

UNOLS SCOAR MEETING
March 25, 2004
Center for Interdisciplinary Remotely Piloted Aircraft Studies (CIRPAS)
Marina, CA

Executive summary

The UNOLS Scientific Committee for Oceanographic Aircraft Research (SCOAR) held a one day meeting at the Center for Interdisciplinary Remotely Piloted Aircraft Studies (CIRPAS) in Marina California on March 25th, 2004. This was the third meeting of the committee and was held in conjunction with a meeting of the Interagency Coordinating Committee for Airborne Geosciences Research and Applications (ICCAGRA), held the day before. In addition to reports by Agency representatives and the CIRPAS representatives, the primary focus of the meeting was to move forward with establishing procedures and information that would support the functioning of CIRPAS as a National Oceanographic Aircraft Facility (NOAF). This includes developing procedures for requesting air time, scheduling and funding mechanisms. It also requires establishing baselines for safety standards as well as guidelines for establishing future NOAF facilities. In support of efforts to reach out to the oceanographic community to make them aware of the opportunities provided by aircraft, the committee has moved forward with drafting an article for EOS and has made efforts to engage with the NSF funded Observatories community during recent workshops.

Recommendations

- Define optimum utilization for CIRPAS in an understandable format and metric.
- Show utilization statistics using this metric.
- Articulate what it would take to maximize utilization of the aircraft.

Committee Action items

Task	Assignment
Collect other agency and CIRPAS procedures for the committee to review in developing NOAF safety standards.	SCOAR/CIRPAS
List of basic instrumentation and data for Ocean Sciences	Bane to review
Need to define a funding mechanism that will work for multiple agencies and users.	SCOAR
Develop a list of instrumentation availability	CIRPAS/other agencies
John Bane will speak with Jim Yoder to see how the aircraft will fit into their facility requirements. Follow-up on letter sent to Margaret Leinen.	Bane
Stay in touch with the ORION office and steering committees to keep abreast of the requirements for	All SCOAR members

aircraft facilities	
Committee review and revise EOS article. They will continue this by email and finalize the article.	Bane will complete with input from others
Complete the details of the NOAF procedure set up.	Flagg/Prince
Call for new members	UNOLS Office
Set up next meeting date and times	TBD
Develop an aircraft request form for CIRPAS	Jonsson

Index of appendices

- I. [Meeting Agenda](#)
- II. [Participant List](#)
- III. [SCOAR Poster \(PDF 113KB\)](#)

Proceedings of the meeting

Welcome and Introductions

The UNOLS Scientific Oceanographic Aircraft Committee (SCOAR) meeting was held on Thursday March 25, 2004, at the Center for Interdisciplinary Remotely-Piloted Aircraft Studies (CIRPAS) in Marina, CA. John Bane, SCOAR Chair, called the meeting to order at 0830 and provided an opportunity for introductions. A list of participants is included as [Appendix II](#)

Accept the minutes of the 2003 SCOAR Meetings

A motion was made and approved to accept the minutes of the February and October 2003 meetings.

Agency Reports

ONR – John Freitag

ONR funds one aircraft facility and that is CIRPAS. Funding for use of CIRPAS is provided 60% from facilities and 40% from the science program managers. Due to budget constraints, ONR had to cut back on funding to CIRPAS by about 30% this year. John would like to see SCOAR and CIRPAS put together an aircraft use or request form so that we can facilitate utilization by other users.

Ken Melville asked how close to full utilization CIRPAS is and how much room there is in the schedule for more work. Haflidi Jonsson (Haf) said that last year, CIRPAS completed seven large missions and were pushing everyone very hard to complete all the work. This year the utilization is not as high.

John Bane asked how much funding comes from sources other than ONR. Last year, ONR supported about 67% of the schedule and this year it is about 80%. Combined with the cutback in ONR funding this has required cutting back on contracted personnel and shifting people to other projects within the group.

Ken asked about how CIRPAS differs from NCAR with regard to experienced science mission support for scheduled projects. The answer is that the core personnel are capable of doing this science support. Other contract personnel may be limited more to aircraft operations support. Due to the fluctuations in utilization, the core group is kept small. They have two permanent pilots, who multi-task with avionics, hanger manager, safety manager, government flight relations, and other duties.

The committee discussed utilization metrics and what would constitute full utilization. For the CIRPAS operation it is more complex than just flight hours or mobilization/demobilization hours. Support for a project includes instrumentation integration, mobilization, demobilization, flight hours and data processing. Also included in the utilization is the time devoted to instrument development.

Also discussed were some of the problems with trying to generate a more consistent demand and match that with the capability of the operators. Increasing demand will have to be balanced with increased capability, and this is difficult with only one operator.

Haf stated that something that would help would be to define what the basic suite of support should be.

NSF and NOAA use an OMB approved definition of utilization. This is defined as hours not available for service to others, such as flight hours, mobilization, maintenance, etc.

CIRPAS aircraft are capable of flying about 600 – 700 hours in a year. At the moment, the optimum utilization of CIRPAS is around 300 flight hours, limited by the size of the staff.

The committee decided they need to develop a clear statement of what the current optimum utilization is for the CIRPAS facility. Next, we would be able to articulate what it would take to maximize utilization of the aircraft.

Cheryl Yuhas (NASA) proposed the idea that collaboration between operators and science instrumentation support teams could help distribute the staffing so that it would be more flexible in supporting fluctuating demand.

Action items and recommendations from this discussion:

- ❑ List of basic instrumentation and data for Ocean Sciences
- ❑ Define optimum utilization for CIRPAS in an understandable format and metric.
- ❑ Show utilization statistics using this metric.
- ❑ Need to define a funding mechanism that will work for multiple agencies and users.
- ❑ Develop a list of instrumentation availability

NSF – Jim Huning

Jim's primary responsibility at the moment is to get the HIAPER aircraft completed. He passed out a handout with the information on the HIAPER project. They are going to change the lead-time for proposal submission for use of HIAPER to two years in order to properly plan for missions. Even though NCAR has a larger staff than CIRPAS, they are also working with a reduced staff and are operating with a bare minimum to carry out the

more complicated remote missions. NSF budget for FY 04 is capped at 90% of FY03 and they do not see any prospect for significant increases for the next few years. Due to the limited resources, they are looking at the possibility of partnering with PIs and their institutions for data and instrumentation development.

We discussed the need to bring ocean sciences program managers into the discussion about aircraft support. John Bane will speak with Jim Yoder to see how the aircraft will fit into their facility requirements. There are important scientific questions and associated measurements that can only be done by aircraft. Science program direction for use of aircraft must come from science program managers. Need to follow up with Jim Yoder and possibly with Margaret Leinen about the letter sent to them earlier.

NOAA – Beth White

Beth reported on the aircraft at NOAA's Aircraft Operations Center. In December of each year a letter is sent to all the NOAA line offices asking them to send in their aircraft requirements for the next two to three years, so they can budget out years, plan for the next two years, and develop detailed schedules for the aircraft for the following year. An aircraft working group made up of representatives from each of the Line Offices-reviews the requests and drafts allocation plans. They develop a plan for base funded services, such as snow surveys, hurricane research and reconnaissance, etc. They also develop ~~have~~ a plan for program funded projects. The approximate number of hours for base services is around 2000 hours. Program utilization is around the same, but fluctuates much more. Base program utilization is more stable, but is impacted by the travel budgets of the program offices. They have an aircraft request form, which is online. The allocation process is completed by August.

Beth is Chief of Program Services and Outsourcing in NOAA Marine and Aviation Operations. Her office also assists NOAA Line Offices in chartering aircraft services by using the Department of Interior (DOI) Office of Aircraft Services approved vendor list. NOAA is trying to set up an internal outsourced aviation safety program where they can inspect aircraft operators and establish their own list of approved operators based on their own safety standards. NASA and DOE have similar programs. For UNOLS aircraft we should try to use existing systems as a template or as the actual system for ensuring National Oceanographic Aircraft Facility (NOAF) aircraft safety. Need to use the FAA standards as the minimum standards (parts 135 and 191). Some aircraft are public aircraft and some can be private aircraft operating as public aircraft that are not required to adhere to the FAA regulations. NOAA is going through the process of determining the minimum safety requirements for chartering aircraft. CIRPAS has to undergo a safety and airworthiness review through the DOD contract for the operator of the aircraft.

SCOAR would need to articulate a set of standards that take into account FAA regulations and procedures from other agencies.

Action item: Collect other agency and CIRPAS procedures for the committee to review in developing NOAF safety standards.

NASA – Cheryl Yuhas

Cheryl reviewed the mission and programs of NASA. Climate variability would be the program of most interest to SCOAR. This is in the Earth Science Enterprise. Cheryl reviewed the aircraft available within NASA for earth science uses. (get list). Other aircraft are specifically for aeronautics and would not be useful for science applications. NASA puts out a call for requests in the spring for next year operations. They also ask for five year planning information and follow this with annual allocation.

They are implementing a “catalogue” approach to requests and allocation. The call letter lists all the assets available from NASA and other agencies. They also announce their data requirements to the commercial community and if they want to be listed as an available resource they are included in the call letter. New observing capabilities may displace existing facilities and capabilities. They may be partnering with the Air Force for the ER2 operation with the U2s. They may partner with either industry or NRL for operation of the P3s. The DC8 would also be operated with a partner or by some other operator.

They will be working to develop new capabilities using AUVs and other platforms that would be considered experimental or developmental. An example would be adapting the global hawk to scientific uses. This is a transitional period, and by 2008 they will have determined from the community what their requirements are. They would develop a five-year rolling plan for capabilities to meet these requirements.

Planning over the last year has led to the catalogue project and the developmental platform project. They will be running around 200 hours on the ER2, DC8 and one P3 and 100 hours on the WB-57. Around 300 hours would be used on light aircraft.

NASA will be a mission-oriented agency, not a facility operator. Their contribution will be primarily with space based observing systems. Other research and development in sub-orbital or surface related programs are to calibrate, validate or develop space-based instrumentation.

Because of the increasing limitations on budgets, the community needs to identify the priorities for sub-orbital observations that would be used by all the ICCAGRA agencies to determine priorities for platforms. ICCAGRA will be reviewing their charter and will have it re-certified by each agency.

UNOLS report – Mike Prince

Mike gave a brief review of fleet renewal and scheduling issues, and he discussed the need to provide input on the ocean science community’s requirements for frequency spectrum use. We will need to include aircraft sensors and communications systems in this catalogue of uses.

Pioneer and ORION workshop reports – John Bane

John reported on these two workshops, where plans for allocating the funds for building ocean observatory initiative (OOI) infrastructure were worked on. John attended these workshops to address the potential use of aircraft for observatories. At ORION he

presented a poster and discussed the purpose of SCOAR and the capabilities that aircraft could provide.

(Include John's slides and poster in these minutes as appendices)

John also presented a view of how three additional aircraft centers could support coastal observatories. There was some discussion about how this information was received. This was apparently mixed, with some people not interested, some viewing it as another competition for limited resources and some seeing the need for aircraft as the best way for certain observations. The committee felt that it would be necessary to stay in touch with the ORION office and steering committees to keep abreast of the requirements for aircraft facilities.

Discussion moved to getting information to the community about the resources available for aircraft research support. Providing information about access, past users and other resources would be important. John mentioned that the one page flyer that was mailed with the FOFC aircraft flyer has generated several enquiries about aircraft and SCOAR.

Cheryl mentioned a previous NASA call for proposals that would support projects that addressed specific mission requirements AND used UAVs. She wondered if such a process could be funded for aircraft use. Beth mentioned that NOPP would put out a call for proposals in the near future that could be a candidate for promoting aircraft.

EOS article – John Bane

John circulated the draft EOS article to the committee for review and revision. They will continue this by email and finalize the article.

Procedures for the CIRPAS National Oceanographic Aircraft Facility:

- CIRPAS - Aircraft Request Form
 - Haf has started on a draft and will be the lead person on this project.
 - Will work with Mike to finalize the draft and circulate to SCOAR plus for comment and suggestions.
 - Need enough information to determine feasibility of using CIRPAS aircraft for the project.
 - Will need to know about additional support requirements such as data analysis, etc.
 - Need to clearly articulate what the facility operator is making available.
- Safety regulations & Inspections
 - Bob Bluth will take the lead on preparing this information.
 - Articulate the existing safety procedures for CIRPAS and the regulatory framework within which these aircraft are operated. Use existing CIRPAS safety procedures.

- Interagency Committee on Aviation Policy (ICAP) under GSA will be holding a meeting in July to discuss getting all the agencies to develop a minimum set of safety policies for chartering aircraft.
- CIRPAS aircraft are Navy owned, but are operated under a charter as public use aircraft.
- A commercial aircraft operating under charter for a government agency can be operated as a public use aircraft for the duration of the charter.
- They operated under Federal Acquisition Regulations, which should be acceptable to other agencies.
- Information needs to include safety related requirements for using the CIRPAS aircraft.
- Scheduling and funding mechanisms
 - Funding
 - Bob and John will take the lead
 - John Bane will talk with Jim Yoder, Jim Huning and John Freitag about funding mechanisms and the possibility of base funding for the facility. He will follow up on the letter to Margaret Leinen.
 - A cost structure and rate are needed. What metric or method should be used as a basis for cost per project?
 - Develop an average project rate over the past five years. Perhaps add a range of project costs.
 - Develop a simple method for providing project cost estimates for planning purposes.
 - Calculate the flight hour cost: Fuel, oil, planned and unplanned maintenance and pilot costs per hour.
 - Show what costs would be added to this for a project's total cost.
 - Show how many hours per day an aircraft would be flown.
 - Scheduling
 - Mike, Bob, Jim Huning and John Freitag take the lead.
 - Current process is on a first come, first serve basis.
 - Post schedule on CIRPAS and SCOAR website.
 - Review and articulate a procedure for optimizing the facility schedules.
 - Consider alternative solutions for scheduling such as OFAP.
 - Do we need to request target dates, a panel to make decisions, etc.
- Project planning procedures and information.

- Haf with help from Ken Melville, Dan Riemer, Mike Prince and Stewart Lamerdin
- We should have something similar to a “Cruise Planning Manual”
- Standard instrumentation suite and services.
 - John Bane, Ken Melville, Haf and Dan Riemer take the lead.
 - Draft list already started.
 - Needs to be reviewed and refined
 - Need to decide what is really standard
- Requirements for being a UNOLS National Facility
 - Charlie Flagg take the lead.
 - Include safety regulations requirements
 - Use the Annex II and UNOLS Vessel requirements as a starting point.
 - Articulate criteria to be used in evaluating an application for designation as a National Oceanographic Facility.

Draft list of standard instrumentation:

- A/C Flight parameters
 - Position and altitude, time
 - GPS – Wide Area Augmentation System (WAAS), Differential GPS
 - Inertial navigation system
 - Distance above surface (specify level of precision)
 - Radar Altitude
 - Attitude, rate of climb, heading, TAS, groundspeed and track
- Flight level parameters
 - Air parameters
 - Temperature
 - Pressure
 - Humidity
 - Wind speed and direction (horizontal, vertical)
 - Wind turbulence
 - Liquid water
- Remotely Sensed
 - Solar Radiation, incoming (through guest developer)
 - SST
 - IR ocean surface imaging
 - Visible imaging, digital video and frame grabbing
- Air column
 - Deployed sensors
 - Drop windsonde

- In the water parameters (deployed sensors)
 - AXBT, AXCTD, AXCP, AXKT, AX**, sonobuoys, etc.
 - Argo floats and other floats
- Instrumentation integration facility
 - Downward looking hole
 - Data and power bus, including time and/or position stamp

Draft list of available options

- A/C Flight parameters
 - Distance above surface (specify level of precision)
 - Laser Altimeter
- Flight level parameters
 - Aerosol and cloud physics
 - Trace gasses, CO₂, SO₂, others?
- Remotely Sensed
 - Salinity ***
 - Visible spectrometer and hyper-spectral imaging
 - Wave height measurements
 - Bathymetry ***
 - Mapping beach/dunes/coastal erosion
 - Scanning RADAR
 - Scanning LIDAR
- Air column
 - Towed sensors
 - Multiple sensors on tow body
 - Remote sensors
 - LIDAR (Doppler)

Action Items assignments listed above.

- ❖ NOAF requirements (above)
- ❖ EOS article submitted by June 1st.
- ❖ Member solicitation
- ❖ Next meeting by correspondence

New membership:

Announce the need for new committee member in UNOLS news and other venues, including a blast to UNOLS representatives. Mention in the EOS article the need for a member.

Scientific disciplines that could be considered for new members include:

Biologists/Remote sensing

Marine meteorologists

The meeting adjourned at 4:20 pm.

