CSA Ocean Sciences Inc.

Equipment Catalog

2019

Headquartered in Stuart, Florida, CSA Ocean Sciences Inc. maintains regional offices throughout North America, and global offices in South America, the Caribbean, Mediterranean, Middle East, Southeast Asia, and Australia. Company assets are managed at these locations to support international marine science work.

CSA Ocean Sciences Inc. also maintains a network of Oil Spill Water Column Monitoring (WCM) kits containing pre-staged and rapid mobilization ready offshore science assets.

Office Locations and Project Countries

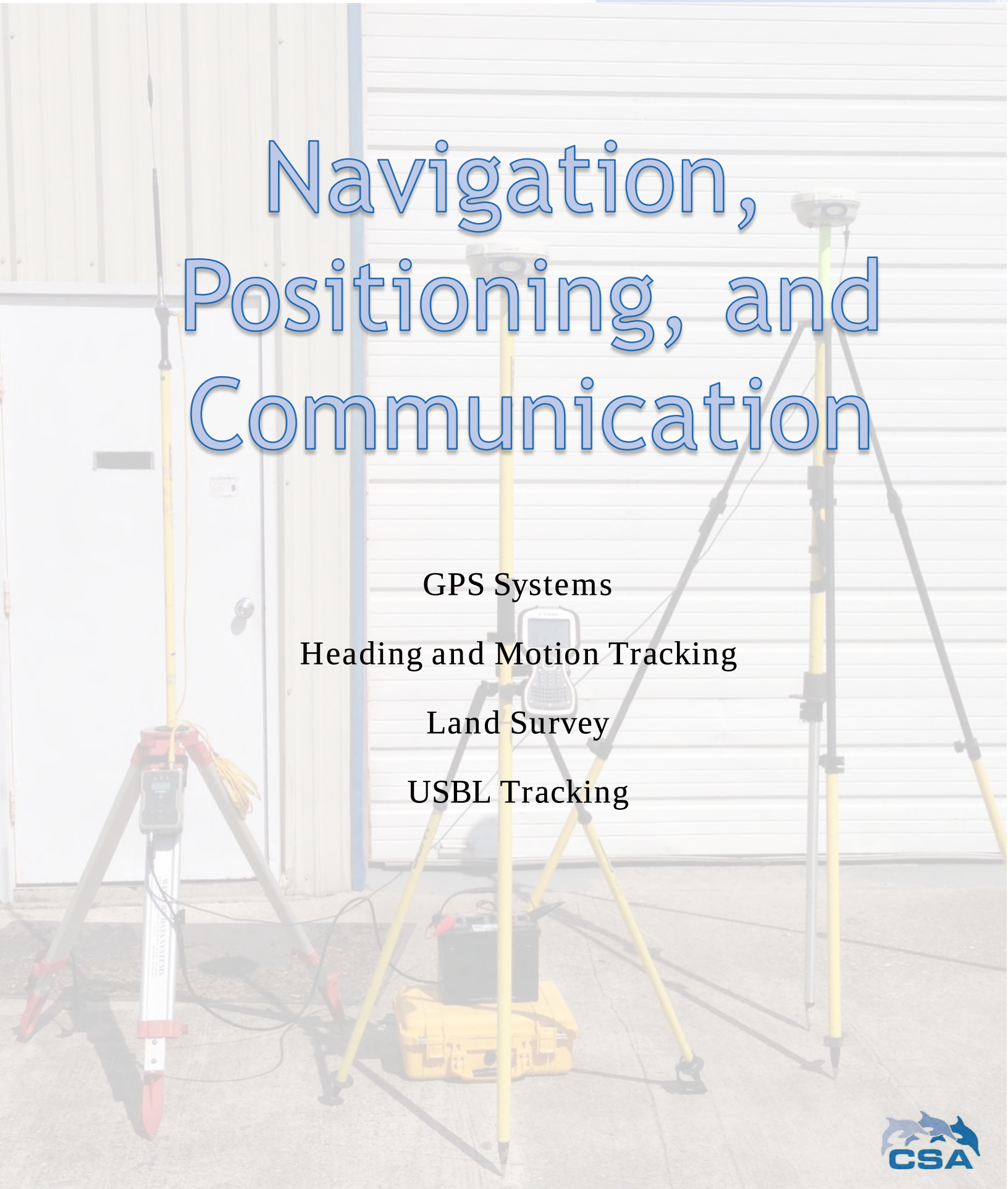
Office Location

Project Country

CSA
Continental Shelf Associates

Geophysical Equipment

Table of Contents



Navigation, Positioning, and Communication

GPS Systems

Heading and Motion Tracking

Land Survey

USBL Tracking

GPS Positioning and Motion Tracking

Trimble SPS 361/461

The Trimble® SPS361 and SPS461 GPS heading and positioning receivers are modular, dual-antenna systems for marine construction and hydrographic survey. Units are paired with GA530 DGPS antennae's.

They provide vessel positioning, vessel heading, and pitch or roll; the SPS461 includes all the features of the SPS361, plus it's available with internal 450 or 900MHz radio and is upgradable to varying levels of positioning (including precision RTK).

Trimble SPS 855/555H

The Trimble® SPS 855 Receiver and 555H Modular Add-on GNSS Receiver combination offer location information for projects requiring extremely precise position and heading information. Units are paired with Zephyr 3 Rugged GNSS antennae's.

As a modular system, the SPS 855 can operate as a stand-alone position only or position and heading system. The unit accepts satellite and radio corrections, and is equipped wither internal radio. Upgrade options include Location and Precise RTK accuracy levels.

Applanix POS MV Elite

Applanix's proven POS MV system offers a turnkey positioning solution providing attitude, heading, heave, position, and velocity information for marine applications.

The system combines GNSS position information with IMU motion and GAMS data to produce six degrees-of-freedom orientation and position output, easily integrated with vessel mounted survey instruments and navigation software.

Land Survey

Trimble R-8 Model 3 RTK GPS

Trimble's R8 integrated GNSS survey system offers a scalable solution for an array of high precision survey operations. As configured by CSA, the R8 Model 3 system consists of a base station, controller, and rover.

Offering RTK accuracy position information, the unit in a base station/rover configuration utilizes the system's internal radio modem to supply hyper-accurate position data during near-shore surveys.

USBL Tracking

USBL – Sonardyne Ranger 2

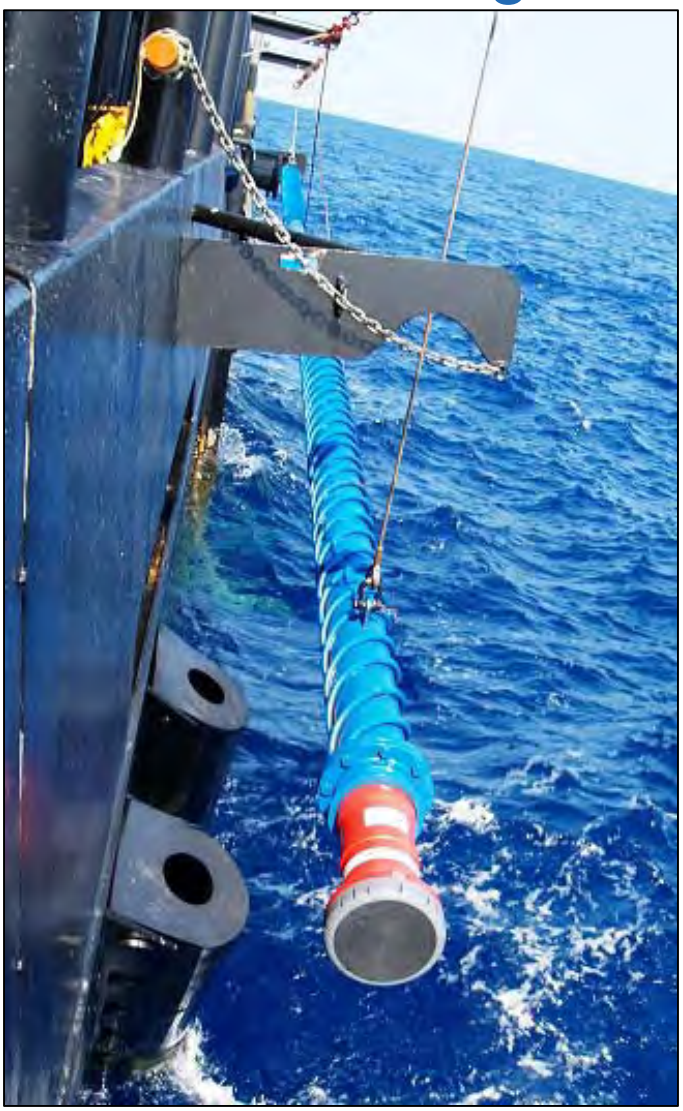
GYROUSBL Transceivers

WSM 6+/WMT 6 Transponders

Survey grade, Ultra-Short Base Line (USBL) acoustic positioning system designed for deepwater, long-range tracking of underwater targets, equipment, and position referencing for dynamically positioned (DP) vessels. Transponder units available in 1,000 and 4,000 meter depth rating.

Ranger 2 USBL integration with HYPACK Survey navigation software offers a seamless interface merging subsea position information with vessel navigation and data logging capabilities.

This system is regularly mobilized on vessels of opportunity with minimal calibration, as shown here with CSA's vortex side-pole.



USBL – Tracklink 1500MA

One of the most prolific shallow water USBL tracking systems on the market, CSA Ocean Sciences utilizes both 500-m and 1,500-m range beacons.

A single Tracklink 1500MA transceiver tracks up to 16 targets at a range of up to 1,000 m, utilizing their Broadband Acoustic Spread Spectrum (BASS) technology.

As the industry's smallest and lightest transceivers available, they offer easier, efficient, reliable, user-friendly operation.

Remote Sensing and Marine Acoustics

Multibeam Echosounders

Side-Scan Sonar

Sub-Bottom Profiling

Marine Magnetics

Software

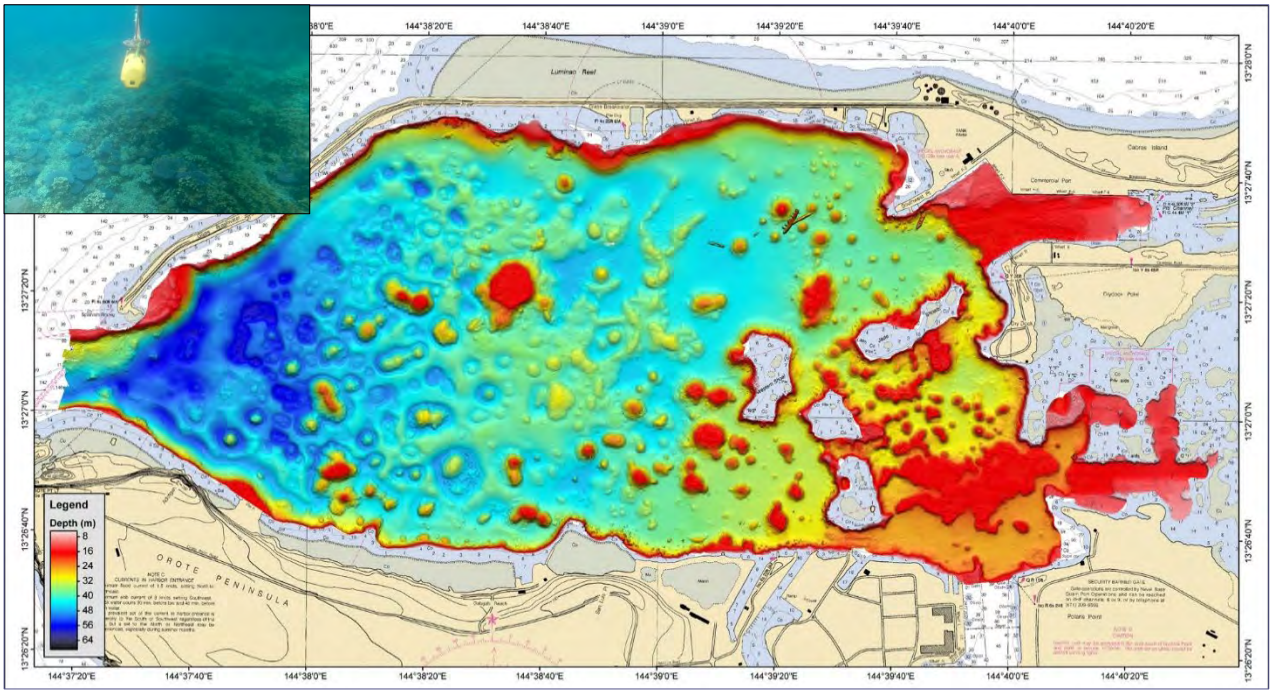
Unmanned Surface Vehicle Platforms

Multibeam Sonar

EdgeTech 6205 Bathymetric Side-Scan Sonar

EdgeTech's 6205 sonar system combines swath bathymetry with dual frequency side-scan sonar to deliver high-quality 3D bathymetry co-located with side-scan and acoustic backscatter data for shallow water acoustic surveys. The echosounder head, which is streamlined for efficient mobilization/demobilization and deployment, contains an integrated Sound Velocity Sensor while interchangeable sonar arrays allow for numerous side-scan sonar and bathymetric frequency configurations:

230/550 SSS ; 230 Bathy
230/550 SSS; 550 Bathy
550/850 SSS; 550 Bathy
550/1600 SSS; 500 Bathy (primary CSA configuration, results shown below)



R2Sonic 2024/2020 Wideband Multibeam Sonar (single or dual-head configurations)

The R2Sonic 2024 multibeam echosounder represents a new class of versatile, multi-use sonar system. Its small, 12.9 kg sensor head can be pole or hull mounted for shallow water applications, and integrated into AUV or ROV platforms for more specialized work.

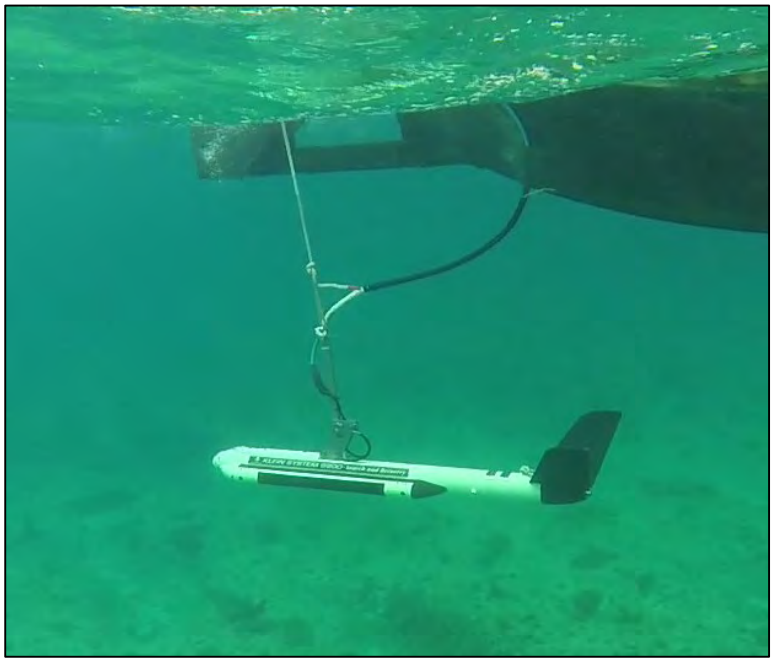
The unit operates at 170-450 kHz, with an optional upgrade to 700 kHz for detailed inspections or surveys. With a maximum vessel speed of 11 kt, the 2024 system also offers an attractive solution for bottom mapping and bathymetric surveys.

For shallow-water applications, the 2020 multibeam is a portable and efficient option. Operating between 200-400 kHz, with a 700 kHz option, the unit provides focused, high-resolution sonar imagery.

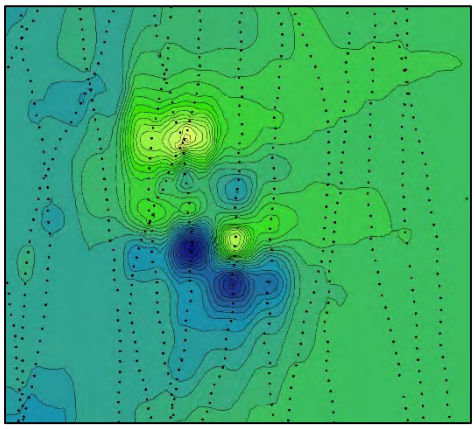
Side-Scan Sonar; Marine Magnetics

Klein 3000 and 3900 – Side-Scan Sonars

The 3000 and 3900 Systems present the latest technology in digital side-scan sonar imaging. The simultaneous, dual-frequency (100/500 kHz; 445/900 kHz) operation is based on new transducer designs as well as the high-resolution circuitry recently developed for the Klein multi-beam focused sonar. Depth rated to 1,500 m, the unit can be towed in tandem with a magnetometer or equipped with a USBL beacon for precision tracking. CSA also offers options for tow mounts, depressor wings, cable counters, and deck winches.



Geometrics G-882 Cesium Vapor Marine Magnetometer

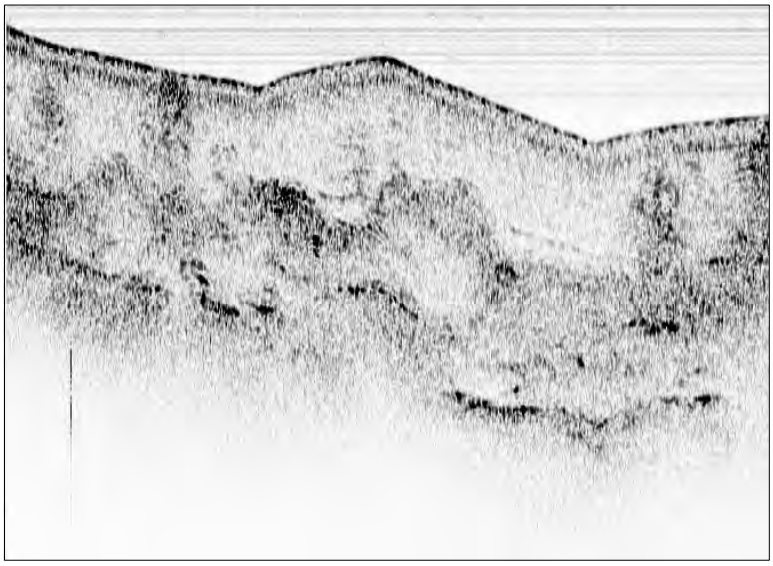


Easily deployed from small vessels or in tandem with other towed arrays, this instrument assists with the detection and location of ferromagnetic objects, such as pipelines, cables, unexploded ordnance (UXO), or archaeological materials. Operating at depths up to 2,700 m, CSA's units are equipped with an altimeter and backed by our Geospatial Services and GIS expertise for data processing and visualization.

Sub-Bottom Profiling

Klein 3310 – Sub Bottom Profiler

Using Klein 3000 sonar hardware, the 3310 K-Chirp Sub-Bottom Profiler provides the user with a versatile, interoperable solution to combine both side-scan sonar with sub-bottom profiling operations. The 3310 CHIRP transducer integrates seamlessly with the 3000 towfish frame and electronics bottle, effectively merging the profilers 2-8 kHz profiling sonar with the 100/500 kHz dual frequency side-scan system. The combined unit has a maximum operating depth of 600 m; penetration depth is between 5-50 m and resolution up to 12.5 cm.



EdgeTech 3100 CHIRP Sub-Bottom Profiler

The 3100 sub-bottom profiler is a portable, 300 m depth-rated profiler. CSA offers the SB-216S configuration, which operates at a frequency range of 2-16 kHz. Bottom penetration ranges between 6-80 m with up to 6 cm vertical resolution.

Both pole and tow-line mounting options are available to maximize efficiency and ease of use during shallow water surveys. The unit also has a low power requirement which, combined with is light weight, makes it ideal for deployment from smaller platforms.

Additional Echosounders

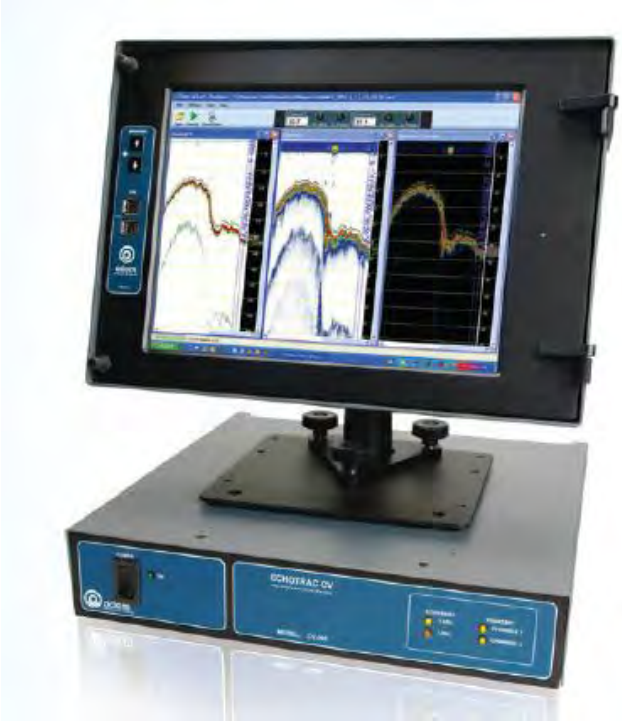
38 and 200 kHz transducers on side-pole mount

Simrad EK60 Split Beam Echosounder

Considered one of the most effective scientific echosounders for marine applications, the EK60 offers an ideal system for water column surveys and biological studies. The system operates seven echo sounder frequencies simultaneously ranging from 18-710 kHz in a portable platform well suited for mobilization on vessels of opportunity.

Kongsberg Mesotech Ltd. M3 Sonar 500 kHz

A compact, portable, and versatile multi-beam sonar, the M3 transducer operates at 500 kHz with a maximum range of 150 m. The unit is ideal for shallow water bathymetric surveys as well as integration on ROV platforms.



Teledyne Odom CV300

As a Hydrographic Single Beam Echosounder, the Odom CV300 provides users with multiple transducer options and user-selected high (100 kHz to 1 MHz) and low (3.5 to 50 kHz) frequencies. The unit can operate as a stand-alone system for bottom mapping, or as an integrated component for benthic survey where precise water depths are required for sampling and equipment deployment.

Data Acquisition and Processing Software

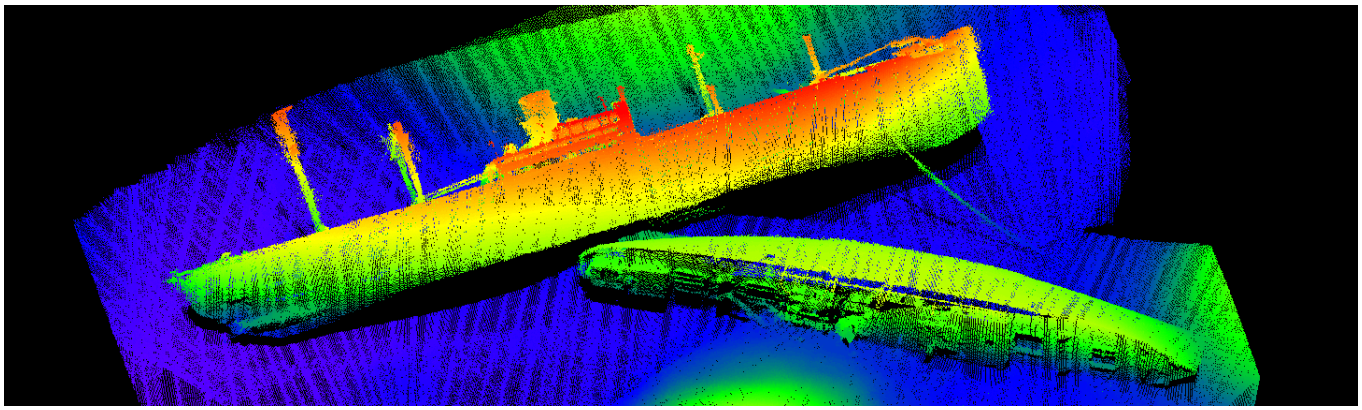
HYPACK Survey and HYSWEEP

As an integrated hydrographic, navigation, and marine science software solution, CSA Ocean Sciences Inc. utilizes HYPACK software extensively during field operations. The software provides a comprehensive program for planning marine surveys and sampling operations as well as real-time project navigation, data acquisition, and post-project data processing capabilities. The software interfaces with most scientific instrumentation used by CSA Ocean Sciences, including sonar echosounders, USBL systems, navigation equipment, and marine magnetometers.

QPS-QINSy, Qimera, and Fledermaus

An industry leading program for hydrographic surveys, seafloor mapping, and data visualization, the QPS software suite features some of the most powerful tools available for handling sonar mapping operations and 3D seafloor data presentation.

CSA Ocean Sciences Inc. uses QPS programs for sonar project navigation, data acquisition, and post processing. Primarily used to administer large sonar datasets, QPS software generates detailed 3-dimensional maps that greatly enhance the interpretation and reporting of bathymetric features and seafloor objects, such as shipwrecks, geohazards, and obstructions.



SonarWiz 7

Purpose built for handling sonar data acquisition, processing, and visualization, Sonar Wiz offers a streamlined interface for acoustic mapping work. In addition to its tools for handling acoustic data (single beam, side scan, sub-bottom, bathy, etc.) the program also offers tools for processing and visualizing marine magnetic survey data. As such, it offers a streamlined interface for common marine remote sensing survey operations, including bottom mapping, habitat characterization, and target investigations.

Unmanned Surface Vehicles (USVs)

In partnership with SeaRobotics, CSA Ocean Sciences Inc. has integrated two USV platforms into its inventory of marine survey equipment. These systems are designed for shallow or confined water missions where multi-instrument arrays are needed for detailed survey operations. Each system can be deployed as a stand alone system or in tandem with other survey platforms to function as a force multiplier. The systems include a custom built USV-2600 and the SeaRobotics/Xylem HYCAT.

Instrument Payloads:

- DGPS/RTK
- Hemisphere AtlasLink RTK GNSS
- Side-Scan Sonar
- Sub-bottom profiler
- Bathymetry
- Multi-beam sonar
- Imaging Sonar
- Sontek M9 RiverSurveyor ADCP/Multi-beam Echosounder
- EdgeTech 2205 Bathymeteric Side Scan Sonar
- Magnetometer
- YSI Multi-Instrument Sonde
- Forward-Looking Video/Still Camera
- Modular Smart Battery
- Fluxgate Compass

Missions:

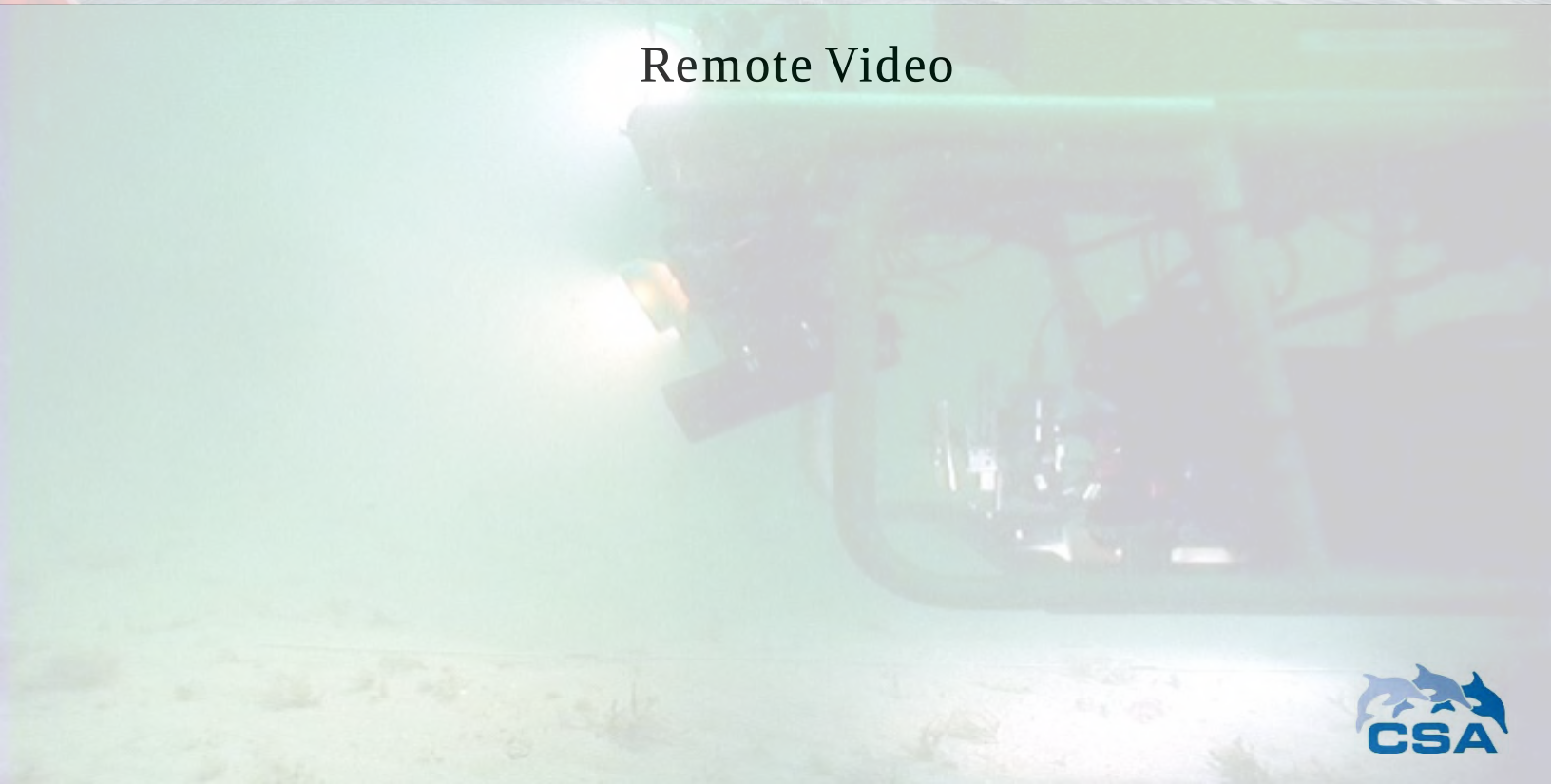
- Bottom/Habitat Mapping
- Surf-Zone Mapping
- Confined Water Work
- Cultural Resource Documentation
- Geo-Hazards
- UXO/MEC
- Canals, Lakes, and Rivers
- River Discharge
- Water Quality

Remote Imaging

ROV Systems and Operations

Remote Still Photography

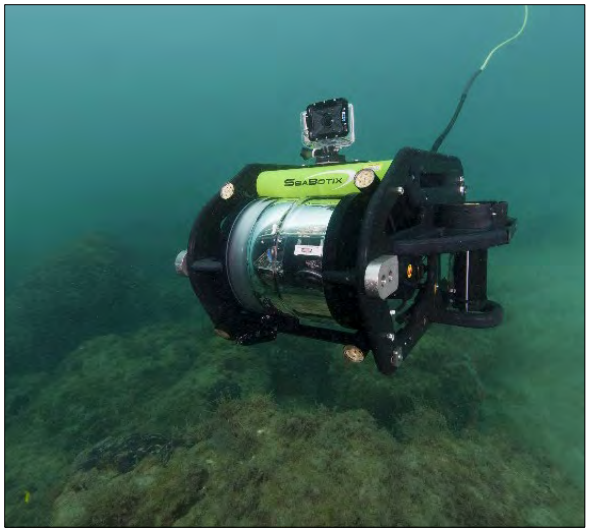
Remote Video



Remotely Operated Vehicles

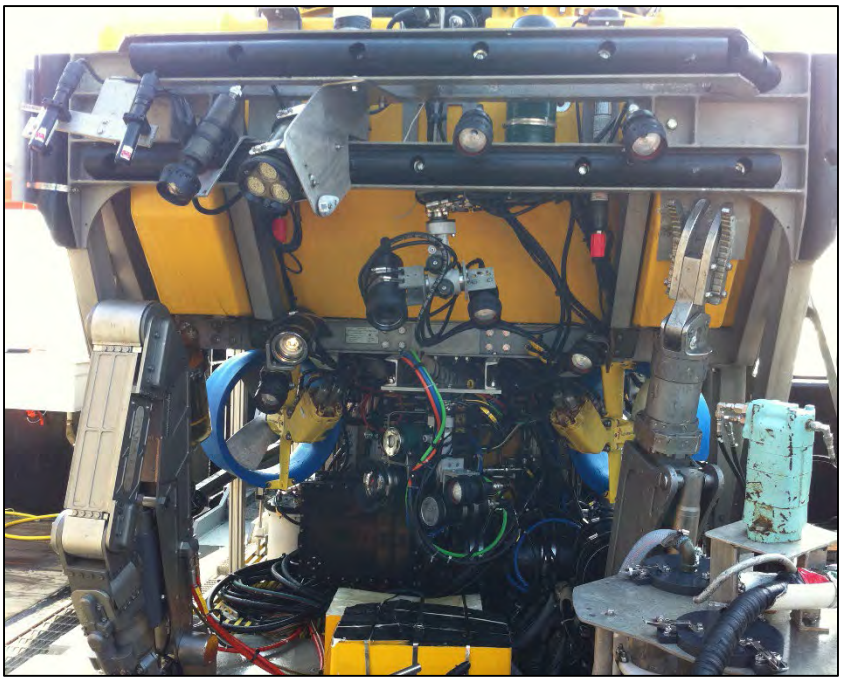
Seabotix LBV300-5 Inspection Class ROV

The ultimate in versatility for a wide range of applications in a very portable package, the Seabotix LBV 300-5 offers a robust solution for inspection-class missions. The unit's five brushless DC thrusters and optional Crawler Skid provide increased stability and exceptional control to a working depth of 300 m. Equipped with a Seabotix grabber, which has a multitude of attachments for varying applications, the unit is also capable of light work involving cutting, grasping, and small object manipulation and retrieval. A 38 cm color LCD monitor is mounted directly to the case lid. A 700 Lumen LED light illuminates the 270° field of view provided by the high resolution color camera mounted on a 180° rotating chassis. Camera and lighting upgrade options are available, as are numerous accessory options such as USBL tracking, imaging sonars, and sonic testing equipment.



Turnkey Working-Class ROV Integrations

CSA Ocean Sciences Inc. has decades of experience working with deepsea ROV systems. We have integrated numerous configurations of our instruments and sampling equipment as payloads on all types and sizes of ROVs. From small inspection class systems to deep sea benthic systems, we have deployed cameras, water quality systems, sample capture devices, and motion and position tracking beacons on third party ROVs. We maintain a broad network of partnerships with ROV operators worldwide and can coordinate remote imaging missions requiring ROV platforms for any scientific operation.



Remote Photo and Video

CSA Towed Imaging Sleds

CSA's deep ocean camera solutions are tailored to suite the multiple needs and diverse applications requested by our clients. Capable of working to depths up to 6,000 meters, our principal imaging system, the [insert name here], offers a versatile set of tools configured to optimize deep sea imaging results.

Fully modular and customizable, we provide both video and still photography at resolutions up to 4K and 16.6 MP, respectively. Our imaging system includes numerous options for lighting and accessories to suite client needs. Furthermore, our individual components can operate as a standalone unit (as shown) or integrate within other instrument platforms.

Designed, engineered, and built using the knowledge gained by decades of operational experience and imaging expertise, CSA's [insert name here] combines the industry's best hardware with the company's proven track record to deliver the highest quality imaging products to our clients.

Underwater Video and Still Cameras

Optical Component Specifications

- SubC Imaging 1Cam Mk 6
- Captures Video and Still Photographs
- Depth Rating: 6,000 M
- Resolution:
  - 4K/UHD over Fiber Optics
  - 4K Internal memory
  - HD over Coax
  - SD real-time composite
- Sled Configuration: Tow or Drop
- Tether Options: Coaxial or Fiber Optic
- Aperture: F2.0 – F3.8
- Shutter Speed: 1/8 – 1/10,000
- Max Still Rate: 1/sec
- Still Resolution: 16.6 MP
- Focal Length: 26.8 – 536 at 16:9

Lighting

- Still Mode:
  - SubC Imaging Aquorea LED
  - Output: 32,000 lumen/16,000 lumen (flood)
  - Temp: 5000 K
  - 80 Degree Beam
  - TTL Synchronization
  - Max Shutter Speed: 1/8000
- Video Mode:
  - Dual DeepSea SeaLite Sphere 5150 Lamps
  - Output: 9,000 lumens
  - Temp: 5000-6500 K
  - 85 Degree Beam
  - 85 CRI White LED

Power Supply

- SWE Seasafe II Smart Module Batteries
  - 30 V
  - 40 A, 28 Ah

Additional Components

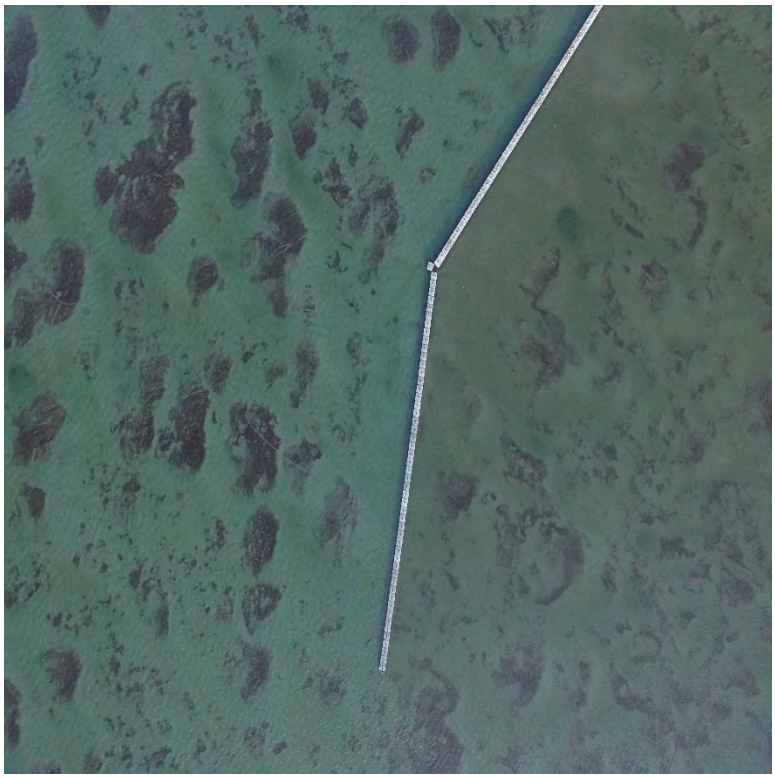
- Altimeter
- Pressure Sensor/Depth
- Motion Tracking
- Laser Ranging
- USBL Connectivity
- Pan and Tilt
- Topside MUX Interface Unit
- Dual Video Recorders

Unmanned Aerial Systems (UAS)

DJI Mavic PRO

Weighing in at 1.62 lbs, the DJI Mavic PRO offers remarkable portability while maintaining high-resolution imaging capabilities. The vehicle's integrated camera system collects 4K video and still imagery at 12 MP. With a 27 minute flight time, service ceiling at 16,400 feet, and 40 MPH travel speed, the Mavic Pro can navigate in a variety of environments and conditions while capturing detailed imagery.

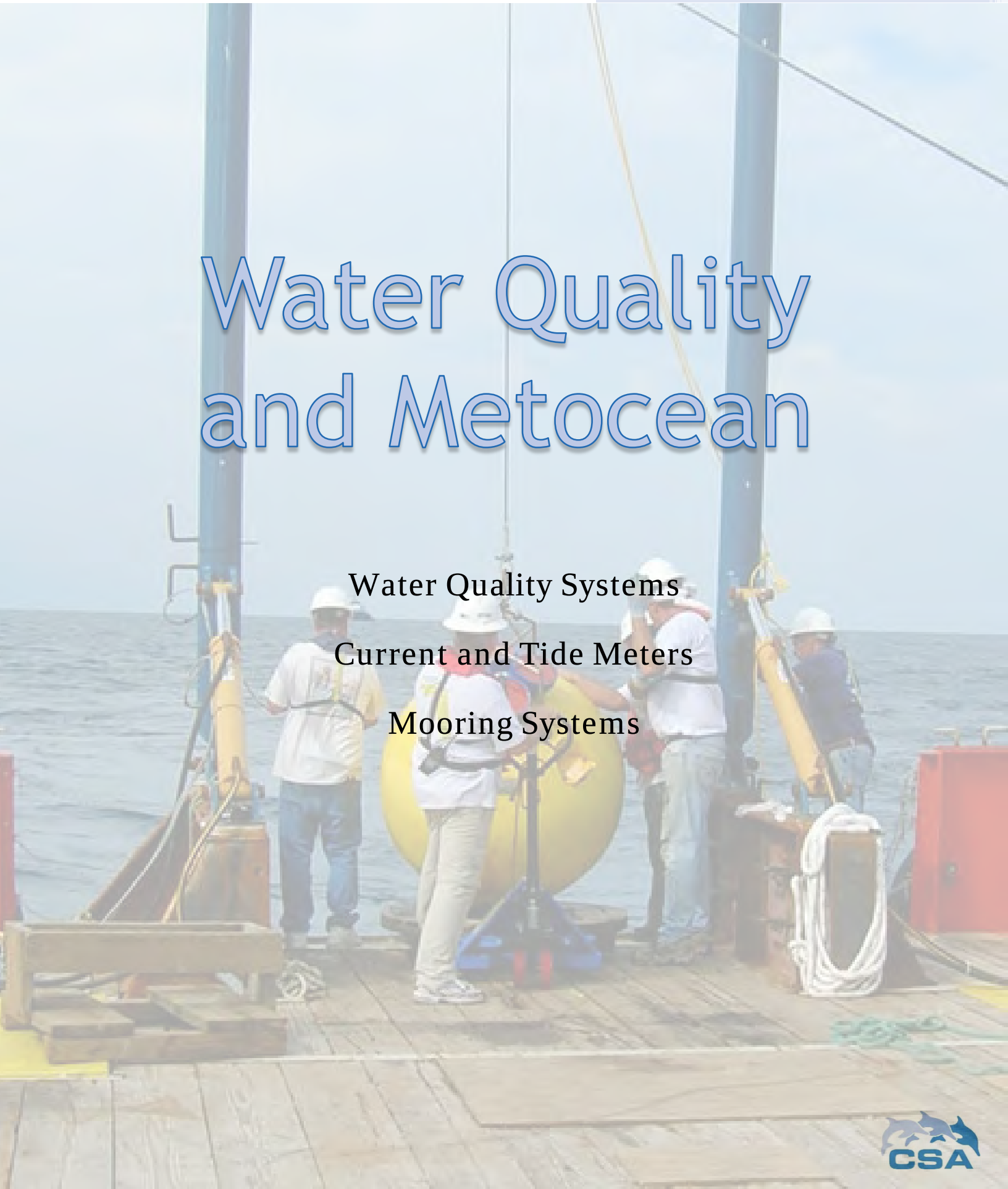
This highly portable unit is easy to deploy and will operate up to 2.5 miles from the pilot. The system is also supported by a desktop application and WiFi connectivity. When connected, the vehicle can stream a live view of its camera feed at up to 720p and 30 fps.



DJI Inspire 1

DJI's Inspire 1 UAS platform incorporates the latest features in aircraft design, propulsion, and hardware into an operational and field-ready aerial survey system. An integrated X3 FC350 camera collects 4K video and still imagery at 12.7 MP. With an 18 minute flight time, and 49 MPH travel speed, the Inspire 1 can maintain navigation precision in wind speeds up to 22 mph.

This collapsible, portable unit is easy to deploy and ready for survey missions to capture still or video imagery. Aerial survey data can be processed to render an array of 2D and 3D products scaled and georeferenced for high levels of geospatial accuracy. With corresponding software, imagery produced with this system can also be used for photogrammetric modeling.



Water Quality and Metocean

Water Quality Systems

Current and Tide Meters

Mooring Systems

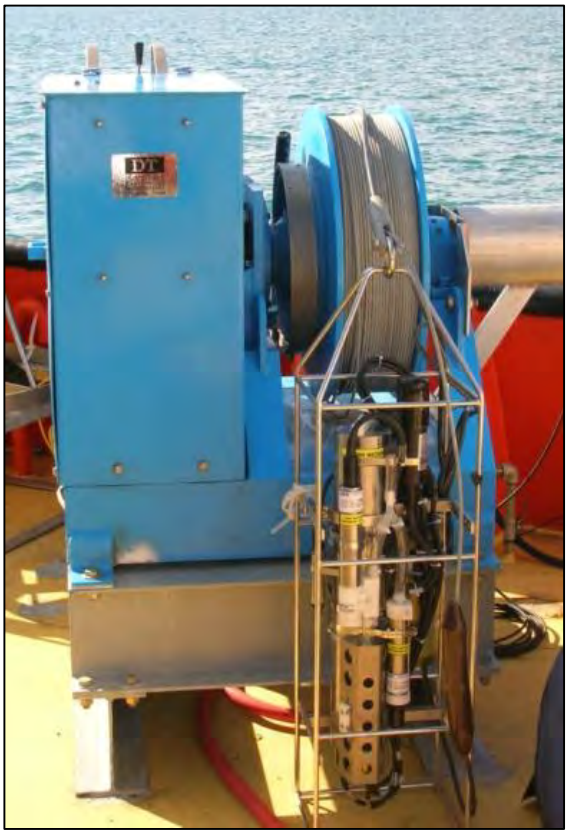
CTDs and Water Quality Sensors

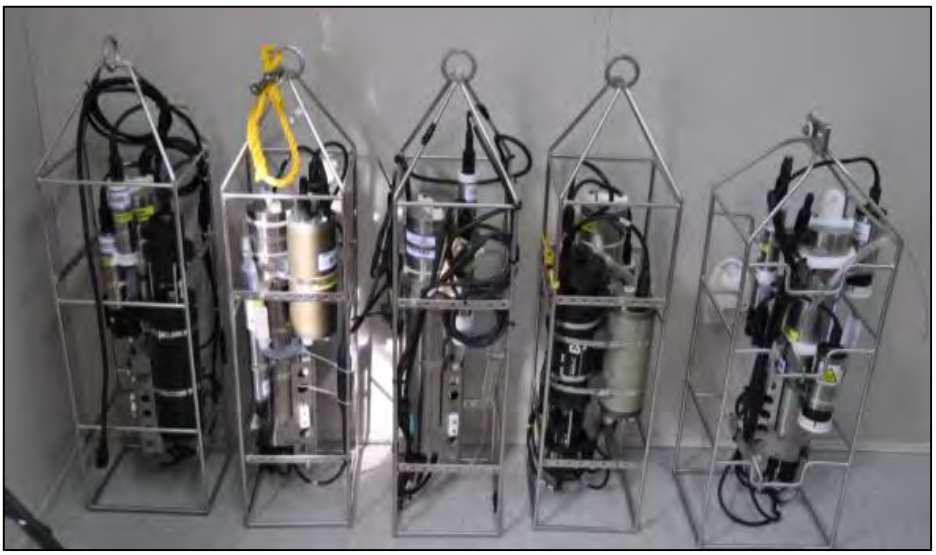
CTD: SBE 19+ V2 and SBE 49 FastCAT

The Sea Bird Scientific family of CTDs measure conductivity, temperature, and pressure (depth) with a high degree of accuracy, resolution, reliability, and ease-of-use for a wide range of research, monitoring, and engineering applications.

The pump-controlled, TC-ducted flow configuration minimizes salinity spiking caused by ship heave and allows for slow descent rates without slowing sensor responses, improving dynamic accuracy and resolving small-scale structure in the water column.

Using a modular cage mount, an array of additional sensor options can be integrated, and the system itself is easily mountable on larger frames for deployment with ROVs, carousels, and other sampling devices.





Water Quality Sensor Options

- Conductivity, Temperature, Depth (Pressure)
- Turbidity sensors
- pH sensors
- Fluorometers
- Velocimeters
- Chlorophyll sensors
- PAR sensors (light)
- Dissolved oxygen sensors
- Transmissometers
- Altimeters

Acoustic Doppler Current Profilers (ADCPs)

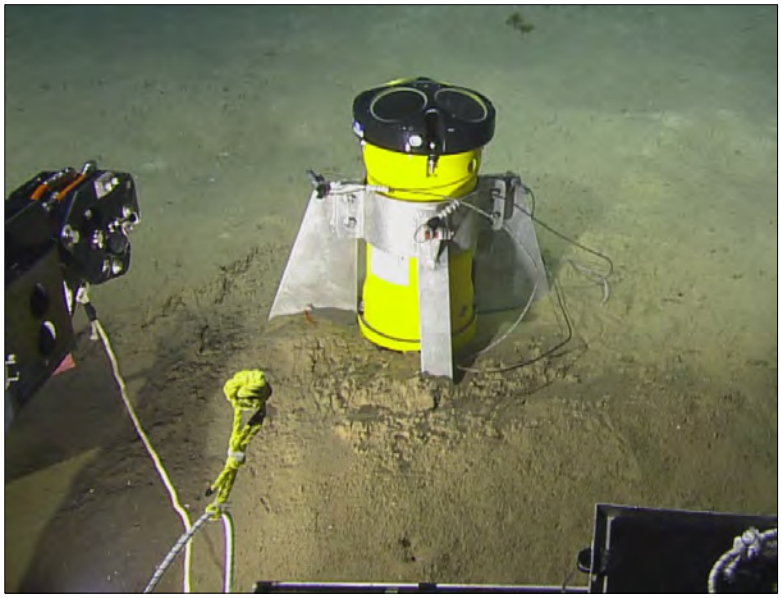
Whether working in shallow water or the deep ocean, we provide ADCP solutions for both stand-alone and integrated configurations.

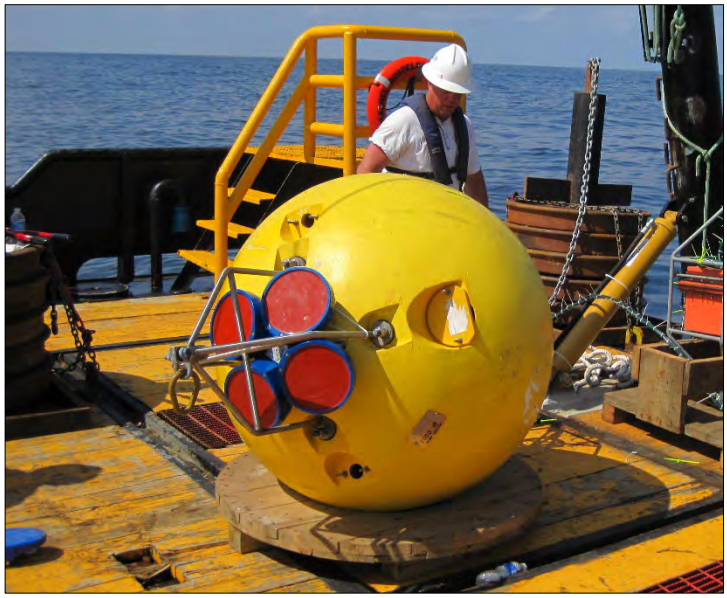
Available Models Include:

- *55 kHz Signature 55*
- *75 kHz Long Ranger*
- *300 kHz Sentinel*
- *400 kHz AWAC*
- *600 kHz Sentinel*
- *600 kHz Monitor*
- *1200 kHz Monitor*
- *1 MHz Aquadopp Z-Cell*

ADCP Moorings and Trawl Mounts

CSA Ocean Sciences specializes in custom ADCP mooring configurations for any deployment need. Shallow water, deep water, integrated arrays; we can provide the appropriate sensor and develop the mooring hardware to suite. Our inventory of acoustic releases offer substantial flexibility for deploying and recovering systems, especially for long-duration deployments.



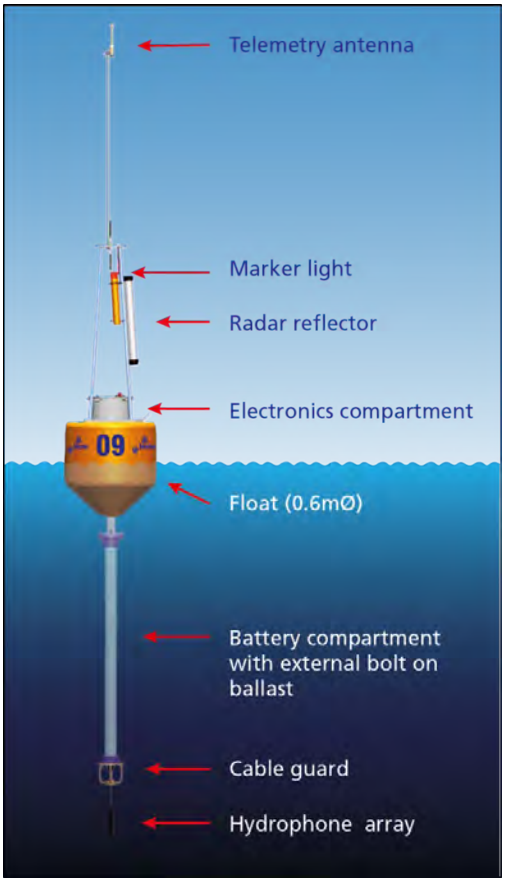


Custom Buoy Systems

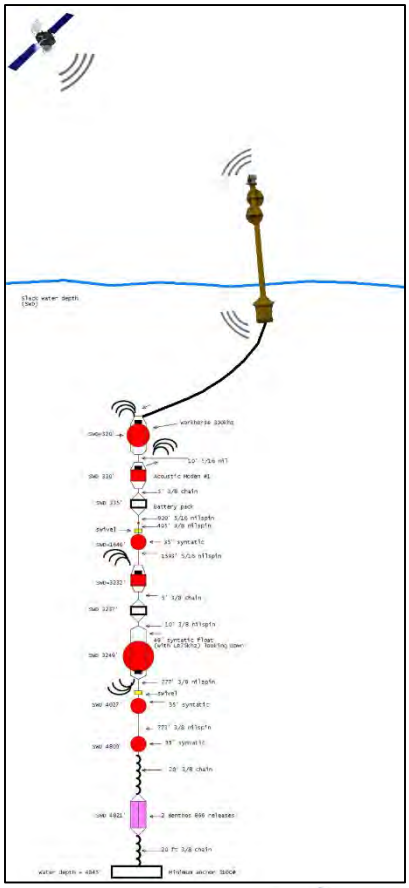
CSA offers an array of customizable buoy options for oceanographic research. These configurable systems work in shallow water, deep water, high current, and for any duration required. Design buoy arrays can incorporate a range of sensor payloads and other data collection tools. CSA provides expertise in the design, deployment, and recovery of marine buoy systems, based on the company's decades of experience deploying buoys worldwide.

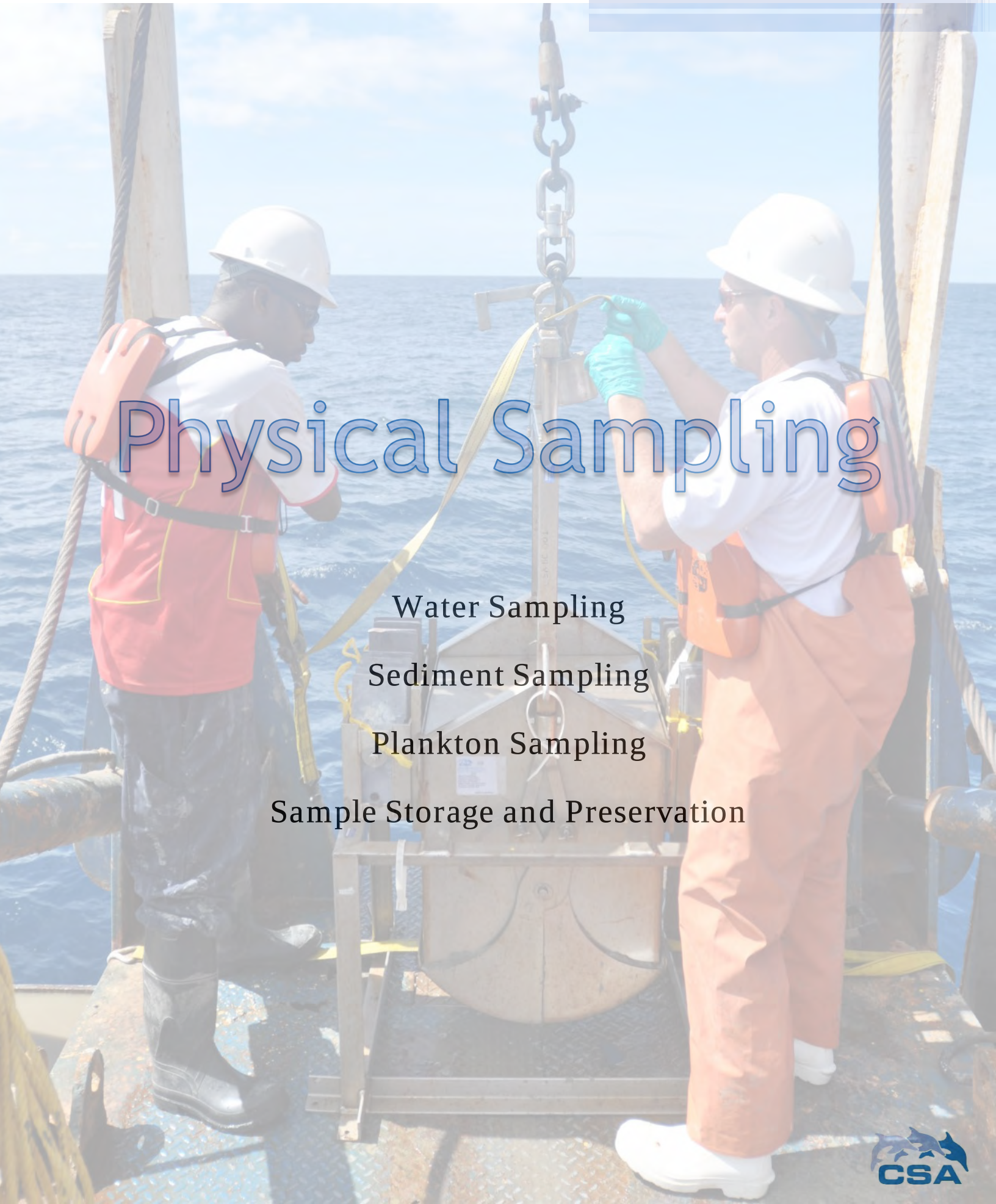
Offshore Buoys

Drift Buoy Systems



Moored Systems





Physical Sampling

Water Sampling

Sediment Sampling

Plankton Sampling

Sample Storage and Preservation

Water Sampling

Rosettes and Sampling Bottles

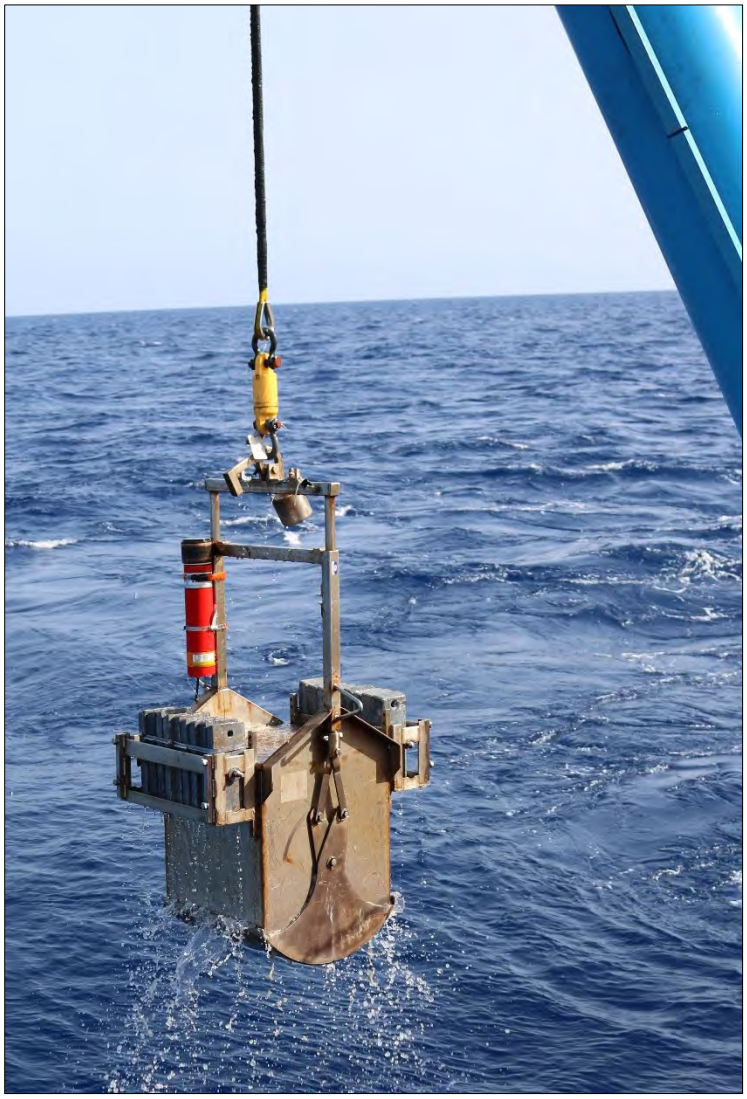
CSA Ocean Sciences offers a variety of rosettes with 6, 12, or 24 positions, capable of holding combinations of our 2L, 5L, 10L, and/or 20L GO-FLO bottles or 1.2L, 2.5L, 4L, 10L, and/or 30L Niskin water sampling bottles. Depending upon configuration, our rosettes are capable of real-time firing as well as being surface programmable for depth or timed firing. Furthermore, our water sampling devices are easily combined with our CTDs and other water quality sensors.

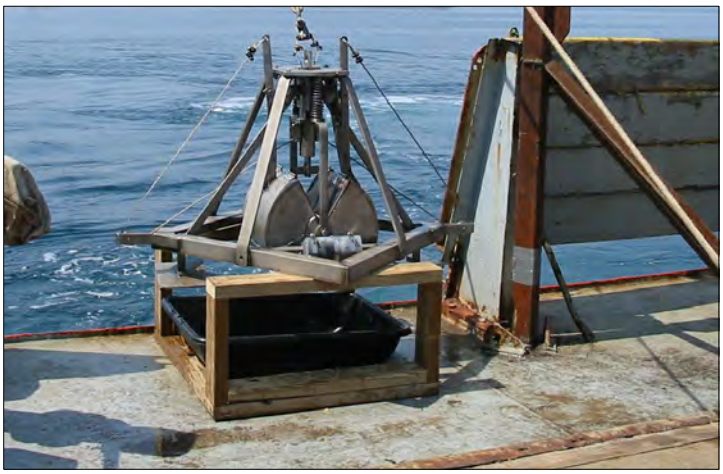
Sediment Sampling

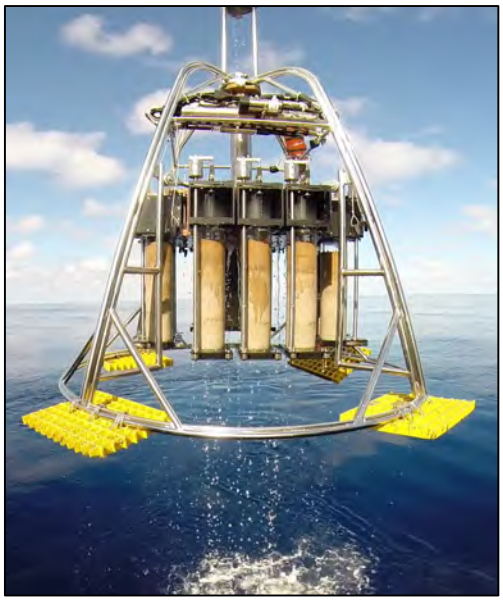
Corers and Grabs

CSA Ocean Sciences provides a wide range of sediment corers and grabs for all depths and sediment types. These are deployed from a vessel or specialized ROV mounted units:

Box Corers (USNEL and Grey-O'Hara)
Ekman Grab
Van Veen Grabs
Ponar Grabs
Smith McIntyre Grabs
ROV mounted Grabs
Maxi-Corer (8-corer module)

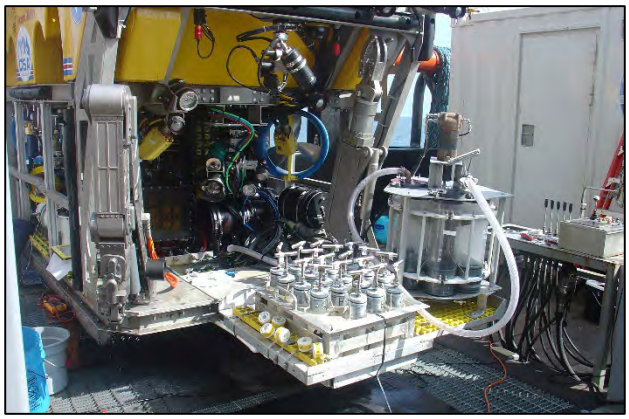




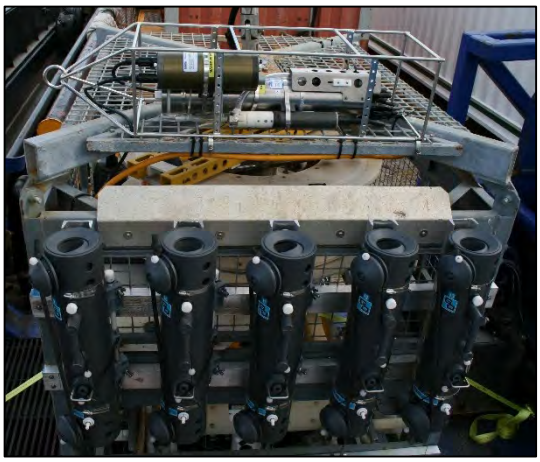


Integrated ROV Solutions

Custom systems designed and engineered by CSA Ocean Sciences for physical sampling from ROV platforms.



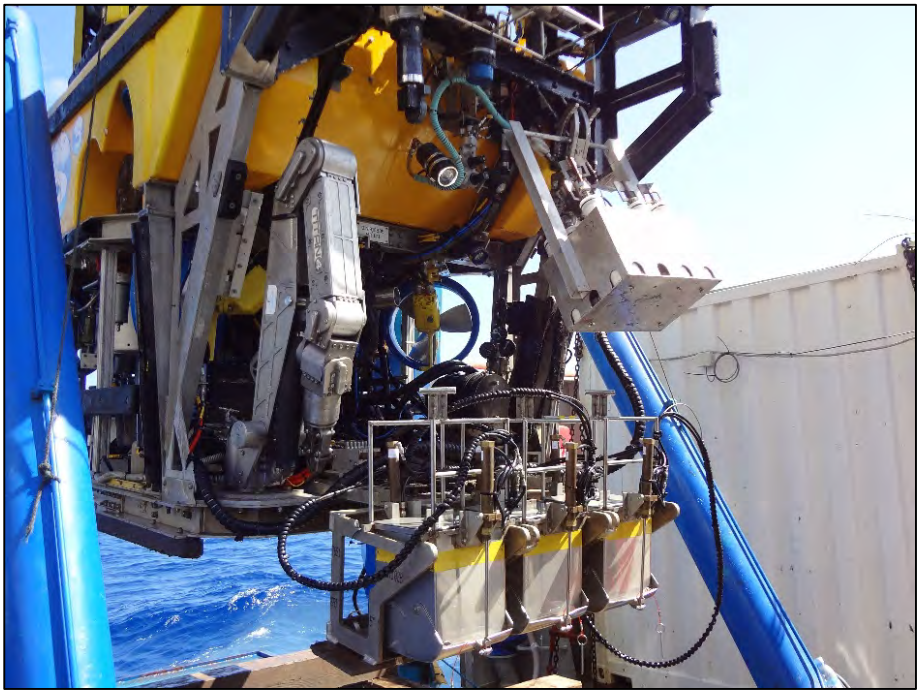
Six Chamber Slurp Sampler: Allows for the collection of fine sediments on the ocean floor for further analysis in the lab. Six individual chambers hold six discrete samples via a suction tube attached to the device and controlled by the ROV's manipulator arm. Shown to the right with an additional rack of push-cores.



Water Bottle Racks: Custom fabricated bottle mounts allow for the attachment of water collection devices to the vehicle. Numerous options for firing are available, with mechanical firing the standard configuration. A rack mount is shown to the left with 5L GO-FLO bottles mounted in tandem with a CTD.

Hydraulic Multi-corer and ROV-mounted Box Cores

Hydraulically operated coring device capable of taking six separate push cores without the use of a manipulator arm. Each core tube articulates down/up past a hinged bottom cover which keeps the core tube clean during transit protects the collected sediment sample after acquisition. CSA also offers ROV-mounted box core units for targeted, bulk sediment sample collections.



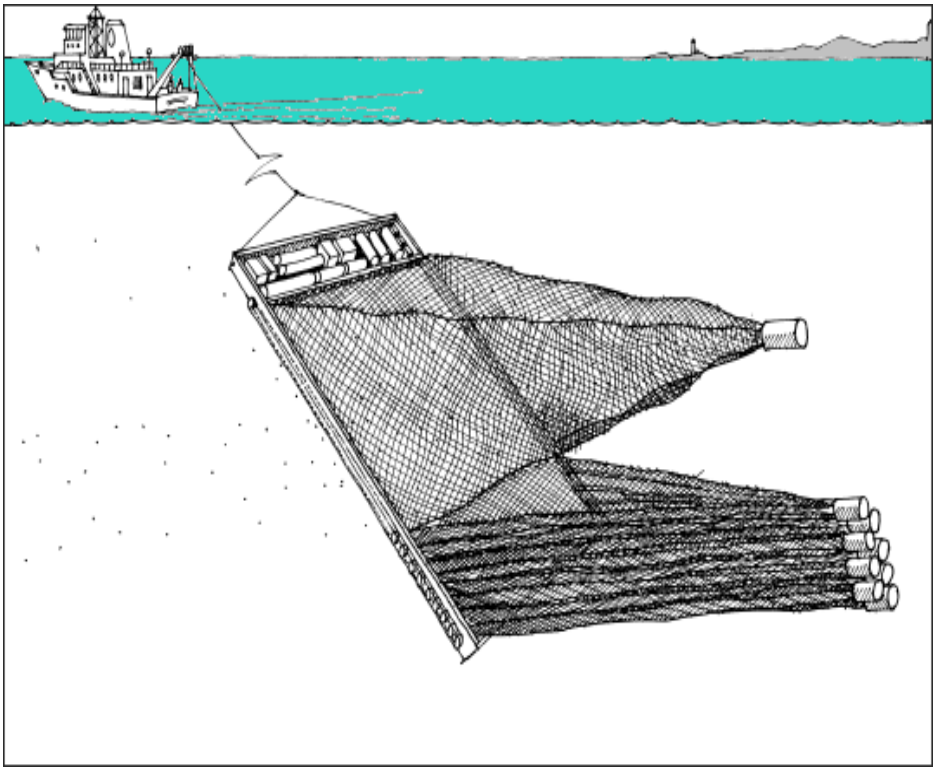
Plankton-MOCNESS

MOCNESS 1 & 10
(Multiple Opening/Closing Net and Environmental Sensing System)

The system is towed behind a research vessel at a speed of 1.5 kt and consists of 5 to 20 nets with mesh size between 64 µm to 3 mm. Nets have an area between 1 and 10 m^2 and are computer controlled to open/close at desired depths.

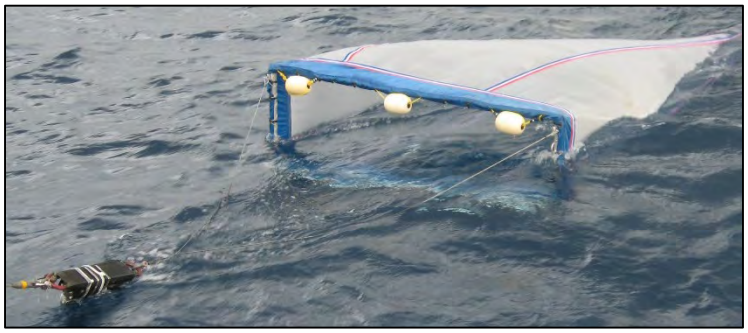
These nets enable capture of zooplankton and nekton in various depth horizons, typically within the upper 500 m of the ocean's surface. All CSA Ocean Sciences MOCNESS systems , however, are capable of sampling to 6,000 m depth (10,000 psi).

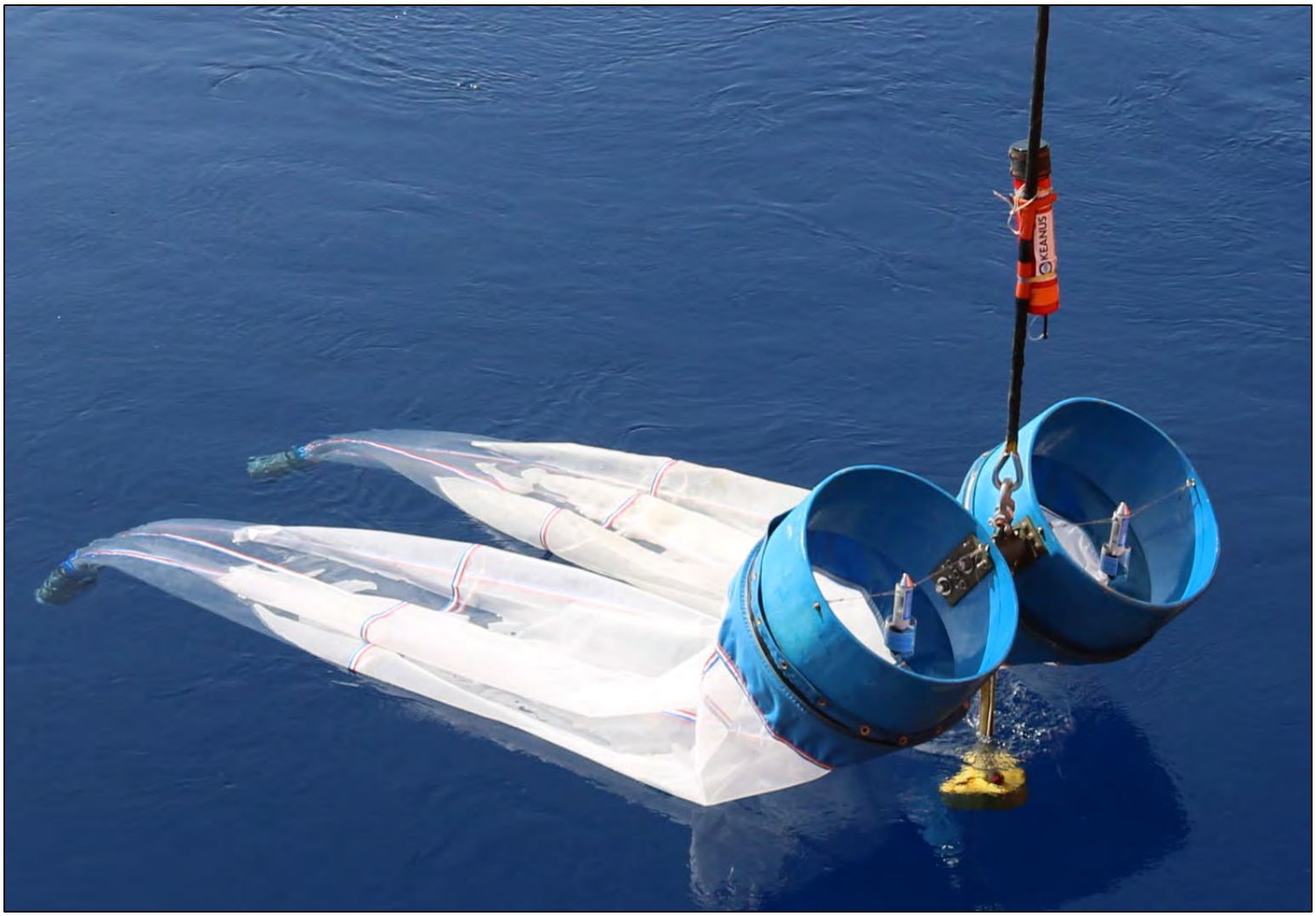
Each MOCNESS system includes a SeaBird CTD probe to measure salinity and temperature at sampling depths as well as optional sensors to record dissolved oxygen, photosynthetically available radiation (PAR), fluorescence, and transmissometers.



Plankton Nets

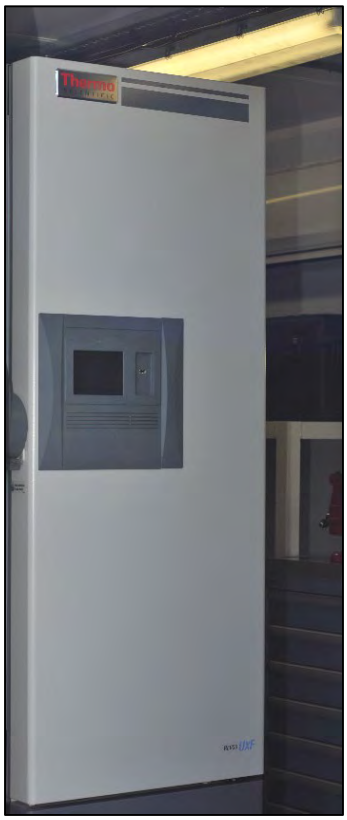
CSA Ocean Sciences offers an array of plankton collection devices. We supply Bongo Nets, Neuston Nets, Manta Nets, and other custom nets to fit a wide range of sampling needs. With each system, we have multiple mesh sizes and net areas, as well as a wide range of flow-meters, cod ends, and towing configurations.





Custom Sampling Solutions and Storage

CSA Ocean Sciences has extensive experience with the design, engineering, fabrication, and deployment of custom sample collection devices. Here, the company can work with clients to devise configured-to-fit solutions for a broad array of applications. Likewise, CSA can provide on-site solutions for sample organization and storage, including Sub80 freezer units.



Deck and Support Equipment

Winches

A-Frames

Mobile Container Units

Additional Deck Equipment

Slip Ring Winches

Ranging from 5 to 150 hp models, CSA's inventory of slip ring winches primarily consists of DT Marine models with some specialty units also available. Likewise, we offer a variety of conducting cables as well as neutrally buoyant, high tensile strength line for operations as needed. All winches are equipped with multiple channel slip rings, level winds, and options for local or remote operation.

Note: The table is a representative listing of CSA's available slip ring winch systems, additional units, line types, and line lengths available upon request

Winch	HP	Speed, M/min (ft/min)	Pull Strength, kg (lbs)	Current Line Type *re-spooling available upon request
DT3125EHLWR	125	80 (275)	9,070 (20,000)	6km .68"coax
InterOcean 72480	75	60 (200)	4,535 (10,000)	4km .68" coax
DT3060EHLWR	60	60 (200)	3,540 (7,800)	6km synthetic
DT3050EHLWR	50	100 (330)	2,720 (6,000)	6km synthetic
DT3050EHLWR	50	100 (330)	2,720 (6,000)	5km .45" coax
DT3040EHLWR	40	60 (200)	2,270 (5,000)	3.3km synthetic
DT3025EHLWR	25	45 (150)	1,815 (4,000)	2.3km synthetic
DT1020EHLWR	20	45 (150)	1,450 (3,200)	Towed video cable
DT3010EHLWR	10	30 (100)	910 (2,000)	1.1km .45" coax
DT3005EHLWR	5	30 (100)	545 (1,200)	.22km .45" coax

Articulating A-Frames

CSA Ocean Sciences maintains a large inventory of stiff-leg and hydraulic articulating A-frames capable of up to 10 tons lifting capacity. Articulating A-frames run from supplied hydraulic power packs, and all have weld and load certificates. Our A-frames unbolt into three sections, making them easy to transport on the road or overseas. Below are CSA's standard articulating A-Frame sizes and dimensions.

Type	Lift	Height; ID Meters (feet)	Width; ID Meters (feet)
Hydraulic, Articulating	10 T	5.8 (19)	4.9 (16)
Hydraulic, Articulating	5 T	5.2 (17)	2.4 (8)
Hydraulic, Articulating	5T	5.2 (17)	2.7 (9)
Hydraulic, Articulating	5 T	4.2 (14)	2.7 (6)

Mobile Container Units

CSA Ocean Sciences maintains numerous mobile container units worldwide. These climate controlled works areas are configured as laboratory stations, navigation centers, remote sensing control rooms, and work vans with modular configuration for custom applications.

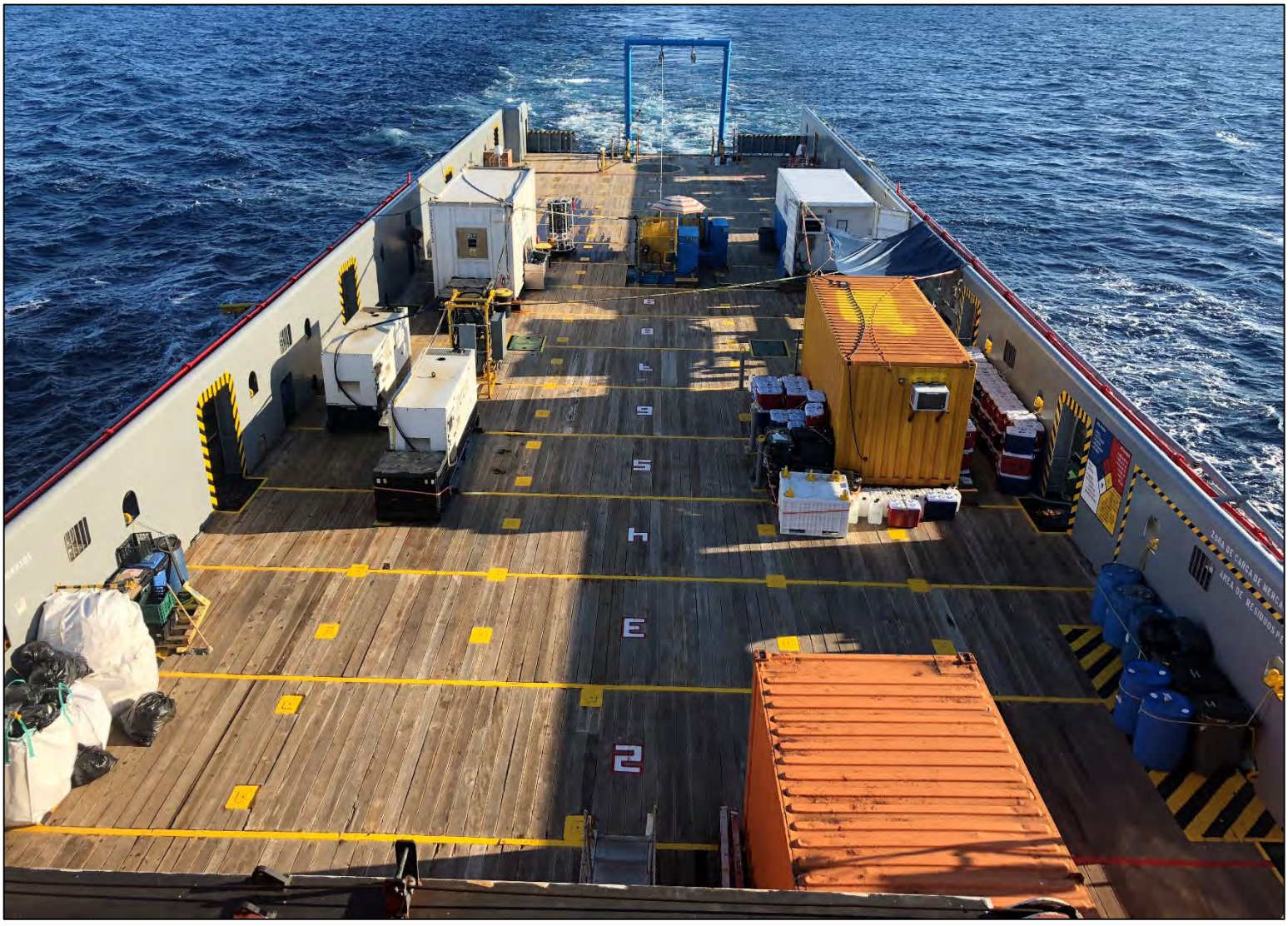
Standard units are 8 x 20 ft (2.4 x 6 m) with dual egress and stock safety supplies. Wet labs are available, and optional accessories include VHF radio, satellite phones, computer work stations, and scientific instrumentation.

Additional Deck Equipment

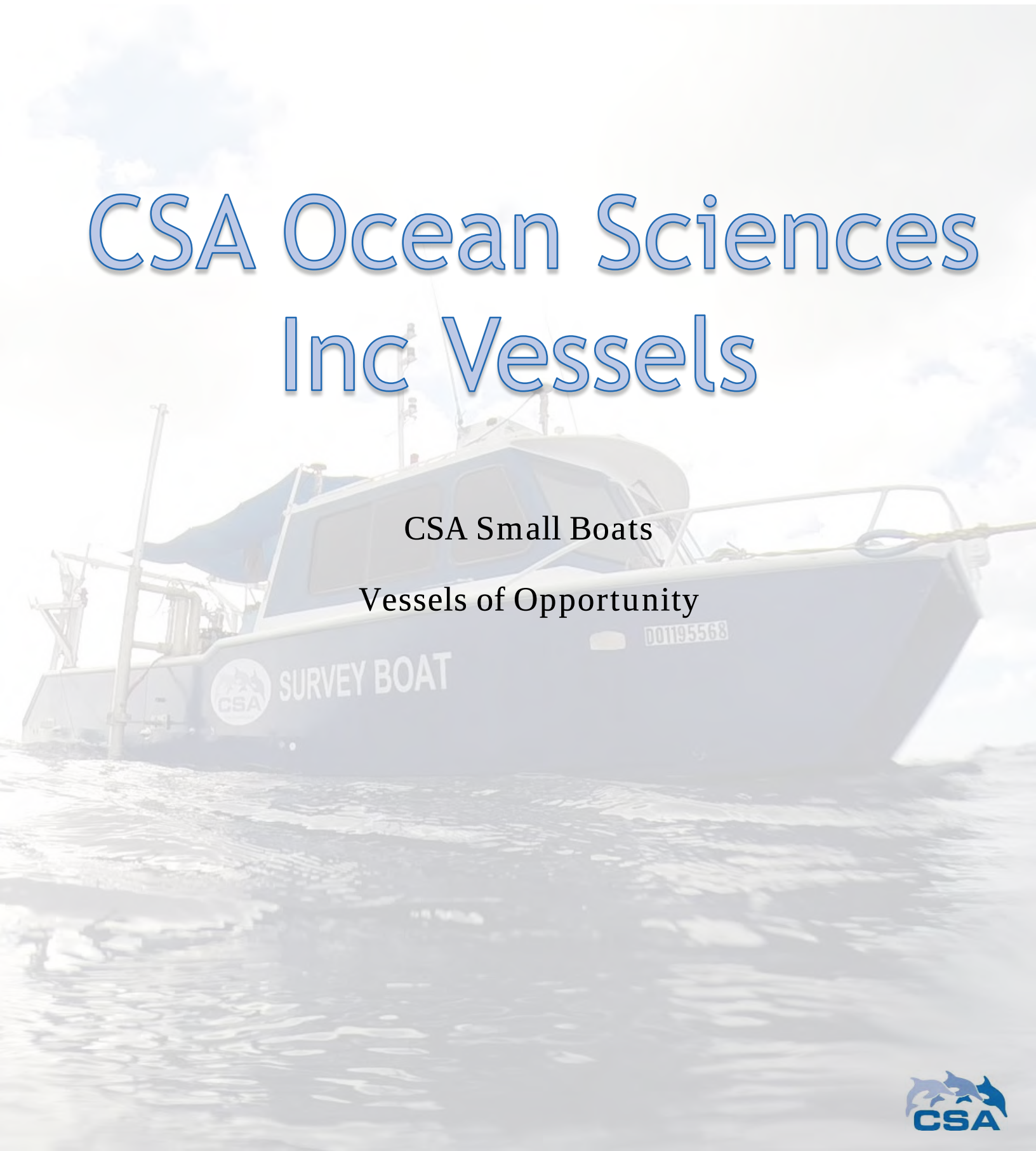
To support the numerous types of offshore services provided to our clients, CSA maintains a large inventory of equipment to facilitate project mobilization/demobilization, deck operations, equipment deployment and recovery, sample processing and storage, maintenance and repair of items, and supports virtually all other offshore operations needs. This inventory of support equipment includes:

Hydraulic Power Units (HPU)
Pneumatic Winches (tuggers)
Side Poles
Outriggers
Davit Arms
Air Compressors
Mobile Storage

Generators
Electrical Transformer/Distribution
Blocks and Sheaves
Cable counters
Tool Boxes/Job Boxes
Lifting and Rigging Equipment
Refrigerators/Freezers



CSA Ocean Sciences Inc Vessels



CSA Small Boats

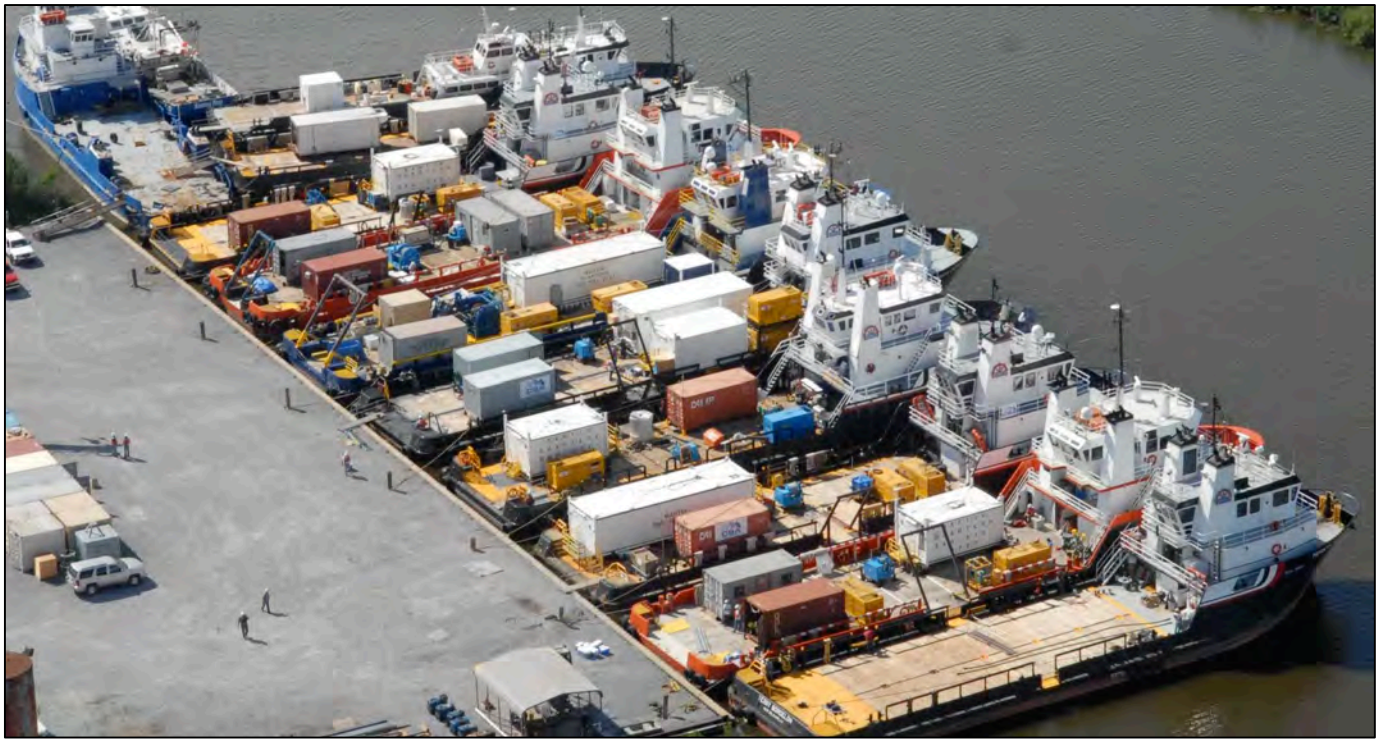
Vessels of Opportunity

CSA Ocean Sciences Small Boats

CSA has a fleet of small boats capable of supporting our diverse marine science projects. These platforms are staged across the world at CSA facilities, and most are trailerable to facilitate the needs of nearshore projects. They are routinely configured for diving operations, marine remote sensing, and a variety of physical sampling tasks.

Vessels of Opportunity

With over 40 years of oceanic experience, CSA Ocean Sciences Inc. has assembled a worldwide database of vessels or opportunity and brokers. We routinely mobilize and operate these vessels in remote, international locations, accomplishing safe and efficient worldwide marine operations.



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