Scientific Committee for Oceanographic Aircraft Research

Report to the UNOLS Council
March 2011

Chair: Daniel S. Schwartz

I regret being unable to attend this Council Meeting in person, due to prior travel commitments on the west coast. Following is our Committee's report.

- The SCOAR, during last June's meeting at the CIRPAS facility in Marina California, resolved to recommend that ONR support a technology and scientific demonstration project that would employ an unmanned aerial system (UAS), to be launched from, and recovered aboard, a UNOLS vessel, and that it be employed to collect useful scientific data while operating away from the ship. The agency is currently working with P.I. Ken Melville on the feasibility of such an operation as part of an upcoming Physical Oceanography cruise of the R/V *Roger Revelle*, in the Indian Ocean. There are a number of technical, logistic and infrastructure challenges to be worked out and we hope to report further progress on this UAS and off-board aerial sensor demonstration at the next meeting. SCOAR continues to play a facilitating role in offering assistance to individuals involved with this demonstration, as planning continues.
- SCOAR currently has an opening for another member. UNOLS Council members are encouraged to share this information with colleagues who may have an interest in the use aircraft (manned and/or unmanned) and airborne sensors in their scientific research endeavors. The UNOLS Office will be making a broader announcement shortly.
- The next meeting of the SCOAR will take place this summer, again graciously hosted by CIRPAS at the Marina, California facility. Within the next couple of weeks, we will be surveying the members and Federal Agency personnel as to their preference of dates, and a general announcement will be issued.
- On February 4th, NOAA hosted an all-day workshop on Utilization of Unmanned Aerial Systems for Environmental Monitoring. It was emceed by Michael Bonadonna, Senior Staff Meteorologist with OFCM/NOAA. Presentations were made by Robbie Hood, UAS Program Manager at NOAA, Brenda Mulac, UAS Program lead for NASA, Rickey Petty, Program Manager for Climate and Environmental Science at Dept. of Energy, Admiral Phillip Kenul, Director Office of Maritime and Aviation Operations for NOAA, Reginald Beach, Senior Scientist at NOAA's Office of Ocean Exploration, and other participants from the U.S. Army, Coast Guard, Air Force, Customs and Border Protection, and the Federal Aviation Administration. All of these agencies have UAS programs or interests ranging in extent from preliminary to robust. The challenges to fully utilizing UAS for research and monitoring -- airspace issues, payload limitations, emerging technologies, and sensor developments – were the focus of the workshop's discussions.

- The UNOLS aircraft facility, CIRPAS, will in the near future have another platform that offers great promise for ship-based air operations. It is called the Neptune U.A.S. and attached to this report is a description and three photographs. What is unique about this particular UAS is that it is recovered in the water, alongside the ship, rather than by a complicated (and somewhat risky) on-board capture system. Thus, flights terminate in a low inertia recovery to the water, promising greater reliability and safety of operations. We expect to see trials in the future, and will be soliciting interest among investigators who may want to make use of this technology.
- At previous meetings, we have suggested that a possible use of a ship-deployed UAS would be to "clear" an area ahead of and around a vessel performing seismic profiling, to ensure that there is no danger to marine mammals. Current practice requires visual observers with big-eye binoculars, limited to daylight, to scan for marine mammals. A UAS would not only scan a much larger area around and ahead of the ship, but also by employing FLIR sensors it could likely continue the search at night or in poor visibility. CIRPAS has a couple of different multi-spectral optical turrets that could provide this capability. We have discussed with Bob Bluth, the Director of CIRPAS, and with Paul Ljunggren at LDEO, the possibility of a pilot project utilizing the CIRPAS aircraft and optical turrets in a demonstration to detect and image breeching whales. A specification sheet on this sensor is attached.

Airborne environmental and oceanographic sensors and platforms are rapidly evolving with promising increases in capability and applicability. In an era of austere Federal budgets, these may offer a cost effective way to acquire data over a variety of spatial and temporal scales. It is worth our community's attention to monitoring of developments in these fields as we enter the second decade of the twenty-first century.

Neptune UAV