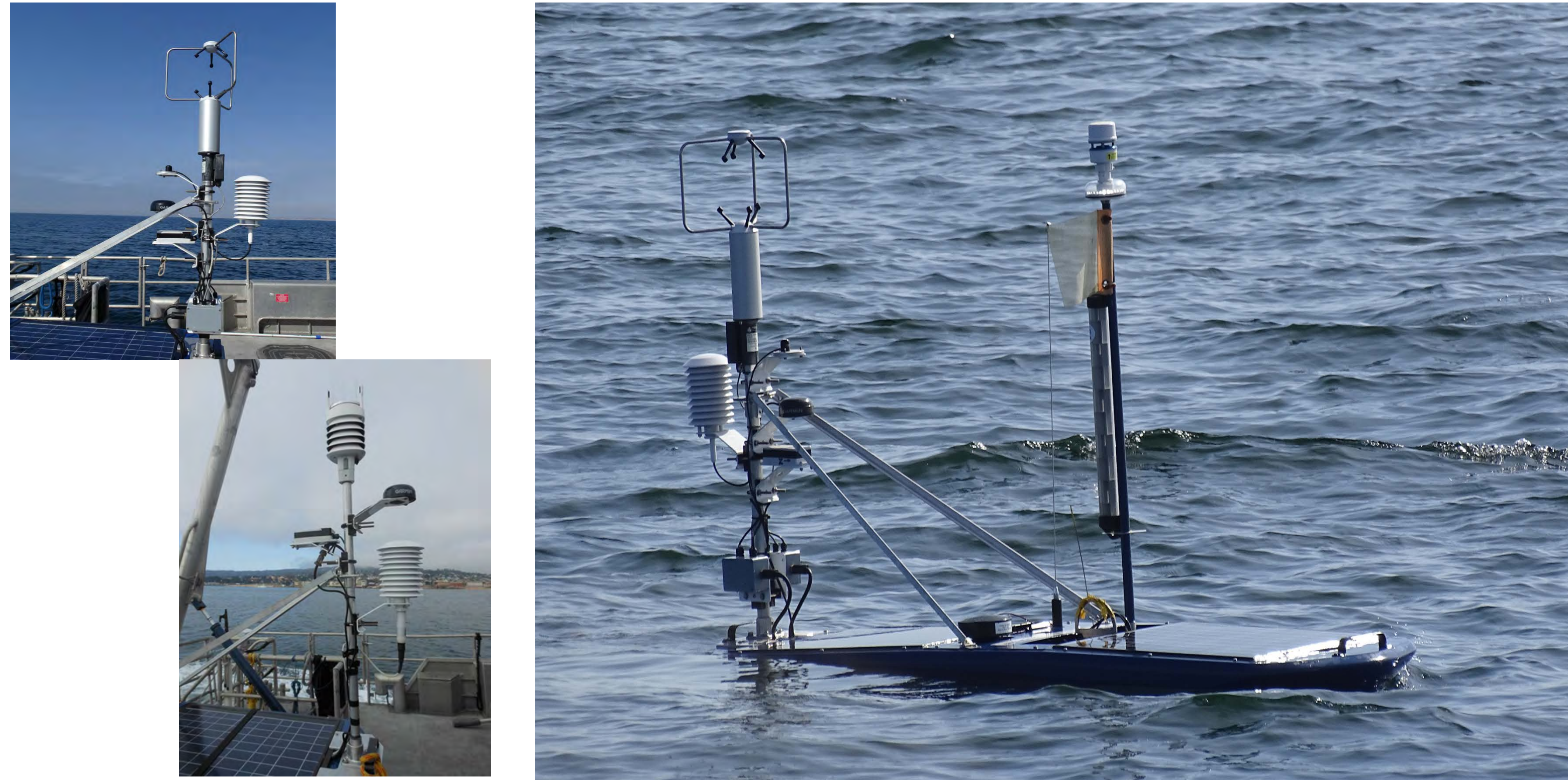


Autonomous Wave Glider Based Measurements and Analyses In Support of Electromagnetic



Naval
Postgraduate
School



NPS mean and turbulence sampling payload systems developed for autonomous Wave Gliders

Proposed Efforts

- Modify current sensor suite for EM propagation application, improve the sensor suite for accuracy and endurance, and test the sensor suite at sea;
- Investigate the sensitivity of EM propagation prediction to ingesting near-surface in situ measurements made within the wave boundary layer;
- Engage METOC students at the leading edge of capability and technology development as a crucial component of their education at NPS.
- Explore close collaborations with other Navy institutions on joint sensor testing efforts. Preliminary plan is to work with NAVO Glider Operation Center (GOC) to integrate NPS sensor suite on the NAVO gliders for long term testing beyond 1-day period.

SHARC Sensor Development and Testing

- Autonomous Wave Gliders, or SHARCs, are ideal platforms for sampling air-ocean properties without introducing significant flow distortion and thermal effect.
- NPS has developed payload systems for use on SHARC under previous CRUSER support. Initial testing at sea shown good results from these systems.
- A modified sensor suite is needed for the particular application of atmospheric effects on electromagnetic (EM) and electro-optical (EO) propagation.
- Extensive testing of the payload systems are needed to full understand the sensor capability and know the operational limits of the sensor suites.
- Various Navy institutions also independently worked on METOC sensing from Wave Gliders. An coordinated effort is needed.

Navy Applications

- Large amount of observational data are needed for improving physical parameterizations in environmental forecast models as well as in model evaluations.
- The most significant data shortage are those close to the surface needed for evaluating and improving EM ducting models and optical propagation models, both are critical components of Electromagnetic Maneuver Warfare (EMW) concerning radar and communications and directed energy weapons. High vertical resolution in situ data close to the ocean surface were not available in the past for this application, resulting in largely unknown errors in the EM prediction as tactical decision aid.
- Wave Glider can potentially make in situ measurements in data sparse regions or regions of strategic importance.