Accomplishments for Fiscal Year 2022
NOAA's Atlantic Oceanographic and Meteorological Laboratory

Cutting-edge Earth system research and observations for the Atlantic region to assess, predict, and project changes in weather, climate, ocean, and marine ecosystems.

Letter from the Director

_____

Our team at NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML) worked diligently throughout fiscal year (FY) 2022 to carry out NOAA's mission. This document highlights AOML's major accomplishments for FY22 and the impact our research has on the South Florida community, the nation, and the world. It also reflects our strategic objectives in support of NOAA's Office of Oceanic and Atmospheric Research (OAR).

From the opening of our state-of-the-art data center to the deployment of new, advanced uncrewed observing systems, AOML is at the forefront of cutting-edge scientific research. In FY22, AOML successfully executed numerous field campaigns, developed and tested new instruments and models, observed new areas of the Earth system, and published 134 scientific papers, all while actively seeking ways to incorporate diversity, equity, inclusion, and accessibility. I am honored to lead this dedicated team of scientists and administrative, information technology, communications, facilities, and engineering staff and highlight their many accomplishments over the past year.

I would like to express my sincere appreciation to the entire AOML community, and for the invaluable support of our cooperative institutes, cooperative science centers, partner programs, and collaborators across NOAA this past year.

We look forward to celebrating our 50th anniversary and using this major milestone to reflect on how far we have come, as well as how to build on decades of accomplishments to make the most impact. With a focus on the future, we aim to empower our team; observe, assess, and model components of the Earth system; and to transition our research to support NOAA's mission and serve the nation.

_____

Sincerely,

Dr. John Cortinas
Director of NOAA's Atlantic Oceanographic and
Meteorological Laboratory, Miami, Florida

Preface

Our research portfolio encompasses ocean, coastal, and atmospheric research to ready the Nation for changes driven by weather, climate, and pressures on marine ecosystems. We are diligently working on creative solutions for some of society's most critical challenges, including climate change, extreme weather events, degrading water quality and ecosystem health, to better serve the needs of diverse communities.

Our laboratory is dedicated to helping NOAA achieve its goals of building a climate ready nation, protecting lives and property, developing cutting-edge models and instruments, and observing the Earth system from the bottom of the seafloor to the tops of tropical cyclones, all while creating a diverse, equitable, inclusive, and accessible workplace and focusing on ways our research can support vulnerable communities.

Whether in the field (flying into storms, spending months at sea) or in the lab (developing and improving models, analyzing samples, running experiments), we gather data and develop products that assist decision makers, emergency managers, other scientists, and communities across this Nation and around the world. The following accomplishments describe some of the high impact work we conducted in FY22 and align with the goals set out in our strategic plan.

Expanding Our Reach Through Partnerships

We are grateful for our Cooperative Institute partners, the Cooperative Institute for Marine & Atmospheric Studies (CIMAS) and the Northern Gulf Institute (NGI), who work with us as a cohesive unit to execute our mission and advance scientific discovery.

We also appreciate our numerous research partners and funders who support our work across the world and make so much of our work possible. The following accomplishments are supported in part by NOAA's Climate Program Office, Coral Reef Conservation Program, Global Ocean Monitoring and Observing Program, Integrated Ocean Observing System, National Weather Service, National Marine Fisheries Service, Office of Marine & Aviation Operations, Ocean Acidification Program, and Weather Program Office.

Goal 1: Empower Our Team

Create an inclusive and cutting-edge environment that fosters discovery, exploration, and success.

AOML Hosts Record Number of Interns

During FY22, AOML hosted a record breaking 30 interns, ranging from high school students to post-doctoral fellows, including NOAA-William Lapenta interns, NOAA-Experiential Research and Training Opportunities interns, and NOAA-Educational Partnership Program/Minority Serving Institutions interns. They joined us from schools and universities across the country to study corals, microbes, hurricanes, air-sea interaction, ocean dynamics, ocean acidification, communication strategies, and much more.

Intern, Morgan Chakraborty, tends to a coral nursery in Biscayne Bay.

AOML Lab Director Receives Presidential Rank Award

President Joe Biden selected AOML Director John Cortinas, PhD, as a 2022 recipient of the Presidential Rank Award. The award is one of the most prestigious for federal career civil service and recognizes the invaluable contributions of dedicated civil servants in the American federal workforce. Dr. Cortinas was recognized for his exceptional leadership throughout more than 15 years of federal service that has led to significant improvements in NOAA's ability to provide accurate and timely forecasts and warnings for many types of extreme weather. He was also recognized as an exemplary role model by working tirelessly to advance diversity and inclusion across NOAA.

AOML Staff Receive Record Number of Awards

In FY22, 38 AOML scientists and staff members were the recipients of 20 prestigious awards for their excellence in research, career achievement, and community impact. These awards included Department of Commerce Bronze Medals, NOAA Administrator's Awards, a NOAA Team Member of the Month Award, NOAA-OAR Employee of the Year Awards, an OAR 2022 EEO/Diversity Award, the NOAA Silver Sherman Award, a 2022 Women of Color STEM Award, the Mississippi State University-Northern Gulf Institute Research Competitive Award, and IEEE's Corporate Innovation Award. Additionally, two AOML scientists graduated from NOAA's Leadership Competencies Development Program.

Scientists Share Research with Communities across the Country

The Return of In-Person Outreach Events!

AOML scientists, staff, and partners eagerly participated in multiple community engagement events in FY22 for the first time since early 2020. These events included the Miami-Dade County Youth Fair, Frost Science Earth Day Celebration, Museum of Discovery and Science's Eye of the Storm Hurricane Awareness Day, and the Homestead Cybrarium Hurricane Andrew 30th Anniversary program.

New Educational Video Series Uncovers the Mysteries of eDNA

AOML released a three-part educational video series in May 2022 entitled "Exploring Environmental DNA." The series was produced by an AOML-CIMAS communications intern from the University of Miami to help the public learn about environmental DNA, or eDNA, and the sampling technology developed at AOML to facilitate its collection. The series also features a hands-on activity that demonstrates DNA extraction.

AOML Scientists Connect with Students Far and Wide

AOML scientists shared their research with more than 750 students across the country in FY22 through virtual programs like Skype-A-Scientist, and in person mentoring programs like the Ocean Discovery Institute's Bahia Program for underserved students in City Heights, San Diego. The AOML Education website was redesigned and new online presentations were added so teachers and students could access them at any time. Capitalizing on virtual learning opportunities and partnerships enabled AOML to expand its reach and engagement with students of all ages, helping them better understand the world around them.

New Leaders Join AOML Management Team

AOML welcomed several new leaders in FY22 to fill key management positions. Rick Lumpkin, PhD, took the helm of AOML's Physical Oceanography Division in December 2021, followed by three new hires in January 2022: Jasmin John as the new deputy director of the Ocean Chemistry and Ecosystems Division; Laura Chaibongsai as the new Communications team leader; and Phil Riobe as the leader of the Computer Network Services team. Renellys Perez, PhD, became the new deputy director of the Physical Oceanography Division in August 2022. Currently, sixty percent of AOML's leadership comes from underrepresented groups in STEM fields.

Goal 1: Empower Our Team

Create an inclusive and cutting-edge environment that fosters discovery, exploration, and success.

Focus on Diversity and Education brings Greater Inclusion, Engagement with Students and the Public

AOML Flies LGBTQI+ Pride Flag

AOML is committed to increasing the diversity of its workforce and creating an inclusive work environment where everyone feels valued, treated fairly, and experiences a true sense of belonging. In honor of Lesbian, Gay, Bisexual, Transgender, Queer/Questioning, and Intersex (LGBTQI+) Pride Month in June 2022, AOML flew the pride flag for the very first time. LGBTQI+ Pride Month raises awareness of LGBTQI+ history and of the significant contributions made by individuals who identify as LGBTQI+.

Eleven AOML employees stand in front of the Pride flag outside of the laboratory.

'Black in Marine Science' Students Visit AOML

AOML hosted its first in-person outreach event in 2+ years by welcoming eight undergraduate students from the non-profit Black In Marine Science organization. The group visited Miami in May 2022 as part of a week-long immersion into the South Florida marine science community. AOML director John Cortinas provided an overview of the lab's deep ocean, coastal ecosystems, and atmospheric research. A tour of the facility featuring 22 members of the AOML community showcased a variety of career paths and research areas available to undergraduate students interested in marine science.

AOML Hires Alumna from *NOAA's Educational Partnership Program with Minority Serving Institutions* to Conduct Benthic Habitat Research

AOML hired its first alumna from the Living Marine Resources Cooperative Science Center (LMR-CSC), a NOAA Educational Partnership Program with Minority Serving Institutions (EPP/MSI) center in FY22, helping to create the pathway of building a more diverse NOAA workforce. A primary long-term goal of EPP/MSI is to increase the number of students, particularly from underrepresented communities. CSC graduates provide a diverse candidate pool with degrees in NOAA-mission sciences, technology, engineering, mathematics, natural resources management, and policy that are eligible to successfully join the NOAA workforce. AOML is committed to expanding its partnership with the NOAA EPP/MSI program by mentoring interns, serving as technical monitors, and hiring their alumni.

AOML Scientists Support NOAA's Biennial Education and Science Forum

AOML scientists joined hundreds of undergraduate and graduate science students from across the nation for NOAA's 10th Biennial EPP/MSI (Educational Partnership Program/Minority-Serving Institutions) Education and Science Forum in April 2022. The forum promotes diversity and career opportunities for STEM graduates in the public, private, and academic sectors. AOML scientists interacted with the students, judged science presentations, and spoke about their research and career paths, as well as career opportunities available through NOAA.

AOML Director, John Cortinas, alongside AOML's Chris Kelble and Emily Osborne at NOAA's 10th Biennial EPP/MSI Education and Science Forum.

Goal 2: Observe the Earth System

Collect and evaluate ocean, atmosphere, and marine ecosystem observations that contribute to the body of scientific knowledge of the Atlantic Ocean region to improve the ability to better assess and predict the Earth system.

Hurricane Research and New Technology Push Boundaries to Improve Forecasts

During the 2022 Atlantic hurricane season, AOML hurricane scientists worked tirelessly with numerous partners to gather vital data for track and intensity forecasts. This year they coordinated the longest series of missions into a single tropical system, arranged multiple observing assets for simultaneous data collection, deployed a new small uncrewed aircraft system, undertook a trailblazing mission in the eastern Atlantic, and included a novel "moving nest" capability in its next-generation hurricane model. In partnership with NOAA's Aircraft Operation Center, our scientists flew 72 research and operational missions on Hurricane Hunter aircraft into nine tropical systems, with eight becoming named tropical storms and two becoming major hurricanes.

Cabo Verde Missions Explore Earliest Roots of Atlantic Hurricanes

Scientists at AOML deployed to the Cabo Verde islands in August to explore how tropical waves that move off the coast of West Africa develop into tropical storms and hurricanes. These first-ever missions thousands of miles across the Atlantic marked the farthest east that NOAA's Hurricane Hunters have traveled, helping forecast modelers better predict the future track and intensity of developing storms.

AOML is working to improve weather forecasts and make them more accessible, thereby reducing the impacts of these costly hazards. These improvements can help communities and industry prepare for compounding risks from extreme, high-impact weather and climate events.

AOML Launches New Drone into Eye of Hurricane Ian

AOML hurricane scientists launched an Area-I Altius-600 small uncrewed aircraft system into Hurricane Ian from a NOAA P-3 Hurricane Hunter aircraft just hours before the storm made landfall along Florida's Gulf Coast on September 28. The 27-pound drone completed a 2-hour mission, collecting observations from the turbulent lowest altitudes of Ian. The observations will help researchers better understand the complex dynamics of the hurricane boundary layer where the ocean and atmosphere intersect, as well as improve the accuracy of forecast models. AOML strives to enhance its observing and data dissemination system infrastructure with new technologies like the Altius-600 drone to leverage more observations through innovative public and private partnerships.

Altius demonstration model with Hurricane Hunter, NOAA WP-3D Orion "Miss Piggy," at NOAA's Aircraft Operations Center in Lakeland, FL. Photo Credit: NOAA/AOC

Collocated Ocean Observations Improve Forecasts

To tackle the forecasting challenge of rapid intensification, AOML scientists coordinated with multiple partners to launch a host of instruments—underwater gliders, saildrones, and dropsondes—to sample the ocean and atmosphere in real-time. Seven underwater gliders (four from AOML) monitored ocean conditions in the eastern Caribbean during the passage of Hurricane Fiona on September 17-20. One AOML glider a few kilometers from the center of Fiona collected collocated observations with an AOML-PMEL saildrone uncrewed surface vehicle. Researchers aboard NOAA's P-3 Hurricane Hunter aircraft additionally deployed GPS dropsondes in proximity to the saildrone and glider for a more holistic view of Fiona and the storm's impact on the marine environment. Using data collected from these instruments, the National Hurricane Center upgraded Tropical Storm Fiona to a Category-1 hurricane as it traveled south of Puerto Rico. These collocated observations are another example of how AOML is working to build out a system of more comprehensive, core ocean and atmospheric observations, data delivery, and services from which the private sector can develop value-added products and services to meet societal needs.

Goal 2: Observe the Earth System

SAM Project Completes First Cruise in Three Years

After a 3 year lapse in field work due to safety protocols necessitated by the COVID pandemic, the South Atlantic Meridional Overturning Circulation (SAM) project completed its first cruise since 2019. SAM seeks to capture the daily variability of key components of the Meridional Overturning Circulation in the under-sampled South Atlantic Ocean. The Meridional Overturning Circulation is an important part of the global climate system with important societal impacts. AOML engineers participated in the July-August 2022 cruise aboard the Brazilian *R/V Alpha Crucis* to recover and redeploy three Pressure Inverted Echo Sounder moorings.

A rainbow and the font of the NOAA Ship Ronald H. Brown.

PIRATA Science Team Sets New CTD and Mooring Service Milestones

In November - December 2021, AOML scientists led a cruise in support of the Prediction and Research Moored Array in the Tropical Atlantic (PIRATA) project, a joint effort of Brazil, France, and the United States to study and improve the predictability of ocean-atmosphere interactions in the tropical Atlantic. During the cruise, the science team accomplished several new milestones for the project, including the most deep ocean CTD casts ever completed (70, one higher than the previous record), and the largest number of PIRATA mooring sites visited (8, previous record 6). The PIRATA buoy array provides critical real-time data that are used to develop and improve models of the Atlantic climate system for global ocean and weather prediction.

Holistic Approach Advances Coral Research and Conservation Efforts

AOML coral scientists tackled a wide array of coral research projects in FY22 aimed at increasing their overall understanding of vulnerable coral reef ecosystems and how to mitigate the stressors that threaten them. One AOML study found that seafloor sediments have the potential to transmit a deadly pathogen to local corals and hypothesized that sediments have played a role in the persistence of a devastating coral disease outbreak throughout Florida and the Caribbean. Another showed how coral fragments exposed to an oscillating temperature treatment responded better to heat stress caused by warming oceans. This research helps scientists engage in more efficient, lasting coral restoration efforts. They also identified genetic variants in staghorn coral (*Acropora cervicornis*) that better tolerate elevated temperatures and nutrient pollution, two major stressors that put this already critically endangered species at increased risk. The identification of stress-resistant genetic variants provides scientists with an important tool for improving coral survivorship and restoration success.

'Omics Technologies Improve the Understanding of Microbial Communities

The AOML 'omics team made considerable strides in FY22 to leverage 'omics technologies for the benefit of ocean and human health. An AOML led study of methane ice worms in the Gulf of Mexico revealed how their microbiomes are shaped by the hydrocarbon-rich environment of the Gulf sea floor. The team also partnered with NOAA's Great Lakes Environmental Research Laboratory and Monterey Bay Aquarium Research Institute to publish a first-of-its-kind autonomous underwater vehicle (AUV) survey of western Lake Erie. The study validates the AUV technology for detecting harmful algal blooms that impact coastal lake communities. Studies of the microbial and planktonic effects of increasing ocean carbon dioxide levels and ocean acidification continue using both shipboard and sediment observations.

Coral Rescue

Over the summer, the Coral Group rescued at-risk corals following the partial collapse of a sea wall that hosted colonies of important coral species. Studies have shown that corals near Port Miami are more resilient than their counterparts found in offshore reefs, and it is hypothesized that corals in these habitats may be better able to survive climate change. Therefore, it was vital that AOML researchers relocate these important colonies to protect them for future generations.

Goal 3: Assess and Model the Earth System

Understand the Earth system by creating accurate, predictive, high-fidelity models that characterize and assess change and predict future Atlantic Ocean regional and global outcomes.

Providing Model Evaluations of Impacts on Essential Fish Habitat from Mississippi River Sediment Diversions to the National Marine Fisheries Service

Sediment diversions of the Mississippi River are proposed to mitigate land loss in the Mississippi delta, which has been losing 65 km₂ of wetlands each year since the 1930s. The proposed sediment diversions will alter freshwater flow and thus the estuarine habitat of many fish species that depend on wetlands. AOML conducted Vector Auto-regressive Spatio-Temporal (VAST) modeling of the impact of the proposed diversion in the mid-Breton sound to inform the National Marine Fisheries Service consultation on the impacts of the proposed diversion to essential fish habitat.

Future Changes in ENSO Variability

Worldwide, there is widespread recognition of the impact of greenhouse gas emissions on the climate system, leading to dangerous, accelerated warming. Scientists at AOML investigated the projected changes in the seasonal evolution of El Niño-Southern Oscillation (ENSO) in the 21st century under the influence of increasing greenhouse gases. This study found that global climate impacts on temperature and precipitation are projected to become more significant and persistent, due to the larger amplitude, increased frequency, and extended persistence of El Niño in the second half of the 21st century (2051-2100). The anthropogenic influence of El Niño is also projected to emerge on top of natural variability in the second half of the decade. This is an example of how AOML is strengthening interdisciplinary and integrated research that looks across Earth systems to understand the complex, cascading, and compounding effects of climate change.

Researchers Mark 30 Years of Progress in Hurricane Forecasting since Andrew

August 24, 2022 marked the 30th anniversary of Category-5 Hurricane Andrew's landfall near Homestead, Florida with 165 mph sustained winds, becoming one of the most catastrophic hurricanes in U.S. history. AOML staff and scientists recognized this milestone by remembering the numerous challenges associated with the disaster, but also celebrated how far hurricane research and forecasting have come in the last three decades. Since Andrew, AOML has made great strides in advancing hurricane predictions through better observations, forecast models, and analyses. NOAA has drastically improved its track and intensity forecasts, increasing track accuracy by 75% and intensity forecasts by 50%. NOAA scientists now use an array of satellite information, land-based, sea-based, and aircraft-related instruments to collect observational data, all with the goal of protecting lives and property.

## Hurricane Model Introduces Storm-Following Nests Capability

In FY22, hurricane scientists at AOML demonstrated how storm-following nests applied to multiple hurricanes in the same forecast cycle can improve intensity predictions by as much as 30%. The results will play a pivotal role in the development of storm-following nests for NOAA's next-generation tropical cyclone modeling system, the Hurricane Analysis and Forecast System (HAFS), slated to become operational in 2023.
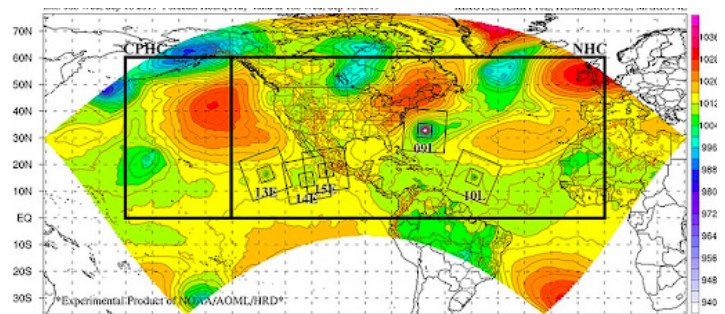
Storm-following nests are shown for five tropical cyclones in an experimental version of a hurricane model.

Study Explores the Relationship of Anthropogenic Carbon and Ocean Circulation

Within the U.S. and internationally, there is a growing demand for information about current and future greenhouse gas emissions, their impact on the state of the global climate system, and options and the effectiveness of climate change mitigation measures at different scales. In a recently published study, scientists at AOML and international partners quantified the strength and variability of anthropogenic carbon transport in the North Atlantic Ocean. The study found that the buildup of anthropogenic carbon in the North Atlantic is sensitive to the Meridional Overturning Circulation strength and to anthropogenic carbon uptake at the ocean's surface.
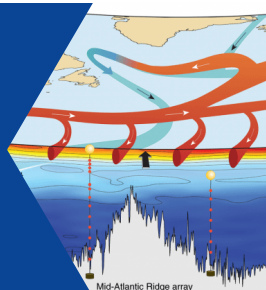
Goal 4: Transition Our Research

Empower end users with research and knowledge that enables decision-making, drives outcomes for operational partners, and advances scientific knowledge.

Transition Process gains momentum in its second year

OAR's mission is to conduct research to understand and predict the Earth system; develop technology to improve NOAA science, service, and stewardship; and transition the results so they are useful to society. AOML directly supports the transition of research through a well-developed transition process supported by an AOML developed reporting system and analytics dashboard. Over the past year, the number of projects identified that require transition plans doubled from 33 to over 60, with more than half in the development, review, or approval phase, and two fully completed transitions.

A saildrone after deployment in St. Thomas for the 2022 hurricane season. Image Credit: Saildrone

## Use of Uncrewed Surface Vehicles to Accomplish NOAA's Missions

In collaboration with NOAA's Uncrewed Research Transition Office (UxSRTO), AOML co-developed five high priority autonomous uncrewed vehicle (AUV) transition plans in FY22, including a "One-NOAA" Umbrella Transition Plan, in a record two weeks. This resulted in over $2M of additional funding to support a total of seven saildrones during the 2022 hurricane season to improve forecasts. The collaborative team also co-developed a R2X Bridging Program that resulted in $200K of funding for a pilot project critical to ensuring saildrone data are assimilated into hurricane forecast models, demonstrating AOML's support of NOAA's Next Generation Strategic Goal to reduce loss of life, property, and disruption from high-impact events.

Another Strong Publication Year Provides Significant, Actionable Insights for the Atlantic Ocean and Earth System

Publications provide essential knowledge to the public and scientific community, drive innovation, and lay the foundation for new advancements. With 134 peer-reviewed publications for FY22, AOML contributed significantly to the knowledge base of the scientific research community. Researchers conducted analyses to show that changes in equatorial Pacific Ocean temperatures can help predict changes in the Florida Current, demonstrated that seafloor sediments can transmit a deadly pathogen to local corals, and quantified the value added to tropical cyclone intensity forecasts by storm-following nests.

Hurricane and Ocean Testbed Successfully Launched

The William M. Lapenta Laboratory at NOAA's National Hurricane Center opened in early FY22 as a place where research meteorologists and forecasters, as well as oceanographers, can collaborate in transitioning the latest research into operational products through the Hurricane and Ocean Testbed. The new facility is equipped with state-of-the art technology to facilitate teamwork, enabling researchers and forecasters to explore opportunities and find solutions to common forecast challenges, resulting in better analyses and forecasts of high-impact tropical and marine weather and ocean conditions. AOML strives to make its data reproducible, easily discoverable, and compatible with other products or systems by leveraging cloud infrastructure, thereby maximizing accessibility, transparency, reliability, usability, and public trust in accordance with data community standards.
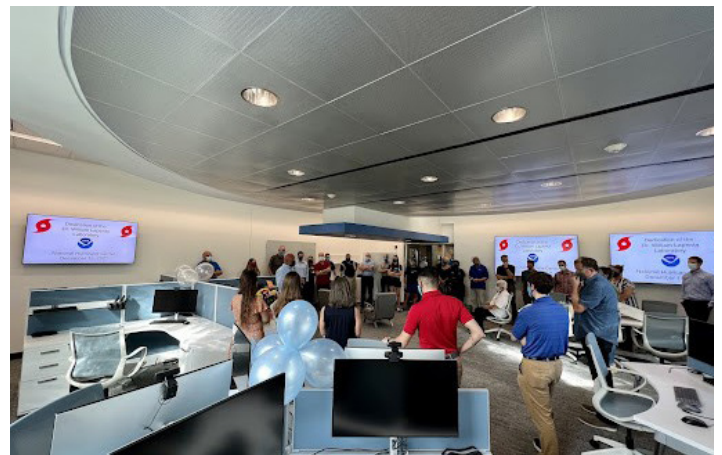
Researchers using the Hurricane Ocean Testbed for the first time.

Goal 4: Transition Our Research

State of the Climate 2021

The ocean is a dynamic and connected component of the earth system. Ocean warming, decreasing sea-ice extent, changing currents, rising seas, ocean acidification and deoxygenation are affecting the nation's valuable living marine resources and the many ocean-dependent businesses and communities. AOML scientists contributed to the 2021 *State of the Climate* report by communicating the impacts of Earth's warming and changing environments in Chapter 3 of the report, "Global Oceans," by co-editing the chapter and contributing to sections on Meridional Overturning Circulation, Ocean Currents, and the role of the oceans in the carbon cycle. AOML researchers also contributed to Chapter 4, "Tropics," by authoring two sections of the chapter, Tropical Cyclones and Tropical Cyclone Heat Potential. The *State of the Climate* report was a key knowledge transition, instrumental in communicating the impacts of the Earth's warming and seasonal to decadal climate variability on the global oceans. The report, delivered to the scientific community and general public, aims to improve scientific understanding of the changing climate system and supports a climate-literate public that is better equipped to understand its vulnerabilities and make informed decisions.

A large mat of Sargassum on the ocean's surface.

Arming Decision Makers - Resilience to Human Health Risks at the Coast

Large accumulations of *Sargassum* are a recurrent problem in the Caribbean Sea, Gulf of Mexico, and tropical Atlantic Ocean. These events cause significant economic, environmental, and public health concerns. In collaboration with National Environmental Satellite Data and Information Service (NESDIS) CoastWatch and the University of South Florida, AOML produces experimental *Sargassum* Inundation Reports that provide an overview of the risk of *Sargassum* coastal inundation for the Caribbean and Gulf of Mexico.

regions. This reporting system demonstrates how AOML works to build resilience to human health risks at the coasts.

State-of-the-Art Data Center Supports AOML's Evolving Computer Needs

AOML's new state-of-the-art data center culminated an almost 5-year effort led by AOML's information technology team to provide cutting-edge computing services for the lab's scientific and administrative staff. This massive effort occurred in the background, with no impact to daily computer services. Along the way, numerous technical challenges were encountered and overcome, as well as physical challenges, including construction delays and strict adherence to safety protocols due to the pandemic. The new data center is smaller than its predecessor, but comes with the built-in ability to expand as advances in technology warrant future growth. It is also more energy efficient, with ventilation and air conditioning systems that make it less reliant on external power sources. The data center provides cutting-edge information technology and computing services that are economical and flexible, while also reducing the lab's carbon footprint.

The new data center at AOML delivers cutting-edge computing power while while keeping cooling costs in check. The center's nine cabinet system holds greater than 300 computing assets, as opposed to the old data center's total of slightly more than 100 essential computing assets. The networked computing system at AOML is comprised of 400-500 desktop and laptop computers.

Looking Forward to FY 23

In 2023, we look forward to celebrating AOML's 50th anniversary by using this major milestone as an opportunity to reflect on how far we have come and how we can build on decades of accomplishments to make the most impact on society. Readers are encouraged to check AOML's website throughout the year for updates on these projects and more.

To help communities and businesses prepare for compounding risks from extreme, high-impact weather and climate events, AOML is working to improve its weather forecasts and make them more accessible to reduce the impacts of the most costly hazards. The Hurricane Analysis and Forecast System (HAFS) is NOAA's next-generation tropical cyclone modeling system, and it will become fully operational in 2023 after years of development and testing.

AOML is leading a NOAA-wide effort to develop a data management guide for NOAA 'Omics, which will also support our work and partnerships with the Marine Biodiversity Observation Network (MBON) and Bio-GO-SHIP program. In FY23, these projects and others will continue with the help of two new personnel from our cooperative institute partners, and with the benefit of an expanded and renovated lab space. AOML will continue to solidify its reputation as a leader in the use of cutting-edge genetic and bioinformatics technologies to support marine research, monitoring, and conservation efforts.

AOML's Biogeochemical Argo float program is collecting groundbreaking data from the Gulf of Mexico, a previously under-observed region. With these floats and their complex sensors, AOML scientists will be filling data gaps and addressing previously unanswered questions about major marine phenomena. We look forward to sharing the advances from this developing program, as well as data, key findings, and goals for the future, and an array of educational resources.