Welcome to the Deep Sea

A brief introduction to past and present deep-sea research

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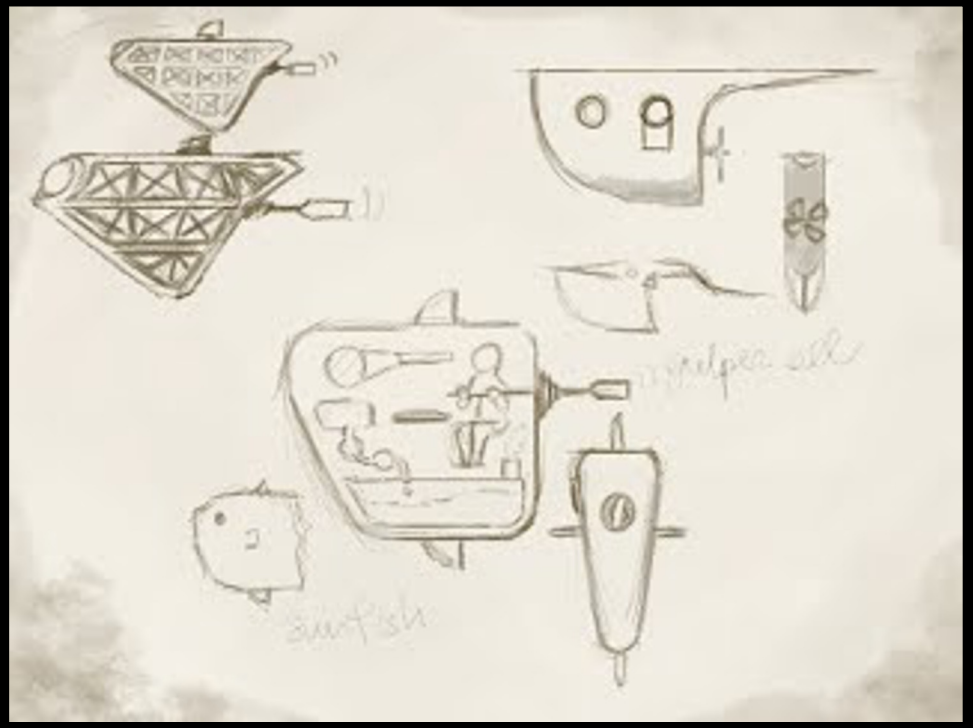
DeSSC New Users Workshop 2025
(Adapted from Dorsey Wanless, Boise State University)

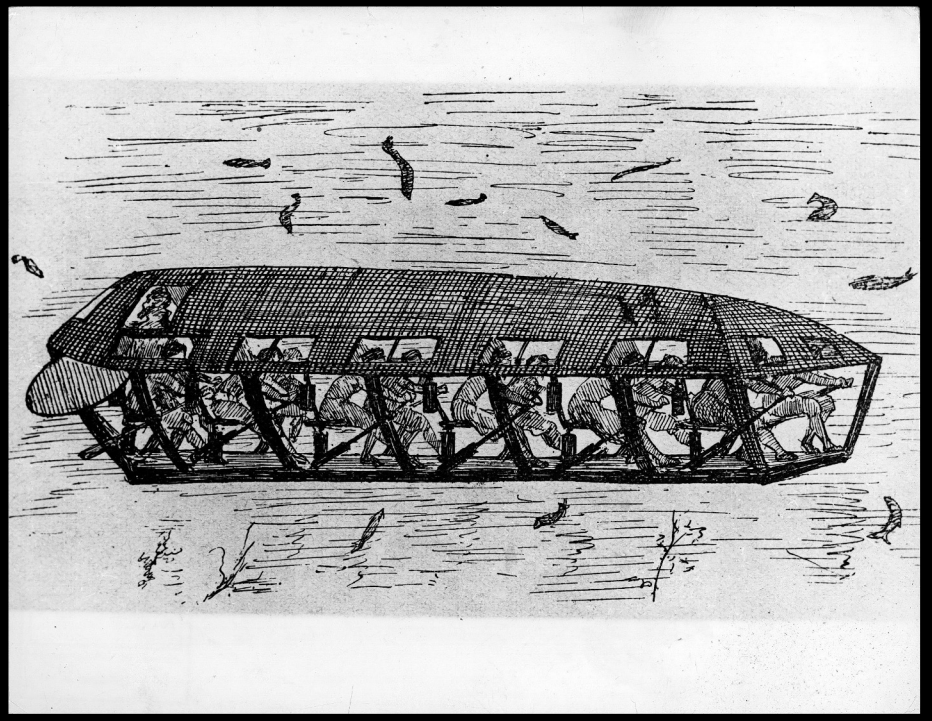
Early Ideas for Submarines

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



At least 14 different submarine designs were patented by 1727

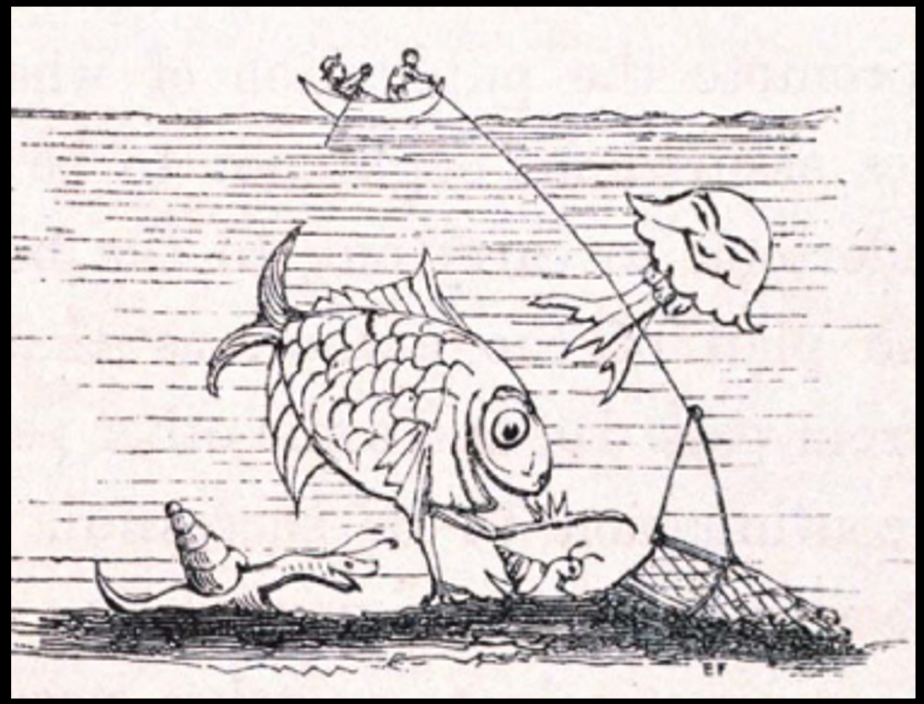
Cornelius van Drebbel (a Dutch Inventor) was the first to actually build a submarine 1620

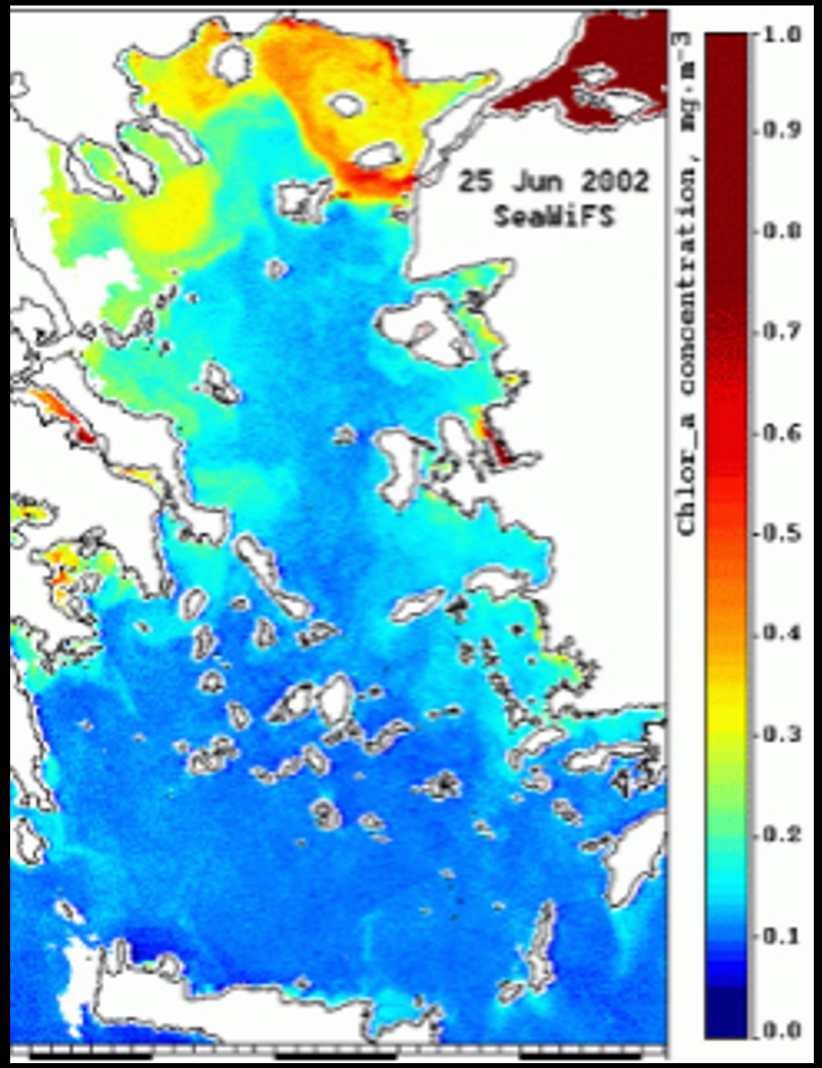


It completed several journeys on the Thames River at a depth of 12- 15 feet

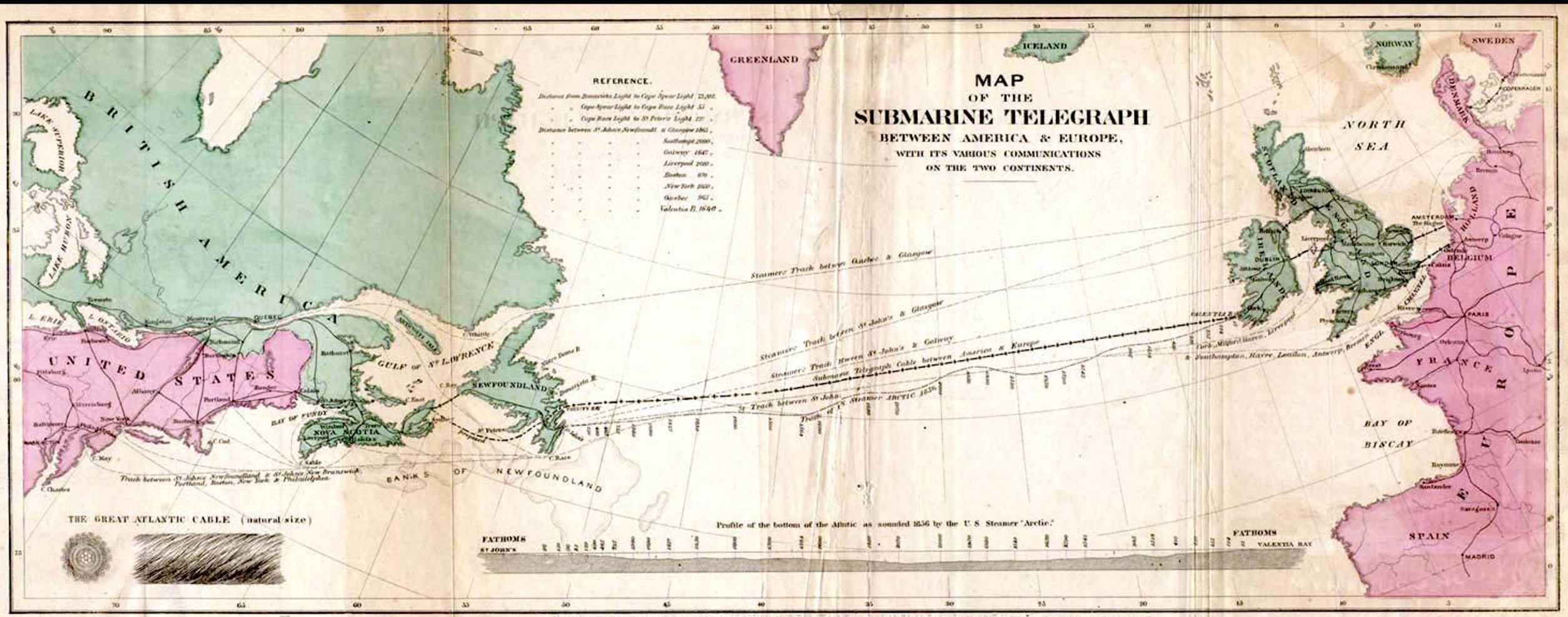
The Azoic Hypothesis

no life below 550 meters depth





Telegraph Cables

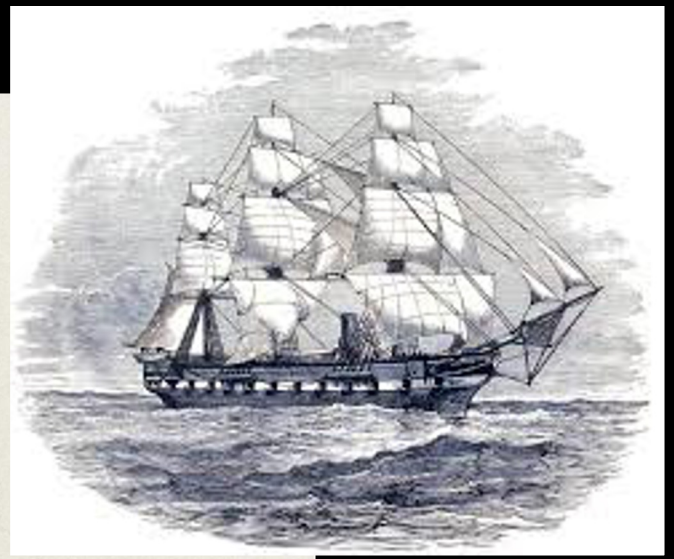


Printed for HOWE'S ADVENTURES & ACHIEVEMENTS OF AMERICANS.

Telegraph Cables

Telegraph Cables

HMS Challenger

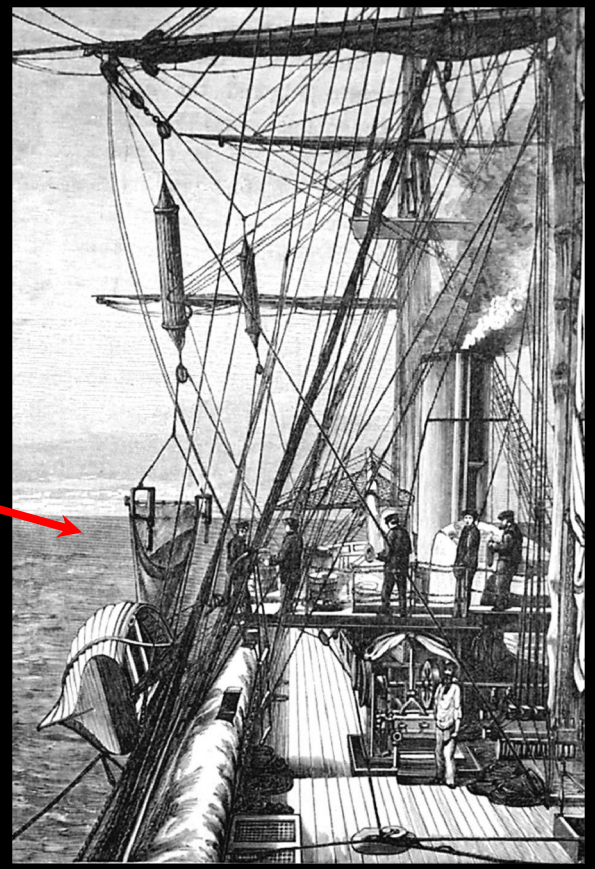


1872 – 1876 First scientific expedition organized to gather data about a wide range of scientific features and processes (temperature, chemistry, water depths, currents, and marine life).

http://19thcenturyscience.org/HMSC/HMSC-Reports/1912-Murray/PDFpages/-1912-Murray.html

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."

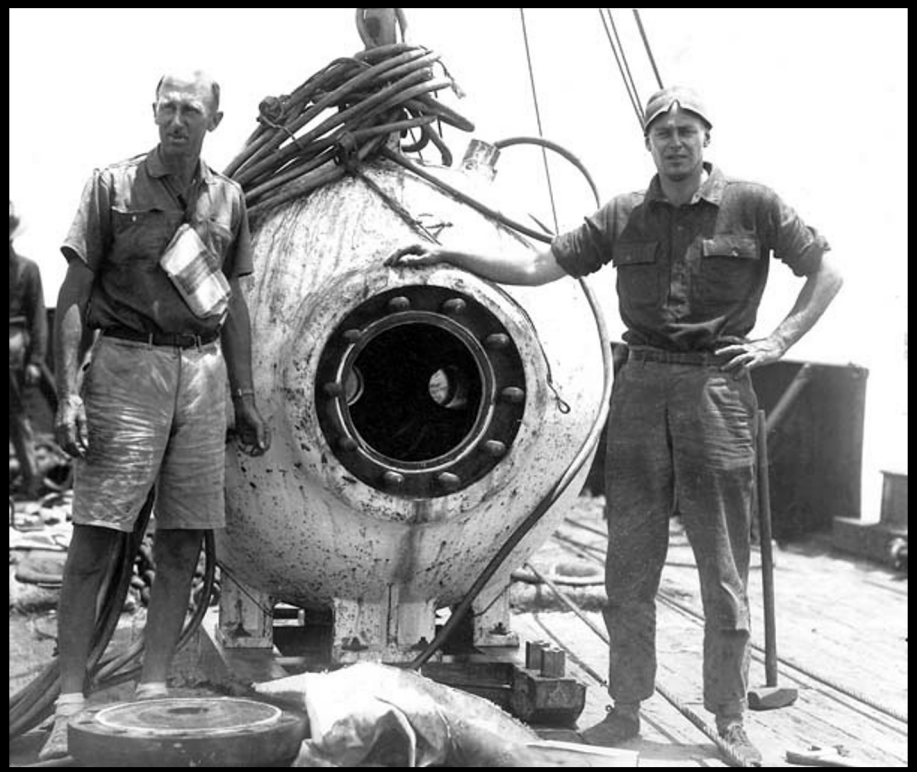
-Professor Moseley in "*Notes of a Naturalist*" on the Challenger, p. 501.

Bathymetric Map of North Atlantic by Sir John Murray

Made the first systematic attempt to chart the basins of the worlds oceans (492 bottom soundings)

HMS Challenger
A complex legacy

The Bathysphere (1932)

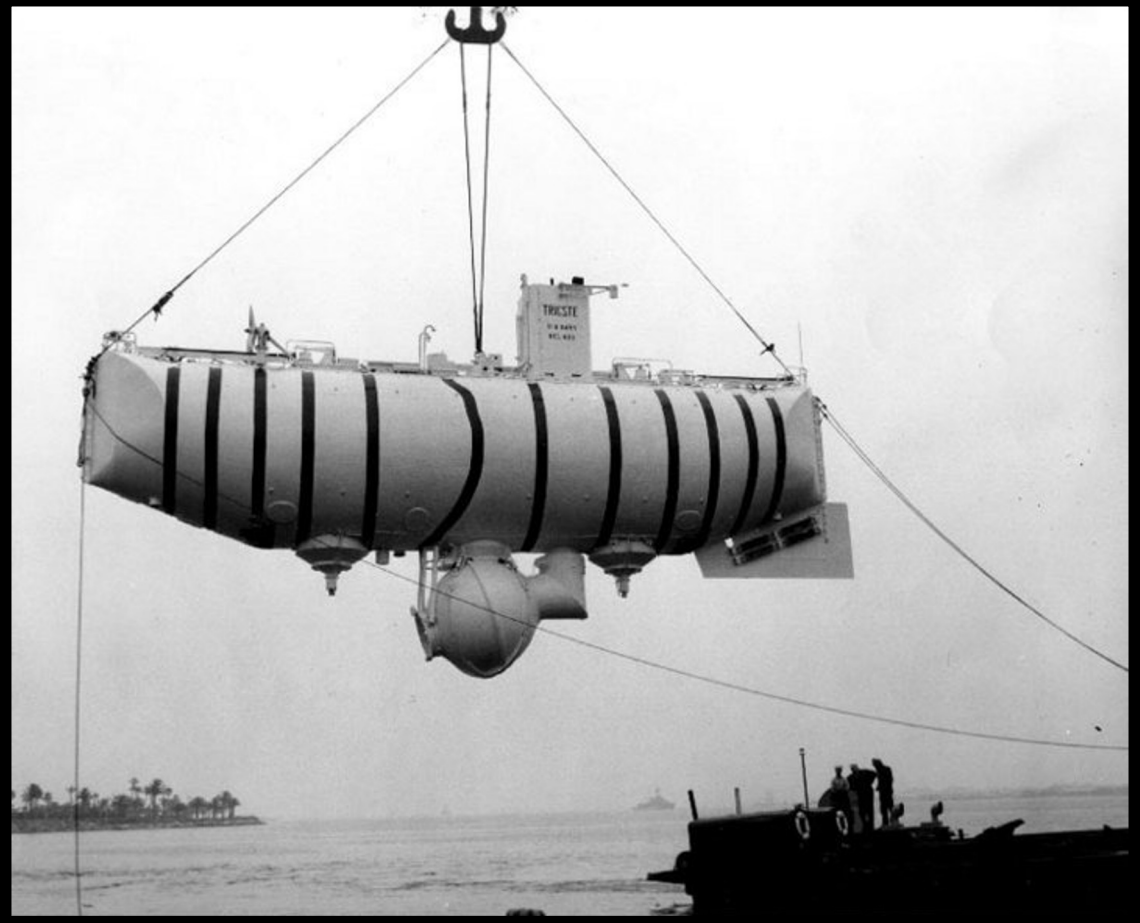


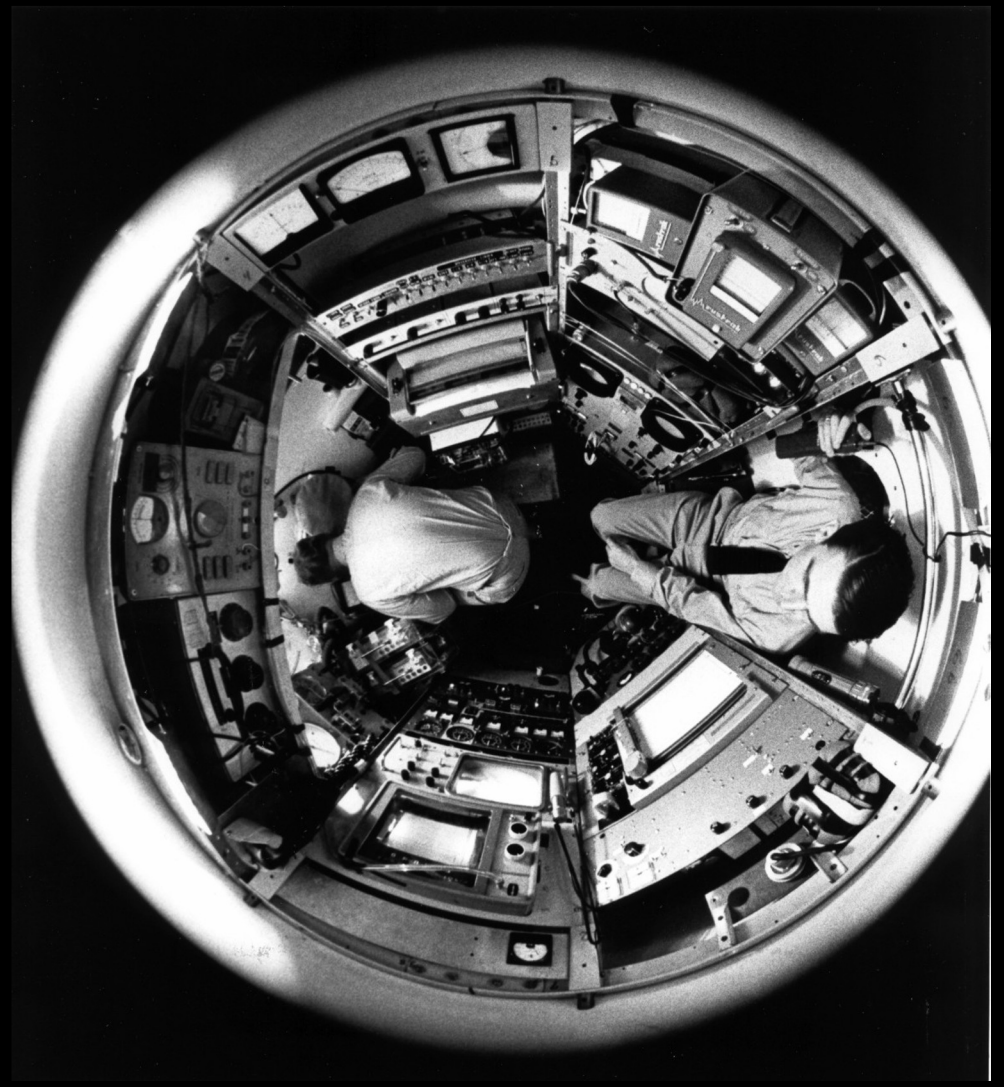
www.oceanographerschoice.com

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

Bathyscape Trieste (1960)

First descent to the Challenger Deep, 10,915





Alvin Submersible 1964 … to present

Alvin

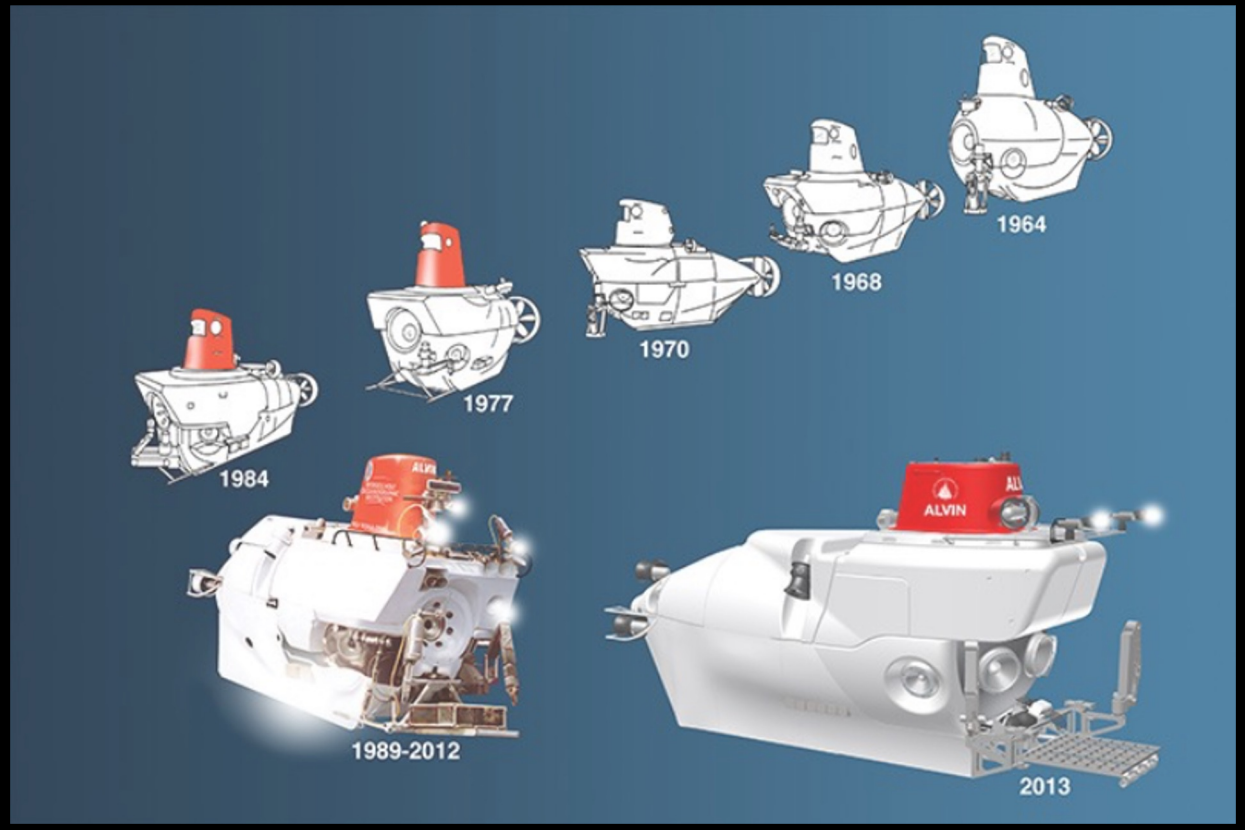
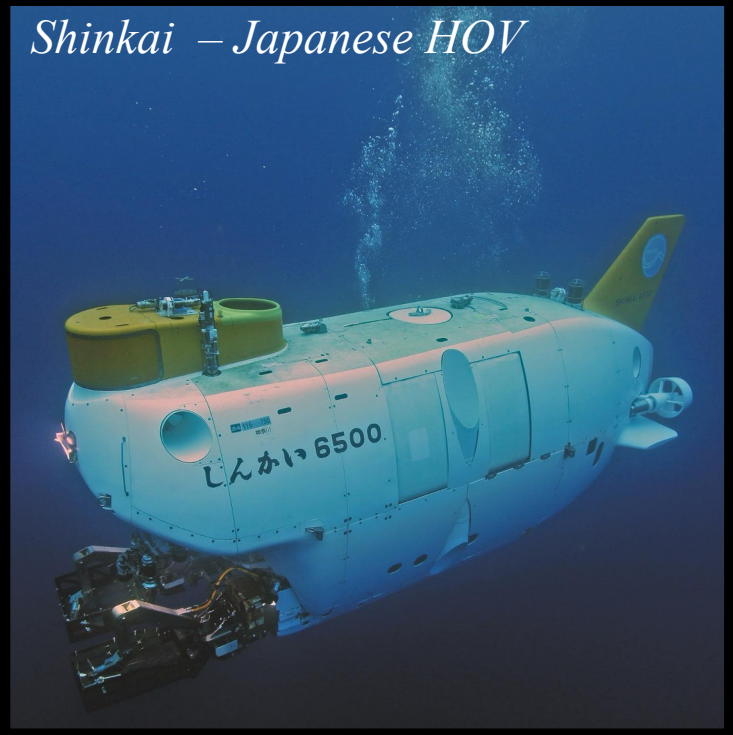


Photo: WHOI

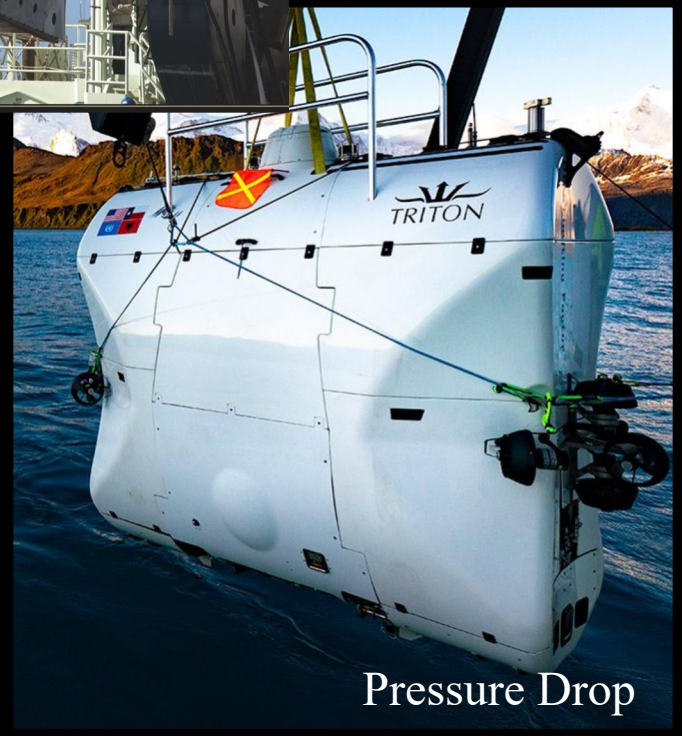
Human Occupied Vehicles

French HOV *Nautile*



Shinkai – Japanese HOV

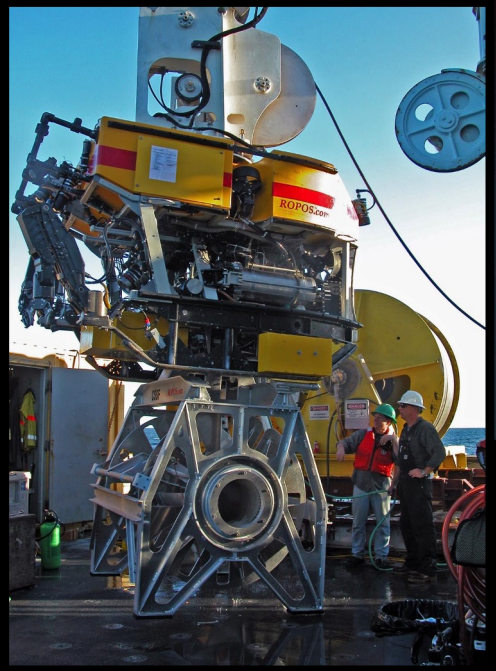
Alvin Submersible



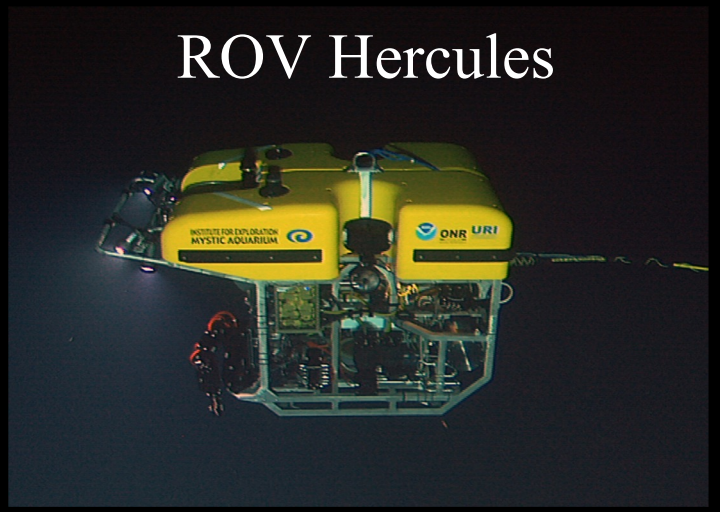
Pressure Drop

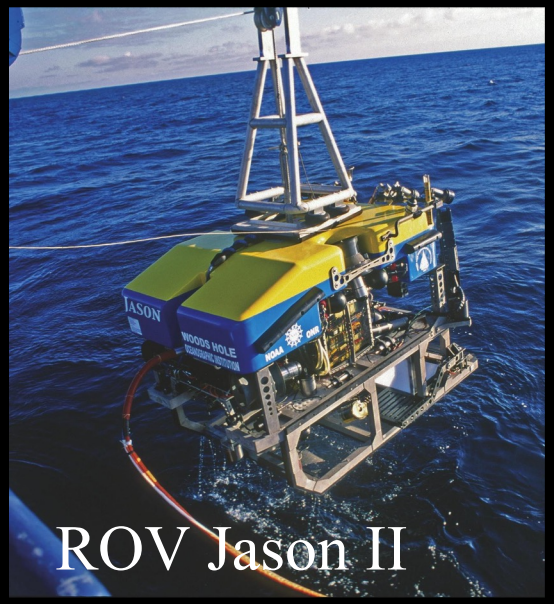
Remotely Operated Vehicles

ROV *ROPOS*



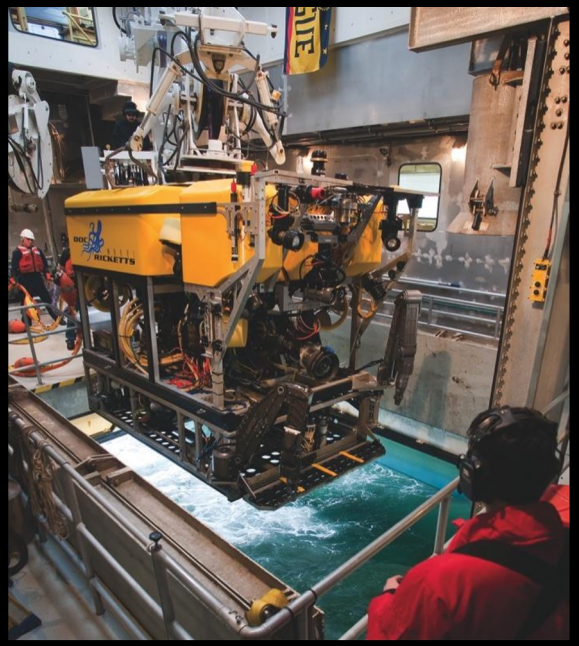
ROV Hercules





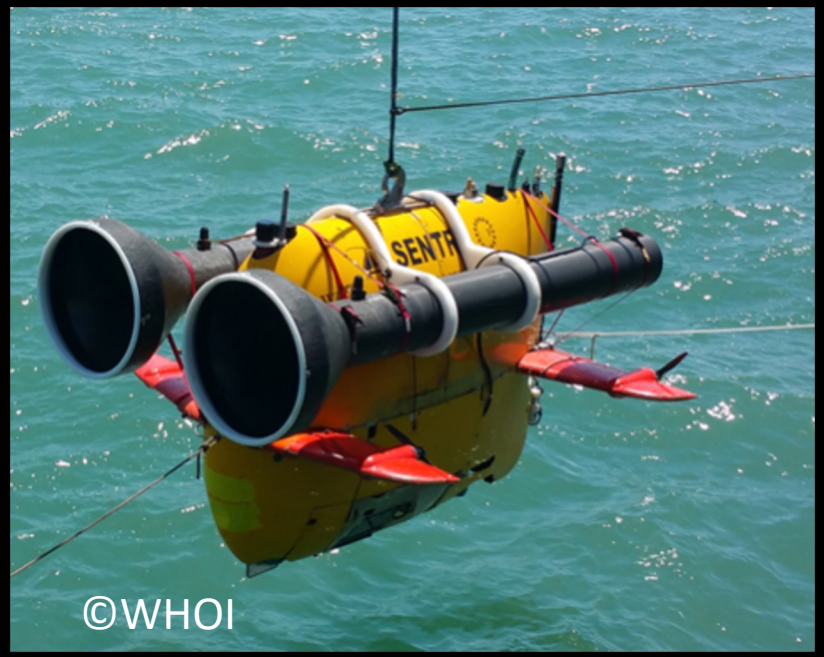
ROV Jason II

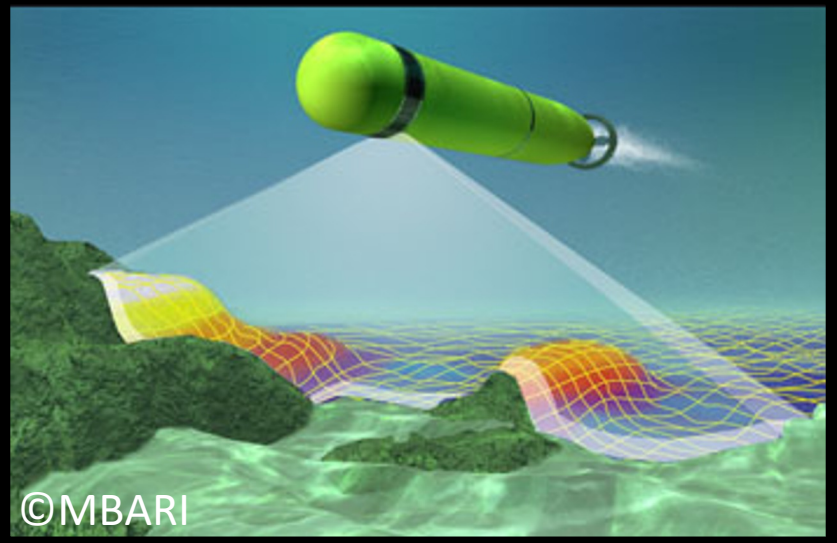
ROV

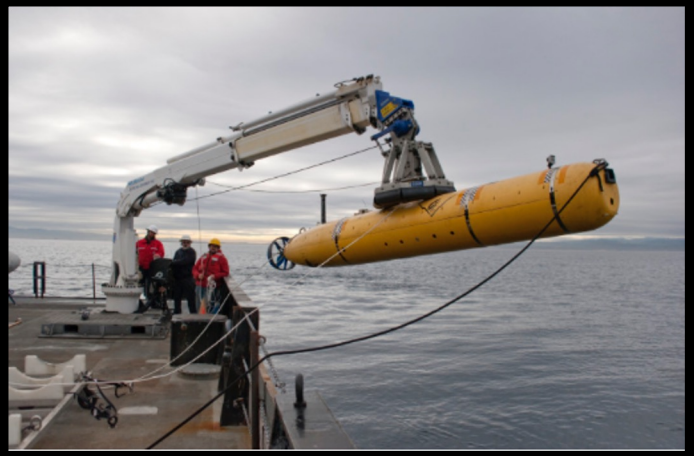


ROV Doc Ricketts

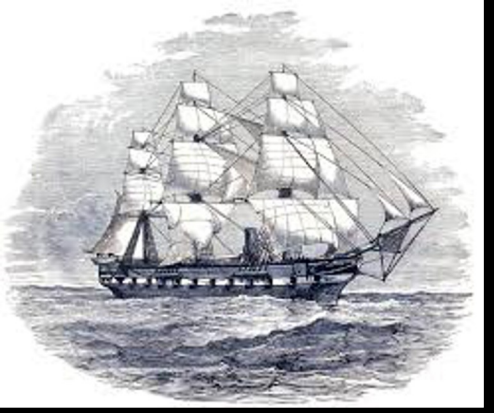
ROV Subastian

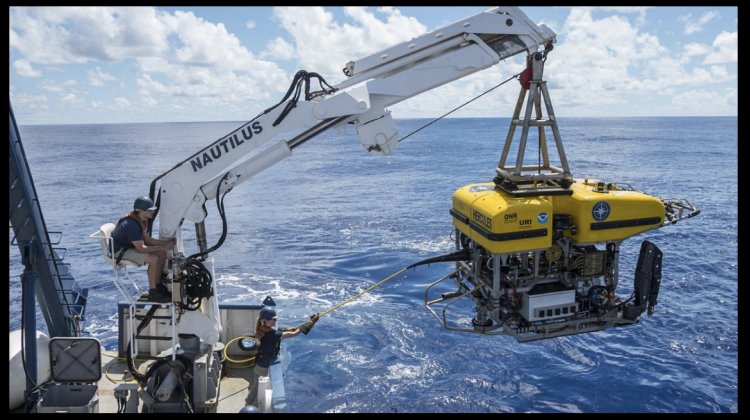






Autonomous Underwater Vehicles





Then

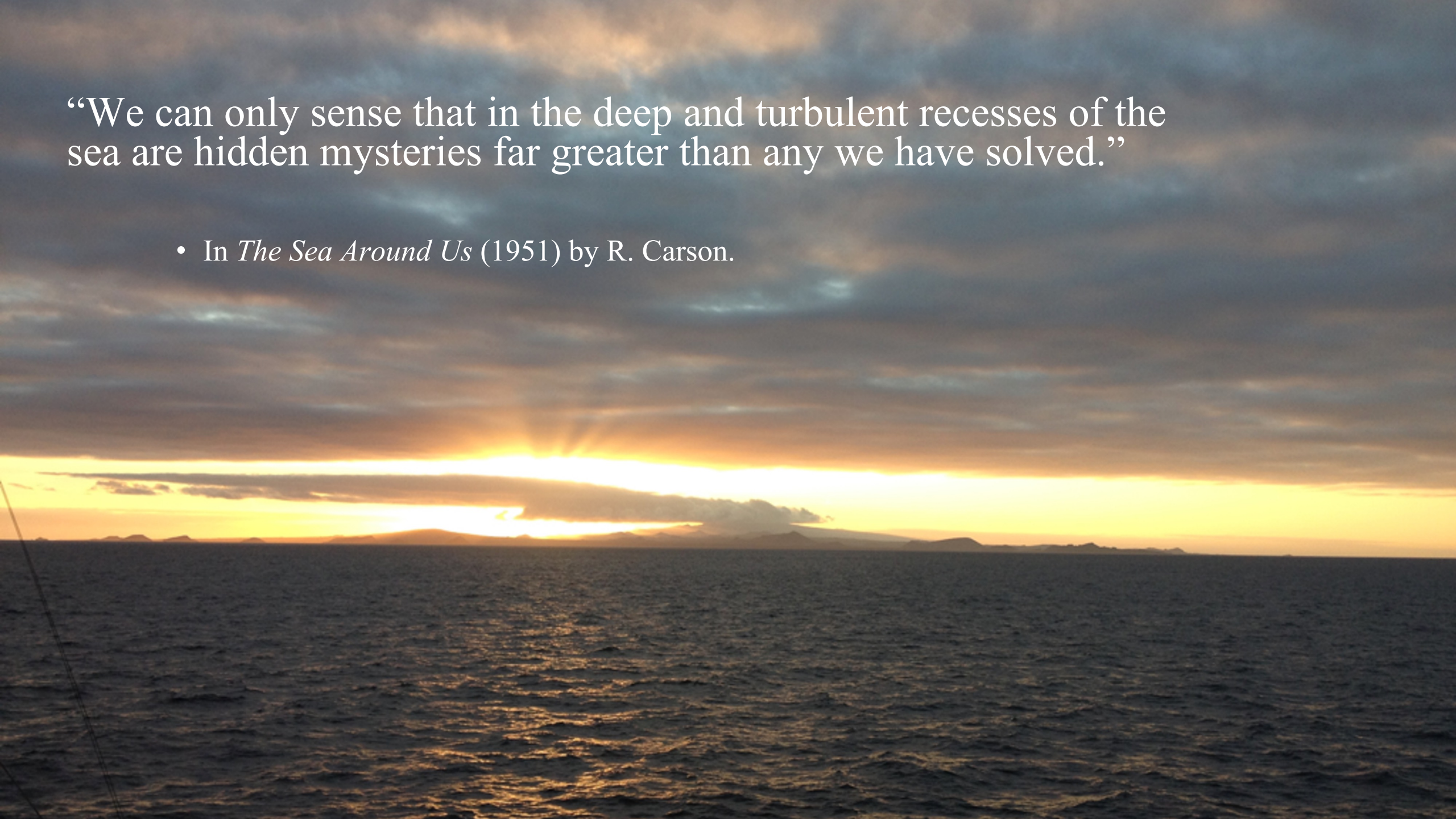
- Not open to all
- Samples and data not in a generally accessible repository
- Not much metadata or global datasets
- Training was on the job
- Inseparable from exploitation

Now

???

Future

- 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.