

# AUTONOMOUS UNDERWATER VEHICLE



## AUV CAPABILITIES

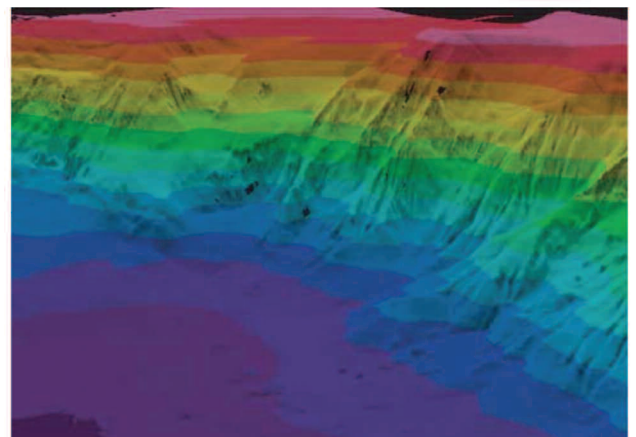
C & C Technologies, Inc. pioneered the world's first commercially operated Autonomous Underwater Vehicle (AUV) for oil and gas exploration.

Now the company leads the market with its four AUVs.

As frontrunners in the fields of AUV technology and deepwater mapping, C & C professionals have an unmatched depth of talent and experience.

C & C's surveying experience spans the world four times over, it sets the standard in deepwater AUV capability with more than 200,000 kilometers of survey experience for more than 62 clients.

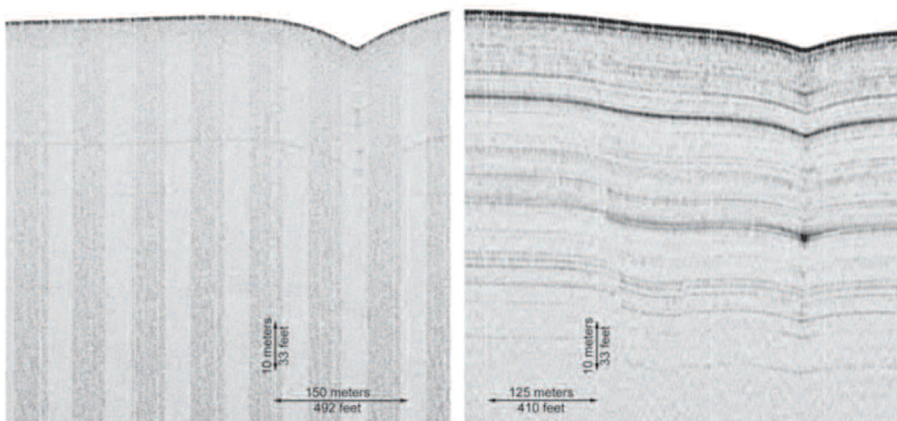
AUV data is processed onboard and charts are transferred via satellite to a secure Web site for the fastest possible turnaround of client data.



*3D Bathymetry Data Example  
(Data courtesy of (BP))*

## UPGRADES

C & C is committed to delivering state-of-the-art data to our clients. Current upgrades to our AUVs include a dynamically focused side scan sonar with a smaller beam width and a higher cross track resolution (230 kHz vs. 120 kHz), a subbottom profiler with lower frequency (1-6 kHz) for deeper penetration, four transmit transducers and an 8-element receiver array. The C-Surveyor proprietary camera system takes flash illuminated black and white photographs of the seabed. The camera is available to take photos at fixed time intervals and each photograph has a resolution of 1360 by 1024 pixels. After the dive, images are recovered and post-processed.



*Original vs. C & C Proprietary Subbottom Profiler Technology Examples  
(Data courtesy of (BP))*



*AUV Camera Image*

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## AUV SPECIFICATIONS

### AUV SENSOR PACKAGE

C & C currently has a fleet of four AUVs.

Each AUV has the following equipment installed:

- Kongsberg Simrad EM 2000 Multibeam Bathymetry System - 111 beams
- Seabird Electronics SBE 49 FastCAT CTD with Digiquartz Depth Sensor
- Payload - UltraSparc 650 mHz cPCI with 1 gigabyte ram
- RDI Navigator DVL - WHN300 - 300 kHz
- Kongsberg Simrad HiPAP Ultra Short Base Line (USBL) Acoustic Positioning System
- Link Quest Acoustic Data Modem
- IMU90 Motion Reference Unit



C & C AUV Workshop

### C-SURVEYOR II

Depth Rating: 3,000 meters (9,842 feet)  
Length: 6.2 meters (20.34 feet)  
Power: Aluminum Oxygen Fuel Cell  
Side Scan Sonar: EdgeTech Full Spectrum Chirp Side Scan Sonar - 120 / 410 kHz  
Subbottom Profiler: EdgeTech Full Spectrum Chirp Subbottom Profiler - 1 - 6 kHz with 8-element receiver array  
High Resolution Camera System with Photo Mosaic Capability at 6-10 meters from seafloor

### C-SURVEYOR III

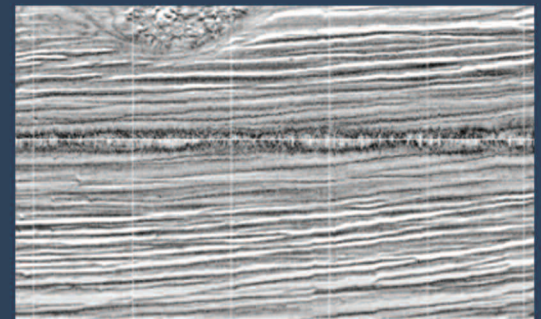
Depth Rating: 4,500 meters (14,763 feet)  
Length: 6.4 meters (20.99 feet)  
Power: Aluminum Oxygen Fuel Cell  
Side Scan Sonar: EdgeTech Full Spectrum Side Scan Sonar: Chirp Dynamically Focused (230 kHz) or Std 410 kHz (Resolution: ~.7m out to 225 m for DF)  
Subbottom Profiler: EdgeTech Full Spectrum Chirp Subbottom Profiler - 1-6 kHz with 8-element receiver array  
High Resolution Camera System with Photo Mosaic Capability at 6-10 meters from seafloor

### C-SURVEYOR IV

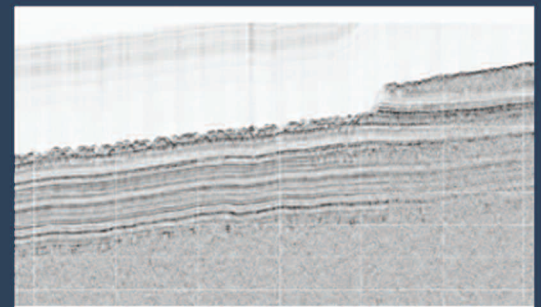
Hugin 1000 AUV  
Depth Rating: 3,000 meters (9,842 feet)  
Length: 4.57 meters (15 feet)  
Power: Lithium Rechargeable Batteries  
Two Interchangeable Payload Packages:  
Payload Package A: Edgetech 220 Side Scan Sonar / Subbottom Profiler with Kongsberg EM 2000 multibeam  
Payload Package B: Kongsberg HISAS Synthetic Aperture Sonar with Kongsberg EM 3002 Multibeam

### C-SURVEYOR V

Depth Rating: 3,000 meters (9,842 feet)  
Length: 6.2 meters (20.34 feet)  
Power: Aluminum Oxygen Fuel Cell  
Side Scan Sonar: EdgeTech Full Spectrum Chirp Side Scan Sonar - 120 / 410 kHz  
Subbottom Profiler: EdgeTech Full Spectrum Chirp Subbottom Profiler - 1 - 6 kHz with 8-element receiver array  
High Resolution Camera System with Photo Mosaic Capability at 6-10 meters from seafloor



Post Processed Side Scan Data Example  
(Data Courtesy of BP)



Post Processed Subbottom Data Example  
(Data Courtesy of BP)

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