

Bigelow | Laboratory for
Ocean Sciences

IMPACT REPORT 2021





From the surface to the seafloor,
our science makes an

impact



The ocean gives our planet life. Despite all it does for us, we still know so little about it. It remains largely unexplored and deeply mysterious, brimming with unknown life and untapped potential.

Perhaps nowhere better exemplifies this than the deep sea. As the consequences of climate change mount and emerging industries look to the potential resources of this enigmatic region, research is urgently needed.

From phytoplankton in sunlight surface waters to microbes in darkness beneath the seafloor, Bigelow Laboratory scientists work around the world to make discoveries and create solutions. I hope you enjoy this snapshot of some of the ways our bold ocean science has made an impact during the last year.

A handwritten signature in dark ink that reads "Deborah A. Bronk".

DEBORAH BRONK, PhD, *President and CEO*

READ THE IN-DEPTH STORIES BEHIND OUR PROGRESS AT IMPACT2021.BIGELOW.ORG



Ocean Health & Function

WE REVEAL HOW THE OCEAN WORKS AND HOW TO BETTER CARE FOR OUR PLANET.

The tenacity of life holds key insights into overcoming environmental challenges. This year, our scientists revealed how some species of photosynthetic algae lived through the last mass extinction event and the resulting months of darkness. This discovery helps illuminate their unrecognized connections to global processes and raises fundamental questions about their role in the ocean.

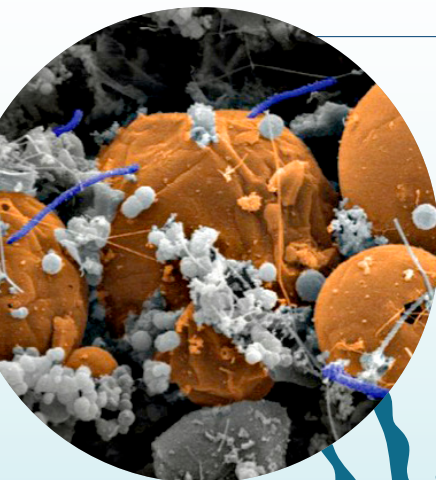
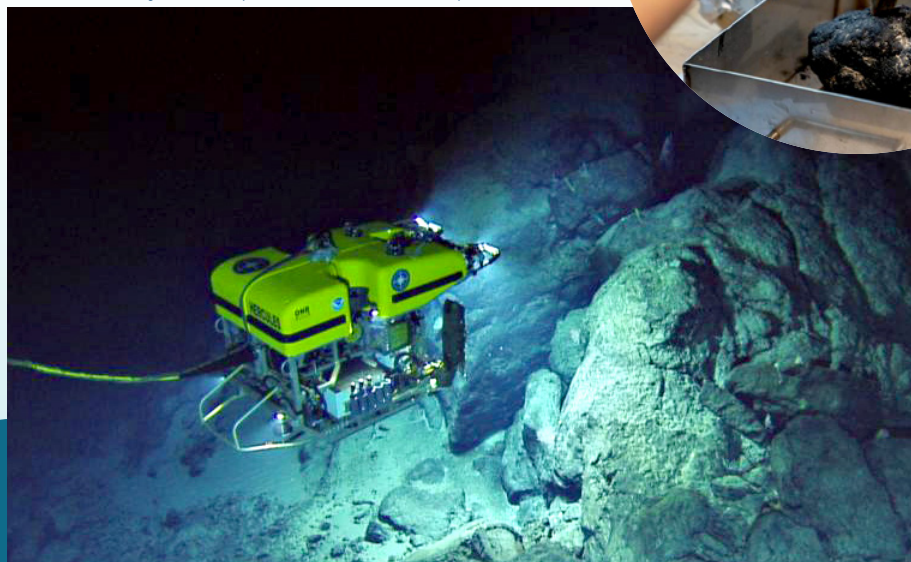


Photo: Luc Riolon

Even on a microscopic level, the past can illuminate our future. Research led by Bigelow Laboratory revealed that a group of microbes have been at an evolutionary standstill for millions of years. The discovery may have significant implications for biotechnology applications and even how scientists understand microbial evolution.

The seafloor is a trove of potential discoveries and resources, but it remains largely unexplored. It is also home to sensitive organisms that play critical ecological roles and offer valuable insights. This year, our researchers launched an international effort to better understand the impacts of emerging industries on these environments. Their findings will guide use of this important frontier.

Photos, below and right: Ocean Exploration Trust, NOAA Ocean Exploration, NOAA ONMS





As the Earth warms and its population grows, pressure is mounting to optimize food production and decrease its impact on the planet. Our scientists are leading teams across the Northeast to develop seaweed-based dietary supplements to reduce methane emissions from cattle and improve the environmental and economic sustainability of dairy production.

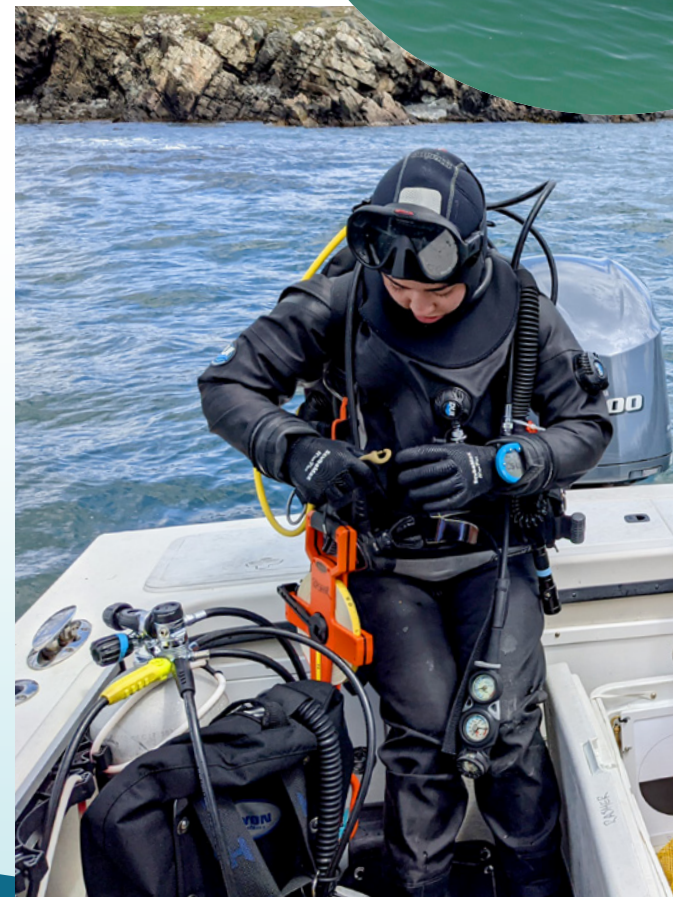
North Atlantic right whales play a vital ecological role but are some of the most endangered animals on the planet. Our researchers shed light this year on future whale habitats in the rapidly warming Gulf of Maine. Their work will aid proactive conservation and management efforts to restore the whales' population.

Plankton are some of the most numerous and important organisms in the ocean. The balance of chemical elements inside them shapes food webs and global carbon cycles. This year, our researchers discovered that processes in the subsurface ocean control these ratios. This understanding will allow scientists to better predict how oceans will respond to climate change.



Our Changing Planet


WE FOCUS ON KEY SPECIES TO PREDICT, COMBAT, AND ADAPT TO CLIMATE CHANGE.





The Ocean's Potential

**WE DEVELOP THE TOOLS AND UNDERSTANDING NEEDED
TO UNLOCK THE INCREDIBLE OPPORTUNITY OF THE OCEAN.**



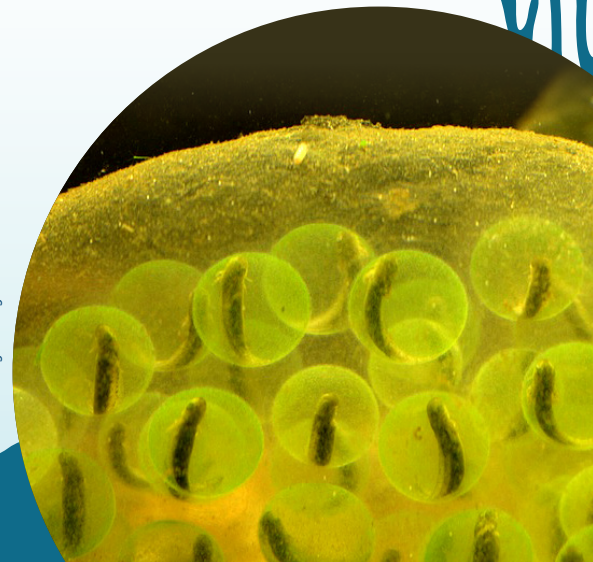
All organisms leave genetic traces of their presence, and this environmental DNA can be used to help manage and care for aquatic ecosystems. Our scientists are currently helping lead a statewide effort to pioneer the technology needed to turn this DNA into discoveries about key organisms and their responses to environmental changes.

Photo: Rene Francolini

Satellites, sensors, and genomic sequencing flood scientists with an increasing amount of information each day. Effectively utilizing this “big data” is the next major opportunity for ocean science. This year, we launched a new center to use artificial intelligence and other cutting-edge approaches to create data-driven forecasts that help people use and care for the ocean.

The relationship between a particular salamander and an alga has the surprising potential to unlock new medical solutions. Our researchers worked this year to understand the connections between the organisms and the effects they have on each other. The results could lead to innovative drugs that regulate human immune systems and tissue repair.

Photo: Roger Hangarter





Thank you

Bigelow Laboratory is an independent, nonprofit institute. Our work is only possible with the help of a generous community of supporters. They share our passion for the ocean and our optimism about its boundless potential. They advise us, inspire us, and provide the philanthropic support that powers our work.

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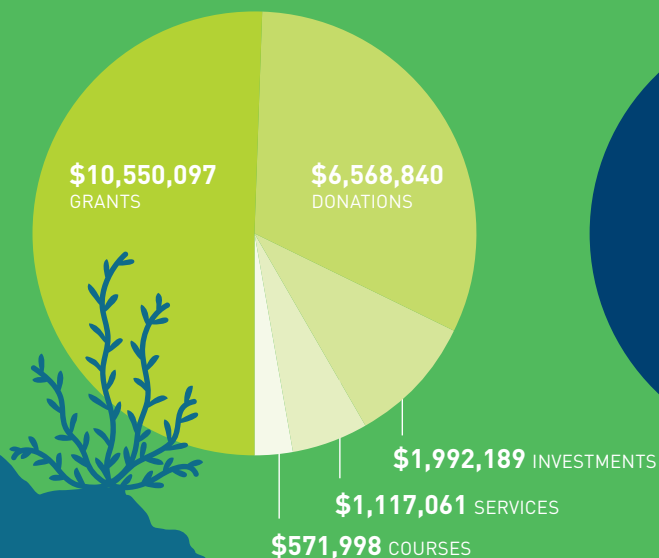
2021 FINANCIALS

JULY 1, 2020 – JUNE 30, 2021

View our audited financial report at bigelow.org/financials.

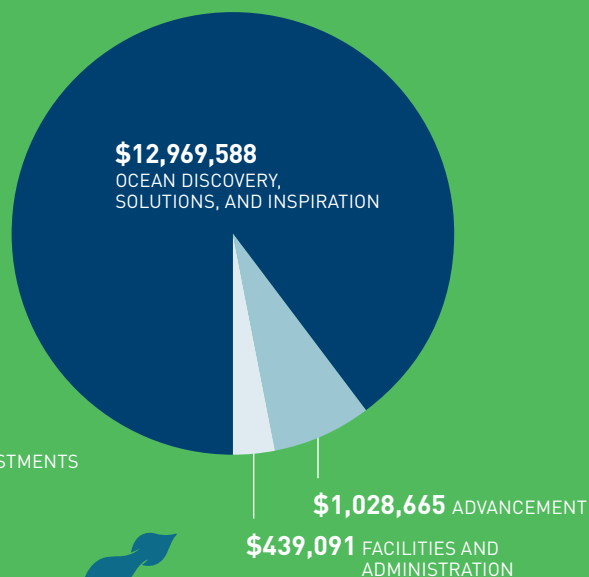
Revenue

\$ 20,800,185 TOTAL



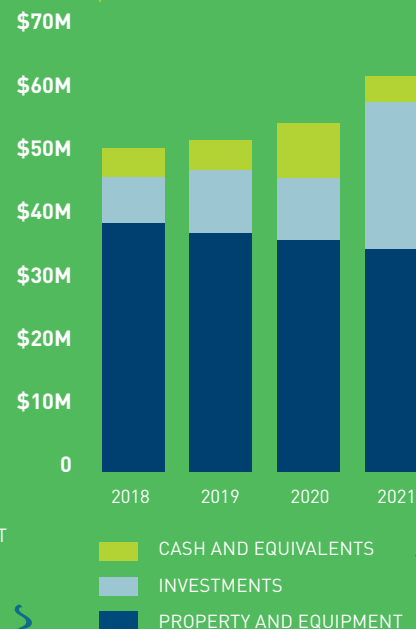
Expenses

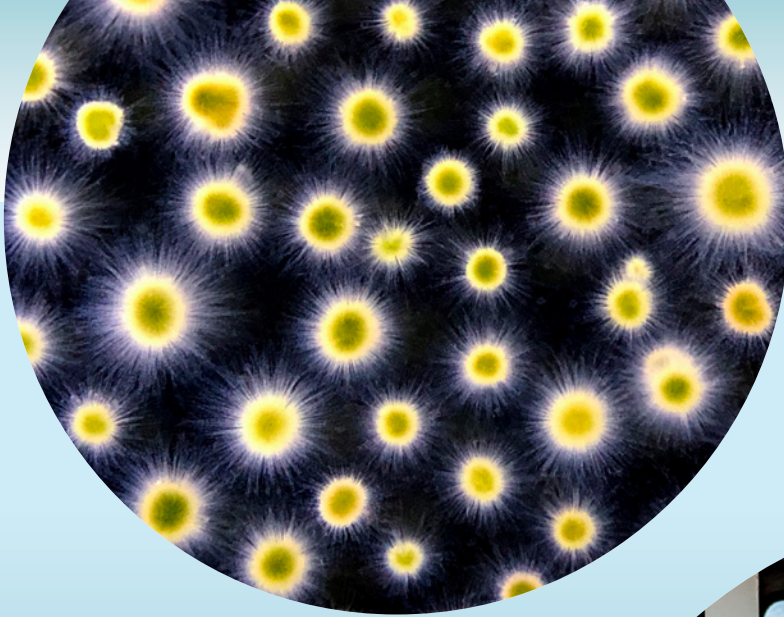
\$14,437,344 TOTAL



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2018–2021





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Photos, left to right: Peter Countway, Atlantic Sea Farms, Colby College, Peter Countway, Yoon Byun

