



# ***Scientific Committee for Oceanographic Aircraft Research***

Report to the UNOLS Council and  
Annual Meeting  
22 October 2014

# SCOAR MEMBERS

- Bailey, Ro UAF 02/13 to 02/16
- Bluth, Bob | (ex-officio) NPS 01/03
- Fisichella, David | (Chair, RVTEC)WHOI 11/10 to 11/14
- Hartz, Steve | (RVTEC Rep, ex-officio)UAF 05/07
- Jonsson, Haflidi | (ex-officio) NPS 01/03
- Kudela, Raphael UCSC 10/11 to 10/14
- Lenain, Luc SIO 06/11 to 06/14
- McGillivray, Phillip USCG 04/10 to 04/16
- Schwartz, Daniel | (Chair, SCOAR) UW 04/09 to 04/15
- Woods, Roy | (ex-officio) NPS 03/09

# 2014 Meeting at Scripps Institute of Oceanography

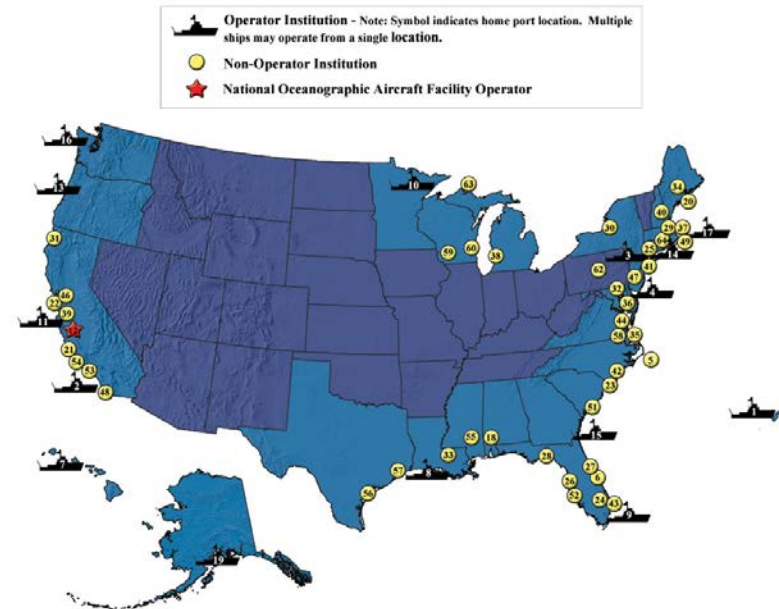


Thank you Bruce Applegate and Luc Lenain!

# List of Participants & Presenters

- Scripps Institute of Oceanography
- University of Alaska
- CIRPAS / Naval Postgraduate School
- NOAA
- WHOI
- University of Miami RSMAS
- UCI
- University of California, Santa Cruz
- NSF
- NSWCDD
- ONR
- University of Washington
- Texas A & M University
- Columbia University, LDEO

# UAS Test Sites Selected by FAA



# IWG-FI Subcommittee for Unmanned Systems

- Co-Chairs are Brian Midson (NSF), Dan Eleuterio (ONR) and Capt. Phil Hall (NOAA)
- Mission: “..to advise, assist and make recommendations to the IWG-FI on policies, procedures and plans relating to unmanned systems uses, upgrades and investments.”
- Goals: establish...set of overarching inter-agency agreements/MOUs, consolidated ops centers for UAS, inventory, common data standards.

# I W G - SUS: Request to UNOLS Members for Information and Input

- What interagency agreements do you have in place
- for unmanned systems (and manned systems)?

Are any of these agreements overarching?

- What is your unmanned systems inventory?
- What metadata standards, data models and architectures are being used for your unmanned and manned systems?
- Do you utilize any consolidated operations centers or centers of excellence?

# University of Miami commissions new aircraft research platform





# ***Why a Helicopter?***

- Various environmental observations require low altitude, very-high frequency of sampling, and/or slow speed of sampling (e.g., aerosols, which have a key impact on climate and health; fluxes –water, carbon, others)
- Maneuverability (complex terrain, urban areas, quick turns for flight tracks)
- Time on station (with fuel truck on the ground or a tank on ship, no need to commute to an airport)
- Remote location ops (e.g., operation from a ship)

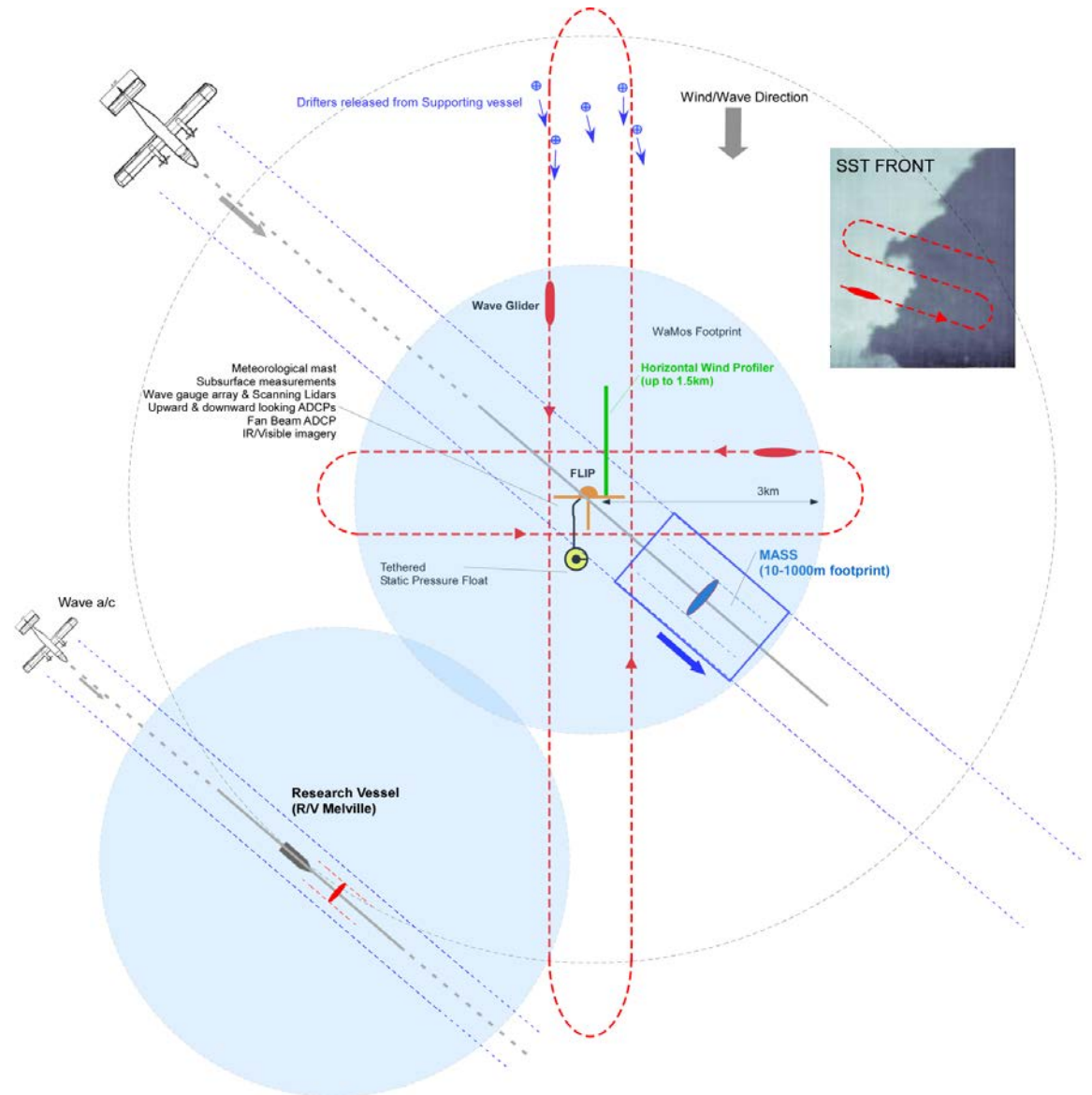
# Comparison of Manned and Unmanned Air Platform Capabilities

	Unmanned System	Manned System
Portability/Ship-Launch	Yes	Limited to Helo/VTOL
Access Remote Location	Yes	Requires runway or helipad
Long Endurance Capable	Yes	Varies/platform-specific
Range	Varies depending on comms: LOS vs SAT	Varies/platform-specific usually better than UAS
Airspace/Flight Clearance	Very Challenging	Straightforward
Low Level Flight Capable	Yes	Helo or special trained crew (as per CIRPAS)
Multi-Platform Ops	Yes	Challenging/do-able
Platform Cost	Broad Range	Expensive
Payload Capability	Quite limited	Significant >200 Lbs.
Operation Cost	Varies depends on ops.	Varies depends on ops.

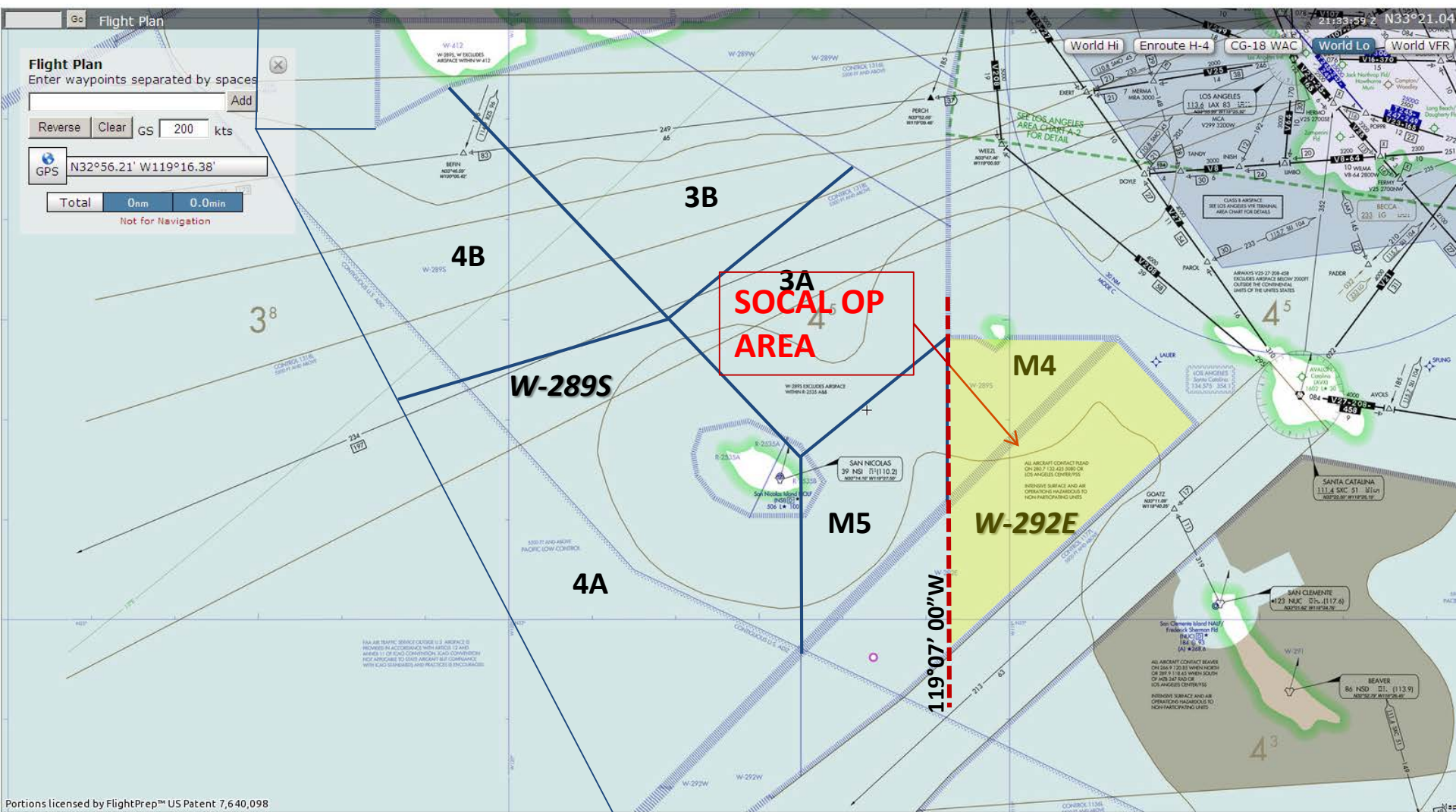
# Examples of recent projects requiring air/ship coordination



# Recent project requiring air/ship coordination: SOCAL2013 (Partenavia P68+Wave Glider + R/V Melville + R/P FLIP) (Melville & Lenain SIO)



# Complex Air & Water spaces request coordination



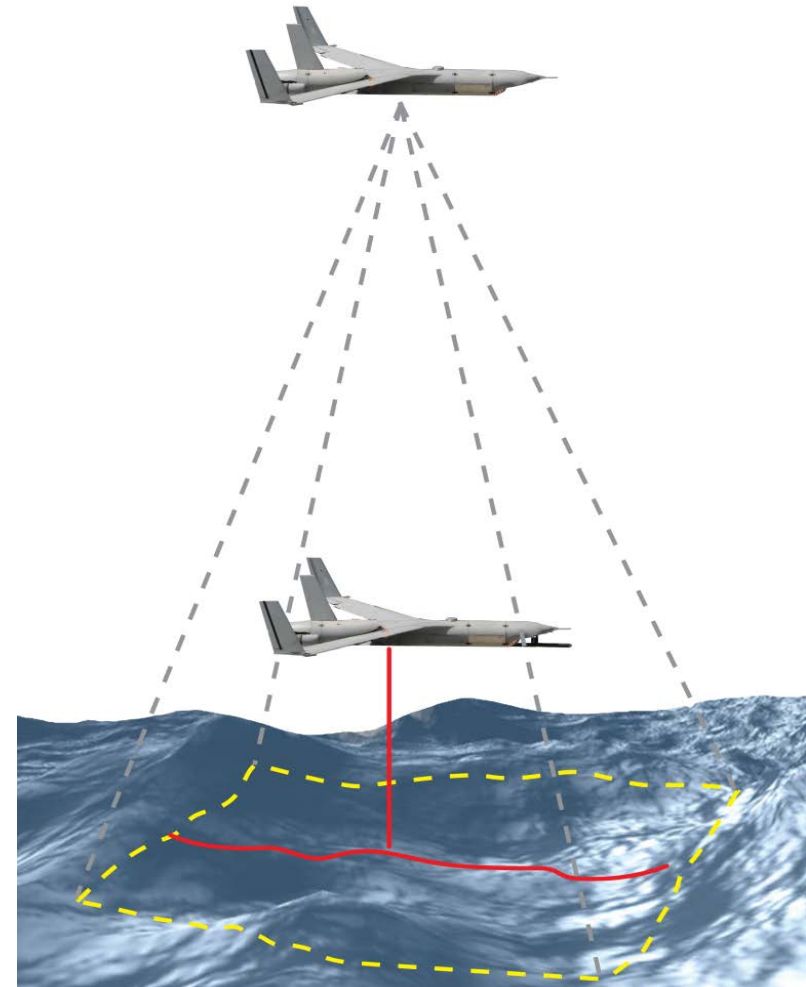
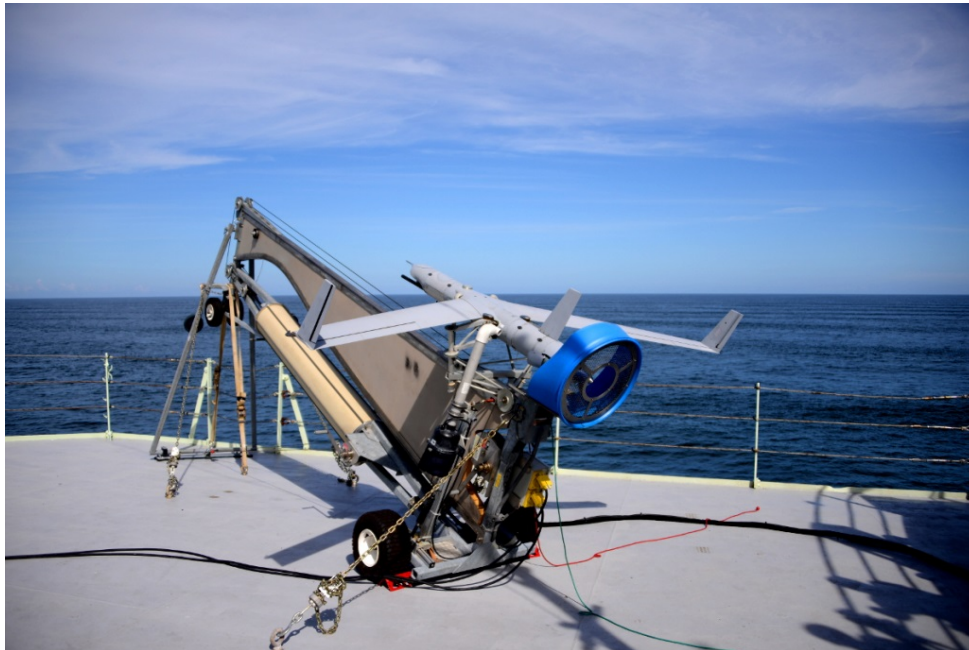
Deployment of R/P FLIP (moored), R/V Melville, MASS-instrumented aircraft (Partenavia P68) and Wave Gliders in November 2013.



# Ship-based UAV measurements of the marine atmospheric boundary layer during TW13

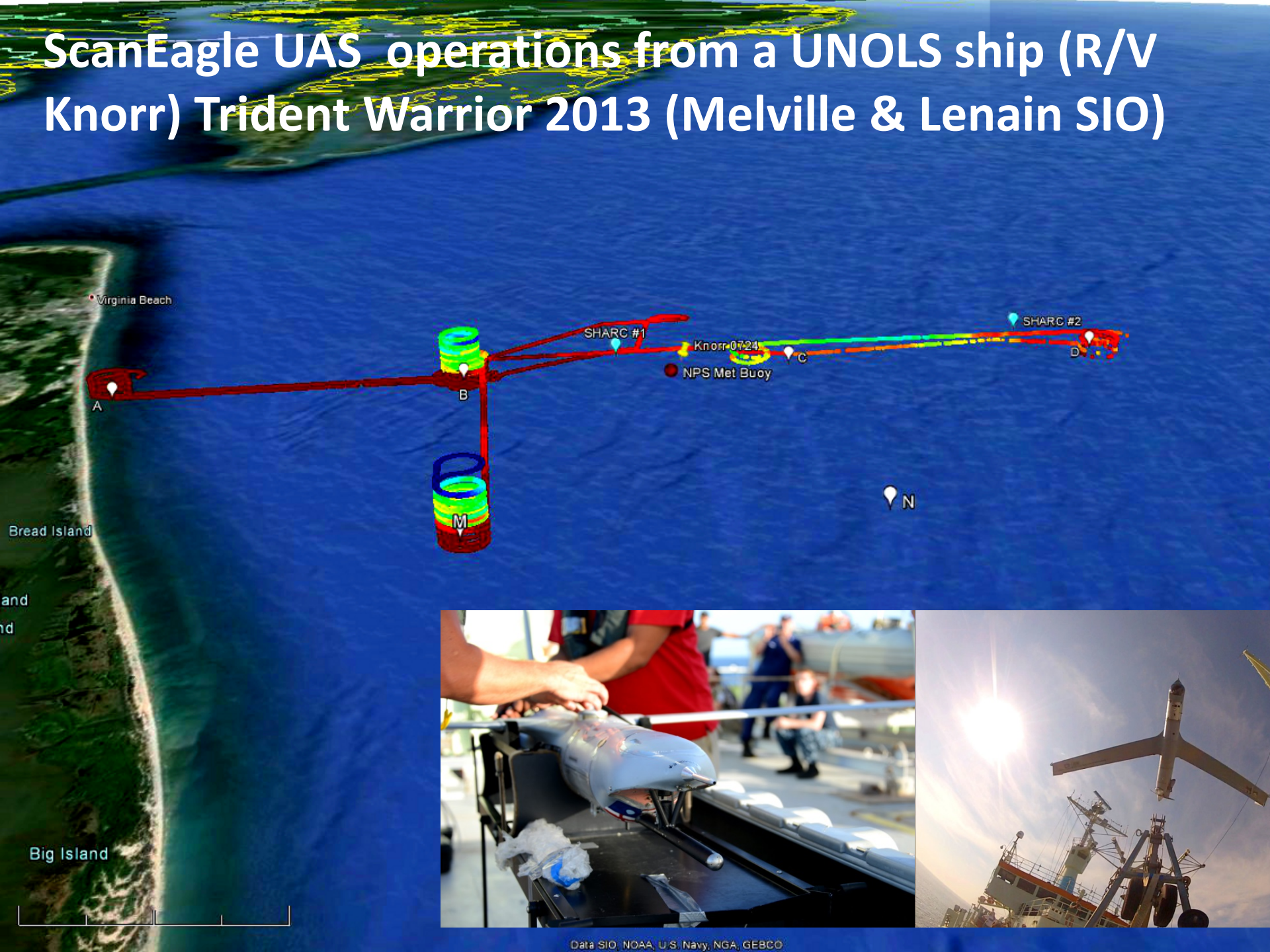
*METOC Unmanned System Experiment  
Electromagnetic Weapon/Sensor Mission*

(Melville & Lenain SIO)





# ScanEagle UAS operations from a UNOLS ship (R/V Knorr) Trident Warrior 2013 (Melville & Lenain SIO)



- **Goal: To demonstrate the usefulness of instrumented, ship-launched and recovered UAVs (ScanEagles) for real-time environmental measurements that can feed into environmental models in a simulated operational environment.**

Science objectives:

- \*Time-varying 3D structure of MABL (vert. profiles wind, temperature, humidity)
- \*Response of MABL to SST, subsurface structure, and visa versa
- \***Real-time data assimilation** of measurements into Coupled Ocean/Atmosphere Prediction System (COAMPS) (NPS, NRL)
- \*Electromagnetic propagation monitoring, model evaluation (SPAWAR, SIO)





# Cooperation between FIC and SCOAR

- Airborne platforms leverage surface ship and observatory data collection and offer cost effective ways to vastly open the geospatial and temporal horizons of legacy and future platforms and facilities. They are becoming an increasingly important component of our UNOLS mission infrastructure.
- Planning for future Academic Fleet improvements and acquisitions must take air/sea interoperability into consideration.
- There are a number of examples of shipboard equipment and infrastructure with which we can effectively enhance ship/aircraft interoperability in the current fleet.

# ***2015 SCOAR Meeting***

- Hosted by the University of Miami RSMAS
- Tuesday April 14 and Wednesday April 15



***Thank you for the sustained support  
of SCOAR and its mission!***

