





Cover: Two NOAA Divers complete a fixed site Structure-From-Motion survey off of the island of Ta'u, AS during the 2023 RICHARD mission. Photo: Nicky VerPlanck, LCDR/NOAA.

Above: NOAA Diver Jason Leonard conducts a stereo videogrammetry survey near Swains Island during RICHARD. Photo: D. Barshis/ODU.





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RICHARD fish team lead Roseanna Lee poses next to one of the largest corals recorded in the world: a collossal Porites dubbed "Big Momma".

Photo: Mia Lamarind/ NOAA

Who We Are



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Purposeful Diving

Our vision is to lead the nation in the advancement of diving safety, education, training, innovation, and execution of underwater operations in support of science, service, and stewardship.









In partnership with the non-profit organization Diving With A Purpose (DWP), students and NOAA Divers measured and drew a shipwreck at Horseshoe Reef off Key Largo, FL. Under the direction of four DWP lead instructors, the dive team made nearly 100 dives to measure and draw the shipwreck remains. The research team determined that the shipwreck was a wooden-hulled sailing vessel from the mid-to-late 19th century. We thank you DWP for funding All photos on this page: Brenda Altmeier/NOAA this mission.





A NOAA Diver poses in the rain on a small boat deck off of the island of Ofu, AS after a dive. Photo: Damaris Torres-Puliza/NOAA

Our Divers

With more than **350 divers**, the National Oceanic and Atmospheric Administration (NOAA) has the largest complement of divers of any civilian federal agency. NOAA employees, contractors, and volunteers conduct diving operations in our nation's waters and beyond in support of NOAA's scientific research and operations. NOAA Divers are called upon to work in various conditions ranging from the warm, clear waters of a marine sanctuary, to the cold, murky waters of a commercial harbor.

The tasks NOAA Divers complete are as varied as the waters they dive in, with most divers supporting projects and research for these three NOAA line offices: the National Ocean Service (NOS), the National Marine Fisheries Service (NMFS), and the Office of Marine and Aviation Operations (OMAO).

Each line office within NOAA has a different **operational focus**, but work together to ensure **safety** and completion of NOAA's mission for science, service, and stewardship. Two senior diving representatives are elected from each line office to sit on the NOAA Diving Safety and Control Board (NDCSB), which has governance authority over the NOAA Diving Program (NDP). Along with the two senior representatives, the NDCSB is also made up of key members of the NDP administration, specialists in occupational safety, and the Director of NOAA Diving Medicine.

Since its inception in 1971, the NDCSB has had the ultimate authority in reviewing program needs, setting policy, and advising the field on operational diving matters. Through a robust leadership framework, comprehensive training methodology, perceptive policies, and a responsive Standardized Equipment Program, the NDP ensures safe and effective underwater operations in support of NOAA's mission.





We are

Ocean Stewards



Saving Coral Nursery from Bleaching

In early August, the Florida Keys reef tract temperatures spiked above 90 degrees Fahrenheit. These record-breaking sea surface temperatures triggered a mass coral bleaching event in the Florida Keys National Marine Sanctuary (FKNMS), where NOAA and our partner organization, Reef Renewal, maintains a <u>coral nursery</u> off the coast of Key Largo, FL. Coral nurseries support the natural colonization processes of reefs, and so they are crucial to reef recovery. While coral bleaching itself does not kill the corals, it does make the coral more vulnerable and causes severe stress to the reef.

To save the coral nursery from the bleaching event, FKNMS summoned all hands for an emergency dive mission to relocate thousands of coral fragments to deeper, cooler water. The coral fragments are on nearly 100 individual vertical nursery lines, with each line attached to the seafloor by anchors. Each of these lines needed to be moved to depths of 70 feet before the high temperatures bleached the corals.

The mission was a success: thousands of coral fragments were saved by NOAA Divers thanks to the rapid mobilization of the entire staff of the FKNMS, the crew of the R/V Hawksbill, and the FKNMS buoy team supervisor, Brady Booton.



Top left: Bleached corals. Photo: Ananda Ellis/NOAA. Bottom left: a diver carries coral fragments to a boat. Photo: Florida News Bureau. Above: divers inspecting bleaching on the reef. Above left photo: Ananda Ellis/NOAA. Above right photo: Katey Lesneski/NOAA.













Top: Diving program manager Joe Hoyt holds an adult abalone shell with the wild juvenile abalone found during the dive. Bottom: the juvenile abalone. Photos: NOAA

We are Scientists...

Hope for Abalone Recovery

During a research cruise off the coast of California, NOAA Divers found a rare but welcome sight: a wild juvenile white abalone. White abalone (Haliotis sorenseni) is a critically endangered species of gastropod that maintains the health of kelp forests, which are some of the planet's most biodiverse habitats.

Since 2019, the white abalone recovery dive team - consisting of NOAA Divers and our partners — has placed over 12,000 captivebred abalone in the area through a process called "outplanting". The dive team regularly visits the outplanting sites to monitor the growth and survival of the young white abalone. Outplanting white abalone is the only way to rapidly increase the wild population, therefore reducing the risk of extinction.

Finding a juvenile indicates that the species is also successfully reproducing in the wild, hinting that the recovery program is working.

White abalone can only successfully reproduce up to five times in their lives, and only three live juveniles have been found by divers in the last twenty years. Once a common feature of the rocky reefs from southern California to Baja, commercial overfishing in the 1970s caused a steep decline in their numbers. Future conservation efforts will focus on improving the reproductive output, and expansion of the outplanting and wild population monitoring programs. Read more about the white abalone and NOAA's conservation plan here.



outplanting module. Photos: Adam Obaza/NOAA



...& Citizens



determine potential habitat quality. Photo: Kacey Cooper/NOAA



We are Ready to Serve

Borrowed Dive Team Saves NOAA Ship Fairweather

When your ship does not have a dive team but needs urgent diver assistance, what do you do? Call the local Diver Readiness Detachment (DRD).

In the first leg of the field season, *Fairweather* discovered that the rear propellers were entangled in fishing gear. Ship propeller entanglement is a common issue for some commercial ships, but not for Fairweather.

Since Fairweather does not have an active dive team, and only specialized divers can conduct a ship husbandry dive to remove the debris, an outside dive team was needed to allow *Fairweather* to continue their mission. Contractors can be hired to complete this task at a great expense, and to do so, the ship may lose many days at sea.

However, NDC had another idea: to put the new DRD concept to the test.

The DRDs are virtual diving units meant to facilitate unique and urgent mission requests for OMAO.

To support *Fairweather*, NDC assembled a dive team consisting of NOAA Divers from all over the region and deployed them within 72 hours to take advantage of a narrow window of ideal current. At the same time, *Fairweather* pulled into port and met the divers, who began their vital work as soon as they were able.

The divers completed the work within 24 hours, allowing the ship to continue to Alaska to execute their mission in excellent time.





Divers from the DRD pose with the tangled debris they removed from the NOAA Ship Fairweather's propellers. The dive team, from left to right: ENS Connor Healy, LT Patrick Pope, Sean Digre (NDC), ENS Austin Gearty, and ENS Tarah Aniya. Below left: the victorious divers. Below right: the dive team getting ready for the dive to remove the debris from the ship's propellers. Photos: NOAA







We are A Growing Program

A Message from the NDP Manager, Joe Hoyt

The NDP saw many positive changes in 2023 and we are not slowing down! After many years serving on the board as a deputy LODO, I had the privilege to come on board as a fulltime program manager at the end of 2022. This year has been a whirlwind of excitement. Thanks to an excellent team, I have been getting up to speed and tackling program challenges in the field as well as the beltway.

For this past year and beyond, the focus of the NDP is to enable the field to operate more efficiently and effectively, without compromising our excellent safety record. In March, we hosted the first in-person UDS training conference since 2017. During the conference, we provided practical training to enable each UDS to evaluate experienced divers to achieve NOAA Diver status, without needing them to attend an NDC course. This provides an avenue for safely onboarding new hires as divers, with less expense to the agency and with more operational flexibility to NOAA diving units. Many UDSs were also certified as instructors in First Aid, CPR, and Oxygen Administration, which empowers UDSs to provide required inhouse training for their units on their schedule at a significantly lower cost to the agency. The training at the UDS Conference puts more flexibility and operational control in the hands of our most trusted representatives in the field: our UDSs.

The NDCSB also worked tirelessly to do the first substantial updates to the NOAA Diving Safety and Standards Manual (NDSSM) in over 5 years, which was signed into effect by ADM Nancy Hann in March. These policy updates focus on practicality and safety for the field. For example, units are now able to accept reciprocity divers' medical clearances when they are diving under the auspices of their parent institution.

Likewise, we incorporated a means to track depth proficiency that will help ensure diver operational readiness. The updates include many changes that affect staffing levels for various diving modes, conservancy factors for dive computers, depth authorizations, training modalities, and more. While it is nice to have an updated manual, the only thing certain is that it will continue to change as the NDP changes. As a living document, the NDCSB is committed to working with the field to make amendments to the NDSSM that respond to the evolving needs of the field and incorporate the best available science to keep our divers safe and productive.

Operationally, 2023 was the first post-pandemic year where diving missions were back in full swing across the agency, and so we saw a lot of pent up demand for getting back in the water. As a result, the NDC staff collectively spent 522 days in the field supporting diving missions. Moving forward, we both expect and hope to see these numbers grow: the more time NDC can spend on missions, the better we can understand the diverse needs across the agency and position ourselves to enable units to continue to dive. Whether you need chamber support on ships, help installing buoys, or technical divers to carry out scientific tasks, the NDC team is ready and eager to help.

Training continues as a staple NDP mission, and in 2023 the NDC staff continued to deliver the same excellent courses as always while seeking ways to conduct them more effectively for the end-user. This resulted in our first winter course in Honolulu as well as several mobile divemaster courses delivered at the field units, removing the cost and increasing the applicability of the training. Moving forward we will continue



NDP Manager Joseph Hoyt at Southwest Fisheries Science Center during the 2023 UDS Training Conference. Photo: Zee Rosolek/NOAA



We are

A Growing Program



NDP Manager Joe Hoyt (left), NOAA diving instructors, NMFS divers, and NOAA scientific leads joined together to conduct archaeological surveys in the Olympic Coast National Marine Sanctuary, which does not have an active dive team. The team counted 21 anomalies and documented two different shipwrecks in the area. Photo: NOAA

to identify ways to incorporate modern teaching tools to meet expectations as efficiently as possible. Based on feedback from the field, NDP also ran a pilot specialty course in underwater photography and photogrammetry, which will be further refined in 2024.

Administratively, the biggest change of 2023 is a return to a cost-sharing model across the line offices. As you can see from the statistics in this report, the NDP is truly an agency-wide program and is managed at the discretion of the NDCSB's line office delegates. This year, the NDCSB was effective in communicating program needs and requirements that were universally agreed upon, but not funded. As a result, line office leadership across the agency agreed to cost-share NDP at the levels the board articulated. This represents a serious acknowledgement of the value you all bring as divers for the agency, and will allow NDP to move into 2024 and continue to implement changes and deliver more products and services to empower NOAA Divers to continue in their excellent work.

This coming year NDP will continue to see major changes as we change and grow. We just wished our long-standing Diving Medical Officer (DMO), LCDR Gary Montgomery, a happy retirement, and welcomed aboard LCDR Ryan Hawley as DMO. More staffing changes are expected in 2024 with three new instructors, a second DMO, and a passing of the NDC Executive Officer baton. We are also planning to make substantial updates to the Standardized Equipment Program by incorporating dive computers as NOAA diving equipment, with digital dive log uploading to the NOAA Dive Log. And finally, the NDP plans to seek organizational membership with the American Academy of Underwater Sciences. As the recognized standard-setting body for the OSHA scientific diving exemption, this will help both organizations coordinate on consistent standards and streamline collaboration with so many AAUS partners that help us meet our mission needs.

As we look to 2024 and beyond I encourage you all to see NDP as a resource that is invested in your success. We have three legs on the NDP stool: training, mission support, and policy. All three are designed with built-in flexibility to respond to the ever-evolving needs of an agency as complex as NOAA. Having served on the board for many years and working closely with all staff across NDP, I can promise you that everyone involved in NDP leadership is committed to finding the safest way to meet your NOAA diving needs.

See you on the bottom!

-Joe Hoyt, NDPM



















A NOAA Diver swims over a shallow reef during the RICHARD survey mission. Crustose coralline algae still dominate the reefs, but other taxa are starting to return.

Photo: Dr. Courtney Couch/NOAA

Diving In **2023 By The Numbers**













Dives and Tasks in 2023

Making waves with the OSHA Scientific Exemption

Most dives conducted at NOAA are classified as scientific dives, which means they are not subject to OSHA restrictions. This is because these dives use simple lightweight tools, and are primarily for tasks such as scientific or archaeological observation, or other tasks that will advance NOAA's scientific mission. In contrast, working dives are subject to OSHA. NOAA divers conduct working dives for tasks such as installing or removing heavy underwater scientific equipment, or other physically difficult or potentially dangerous tasks. In 2023, the NDP conducted a total of 6,762 scientific dives, versus 1,705 working dives.





Right: a diver holding some of the snails. Photos: NOAA





NOAA Diver ENS Tarah Aniya surfaces from a tank dive in the Oregon Zoo's "Stellar Cove" harbor seal habitat. Photo: Micah Reese/Oregon Zoo DSO.

The NDP Total Dive Modes and Platforms in 2023

Most dives NOAA conducts take place off of a small boat. Boats that are less than 300 tons have more utility for divers than most other platforms, since smaller boats can more easily navigate to the dive site.

Number of Dives by Mode

DECO	
	No E
	Deco
MODE	
	SCU
	Char
SCUBA	
	Ope
	Clos
	Sem

Dive Platform & Mode

Dive Platforms **|** Chamber 93 Pier or Dock Small Boat 773 7,048 Decompression 10,664 Pool or Tank 962 compression 238 JBA 10,804 mber or Habitat 98 en Circuit 8,019 sed Circuit Rebreather 407 ni Closed Rebreather 3



Ship 621

Shore 1,088



15

A NOAA Diver from the Florida Keys National Marine Sanctuary Buoy Team collects marker buoys and other marine plastics to recycle in a new partnership with Brightmark. Before the partnership, the old buoys would be sent to a landfill.

Photo: Ben D'Avanzo/NOAA

Line Office Metrics











NOS Metrics in 2023

National Ocean Service diving units have a variety of missions that span from a focus on oceanic instrument installation and maintenance to research monitoring, resource protection, public outreach, and education. Divers at NOS units conduct research missions that include biological monitoring and sampling, invasive species studies, climate change, severe weather damage assessment, restoration and monitoring of coral and seagrass habitats, as well as maritime archaeological surveys. In addition, many of the NOS diving units seek to actively engage the public in NOAA's mission through live diving broadcasts, documentary films, research opportunities for volunteer divers, as well as the installation of mooring buoys that allow safe access to diving sites and protect habitats and resources.



A new sponge was discovered (left), and named Megaciella sanctuarium after Monterey Bay National Marine Sanctuary. Image B shows its skeleton. Photos: NOAA

NOS Divers by Employment Type

CAPS/GS

34%



Total NOS Divers 2014 to 2023





Training & Proficiency Data & Sample Collection 1,310 442 Repair & Maintenance 225 -Inspection or Survey 208 Observation & Monitoring Installation or Removal 420 463 Non-Duty Proficiency 1584

Main NOS Dive Tasks

Top 4 NOS Dive Locations

- 1. Florida Keys: 1250 dives
- 2. Gulf of Mexico: **535 dives**
- 3. Puerto Rico / U.S. Virgin Islands: 374 dives
- 4. Hawaii Coastal **295 dives**













Above: Lindsey Peavey Reeves, a scientist and NOAA Diver, inspects the sound recorder mooring in the proposed CHNMS on July 12, 2023. All photos on this page: Bob Schwemmer/NOAA

Dive Light

Research

In the

Off of the coast of California lies the proposed Chumash Heritage National Marine Sanctuary (CHNMS), where NOAA Divers are beginning to document the baseline data on the local marine life. By installing special sound recorders on the ocean floor, researchers can document seasonal changes in migration, breeding habits, and more without disturbing the creatures being studied. The proposed CHNMS now has two such recorders placed by scientific divers, who will continue to collect and replace the recorders for study every four months.

Below image: anenomes on the rocky reefscape near the sound monitoring station. Bottom right image: a painted greenling, a bat star, and sea urchins on the reef.



New Seafloor Acoustics



The devices are over 65 feet below the surface.





- 1. Puerto Rico / U.S. Virgin Island 3: 1037 dives
- 2. Pacific Territories: 930 dives
- 3. Florida Keys: **463 dives**
- 4. South Pacific Coast: **455 dives**



NMFS

Metrics in 2023

With U.S. coral reefs spanning the Gulf Coast, Puerto Rico, Florida, as well as the Pacific Ocean—including Marianas, Hawaii, and American Samoa—continued diving for the Coral Reef Conservation Program (CRCP) remains a critical part of NOAA's science and stewardship mission. Divers within the National Marine Fisheries Service complete habitat conservation, fishery monitoring, and coral restoration, and other diving activities for the CRCP. One such CRCP mission is the reef assessment and mapping in the Central Pacific called RICHARD. Read more about RICHARD here.



NOAA Diver Juliette Verstaen surveying the RICHARD coral translocation site in Rose Atoll. Photo: NOAA Fisheries





In the Dive Light

Hidden History

NOAA Divers partnered with the National Parks Service and the Task Force Dagger Special Operations Foundation to conduct archaeological investigations at the War in the Pacific National Historical Park in Guam. The survey dives included photogrammetry, inshore coastal surveys, and dives up to 190 feet deep. On the site in 1944, Marines waged a 21-day amphibious battle to reclaim Guam from the Japanese.

To learn more about the diving mission, please visit this link.



An underwater archaeologist uses a metal detector to help find sunken artifacts from the war. All photos on this page: Joe Hoyt/NOAA

Below photos: a diver uses an underwater metal detector to find sunken artifacts.









A diver measures the remnants of a U.S. Marine amphibious vehicle. Top: a diver measures an artifact.



OMAO

Metrics in 2023

The diving program is housed within the Office of Marine and Aviation Operations line office. This office supports diving units aboard NOAA ships as well as several shore-based diving units, including the NDC. The NDC serves as the headquarters for the diving program, and oversees all diver training at NOAA. OMAO ships support the diverse hydrographic, oceanographic, fisheries, and other scientific missions that occur across all regions in which NOAA missions take place.



A diver holds an empty white abalone shell found during the white abalone support mission. Photo: Joe Hoyt/NOAA

Total OMAO Divers from 2014 to 2023



OMAO Divers by Employment Type





Main OMAO Dive Tasks



Top 4 OMAO Dive Locations







Above: NDC Instructor Jill Wentworth oversees a TRCS arill on the Rainier during the RICHARD cruise. Photo: NOAA

Right: Jill Wentworth (foreground) and LT Marybeth Head take a practice dive to test a potential dive course location. Evaluating sites for suitability and safety for new divers is a must for each new course location. Photo: Ray Boland/NOAA

The NDP HQ

522 Days of Support Missions

In addition to 522 field support days, the NOAA Diving Center instructors taught 15 courses and attended 1 first aid instructor course in 2023.

The NOAA Diving Center (NDC) is the administrative headquarters for the NDP, operating out of NOAA's Western Regional Center in Seattle, WA. The NDC provides training and field support to all NOAA Divers, as well as provides administrative support through the NOAA Dive Log, and ensures that they are properly equipped through the Standardized Equipment Program (SEP). For decades, the SEP has provided common equipment and standardized maintenance for issued equipment, thus optimizing both cost and safety. The NDC staff includes training, equipment, hyperbaric, operational, and administrative specialists with extensive experience in military, scientific, and commercial diving.





Overall NDC Mission Support 7,250 Dives Supervised 522 Total Support Days in Field Total Missions Supported **7** NDC Staff 2 Ship TRCSs Calibrated TRCS Installed on Rainier

RICHARD Chamber Support

Total Cruise Days Supported

Mission Legs Supervised

A NDC Chamber Supervisors







A January NOAA Diver course student adjusts her mask in a pool during training. This was the first course ever held in Honolulu, HI.

Photo: Ray Boland/NOAA

Training











Diver Training **& Elective Courses**

NDC instructor Mikey Kent (top) observes four January training course students as they practice laying a transect line over a mock shipwreck. Photo: Ray Boland/NOAA





January Diver Course



Top: January NOAA Diver students watch their instructor near the new buoyancy bar. This was the first NOAA course to be taught using neutral buoyancy as the new NOAA standard. Bottom: students practicing a scientific dive during their course. Photos: Ray Boland/NOAA

May Diver Course



NOAA Diver students exit a shore dive from Alki Point in Seattle, WA, where they will be checked and debriefed by the Divemaster students. Photo: Zee Rosolek/NOAA







In Total, NDC Graduated:

- Diving Medical Techicians
 - Tethered Comms Divers
 - 2 Accelerated NOAA Divers

September Diver Course





Top: The September 2023 NOAA Diver and Divemaster classes pose with their instructors in front of the NDC basin. Bottom: Accelerated NOAA Diver course students about to "ring the bell" to graduate. Photos: NOAA





Diving Medical Technician Course

The Diving Medical Technician (DMT) course is a crucial training for the NOAA Diving Program, as graduates of the course will be the first responders for NOAA Divers during a diving emergency. DMT students learn how to save divers from various diving maladies by using a Transportable Recompression Chamber System (TRCS), administering oxygen or an intraveneous solution, and more. Students must have an Emergency Medical Technician certification before receiving their DMT certification.

You will find DMTs on NOAA ships, small boats, and anywhere else NOAA diving operations occur.

The DMT course typically runs twice per year, however in 2023 only the October course was run. Five NOAA students graduated from the Joint Hyperbaric Medical course in April instead, but also received a NOAA DMT certification upon graduation.



The graduates and the instructors of the October 2023 DMT course in Honolulu, HI gather outside of the TRCS. Photo: NOAA



Top and below: DMT students practice working with the TRCS.

Top and bottom right: instructor Mikey Kent teaches the students about the TRCS.

Photos: Kerry Reardon/NOAA













kit outside of the TRCS. Photo: Kerry Reardon/NOAA



Training our Diving Leaders

A Unit Diving Supervisor (UDS) practices the diver rescue that is required of all divers during annual training in front of the NDCSB. Every UDS must evaluate their unit's divers every year, so evaluating each UDS at the UDS Training Workshop is crucial. Photo: Ray Boland/NOAA



UDS Training

Success: The First UDS Training Workshop Since 2017

For years the NOAA Diving Control and Safety Board (NDCSB) and the NOAA Diving Center (NDC) have been conducting essential training for the local diving leaders, NOAA's UDSs, in biennial events called the UDS Workshops.

During the UDS Workshop, participants from all NOAA diving units gather to learn hands-on skills crucial to their leadership roles, as well as meet other UDSs and the NDCSB. This year the divers met in La Jolla, CA to learn how to field evaluate new NOAA Divers, train their units how to rescue injured or unconscious divers, inspect scuba cylinders, and more. Additionally, four new UDSs were taught how to be UDSs during the UDS 101 session.



The workshop participants gather in groups to discuss a lecture. The UDS Workshops encourage collaboration and hands-on learning. Photo: Steve Lonhart/ NOAA









Left: The UDS participants, the NDCSB, the NDC instructors, and OMAO Director RADM Nancy Hann pose at the 2023 UDS Workshop. Photo: Jessie Spruill, LTJG/NOAA







Visual Cylinder Inspectors

24 Field Evaluators

25







Second row: John Bright, Maddie Roth, and LT Terril Efird during the cylinder inspection session. Photos: Joe Hoyt/NOAA. Third row: the diving session. Photos: Andy David/NOAA. Fourth row: the DAN Instructors session. Photos: Marybeth Head, LT/ NOAA

DAN First Aid & CPR Instructors







NOAA Diving Program 2023

Click here to learn more about the NDP: <u>https://www.omao.noaa.gov/noaa-diving-program</u>

NOAA diving instructor Mikey Kent (underwater, right) evaluates a new CCR with a CCR consultant during the CCR Workshop held at NDC. This workshop resulted in the diving program purchasing four new XCCRs for divers to use. Above water, left to right: Jason Leonard, Jason Nunn, another CCR consultant, Steve Sellers, and NDC diving instructor Sean Digre. Photo: Joe Hoyt/NOAA

60

