

HISTORICAL
EXPLORERS

JAQUES
COUSTEAU

(1910-1997)

French naval officer, explorer, researcher and marine biologist dedicated to studying the ocean and its biodiversity. He is best known for introducing the autonomous diving bell without cables or air hoses running from the surface.



JAQUES
PICCARD

(1922-2008)

Swiss explorer, engineer and oceanographer known for developing aquatic vehicles for ocean current research. Piccard and Don Walsh were, until 2012, the only two people who had reached the deepest point on Earth, the Challenger abyss, in the Mariana Trench.



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PRESENTS

SUBMERSIBLES
MARINE EXPLORATION
TECHNOLOGY

Efforts to explore the ocean aim to investigate the physical, chemical, and biological conditions of the seabed for scientific or commercial purposes. Technological developments and innovation have allowed these efforts to make significant contributions to our knowledge of the oceans in recent years.

MEXICAN
EXPLORERS

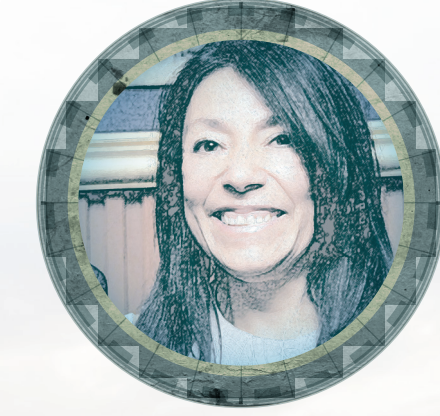
VIVIANNE
SOLIS WEISS

In 1985, she became the first female chief scientist on UNAM's research vessels "El Puma" and "Justo Sierra", also leading research expeditions in 1992 and 1993. She was the first Latin American scientist to board Alvin and travel more than 2,000 meters into the ocean's depths.



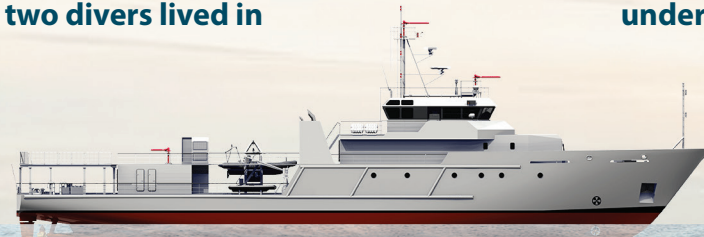
ELVA ESCOBAR
BRIONES

Her research focuses on fauna associated to marine substrates and macroecology. She has discovered new ecosystems and has described several new species. Escobar Briones has represented Mexico in forums like the International Authority of Marine Substrates, United Nations and the IUCN.



CONTINENTAL
SHELF STATION

Cousteau and his team led an experiment that aimed to build an underwater village to allow small groups of people to live under the sea. The first underwater capsule, Conshelf I, was submerged in 1962 in France at a depth of 12 meters and two divers lived in it for 2 weeks.



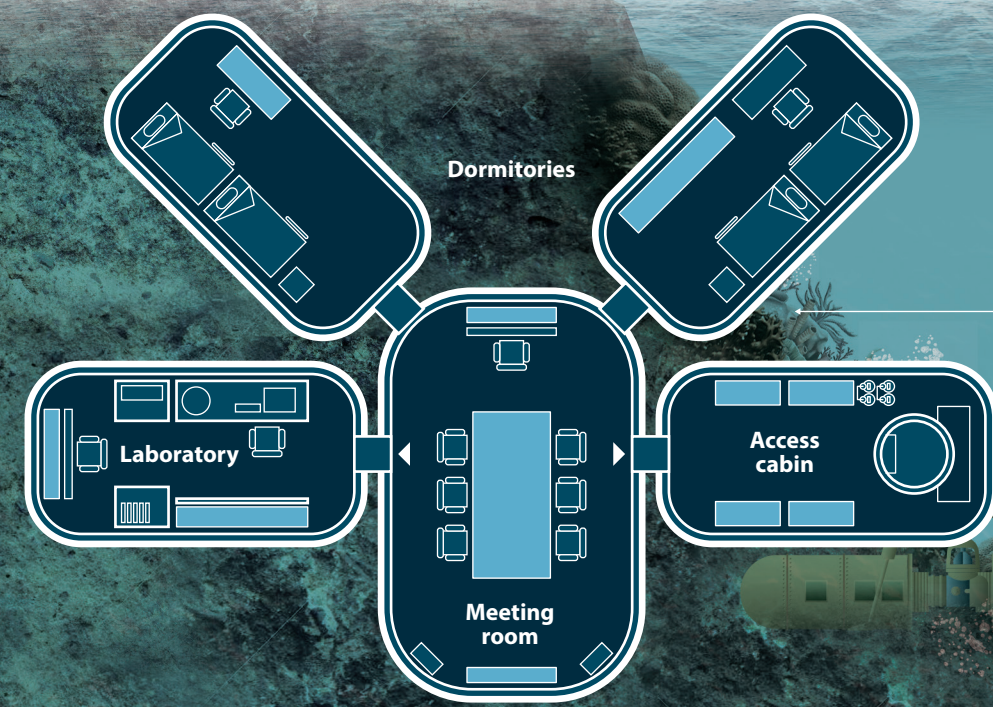
During Conshelf II, techniques used for astronaut training in weightless conditions and technologies such as underwater scooters were developed.

The submersible Denise is launched and recovered with the help of a crane from the ship's platform.



THE CALYPSO

The legendary vessel is a former British Royal Navy minesweeper converted into a research ship by Jacques Cousteau. It was equipped with a mobile laboratory for underwater and oceanographic research.



The project continued in 1963 in the Red Sea with Conshelf II. Five structures were submerged 10 meters and 6 oceanauts lived in them for 30 days.

A separate structure was used as a hangar for 2 submarines.

The team had meetings and developed medical studies in the main laboratory.

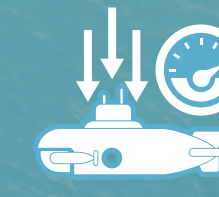
The Conshelf II colony received air, water, food, and energy supplies from a team on the surface aboard the Calypso.

A second laboratory was built at 30 m depth and 2 oceanauts lived there for a week.

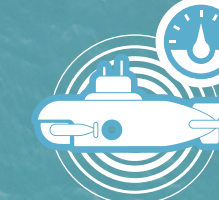
SUBMERSIBLES

An aquatic submersible is a small vessel designed to operate underwater. It is not fully autonomous, so it's usually supported by a ship, platform, shore team, or submarine. There are several types of submersibles, including manned and unmanned vessels, also known as remotely operated vehicles or ROVs.

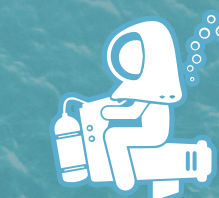
TYPES OF TECHNOLOGY



SINGLE ATMOSPHERE: They have a pressurized hull and the occupants are at standard atmospheric pressure. Its hull is capable of withstanding external pressure.



AMBIENT PRESSURE: To reduce the pressure the hull must withstand, it maintains the same pressure inside and outside the hull.



WET SUBMARINE: It is a vehicle that may or may not be enclosed, and water floods the interior, so SCUBA equipment is used for breathing.

SUBMERSIBLE DENISE SP-350

Known as the "diving saucer", this is a small submarine designed to accommodate two people. It was invented by Jacques Cousteau and engineer Jean Mollard at the French Center for Underwater Research.

SPECIFICATIONS

Type: Submarine
Weight: 3.8 tons
Length: 2.75 m
Propulsion: Electric water jet
Speed: 1 knot
Dive duration: 96 hours
Depth test: 1,000 m
Crew: 2 people

It has a positive buoyancy and is weighted with ballast weights that can be released in case of emergency.

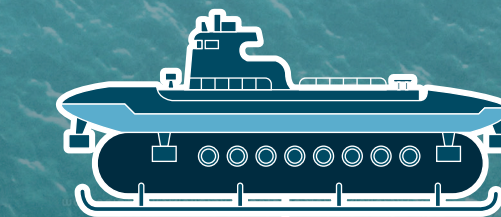
The crew enters through a hatch and lie down on mattresses to operate it.

Upper hull made of pressure-treated steel

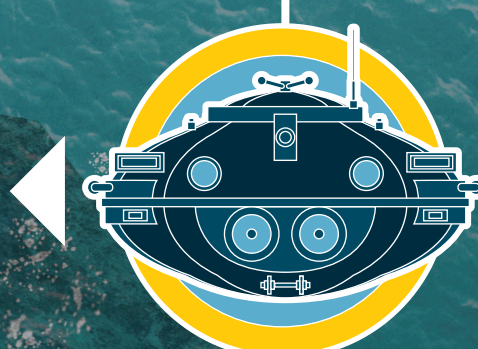
Pump

Energy batteries

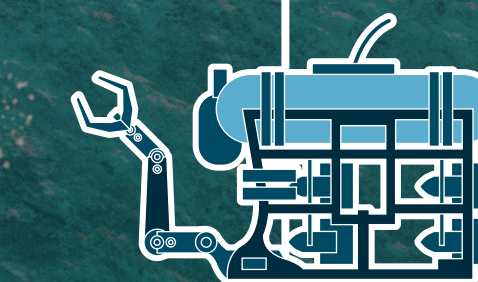
REACHING
THE OCEAN'S DEPTHS



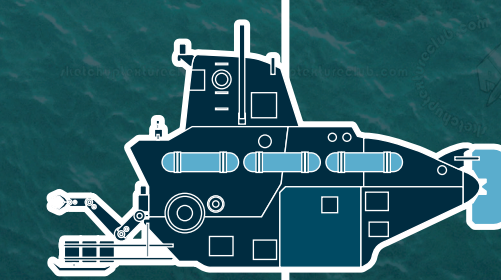
COMMERCIAL SUBMERSIBLES
Private companies have developed small submersibles for tourism and exploration that can accommodate several people.



SP-350
It can withstand pressure of more than 90 kg/cm² (1300 psi), equivalent to 900 meters depth, although for safety purposes, divers never exceed 300 meters depth..



MROV
Small unmanned submersibles called "marine remotely operated vehicles" are widely used to work in waters that are too deep or too dangerous for divers.



DEEP DIVING SUBMERSIBLES
DSV ALVIN
One of the best-known in the world, it has completed more than 5,000 dives. ALVIN can accommodate 3 people, can reach depths of up to **4,500 meters** and make trips of up to 9 hours.

1.43 meters
in height

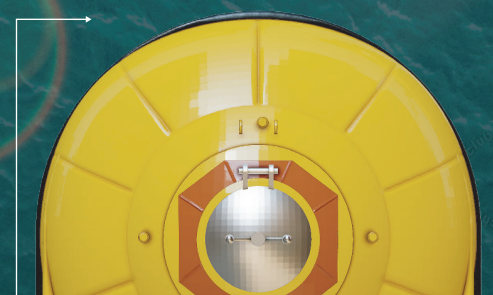


FRONTAL VIEW



LATERAL VIEW

2 meters
in diameter



UPPER VIEW

Electric lamps for night diving and deep-sea photography.

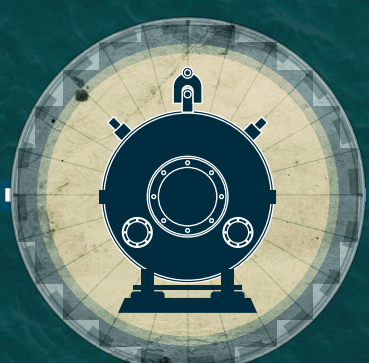
Sonar

Electrically operated arm to pick up objects and examine them through portholes.

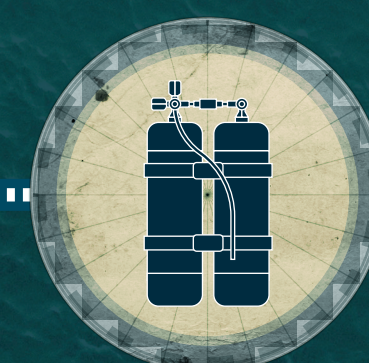
Front viewfinders with windows that allow you to get within centimeters of the target.

Propulsion consists of electrically operated, steerable water jets, which allow it to navigate in all directions and rotate on its vertical axis.

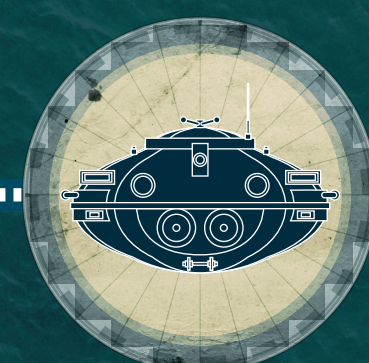
EXPLORATION CHRONOLOGY



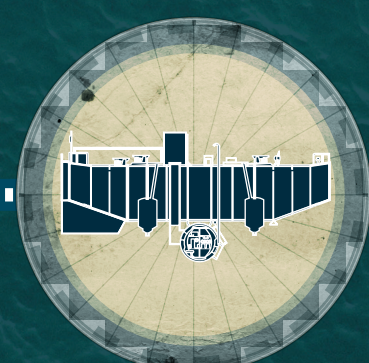
1930. William Beebe and Otis Barton were the first to explore the depths of the sea (435 meters) in the Bathysphere, which was made of steel.



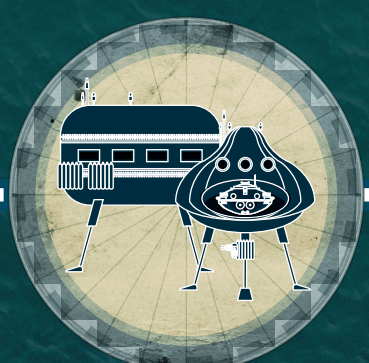
1943. Emile Gagnan and Jacques Cousteau invent the regulators currently used in scuba diving.



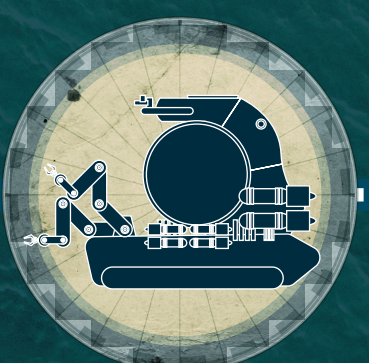
1959. The Denise SP-350 Submersible is built and operated from the Calypso.



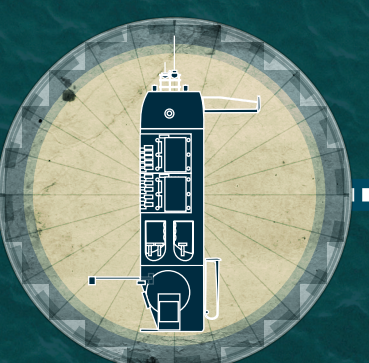
1960. Jacques Piccard and Don Walsh reached the bottom of the Challenger Deep in the Mariana Trench, descending 10,740 meters in the submersible Trieste.



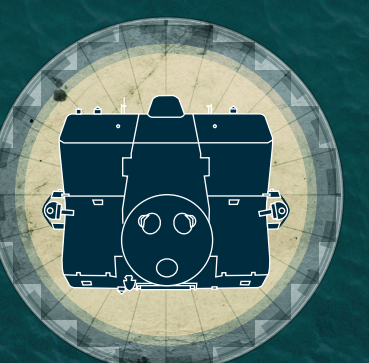
1962. The Conshelf I was built offshore from Marseille, France. Two divers spent two weeks in a small 12-meter-deep chamber on the seabed.



1984. Graham Hawkes builds the Deep Rover, a personal submarine with robotic arms and an acrylic capsule capable of reaching a depth of 900 meters.



2012. The Deepsea Challenger submersible, piloted by James Cameron, completed the second manned trip and first solo mission to the bottom of the Challenger Deep.



2020. Kathryn Sullivan and Vanessa O'Brien, aboard the Limiting Factor submersible, are the first women to reach the bottom of the Challenger Deep at 10,925 meters.