

ENVIRONMENTAL



YSI Water Quality Instruments & Integrated Systems

Cutting-edge measurement technologies



WWW.HOSKIN.CA

Cutting-Edge Measurement Technologies



In partnership with



a xylem brand



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Agenda

Water Quality

- ProDSS
- EXO Series

Water Flow

- FlowTracker
- RiverSurveyor
- HydroSurveyor

Advanced Sampling

- Vertical Profilers
- Eco Mapper
- HYCAT
- Hydrographic Software
- Wave Measurement

Aids To Navigation

- Beacons
- Audible Aids



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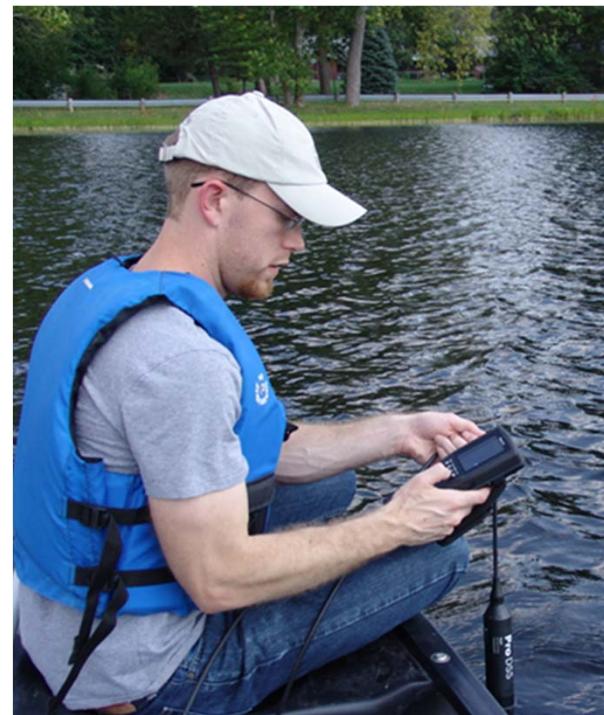
Water Quality

EXO3 & ProDSS



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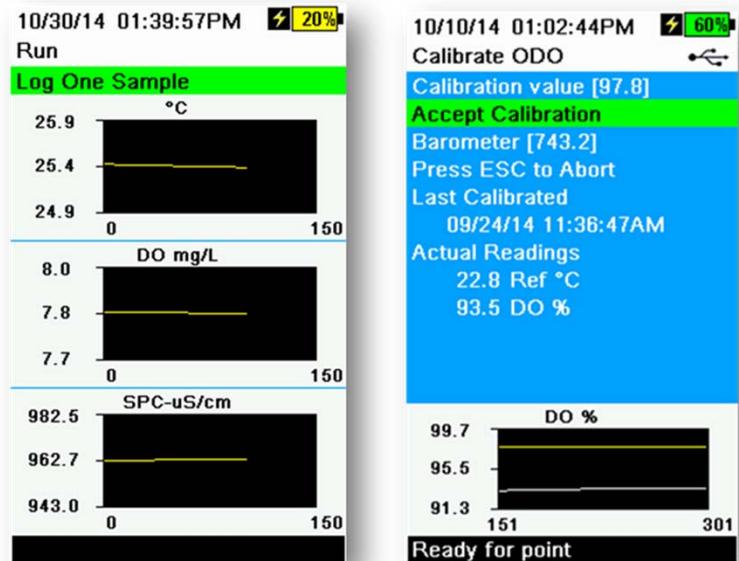
ProDSS



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ProDSS

- One cable design ideal for multiparameter water quality testing and profiling
- Cable lengths available up to 100 meters
- Graphing on handheld
 - Stability during measurement
 - Stability during calibration



ProSolo

YSI ProSolo

Extreme flexibility for the measurement of a variety of combinations for dissolved oxygen, conductivity, and temperature along with depth.
** Other configurations coming soon*



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ProDSS

Parameters

- Dissolved Oxygen (Optical)
- Turbidity
- pH
- ORP/Redox
- Conductivity
- Specific Conductance
- Total Dissolved Solids (TDS)
- Resistivity
- Total Suspended Solids (TSS)
- Depth
- Ammonium
- Ammonia
- Chloride
- Nitrate
- Total Algae (Blue/Green and Chlorophyll)
- Temperature
- GPS



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EXO Sondes

The family of **EXO water quality sondes**
has an option for every application.
Ideal for *in situ* sampling and
long-term monitoring.

For more, visit:
YSI.com/EXO



EXO Handheld



EXO2^s



EXO3



EXO1



EXO2



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EXO 1

- 4 Ports, internal battery, no wiper, spot sampling, short deployment

EXO 2

- 7 Ports, internal battery, wiper, extended deployment, Big5 + special parameters, Algae/ChlA FDOM

EXO 2s

- 7 Ports, no internal battery, wiper, spot sampling, Big5 + special parameters, Algae/ChlA FDOM

EXO 3

- 5 Ports, internal battery, wiper, extended deployment, Big5
- SDI-12 built in

EXO Sondes

- Continuous Long-term Water Quality Monitoring
- Smart sensor technology & Smart QC
- Cable-free operation
- Biofouling Protection – extended deployment times
- Titanium wet-mateable sensors
- Assisted calibrations
- Advanced adaptive sampling



EXO2 Sonde

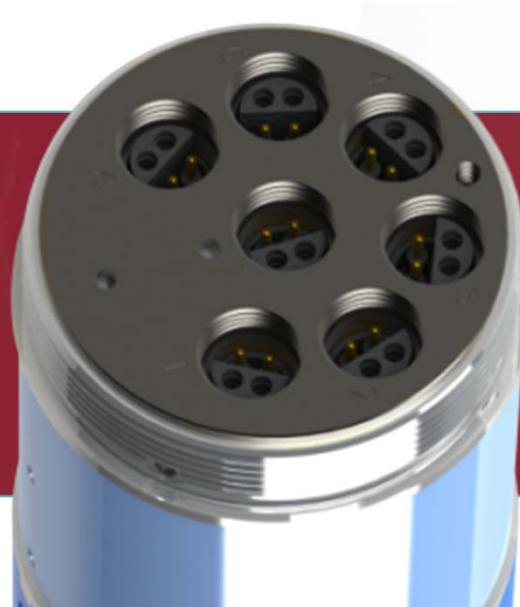


Continuous Monitoring

6 ports + wiper port

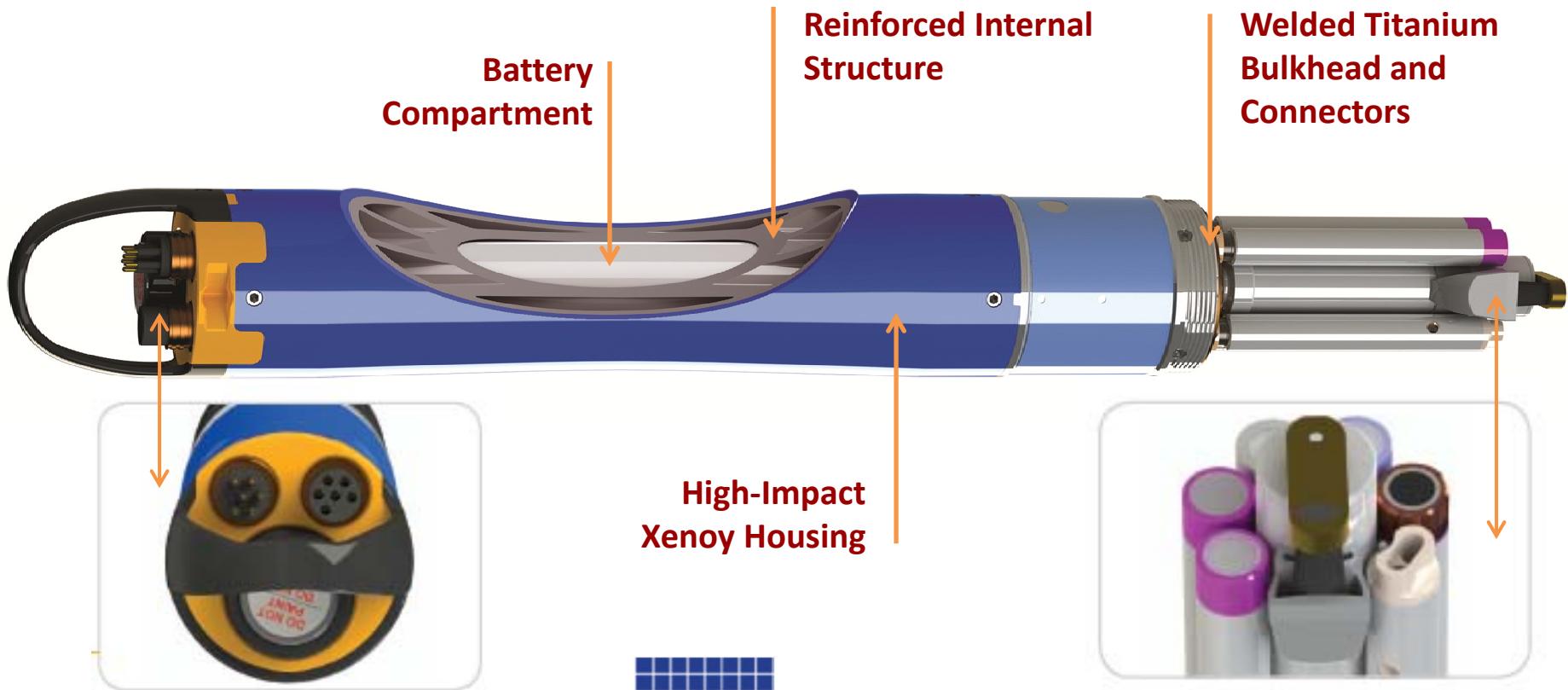
Diameter: 7.62 cm (3.00 in)

Length: 71.10 cm (28.00 in)



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EXO2 Anatomy



Cable connector, battery valve, and expansion port for an additional sensor

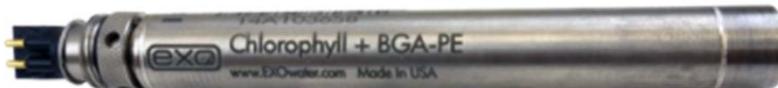
Anti-fouling wiper keeps sensors clear of biofouling and lengthens deployment times by 25%

EXO Smart Sensors



Conductivity and Temperature

- Improved Temp. accuracy and response
- Improved Conductivity range
- Required for all monitoring applications



Total Algae

- Two sensors in one
- Chlorophyll + BGA-PC or PE



Turbidity

- Increased range without loss of accuracy



Smart Wiper System

- For use with EXO2 platform
- Superior anti-fouling
- Faster sampling response



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EXO Smart Sensors



Ph + ORP

- Removable probe head
- Guarded and Unguarded versions



Fluorescent Dissolved Organic Matter (fDOM)

- New for YSI



Ion Selective Electrode

- Replaceable module
- Ammonium, Chloride, Nitrate



Optical Dissolved Oxygen

- Improved accuracy above 200%
- Faster response
- Screw-on membrane



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EXO2 Sonde

Parameters Available

- Ammonium
- Barometric Pressure
- Blue-green Algae, Phycocyanin
- Blue-green Algae, Phycoerythrin
- Chloride
- Chlorophyll
- Conductivity
- Depth
- Dissolved Oxygen, % air saturation
- Dissolved Oxygen, mg/L
- fDOM(CDOM)
- Nitrate
- pH
- ORP
- Temperature
- Turbidity
- Salinity
- Specific Conductance
- Total Dissolved Solids (TDS)
- Total Suspended Solids (TSS)

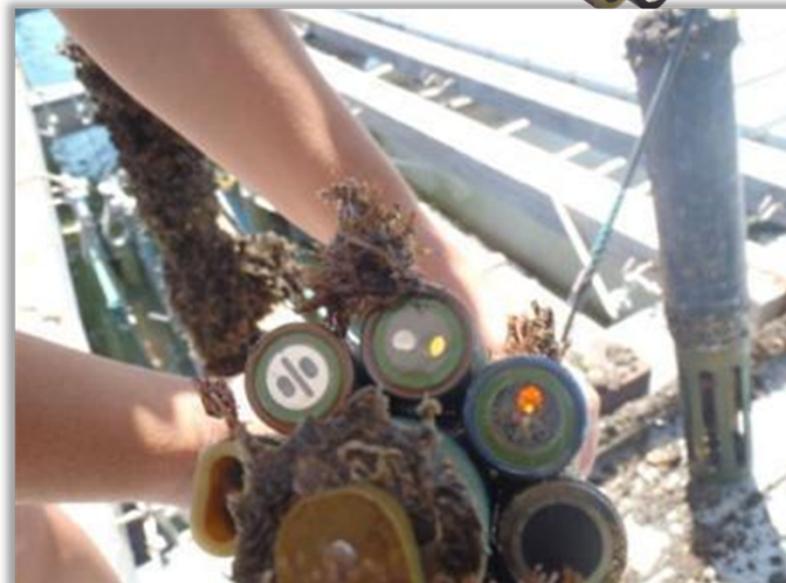


Photo shows sensor after 90-day deployment in the productive waters of the Gulf of Mexico. EXO2 deployed and tested for 4 years at this marine site

EXO3



5-port: 4 sensors + central wiper

Integral SDI-12

Uses fewer batteries

Fits into 6-series installations

Less expensive, purpose-built sonde for standard water quality monitoring



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EXO Handheld

- Full-Color LCD
- USB & GPS
- Wet-Mateable Connector
- Barometer
- IP-67 Housing
- Built in Li-Ion battery
- KOR Software



KOR



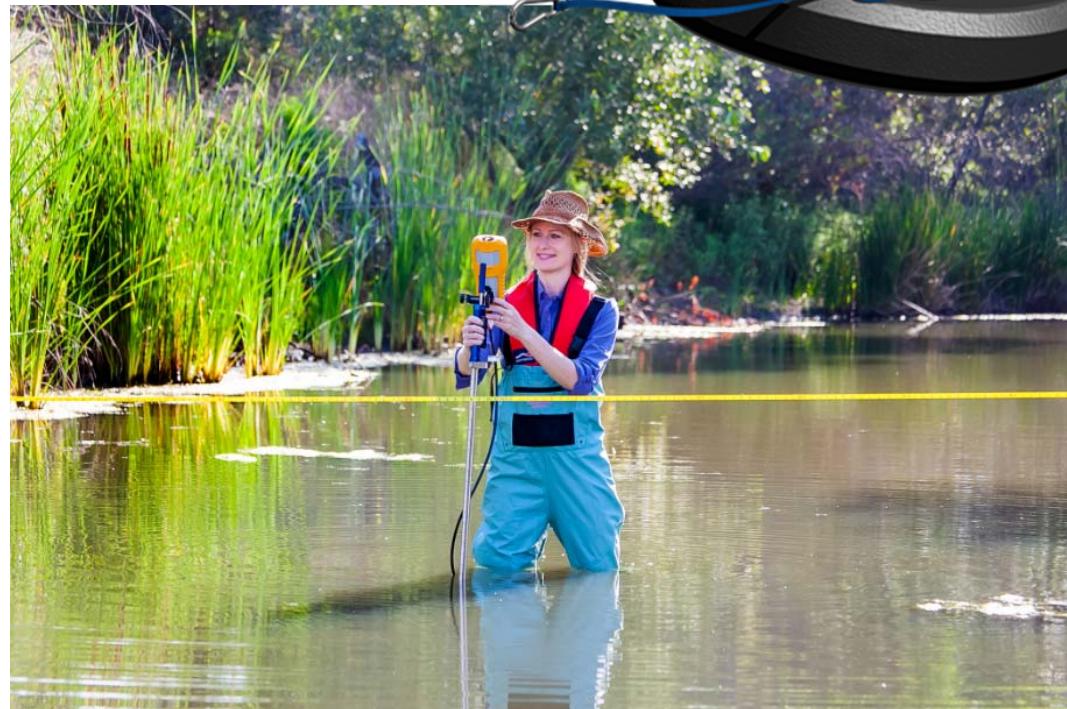
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EXO Go Wireless Adaptor



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Water Flow



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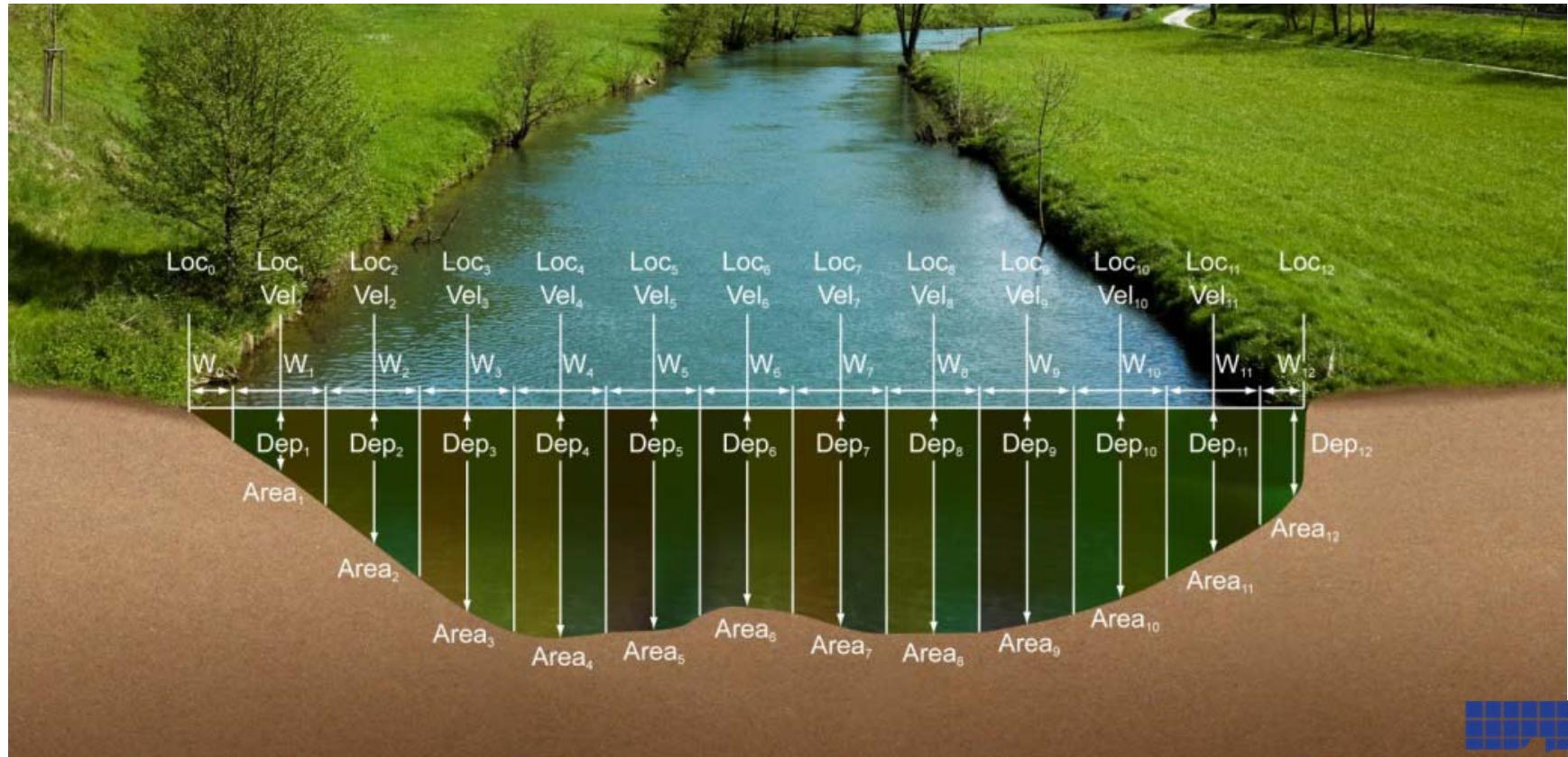
FlowTracker 2



Figure 1:1 - FlowTracker2 with 2D Probe



FT2 Measurement Protocol



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**New,
longer FT2**



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FlowTracker 2

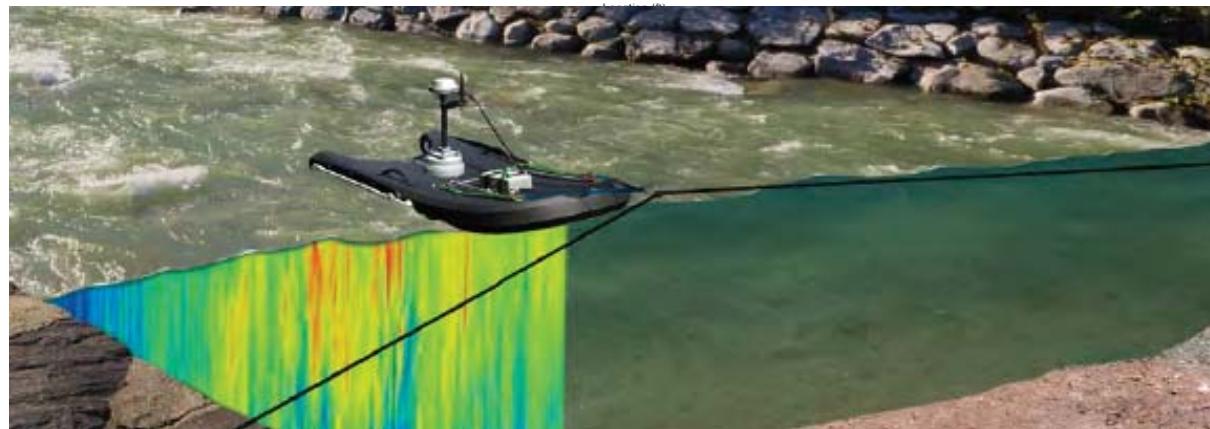
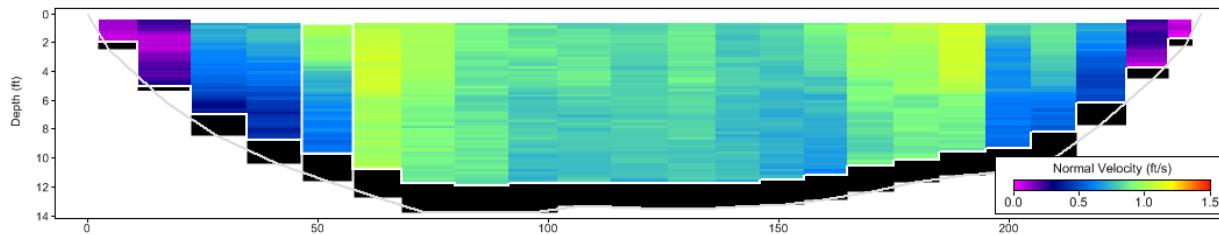


M9/S5 RiverSurveyor



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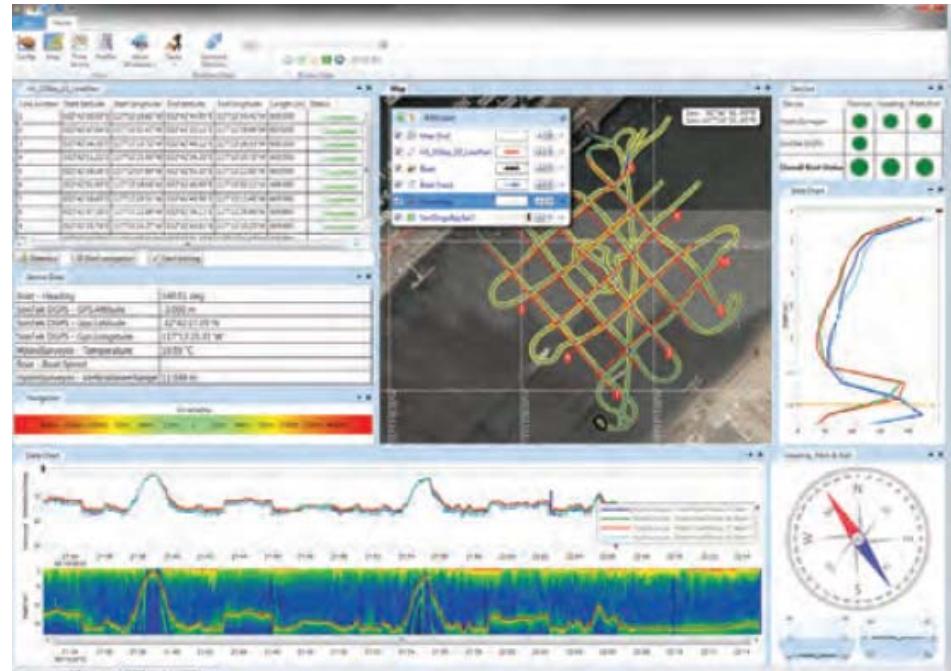
- Acoustic Doppler (Current) Profilers
- Automatically measure velocity and direction for the entire vertical column from the surface, looking down (0.3 to 40 m)
- Can be used at stationary locations (like wading measurements) or from moving boat
- Ideal for non-wadable sites



HydroSurveyor



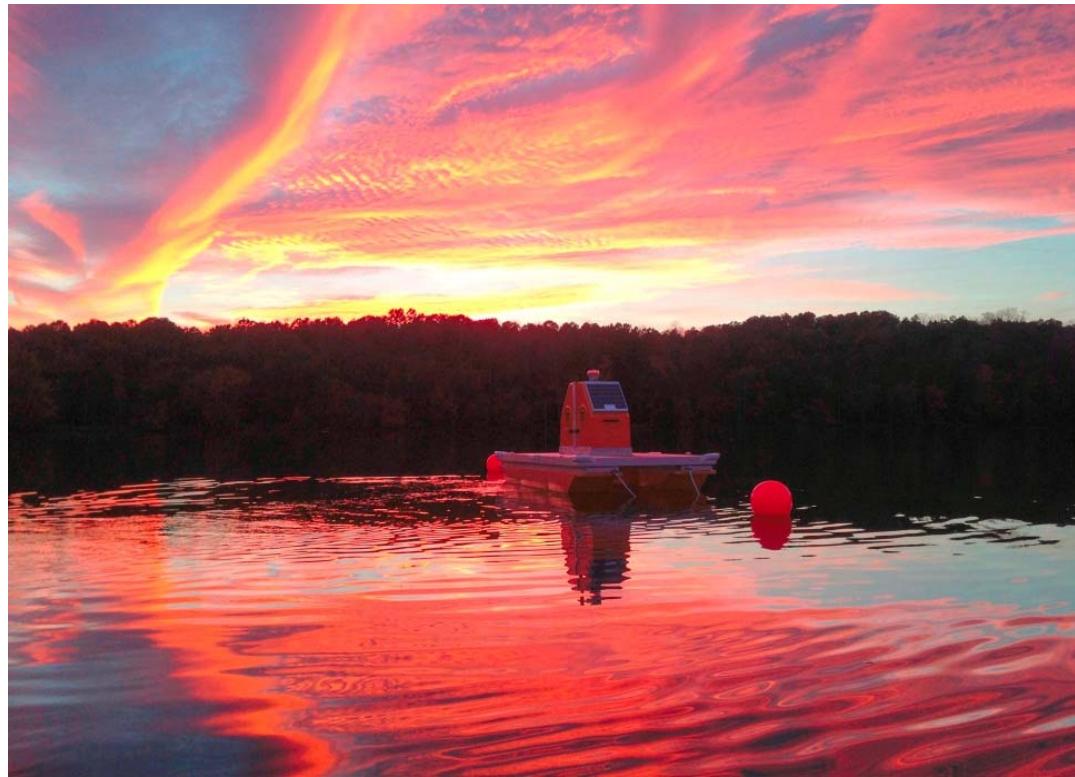
- Flexible and Fast
- All Inclusive
- Software Centric



The HydroSurveyor is a system designed to collect bathymetric, water column velocity profile, and acoustic bottom tracking data as part of a hydrographic survey.



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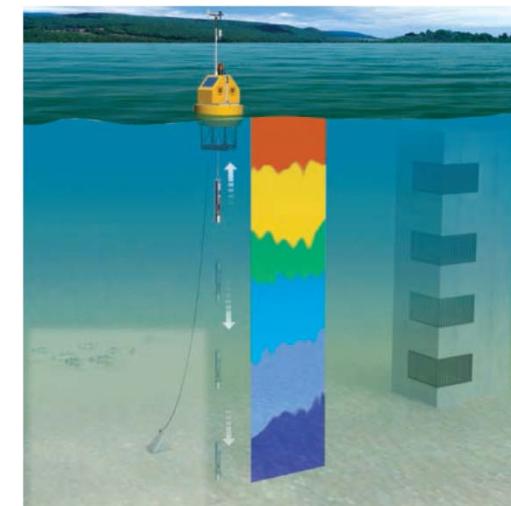
YSI SYSTEMS AND SERVICES: VERTICAL PROFILING SYSTEMS

Monitoring Systems & Services Delivering Better Results



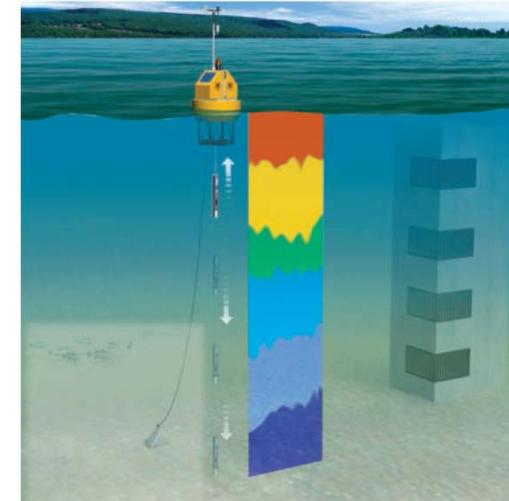
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Advanced Sampling



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Advanced Sampling with EXO



EcoMapper is a cost-effective tool for quickly and easily collecting high-resolution water quality, bathymetry, and sonar data.

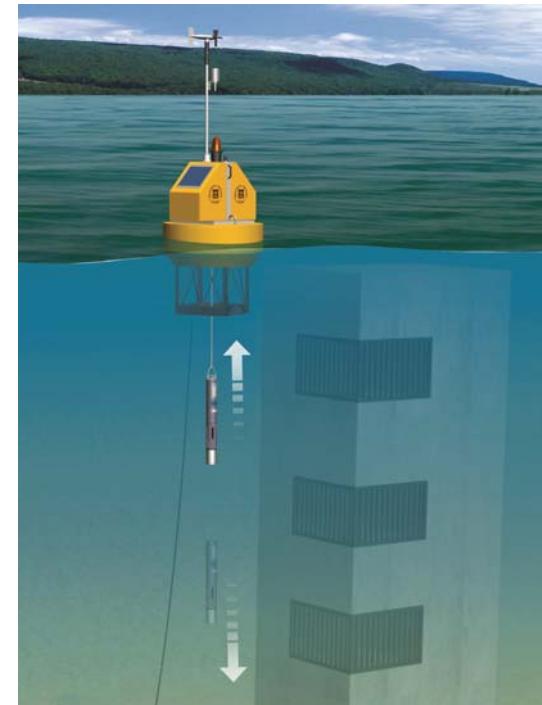


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Why an Automated Profiler?

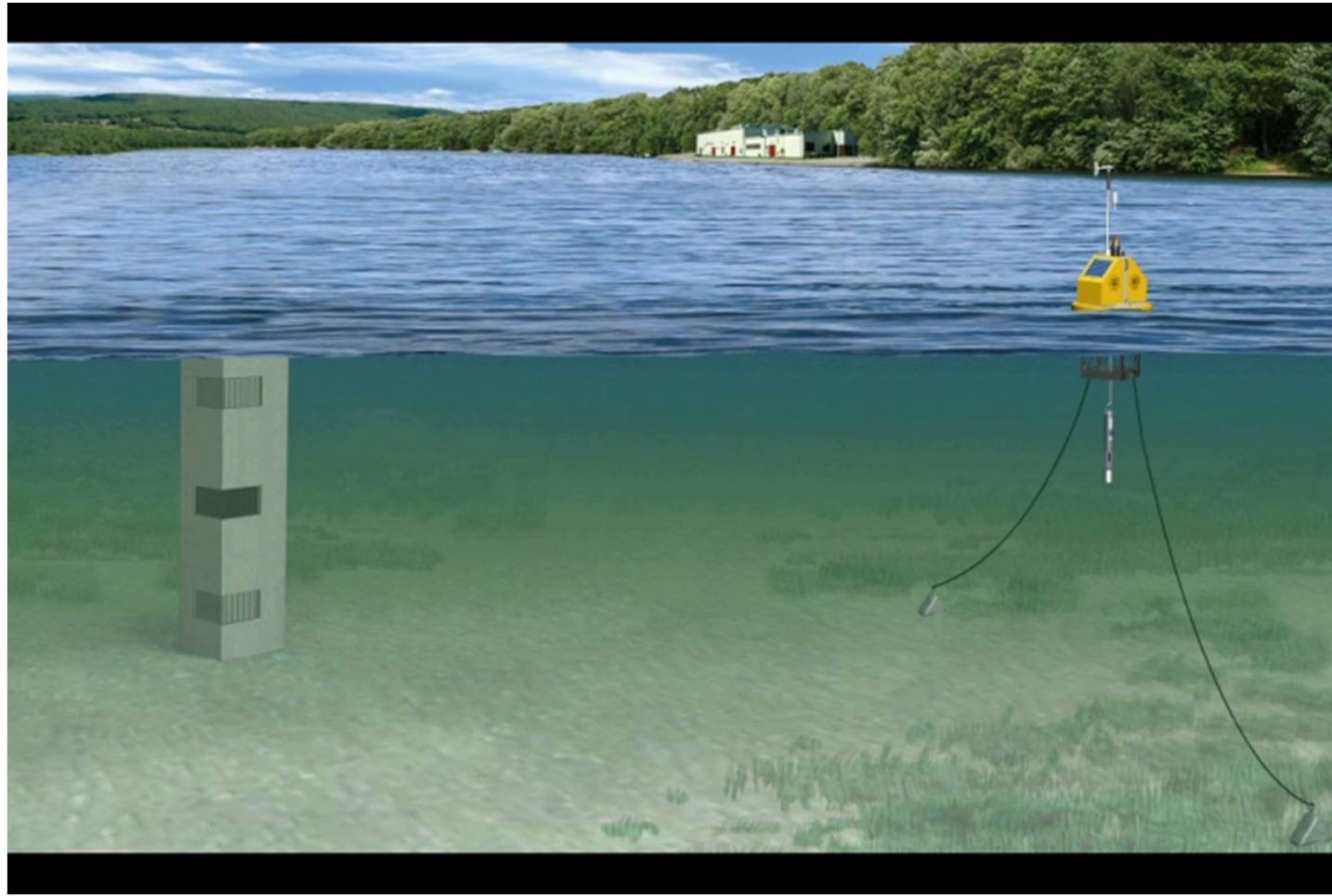
Improved Data Quantity & Quality

- Provides a high resolution data set
 - Resolution of 0.5 meters
 - More data than spot checking or manual profiling
- Takes the “guess work” out of monitoring
 - Accuracy through automation
 - Reliable
 - Works during critical storm events
- Through telemetry, data is delivered to your desktop
 - Eliminate costly and potentially dangerous trips to the field



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Why an Automated Profiler?



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Types of Profilers

Fixed Vertical Profiler

Applications

- Dam
- Pier
- Piling
- Or other stationary location

Configuration

- NEMA 4X Electronics Enclosure
- Solar or A/C power system
- Mechanical, non-corrosive winch
- Automatic vented level compensation



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Fixed Profiler Installation Examples



Types of Profilers

Pontoon Vertical Profiler

- **Applications**
 - Lakes
 - Reservoirs
 - Ponds
 - Estuaries
- **Configuration**
 - Sealed electronics pressure case
 - 6'x12' Pontoon Platform
 - Grated aluminum “clean” decking
 - Solar power system
 - Mechanical, non-corrosive winch
 - Automatic level compensation
 - Depth sounder



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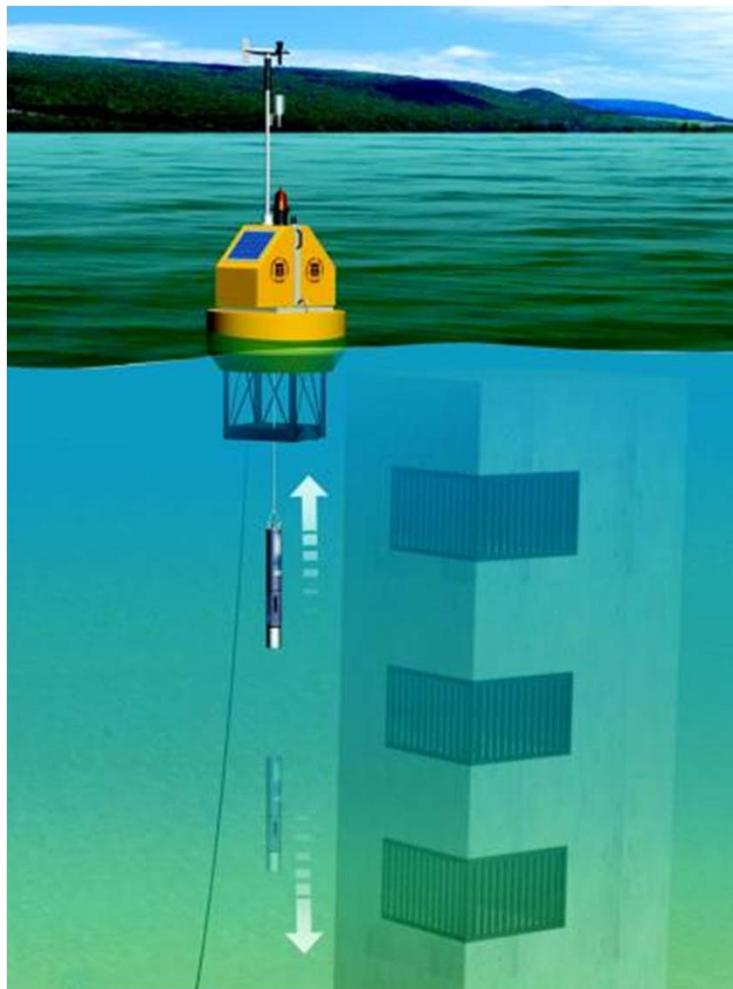
Types of Profilers

Buoy Vertical Profiler

- **Applications**
 - Near Coastal
 - High energy environments
- **Configuration**
 - Sealed electronics pressure case
 - 2 meter oceanographic buoy
 - Closed cell, Ionomer foam
 - Galvanized steel structure
 - Solar power system
 - Mechanical, non-corrosive winch
 - Automatic level compensation
 - Depth sounder



Source Water Monitoring



YSI Integrated System Buoy Fleet

- Payload Requirements
- Wave Conditions
- Current Conditions
- Depth Considerations
- Deployment Logistics



PISCES



EMM 68



EMM 700

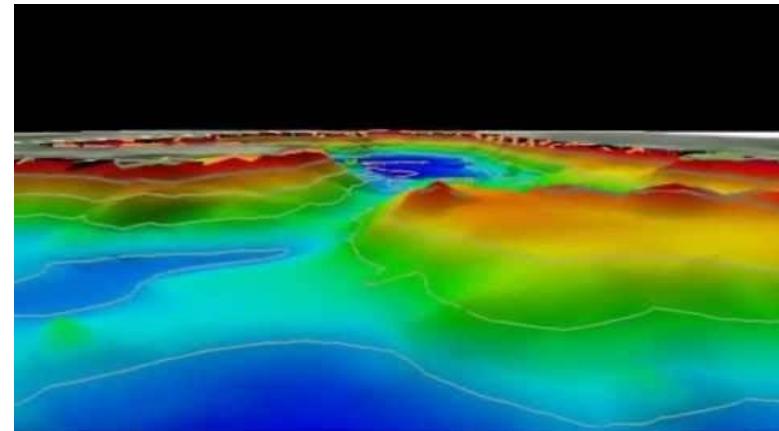


EMM 2.0



EcoMapperAUV

The next generation of autonomous water quality vehicles. The i3XO EcoMapper generates high-resolution maps of water quality, water currents, bathymetry, and sonar imagery.

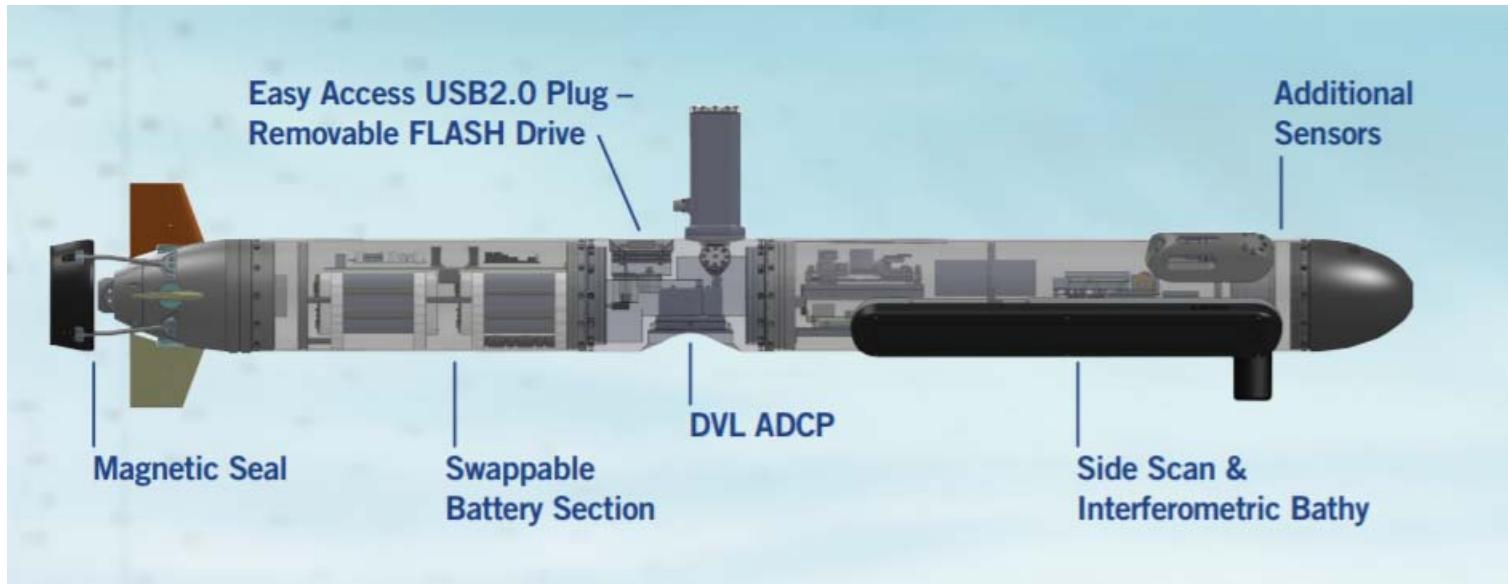


Click to Play Video



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EcoMapperAUV



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HYCAT – Autonomous Surface Vehicle (ASV)



Click to Play

Man Portable Autonomous Surface Vessel (ASV)

A safe efficient means to collect hydrographic data in coastal, remote and limited access areas.

- Bathymetry
- Water quality
- Habitat mapping
- Discharge measurements
- Infrastructure inspection
- Search and rescue operations



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Major Vehicle Functions

Water Quality Measurement

- Up to 18 parameters

Bathymetry

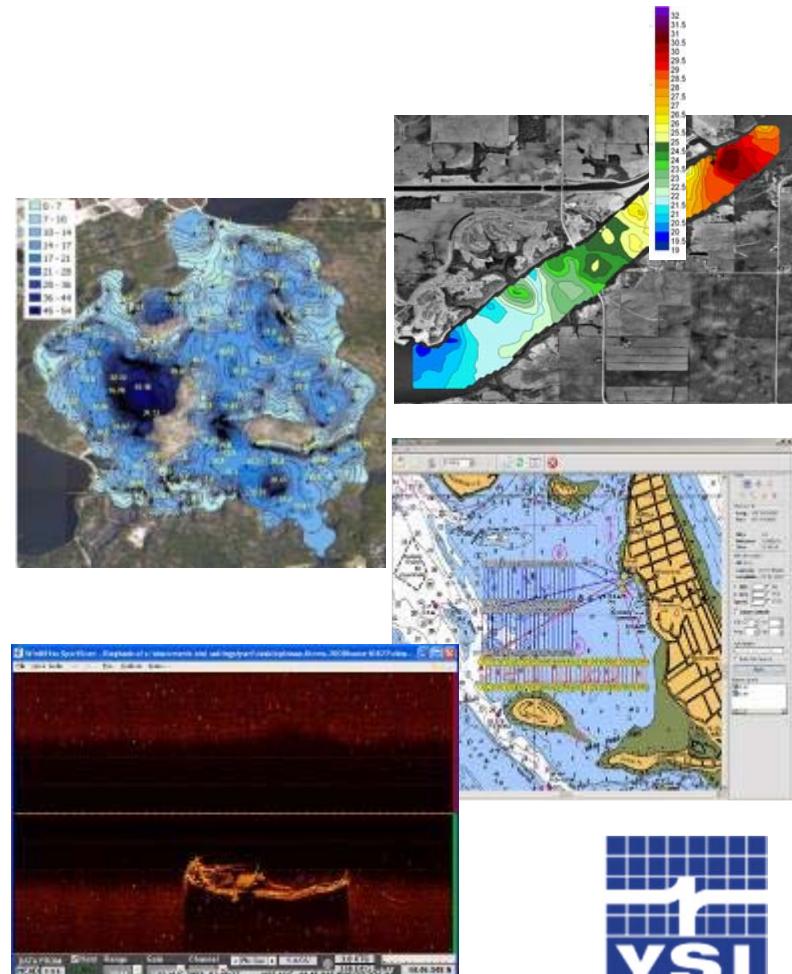
- Submerged terrain
- Compute volume

Navigation

- GPS - when on the surface
- DVL – bottom/water track when below the surface

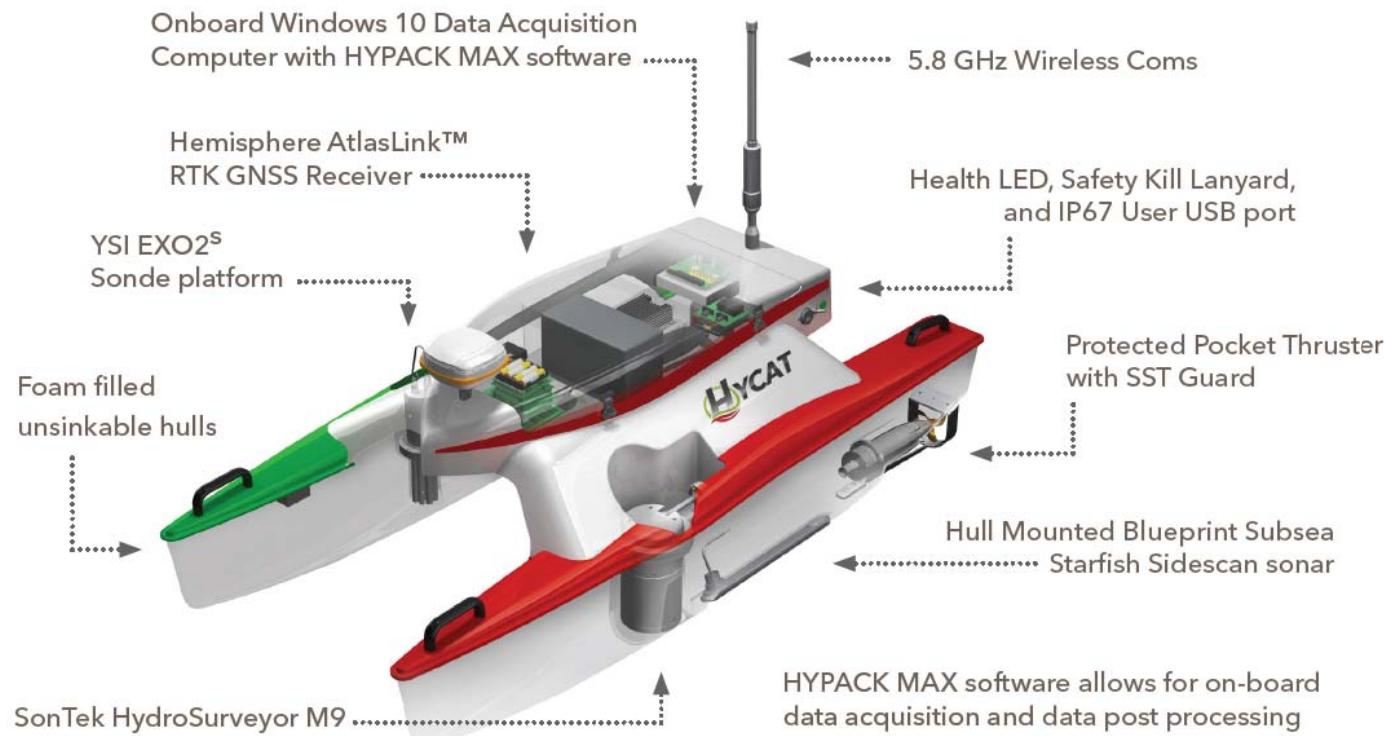
Sonar & Video Imagery

- Side-scan and Multi-beam sonar
- Video and still imaging



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HYCAT – Autonomous Surface Vehicle (ASV)



Xylem Brands



In partnership with



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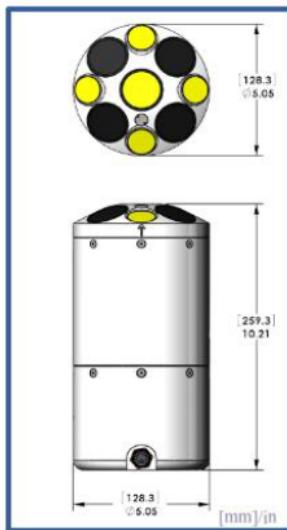


HYCAT – Autonomous Surface Vehicle (ASV)



Onboard Sensors

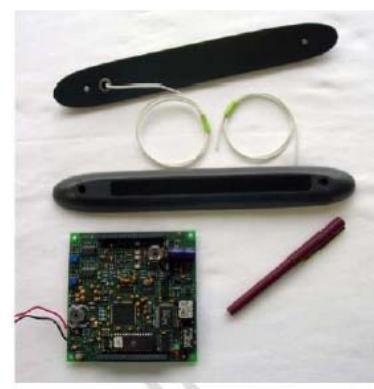
- SonTek M9: RiverSurveyor &/or HydroSurveyor
- YSI EXO 2 (Shorty) multiparameter Sonde
- BluePrint Subsea Starfish 453 side scan sonar
- Hemisphere AtlasLink L1/L2 GNSS receiver
- (Optional) Impact Subsea ISA500 single beam sonar
M9 ADCP



**EXO2 Multiparameter Sonde
(shorty)**



12VDC nom (9-16)
.12 amps
USB output



Shown with standard transducers & board



RiverSurveyor-M9

- Weight in Air: 2.3 kg (5.0 lb)
- Weight in Water: -0.6 kg (-1.3 lb)



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HYCAT – Autonomous Surface Vehicle (ASV)



Autonomy

Control Modes

- Automatic waypoint following
- Automatic planned line following
- Auto heading
- Station Keep
- Thruster
- Stream Gauge

Fail safes

- Anti grounding
- Exit boundary
- GNSS data quality monitoring
- Auto return to recovery position
- Full System health monitoring
 - System current & voltage
 - Battery capacity
 - Coms status
 - Heading sensor data
 - Electronics temperatures
 - Thruster outputs



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HYCAT – Autonomous Surface Vehicle (ASV)



Performance

Specification	Published	Actual
LOA (in)	72	72
Beam (in)	36	36
Draft (in)	7	7
Weight (lb)	120	115.5
Max Speed (kts)	5	8.0
Endurance (hrs)		
@ 2 Knots	6	8.5
@ 3 knots	4	6.0
@ 4 knots	2	2.8



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HYCAT – Autonomous Surface Vehicle (ASV)

Design



Recessed EXO

*Integrated Sensor
Wells*

HYCAT – Autonomous Surface Vehicle (ASV)



Ease of Transportation



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HYCAT – Autonomous Surface Vehicle (ASV)



Launch and Recovery



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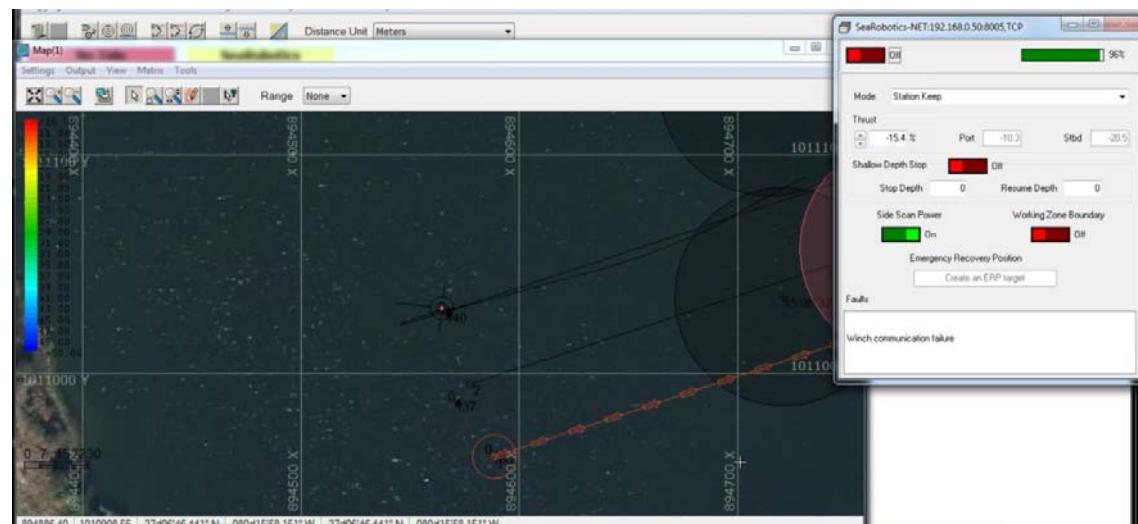
Autonomy and HYPACK Control

Control Modes

- Automatic waypoint following
- Automatic planned line following
- Auto heading
- Station Keep
- Thruster
- Stream Gauge

Fail safes

- Anti grounding
- Exit boundary
- GNSS data quality monitoring
- Auto return to recovery position
- Full System health monitoring
 - System current & voltage
 - Battery capacity
 - Heading sensor data
 - Electronics temperatures
 - Thruster outputs



One user interface provides:

- Increased situational awareness for operators
- Intuitive survey planning, acquisition, and vessel operation
- Realtime survey planning & execution



HYPACK
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ASV Operations: A Case Study

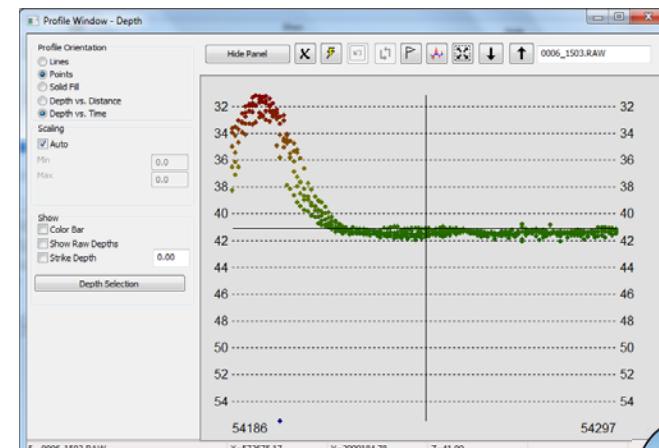
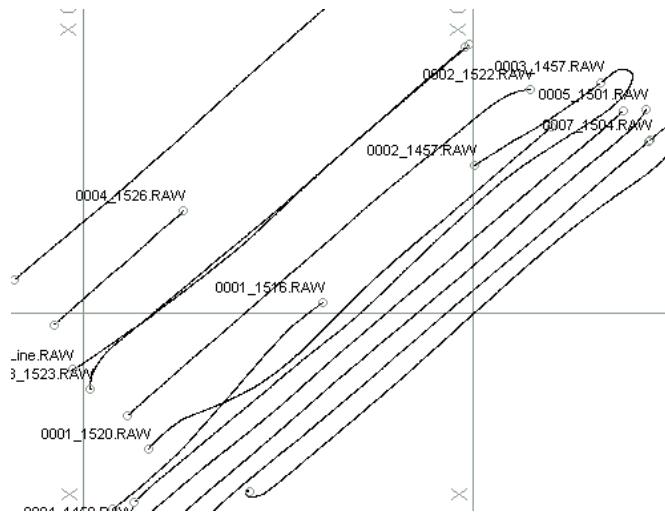
Survey area: 1700 linear meters

Total survey lines: 12

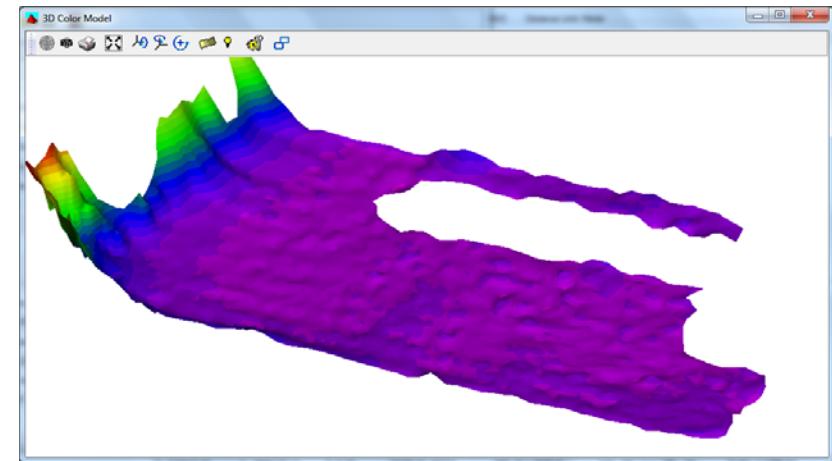
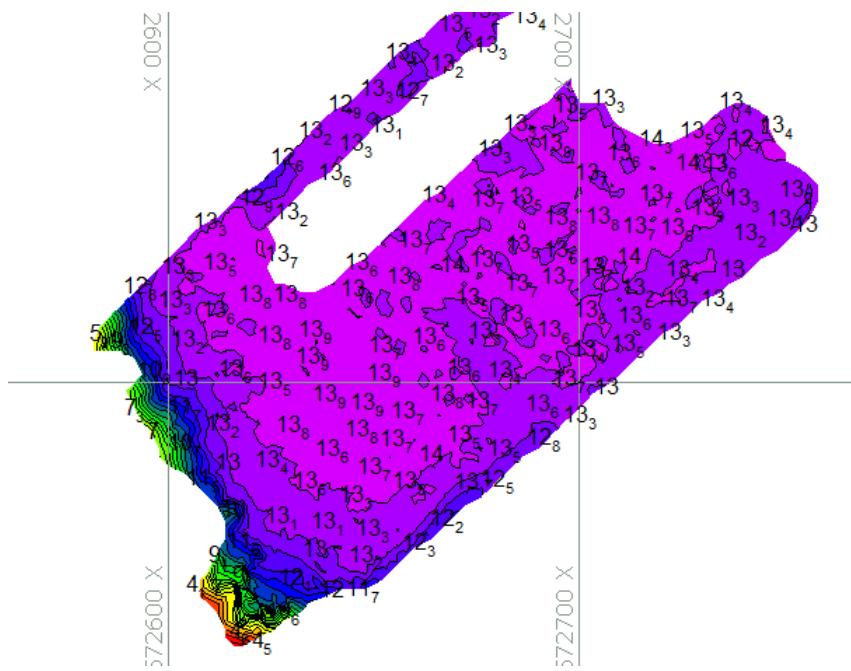
Total survey time: 45 minutes

Line spacing: 5 meters initially, then expanded to 15 meters

Data processing: 10 minutes for bathymetry



Data Output - Contour Map With Sounding Overlay



3D rendering with vertical exaggeration of 3x



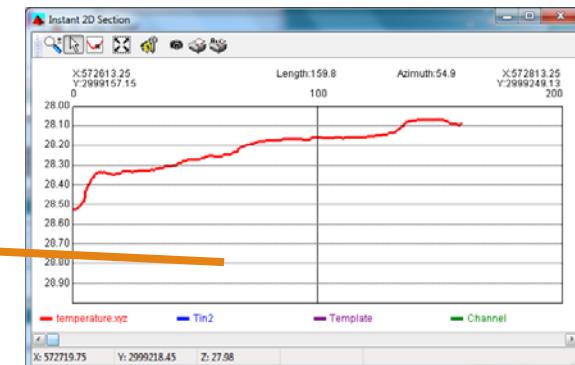
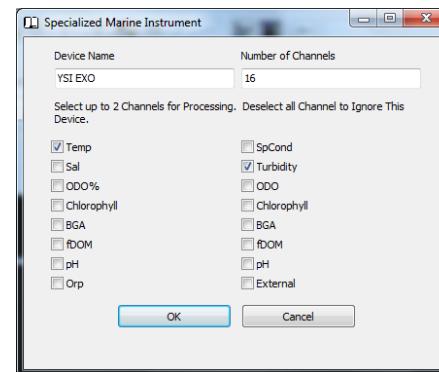
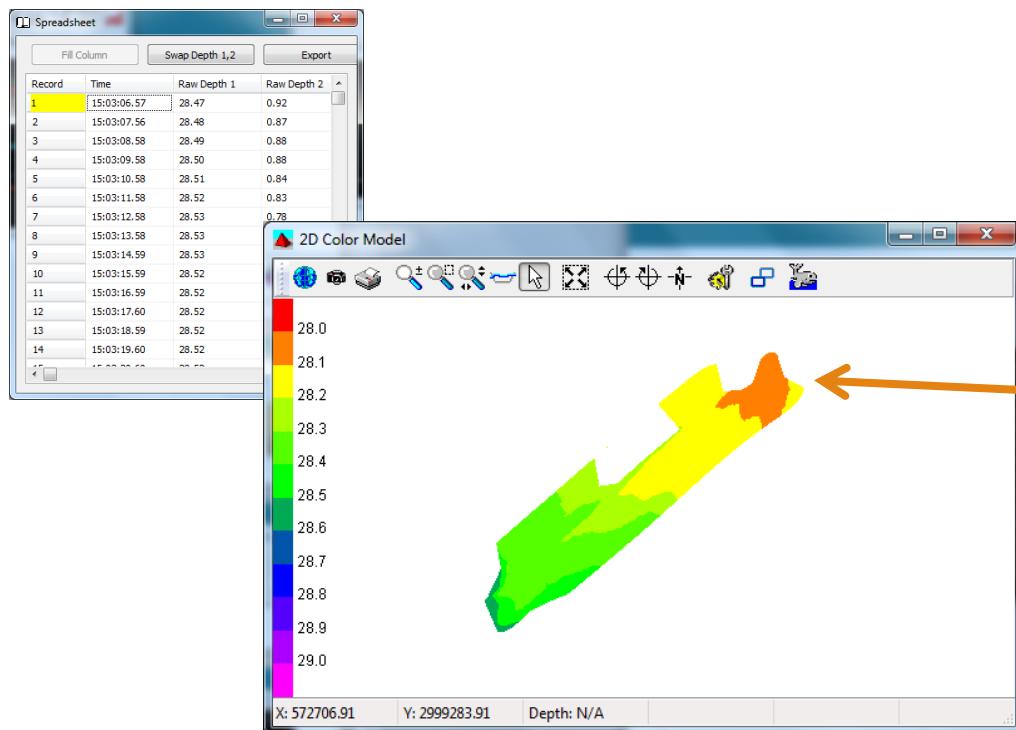
Data Collection Using the EXO Sensor (16 Parameters)



Select any of the 16 parameters for processing.

Creation of time series X, Y, sensor

Simultaneously collected with other sensors



Cross section of temperature



MOTUS Measure Waves from Navigation or Data Buoy



The Aanderaa MOTUS Directional Wave, Current and Water Quality tuned two proven buoy platforms:



Tideland SB138-P MOTUS



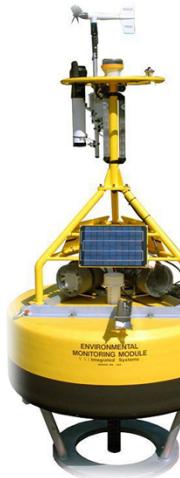
YSI EMM 2.0 MOTUS



AANDERAA
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Ask Aanderaa and YSI about additional buoy platforms

Environmental Monitoring | Offshore Oil & Gas Platforms | Marine Terminals | Harbors and Coastal



Weather Station



- Compact modular design
- Self-contained
- Rugged construction
- Flexible configurations

Horizontal Profiler

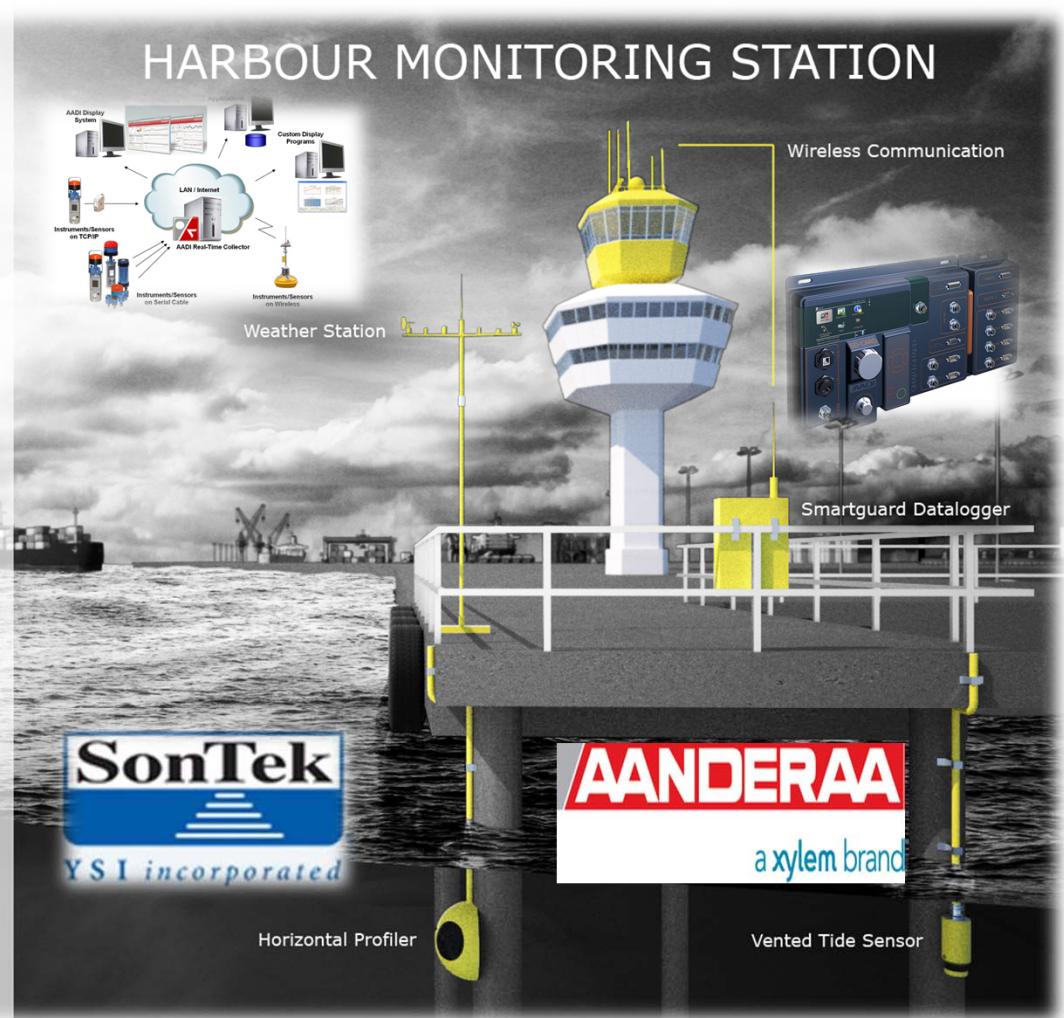


- Compact modular design
- Self-contained
- Rugged construction
- Flexible configurations

Vented Tide Sensor



- Compact modular design
- Self-contained
- Rugged construction
- Flexible configurations



Aids to Navigation – Tideland Solutions



World leader in Aids to Navigation

- Over 1000 port and coastal AtoN systems delivered worldwide
- Over 60 years in business starting as supplier to offshore oil industry
- Members of IALA, IAPH, UKHMA, RTCM, IEC, and NAM

Products include:

- Lighted Beacons and Floating Aids
- Radio Aids and AIS AtoN
- Audible Aids
- Power Sources
- Support Structures
- Remote Monitor & Control

Services

- Installation
- Maintenance
- Consultancy



TIDELAND
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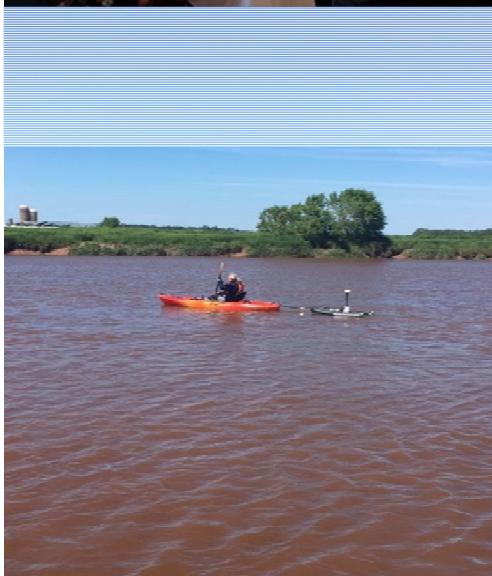
Hoskin Rentals



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Hoskin Scientific Can Provide Rentals for All Environmental Applications

Hoskin Training



Hoskin Service



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About Hoskin



Hoskin Scientific has been supplying testing and monitoring instrumentation to the Canadian market for over 70 years.

Our Environmental department provides everything from systems integration services, water quality, oceanography and aquaculture, to meteorology, hydrology, indoor air quality, soil science, and plant science. We provide solutions for monitoring and sampling biological and chemical parameters in the environment. Hoskin Scientific can equip you to collect the data you need for your project whether through a purchase or rental.

Each office across Canada has sales and service staff readily available to assist you in choosing the right product and having equipment or instrumentation serviced. To find out more about Hoskin Scientific, visit our website today: www.hoskin.ca

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