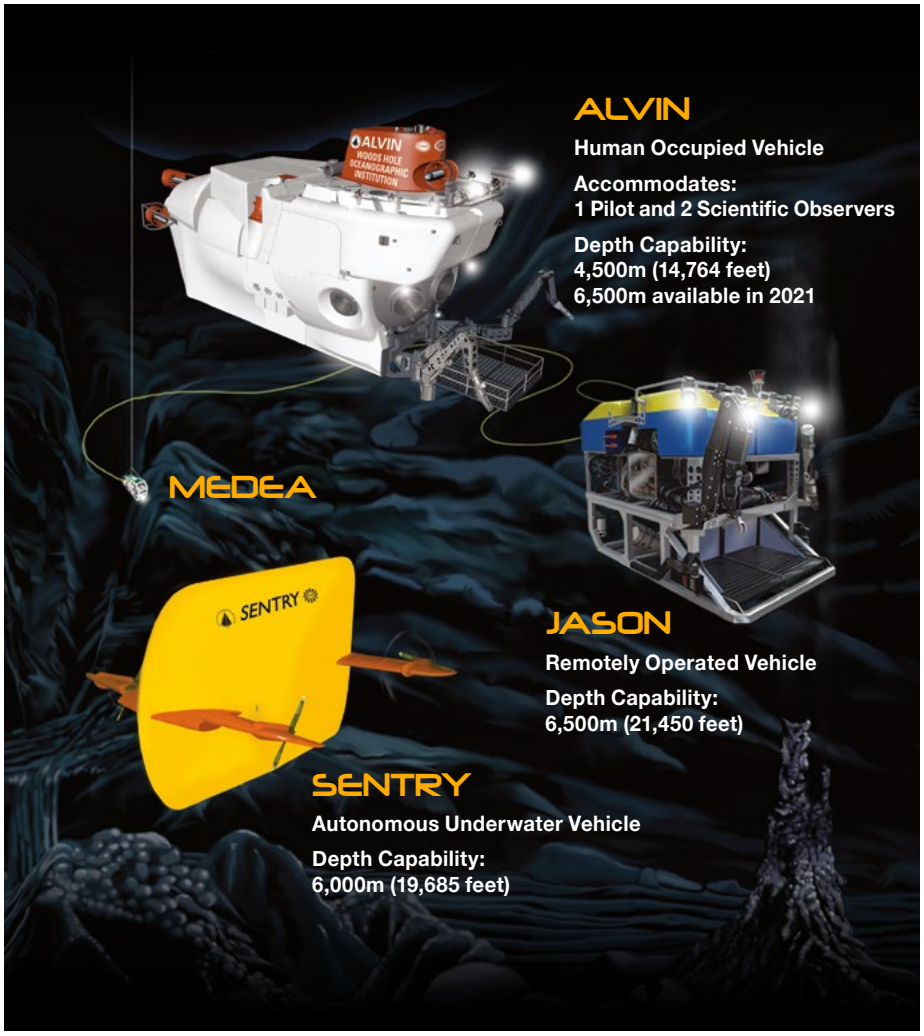
NDSF NATIONAL DEEP SUBMERGENCE FACILITY

WE PUT THE DEEP OCEAN WITHIN REACH.

With more than 50% of Earth's surface covered by oceans deeper than 3000m, the National Deep Submergence Facility (NDSF) exists to support Earth, Ocean and Life scientists worldwide as they continue to explore these fascinating environments and learn more about how this planet Earth is operated from investigating the environment beneath the seafloor, to deep seafloor, and to the oceanic water column.

The NDSF currently provides operational support for three vehicles: the Human Occupied Vehicle (HOV) *Alvin*, the Remotely Operated Vehicle (ROV) *Jason*, and the Autonomous Underwater Vehicle (AUV) *Sentry*. When submitting a proposal for funding, any prospective PI should also complete a formal Ship Time Request* and check the boxes for whichever combination of vehicles Proposal PIs require.



The *Sentry* AUV, depth-rated to 6,000m, and the *Jason* ROV, rated to 6,500m, are reliable workhorses for the NDSF. HOV *Alvin*, the longest serving vehicle in the NDSF. "There is no substitute for direct observation" - Alvin observers describe the perspective gained by examining the seafloor in 3-D through Alvin's multiple viewports. Enabling the use of human eyes and brains is an essential component of the observer's ability to fully understand unique deep-sea environments.

While there is a wealth of information available on all three vehicles on ndsf.whoi.edu, the Chief Scientist for Deep Submergence (CSDS) at WHOI works in parallel with the NDSF specifically to provide liaison between interested scientists throughout the U.S. and the engineers who operate the vehicles at WHOI. NDSF vehicle managers are always available to provide advice to scientists from the very earliest stages of project planning—explaining the relative strengths and merits of individual vehicles and identifying capability gaps to be filled so that scientists can plan the most effective projects possible. First step is to simply email us at: ndsf_users@whoi.edu.

Some examples of recent projects that have made use of NDSF vehicles in pursuit of the goals of various major national and international research programs are listed overleaf. But equally as frequently, NDSF vehicles are funded to support one-off curiosity-driven projects funded through grants to one or more individual PIs.

**Ship Time Request: www.unols.org*

For more information please contact:

NDSF Users Support: ndsf_users@whoi.edu • **See more at**: ndsf.whoi.edu

Specifications

Length	7 meters (23.1 feet)
Breadth	2.6 meters (8.4 feet)
Height	3.68 meters (12.1 feet)
Operating Depth	4,500 meters
Normal Dive Duration	8-12 hours
Gross Weight	20.4 metric tons
Science Basket Payload	181.4 kilograms (400 lbs)
Personnel Sphere Volume:	4.8 cubic meters
Maximum Vehicle Speed (on site, within tether range)	1.5 knots forward, 0.5 knot lateral, 1.0 knot vertical (1 knot equals 0.5 meters/second)
Descent/Ascent Rate	30 meters/minute (98.4 feet/minute)
Propulsion	Six brushless DC electric thrust-ers, each providing 113 Newtons (250 pounds) of thrust

Observation

Five viewports: 3 forward (7" dia.), 2 side (5" dia.)

Electrical Power

Two banks of lead-acid batteries, each 120 V, 125 AH

Communication

Redundant acoustic telephones (voice or code)
Marine band (VHF) radio
Sound - powered phone

Imaging

Two Insite Mini Zeus HD cameras with individual pan and tilt
Two Kongsberg OE14-522 pan/tilt/zoom HD cameras near viewports
Additional situational cameras available
Three 7" HD LCD flat panel displays for in-hull viewing
HD video recorders
Optional HD video/still frame camera for mounting on manipulator
Hand-held still and video cameras

Lighting

Twelve lighting channels
Multiple positionable LED lamps
Situational and emergency lighting
Down-looking survey lighting
Lasers for optical size reference

Propulsion

Seven thrusters
Forward, reverse, lateral capability
Auto heading, altitude and depth

Vehicle Sensors

Fiber-optic gyrocompass: Octans or PHINS
Redundant depth sensors

Acoustic Sensors

Reson SeaBat 7125 dual frequency multibeam seafloor profiling sonar
Imagenex 881 profiling sonar
Tritech Seaking S8540 dual frequency scanning sonar
Navigation:
Dedicated in-hull navigation with touch screen display
Bottom tracking Doppler velocity log
Auxiliary long baseline acoustic navigation system
Sonardyne Homer Pro location beacons

Manipulators/Sampling

Schilling Titan 4: 7 degrees of freedom
ISE: 6 degrees of freedom
Sample storage: Forward 16 sq. ft. sample basket with payload of 181 kg (400 lbs)
Elevator sampler—Mission configurable:
Free ascent
Payload: 90 kg (200 lbs.)
Scientific sampling devices:
Water samplers, tube corers and bio boxes

Scientific Instrumentation Support

Power: 12, 24 and 120 VDC switched circuits available
Hydraulics: 6 available hydraulic circuits
Digital sensor interface
Integrated data system
In-sphere laptop computers

For more information please contact: Rick Chandler, Submersible Operations Administrator, rchandler@whoi.edu;
NDSF Users Support: ndsf_users@whoi.edu; Also visit the Alvin program website at: ndsf.whoi.edu/alvin

NDSF NATIONAL DEEP SUBMERGENCE FACILITY

ndsf.whoi.edu/alvin