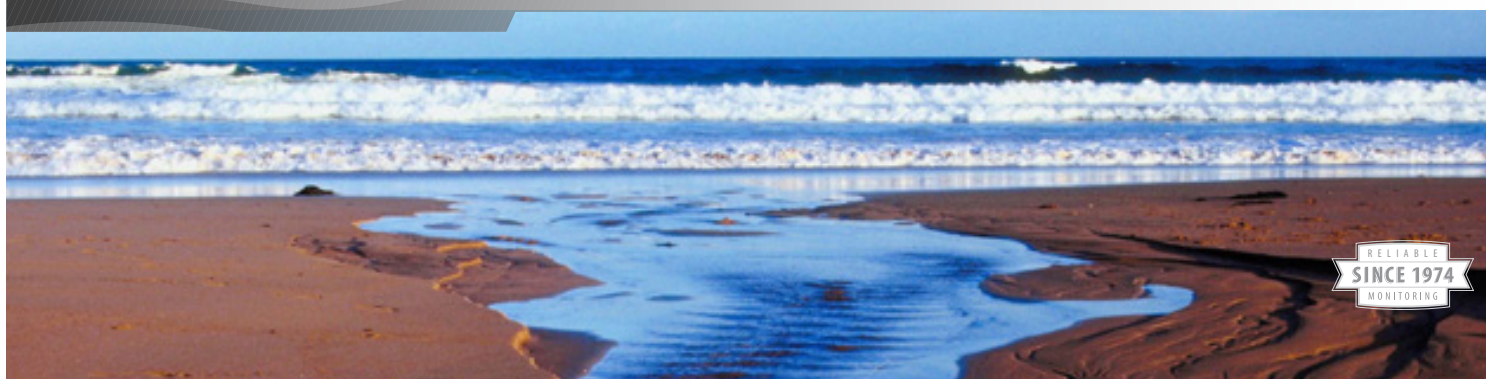




## Oceanography



Instruments for Long-Term, Stand-Alone Monitoring



Campbell Scientific data-acquisition systems are so robust and flexible that they are used in almost every facet of ocean study. They can be customized to monitor factors involved in coastal erosion, ice-floe

movement, currents, salinity, water quality, and tides and waves. Our systems are rugged and low power, so can be stationed on shore or off shore, in any remote, harsh environment.

### MAJOR SYSTEMS

		Measurements	Power	Communications	Description
<b>OBS-3A</b> Turbidity and Temperature Monitoring System		Turbidity Temperature Pressure Conductivity	Three D-cell batteries	Laptop	Combines our OBS® probe with pressure, temperature, and conductivity sensors in a battery-powered recording instrument.
<b>OBS-5+</b> High Suspended Sediment Concentration Monitoring System with Pressure Sensor		Turbidity Pressure	Three C-cell batteries	PC via an RS-232 or RS-485 link	Monitors high sediment concentrations (up to 200 g/l) using an infrared laser and a proprietary dual photo-detection system.

### Custom Systems

Most of the systems we sell are customized. Tell us what you need and we'll help you configure a system that meets your exact needs.

#### Dataloggers Used in Oceanography Monitoring

Our monitoring stations are based around a programmable datalogger that measures the sensors, then processes, stores, and transmits the data. The compact size, rugged design, low power use, and versatility of our dataloggers allow them to be used in many applications, including integration into submerged systems. Our low-power dataloggers have wide operating temperature ranges, programmable execution intervals, onboard instructions, and ample input channels for commonly used sensors. Our dataloggers interface directly to most sensors, eliminating external signal conditioning. On-board instruction sets contain processing routines that range from simple statistics (e.g., average, maximum, minimum, standard deviation) to more complex routines (e.g., FFT, saturation vapor pressure, histogram).

Data are typically output in the units of your choice. Measurement rates and data recording intervals are independently programmable, allowing calculation of 15-minute, hourly, and daily data values from 1-minute or 1-second measurements. Conditional outputs can also be recorded. Channel capacity can be expanded using multiplexers. These features allow you to meet your data re-

quirements, whether it's storing hourly averages of meteorological data or compensating a depth sensor for depth and wave period to produce wave power spectra.



More info: 435.227.9120

[campbellsci.com/oceanography](http://campbellsci.com/oceanography)



## Sensors used for Oceanography

Almost any sensor can be measured by our dataloggers, allowing systems to be customized for each site. Campbell Scientific offers sensors that measure turbidity, dissolved oxygen, pH, conductivity, pressure/water depth, wind speed and direction, solar radiation, temperature (air, water), relative humidity, precipitation, and barometric pressure. Our OBS501 turbidity meter features active antifouling capabilities for better measurements in biologically active water with both high and low turbidity.



## Data Retrieval

We offer multiple communications options for data retrieval, which can be mixed within the same network. Telecommunications options include satellite (Iridium, GOES, Argos, METEOSAT, Inmarsat), telephone (land line, voice-synthesized, cellular), radio frequency, multidrop, and short-haul. On-site options include CompactFlash or microSD cards and laptop computer.

## Software

Our PC-based support software simplifies the entire monitoring process, from programming to data retrieval to data display and analysis. Our software automatically manages data retrieval from networks or single stations. Robust error-checking ensures data integrity. We can even help you post your data to the Internet.

## Oceanography Applications

- Coastal erosion and sedimentation
- Ecosystem research
- Ice-floe movement (GPS)
- Ice-load/impact monitoring
- Oceanographic currents
- Salinity and water quality studies
- Ship-board monitoring
- Structural monitoring
- Temperature profiles
- Tidal monitoring
- Wave height and power
- Weather and climate monitoring

## Oceanography Case Studies

Our oceanography systems have helped a variety of organizations reach their goals. The following are just a few of these:

Campbell gear included in both coastal and open-water stations monitors meteorological and oceanographic conditions at the Gulf of Eilat. The coastal station contains our CR1000 datalogger and is situated on the IUI pier, about 30 m off shore. The open-water station contains a CR800 datalogger, and is situated on a floating buoy about 1 km off shore.

[www.campbellsci.com/eilat](http://www.campbellsci.com/eilat)

Campbell Scientific dataloggers are included in mobile weather stations installed on several ferries in the State of Washington ferry system. The stations measure meteorological parameters along their routes at locations in the Puget Sound. The Washington State Department of Transportation, in conjunction with the University of Washington, posts the ferries' near real-time data on their website.

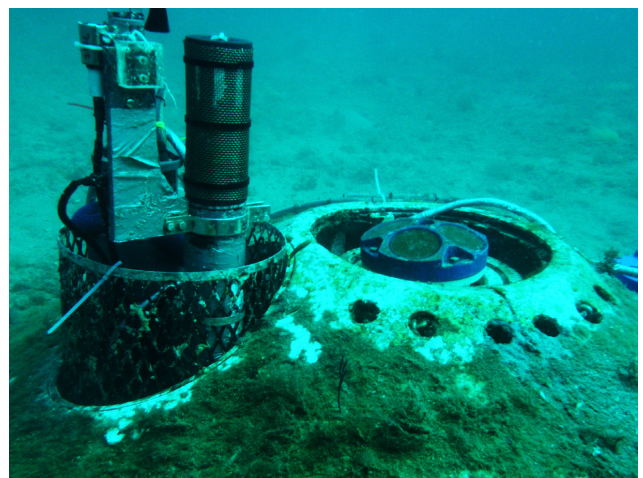
[www.campbellsci.com/washington-state-ferries](http://www.campbellsci.com/washington-state-ferries)

Campbell Scientific dataloggers are mounted on the ocean floor and the backs of jet skis to monitor the effects of cooling water discharges in an Auckland Estuary in New Zealand. The dataloggers make measurements, control other research instrumentation, and provide central processing.

[www.campbellsci.com/auckland-estuary](http://www.campbellsci.com/auckland-estuary)

In the Gulf of Mexico near the Florida panhandle, Campbell dataloggers are used to tie oceanographic sensors into a telemetry system of a met station. A cable carries the data from underwater sensors, through a conduit secured to the ocean bottom, then up to the telemetry system high on the tower. The sensors measure current speed and direction, wave height, and water quality.

[www.campbellsci.com/florida-oceanography](http://www.campbellsci.com/florida-oceanography)



Integrating the ocean-bottom sensors into the telemetry system on the tower make a huge difference in the accessibility of the data.



815 W 1800 N | Logan, UT 84321-1784 | 435.227.9120 | [www.campbellsci.com](http://www.campbellsci.com)  
USA | AUSTRALIA | BRAZIL | CANADA | CHINA | COSTA RICA | FRANCE | GERMANY | SE ASIA | SOUTH AFRICA | SPAIN | UK

© 2005, 2017  
Campbell Scientific, Inc.  
August 4, 2017