specific short-term events, such as an algal bloom, a high runoff episode, an atmospheric storm, a Gulf Stream intrusion, or an ocean eddy event.**

Long-range aircraft operated by agencies such as NOAA, NCAR and NASA are presently available for deep-ocean observatory needs. In order to best serve the nation's growing coastal observing systems and observatories, SCOAR foresees the need for FOUR REGIONAL RESEARCH AIRCRAFT CENTERS. These centers will operate shorter range aircraft, such as: the Twin Otter turboprop; light-twin piston-engine aircraft; and small, slow, good visibility single engine aircraft for inshore water surveys.

The existing Center for Interdisciplinary Remotely-Piloted Aircraft Studies (CIRPAS) at the Naval Postgraduate School is a good candidate to be the West Coast center. New centers on the East Coast, in Alaska, and on the Gulf of Mexico coast are envisioned.

Standard instrumentation packages will be on each aircraft, and specialized sensor/data packages can be accommodated (see panel to the right).



ONE EXISTING AND THREE PROPOSED RESEARCH AIRCRAFT CENTERS

Aircraft Sensors and Capabilities

A/C Flight Parameters
- GPS - WAAS, Differential GPS
- Inertial navigation system
- Position, altitude, time
- Attitude, heading, true airspeed, speed ar over ground, rate of climb
- Distance above surface - radar or laser all

Flight Level Atmospheric Parameters
- Temperature
- Pressure
- Humidity
- Wind speed and direction (horizontal, ver
- Wind turbulence
- Liquid water
- Aerosol and cloud physics
- Trace gasses, CO_2, SO_2, others

Remote Sensing
- Solar Radiation
- SST
- Ocean Surface Salinity
- Visible imaging, digital video, frame grabbin
- IR, UV ocean surface imaging
- Visible spectrometer, hyperspectral imaging
- Wave height measurements
- Bathymetry
- Mapping beach/dunes/coastal erosion
- Scanning RADAR and LIDAR

Air Column Measurements
- Multiple sensors on towed body

Deployable Sensors
- Dropwindsonde
- AXBT, AXCTD, AXCP, AXKT, AX**, sonobuoys
- Argo and other floats