

# Welcome to the Deep Sea

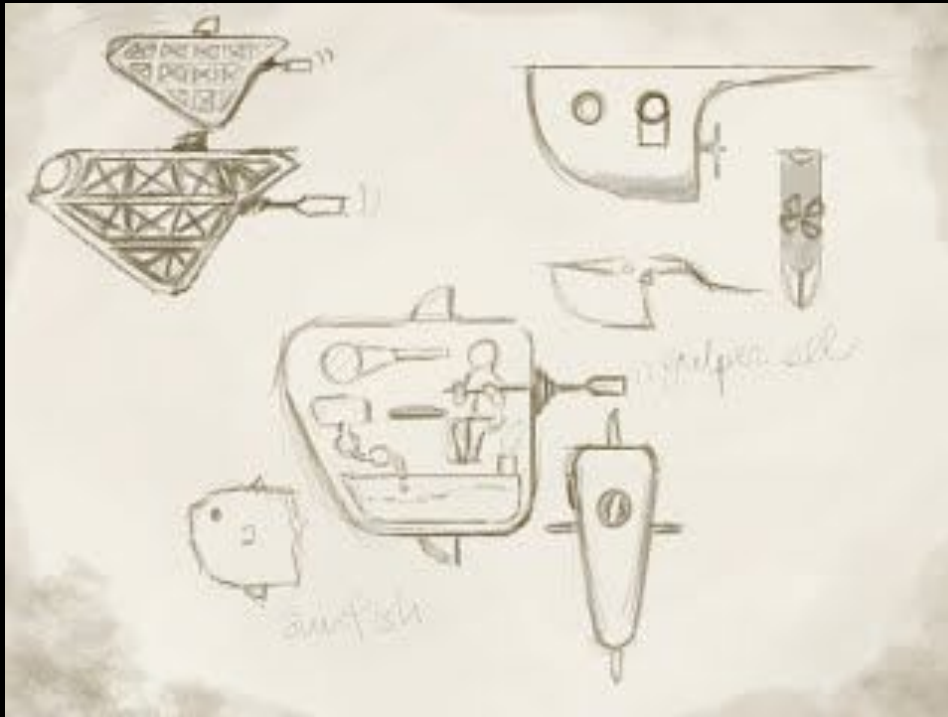
A brief introduction to past and present deep-sea research



Jeffrey Marlow, Boston University  
DeSSC New Users Workshop 2023  
(Adapted from Dorsey Wanless, Boise State University)

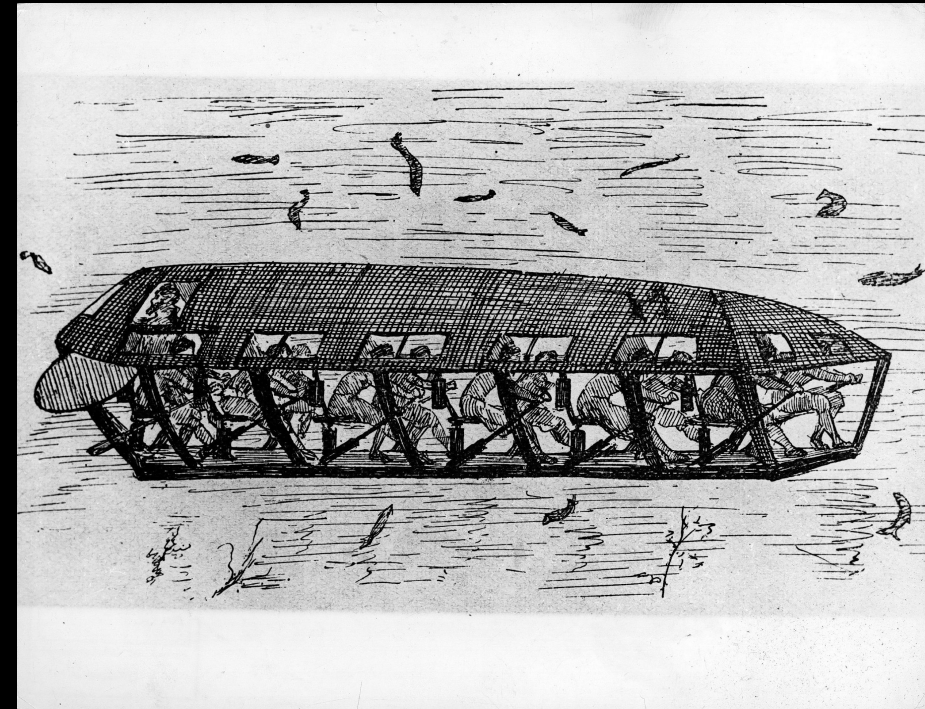
# Early Ideas for Submarines

The first known drawing of submarines were produced by da Vinci ~500 years ago.



At least 14 different submarine designs were patented by 1727

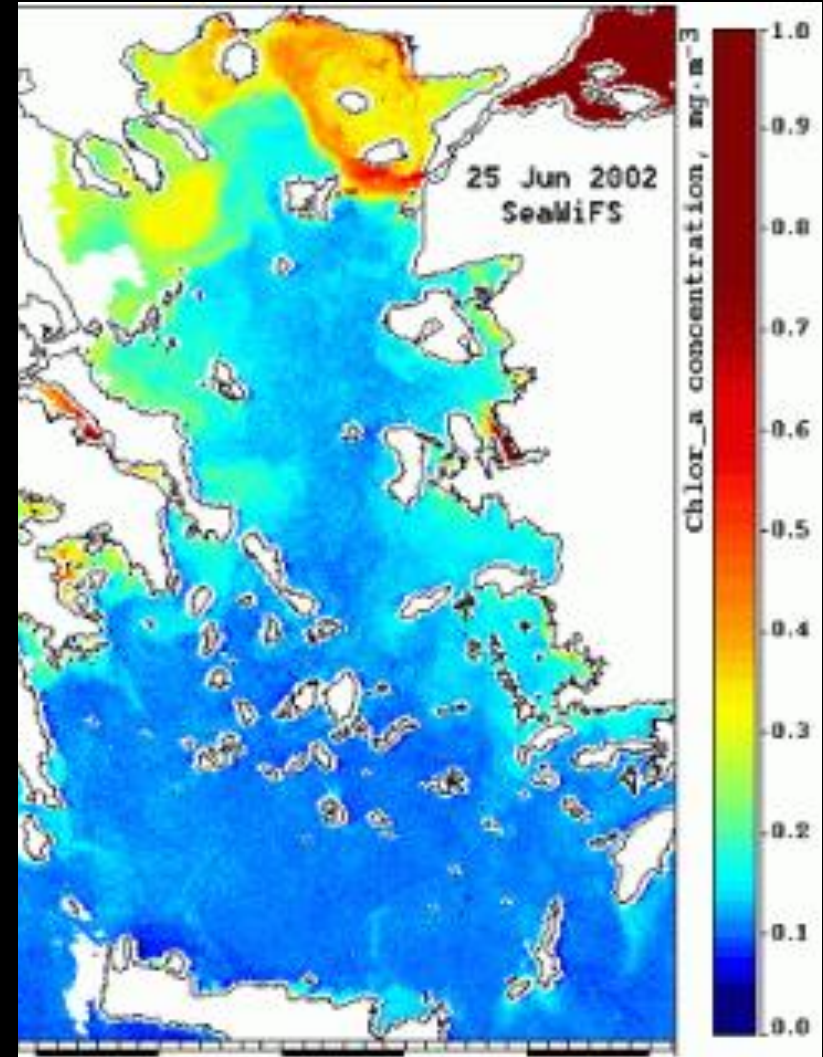
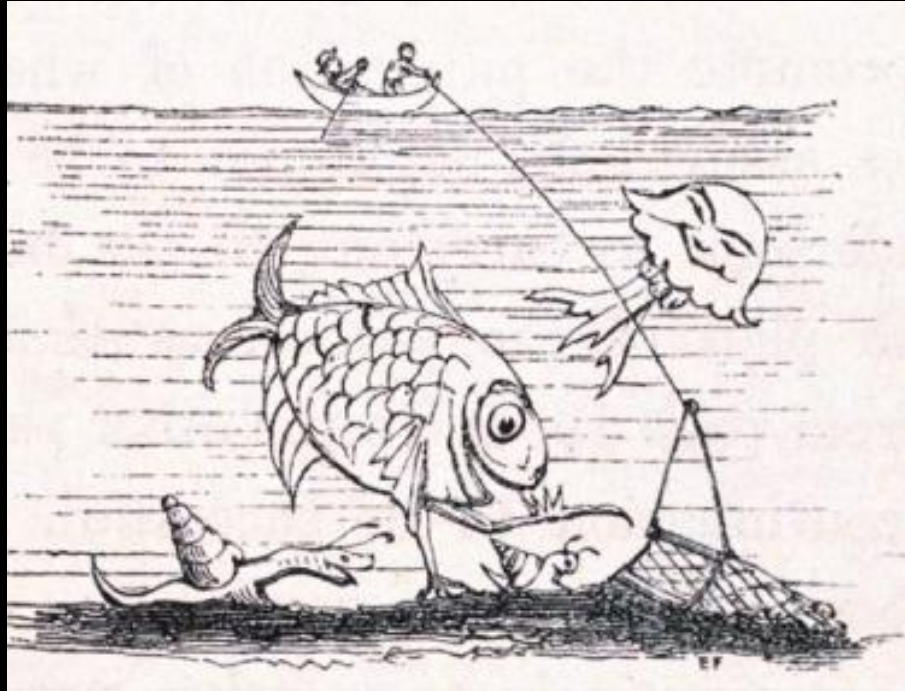
Cornelius van Drebbel (a Dutch Inventor) was the first to actually build a submarine 1620



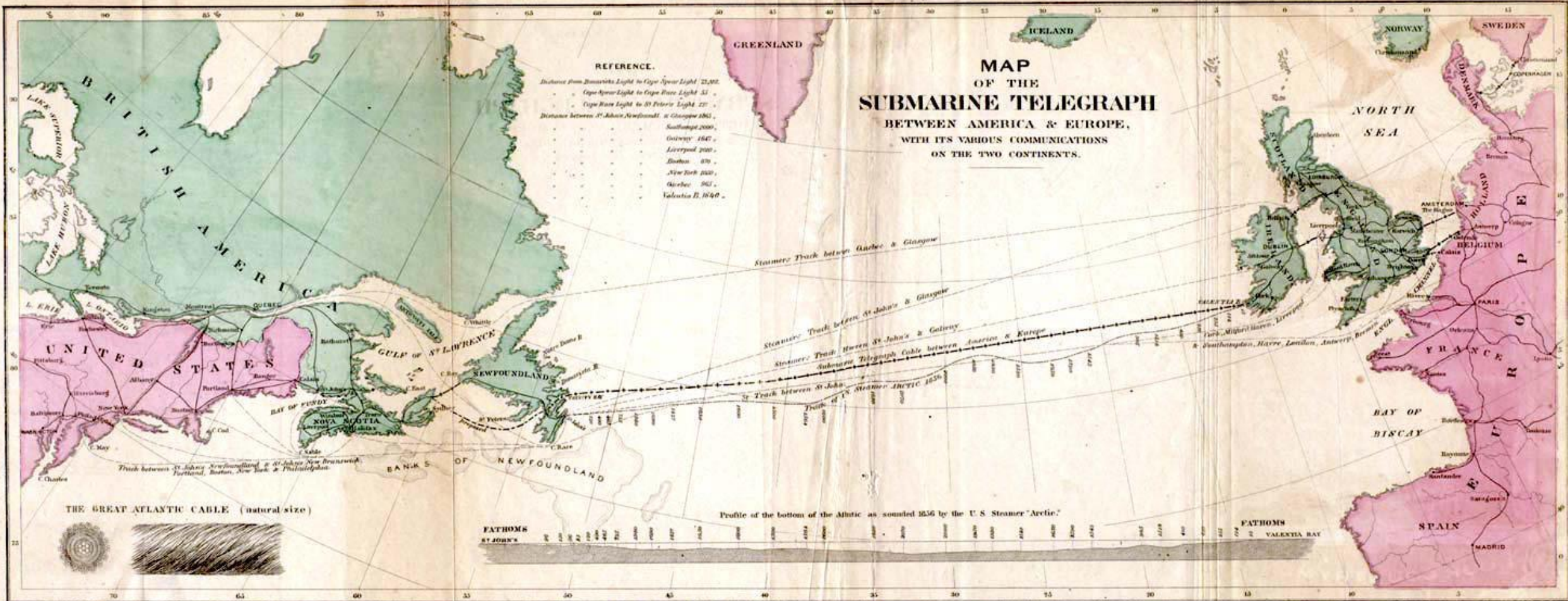
It completed several journey's on the Thames River at a depth of 12- 15 feet

# The Azoic Hypothesis

no life below 550 meters depth



# Telegraph Cables



Printed for HOWE'S ADVENTURES & ACHIEVEMENTS OF AMERICANS.

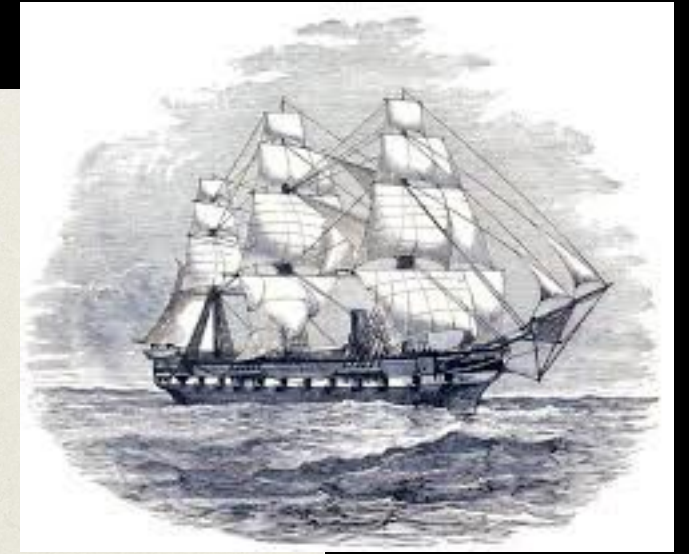
# Telegraph Cables



# Telegraph Cables



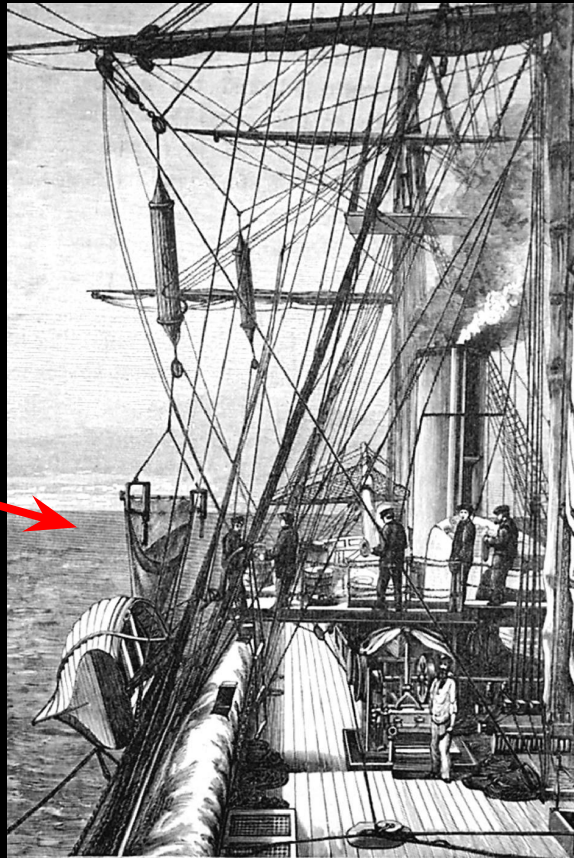
# HMS Challenger



1872 – 1876 First scientific expedition organized to gather data about a wide range of scientific features and processes (temperature, chemistry, water depths, currents, and marine life).

362 sampling sites

Drawing of a dredging apparatus



"At first when the dredge came up, every man and boy who could possibly slip away, crowded round it, to see what had been fished up."

-Professor Moseley in "Notes of a Naturalist" on the Challenger, p. 501.

Bathymetric Map of North Atlantic by Sir John Murray



Made the first systematic attempt to chart the basins of the world's oceans (492 bottom soundings)

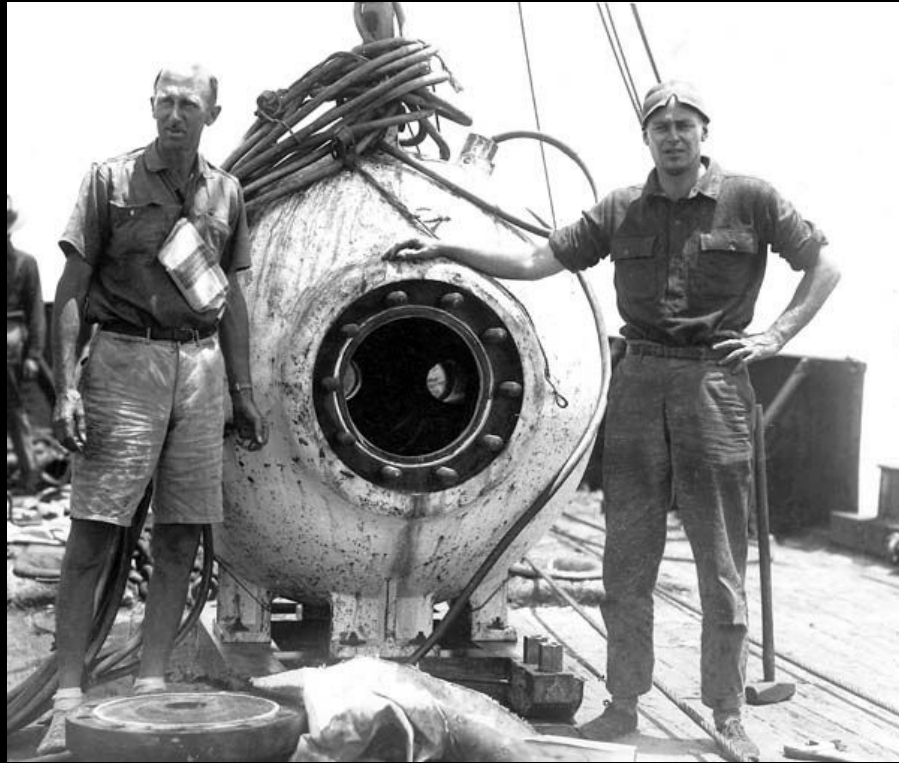


# HMS Challenger

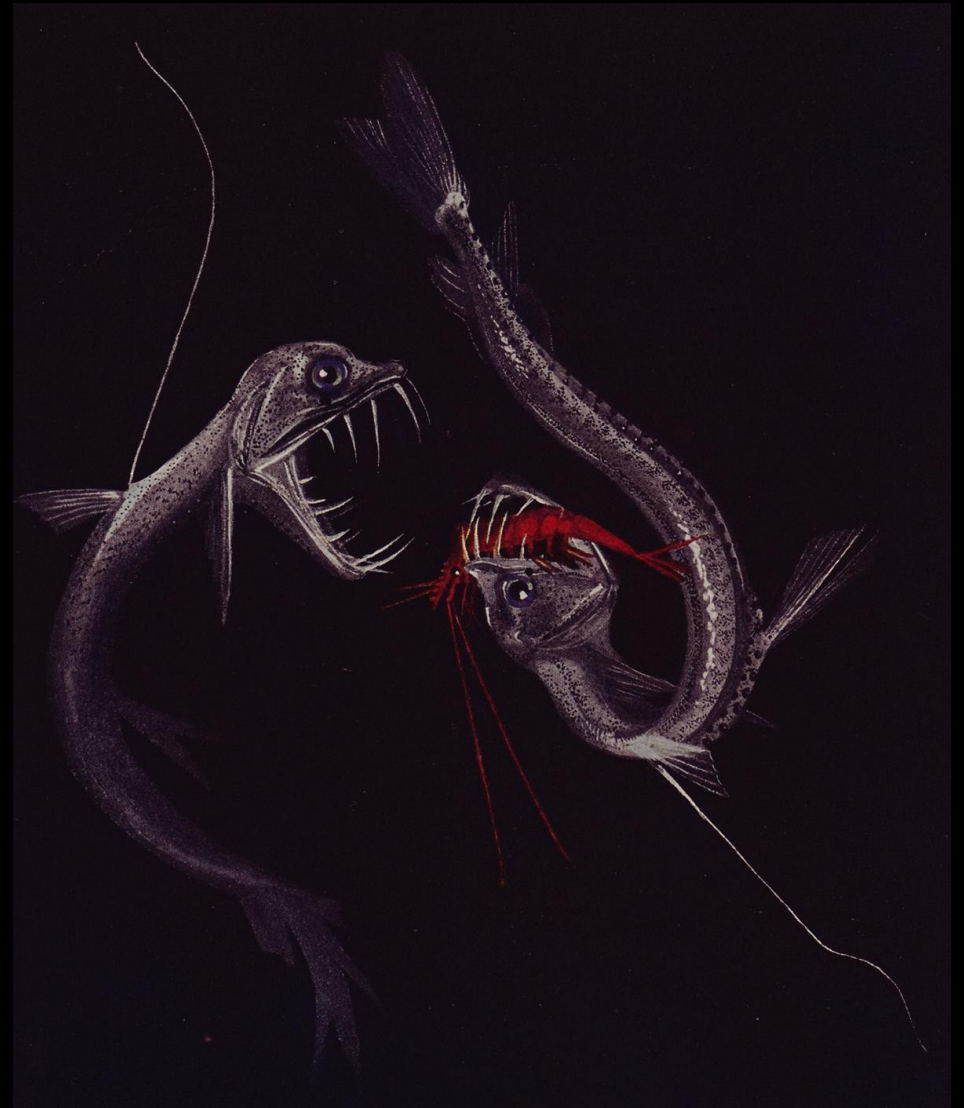
A complex legacy



# The Bathysphere (1932)



[www.oceanographerschoice.com](http://www.oceanographerschoice.com)

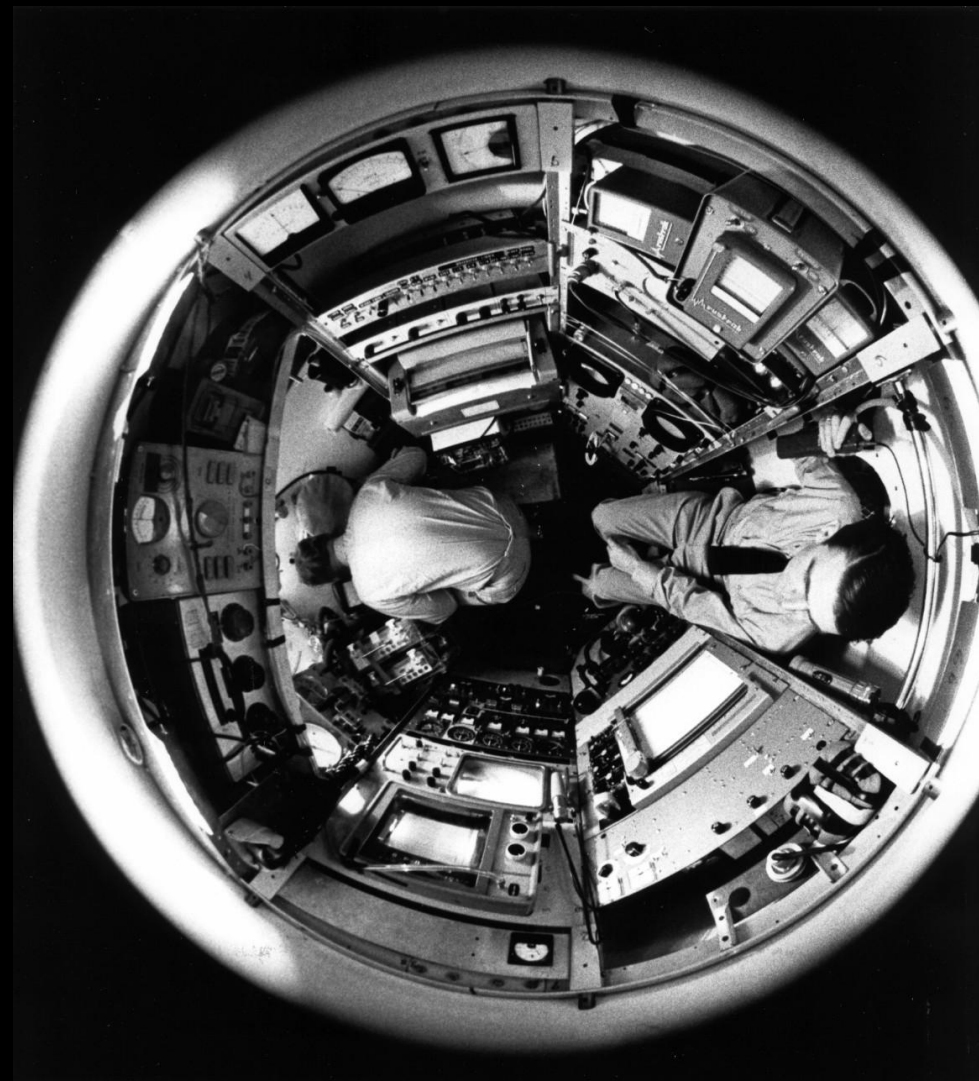
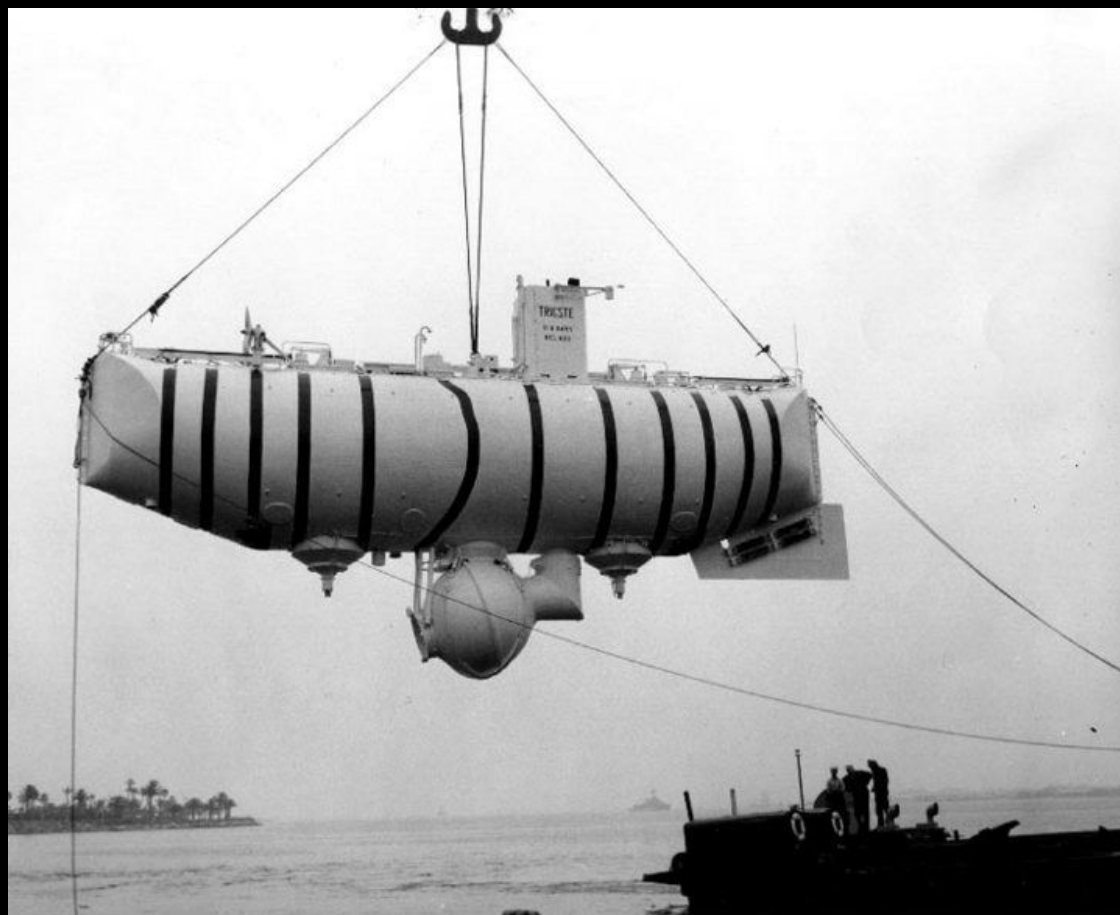


Drawing by Estelle Bostelmann (National Geographic) of two young viper fish as observed by Beebe and Barton from their bathysphere in the depths off Bermuda (1932).

©National Geographic Society; Illustration by E. Bostelmann.

# Bathyscape Trieste (1960)

First descent to the Challenger Deep, 10,915

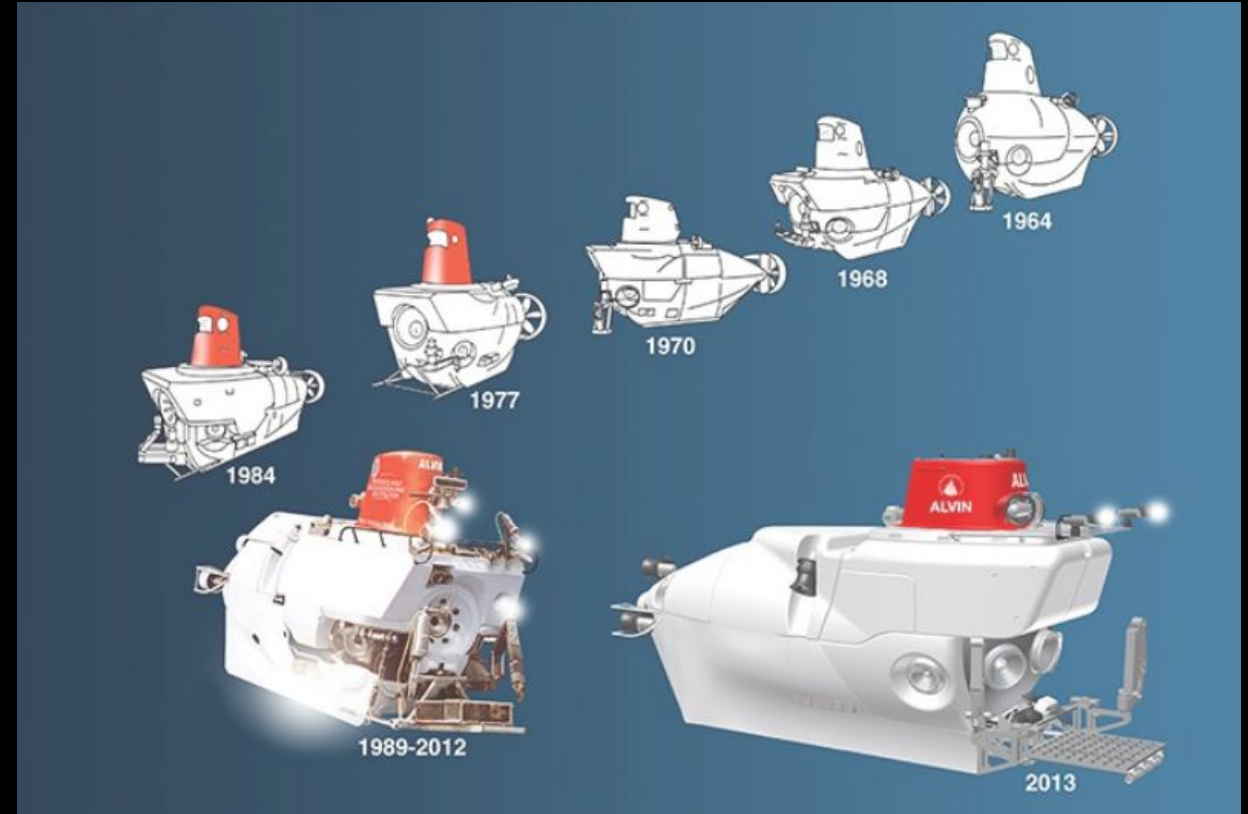


# Alvin Submersible 1964 ... to present



Alvin

Photo: WHOI

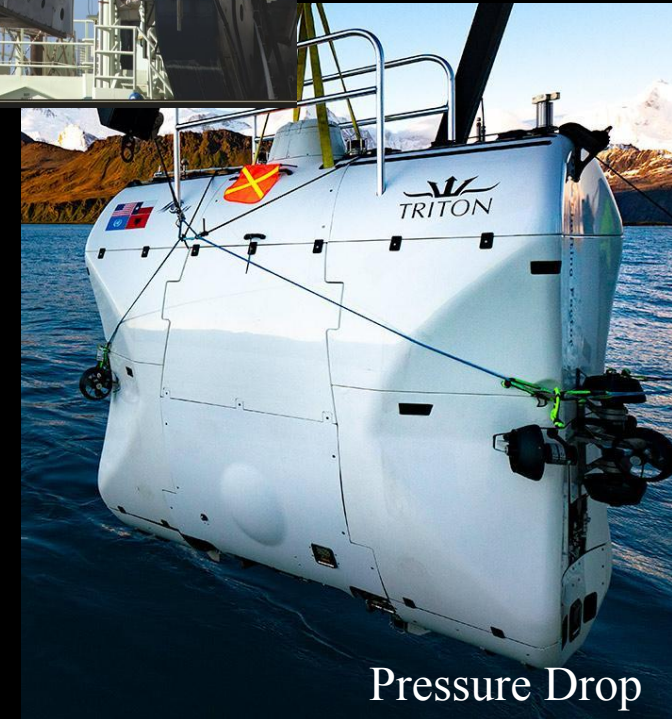
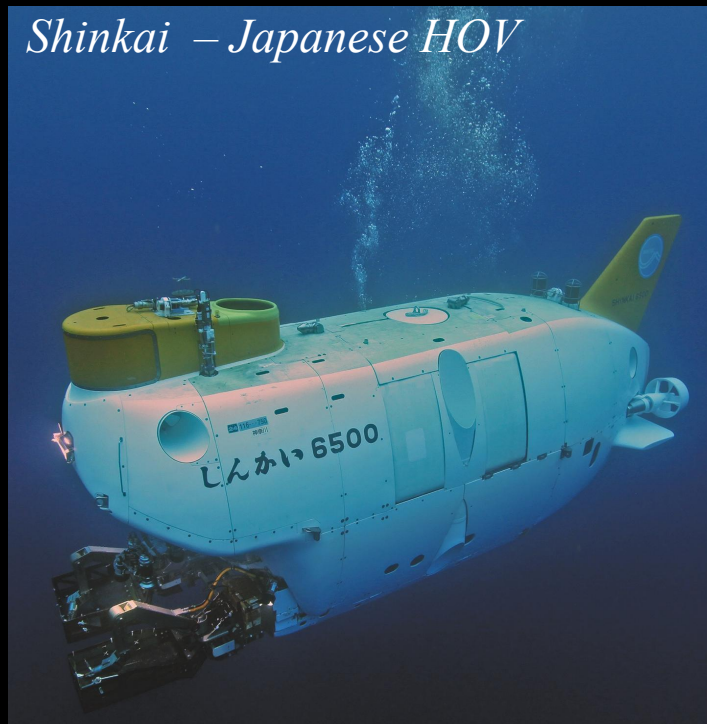


# Human Occupied Vehicles

Alvin Submersible



*Shinkai – Japanese HOV*

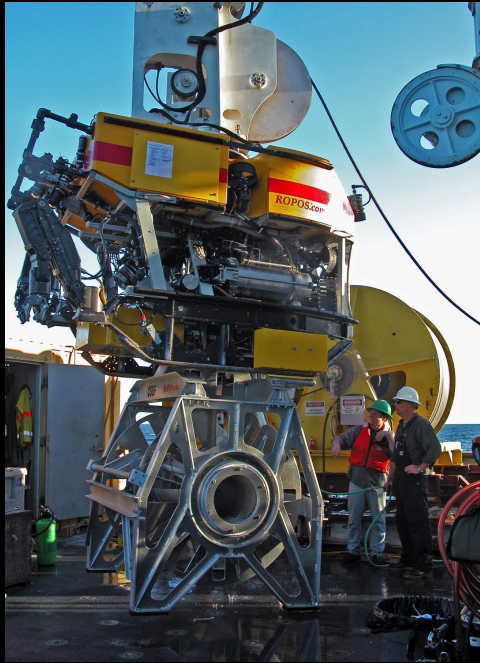


Pressure Drop

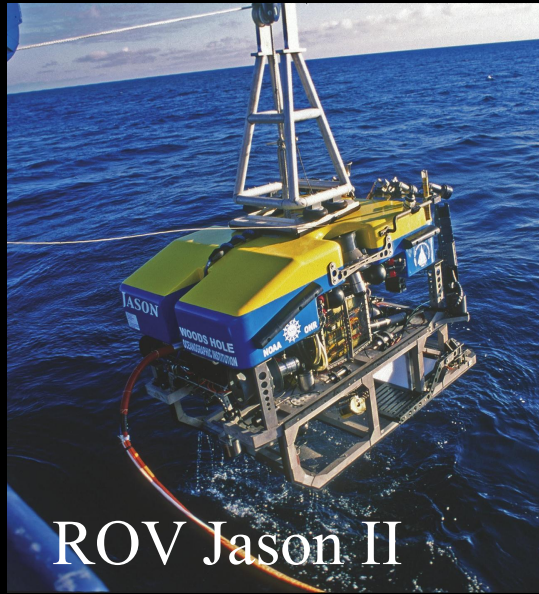
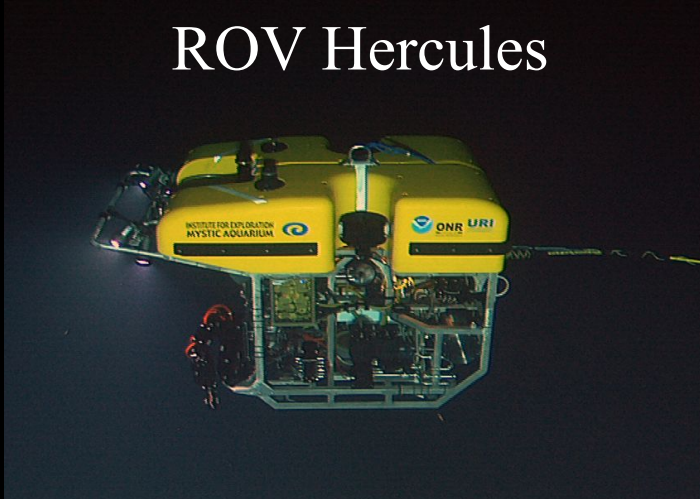


French HOV *Nautilie*

ROV *ROPOS*



ROV Hercules



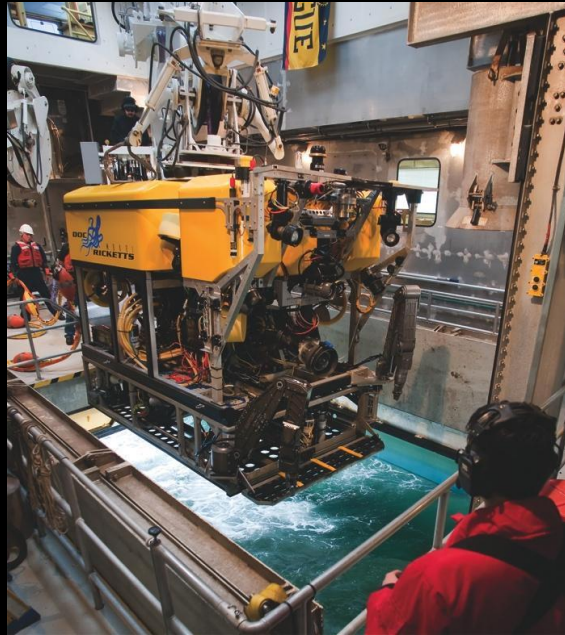
ROV Jason II



Remotely  
Operated  
Vehicles



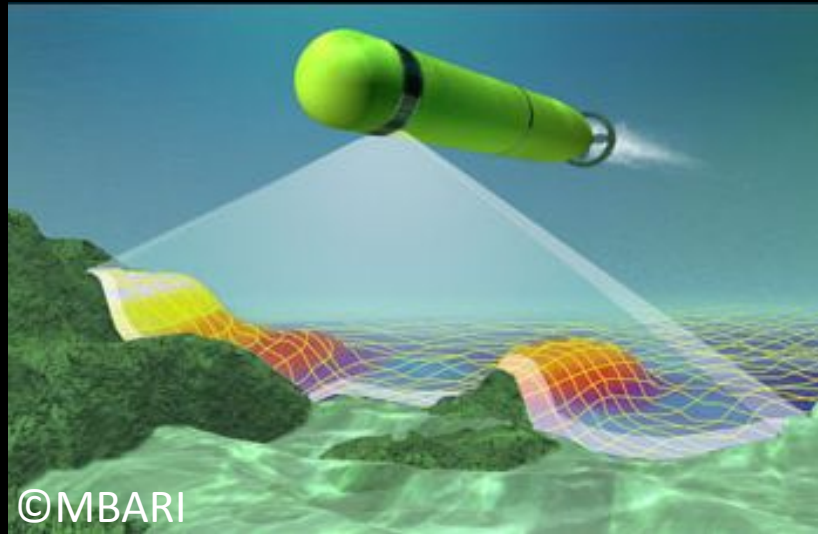
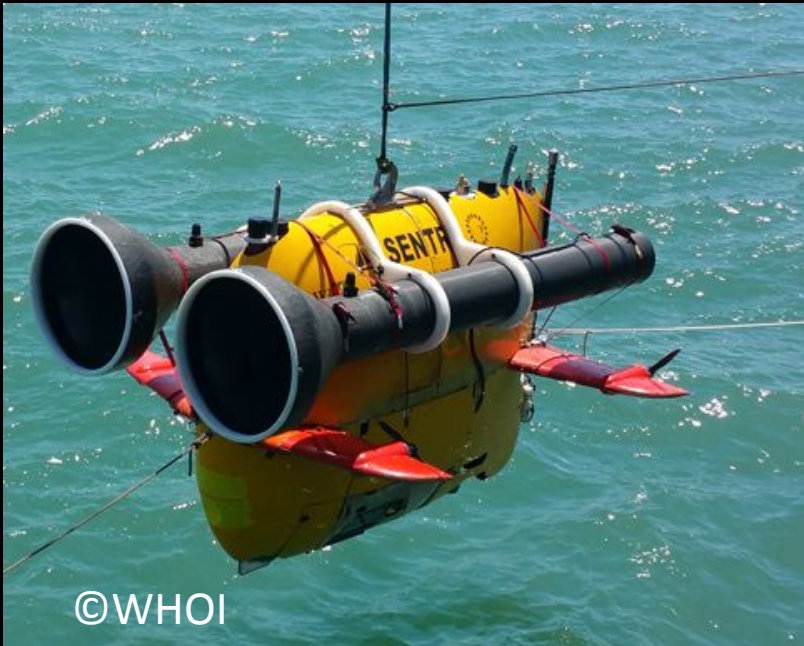
ROV *Victor*



ROV Doc Ricketts



ROV Subastian

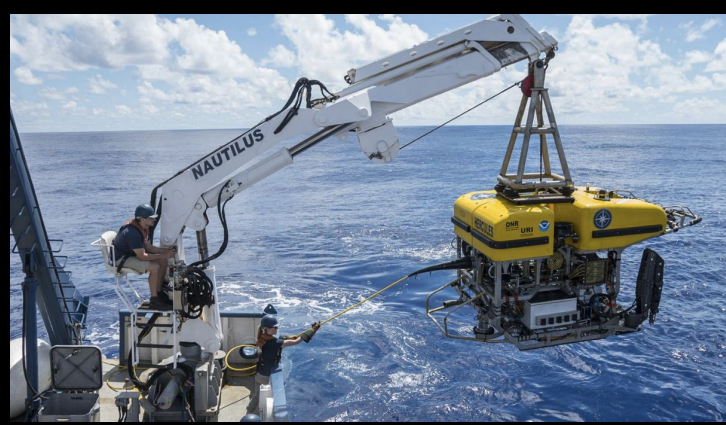


©MBARI



# Autonomous Underwater Vehicles

©WHOI



## Then

## Now

## Future

- Not open to all
- Samples and data not in a repository
- Not much metadata or global datasets
- Training was on the job
- Inseparable from exploitation

- More broadly accessible
- Samples and data are (supposed to be) available
- Big data sets
  - Machine Learning
- Training programs
- Largely driven by fundamental research

???



“We can only sense that in the deep and turbulent recesses of the sea are hidden mysteries far greater than any we have solved.”

- In *The Sea Around Us* (1951) by R. Carson.

