

# A Wave Glider collects METOC and Turbidity data south of Barrow Island for the Wheatstone project.

## CHALLENGE

To monitor solids suspended in the water column (turbidity) during dredging operations.

## SOLUTION

Wave Gliders can be deployed to simultaneously measure suspended sediment concentrations, current speed and direction. This information can be used in real time to differentiate and evaluate the amount of suspended sediment near a dredging operation.

## RESULTS

Simultaneous Wave Glider operations, conducted in separate locations, returned useful statistical results on the condition of the water during the dredging operations allowing the client to ensure the environment was safe and suitably protected during operations.



## The Wave Glider platform

The Wave Glider® is the first autonomous marine vehicle (AMV) that harnesses kinetic energy from wave action to produce forward propulsion in the ocean; in an environmentally friendly manner. The vehicles are completely self-sustaining, using solar panels to power their payloads. The platform includes navigational and control systems, and communicates to an operations center via satellite. Navigational and operational control with full security can be transferred to a local set-up via a master/slave system. This technology provides persistent ocean presence and a reliable data acquisition platform.

## Suspended Sediment Measurements

Single or multiple Wave Gliders have the capability to tow instruments behind them that collect data about sediments in the water column. A variety of tow fish instruments are available, each providing different types of measurements. One such instrument measures particle concentration and particle size in predefined classes. A second measures total suspended sediment in the water column using a backscatter meter which provides insight into particle size distribution changes. Additionally these measurements are combined with standard data recorded by the Wave Gliders such as: air temperature, wind speed, wind direction, atmospheric pressure, wave height, wave period, wave direction, water temperature, salinity and dissolved oxygen.



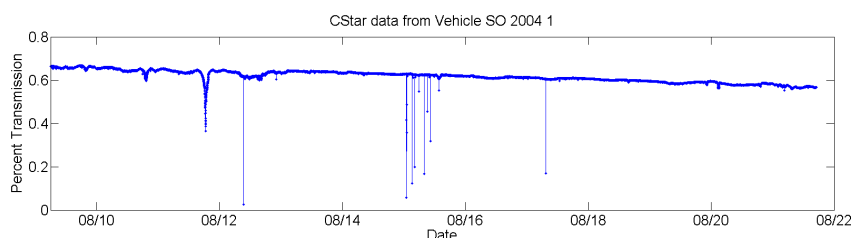
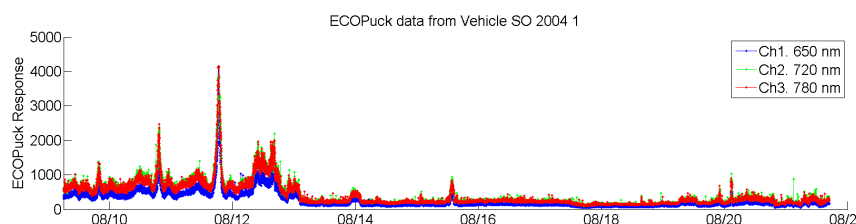
## CASE STUDY: A Wave Glider collects METOC and Turbidity data south of Barrow Island for the Wheatstone project.

### Results: Wave Glider with 2004-1 CStar/ECOPuck

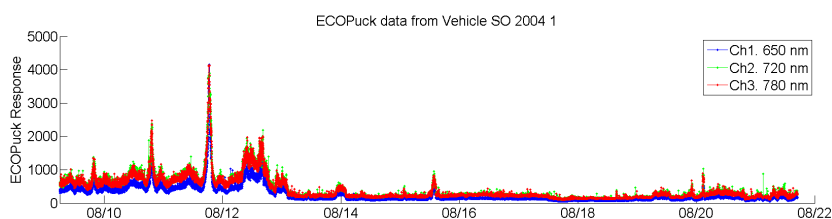
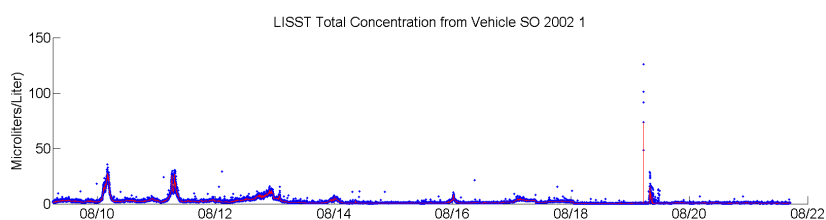
Number of current measurements	2579
Number of weather measurements	5470
Number of wave measurements	692
Number of optical measurements	>40000
Number of CTD measurements	32690
Distance travelled	686 (nm)
Days in water	56
Average vehicle speed	0.7 knots
Maximum vehicle speed	2.8 knots
Maximum wind speed measured	26 knots
Maximum current speed measured	1.1 knots

### Results: Wave Glider with 2002-1 LISST

Number of current measurements	1295
Number of weather measurements	7360
Number of wave measurements	672
Number of optical measurements	47000
Number of CTD measurements	30952
Distance travelled	713.6
Days in water	54
Average vehicle speed	0.7 knots
Maximum vehicle speed	2.8 knots
Maximum wind speed measured	26 knots
Maximum current speed measured	1.9 knots



*The instruments on the AMV show evidence of suspended sediment plumes, rendered as increased backscatter and decreased transmission.*



*This data set has clear events sampled by both AMVs with alternate technologies offering an opportunity to understand the differences through further analysis.*

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