The Journal of Global Underwater Explorers

Quest

Vol. 26, No. 1 – February 2025

PHOTOGRAPHER PORTFOLIO: STEFAN PANIS

CCR FUNDAMENTALS
Redefining entry-level rebreather training

THE *UB-88* PROJECT
Ghost Diving USA restores history and ecosystems

SAVING THE CRAYFISH
Project Baseline divers locate and track populations

HALCYON SYMBIOS
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EDITOR'S LETTER

GUE CCR

GUE's preference for simplicity and standardization has historically delayed its adoption of new technologies. The fully closed rebreather gained traction in the sport diving community during the early nineties with the introduction of the AP Valves Inspiration and other units. However, for several years, GUE divers harbored skepticism towards electronics, oxygen cells, and decompression computers. This skepticism was justified, as the technology was still in its infancy, and the early adopters of the first generations of sport diving CCRs faced several severe accidents.

It wasn't until 2013 that GUE launched its first CCR program, marking its embrace of rebreather technology. With significant advancements in safety and reliability, GUE developed a comprehensive training program to ensure CCRs were not only safe but also valuable tools for advanced exploration and expeditions.

The first generation of GUE CCR students came from the top tier, with GUE Tech 2 as a prerequisite. This provided instructors with highly skilled candidates, reflecting GUE's conservative approach—unlike other agencies that offered CCR training to far less experienced divers with minimal prerequisites.

But as you can read in Graham Blackmore's article on page 32 in this issue of *Quest*, GUE is now offering CCR training to Fundamentals students with tech passes. This allows them to bypass the open-circuit Tech 1 class, which has been the prerequisite certification since 2018. Helium prices and availability have made it increasingly unreasonable to require Tech 1 for a diver who wants to pursue the closed-circuit route directly.

Another aspect that will broaden the choices of CCRs is the recent introduction of Halcyon's Symbios chestmount rebreather. Although its exact integration into the GUE ecosystem is still uncertain at the point of writing, it is highly likely that we will see another closed-circuit rebreather endorsed alongside the reliable JJ-CCR before the end of 2025. For more information, read John Kendall's article on the Symbios on page 52, and Dimitris Fifis' feature describing the pros and cons of chestmount units on page 62.

The robust nature of the JJ-CCR is exemplified by the California Ghost Divers team and their cleanup project on the *UB-88* submarine. Refer to page 12 to learn more about how the JJ-CCRs were utilized in the successful project.

GUE's CCR training continues to evolve, balancing safety, standardization, and exploration. With expanded access and new rebreather options on the horizon, divers have more pathways to integrate CCRs in their training and exploration.

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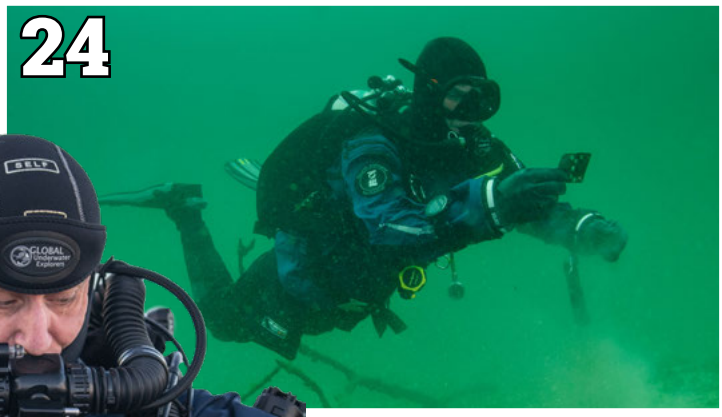
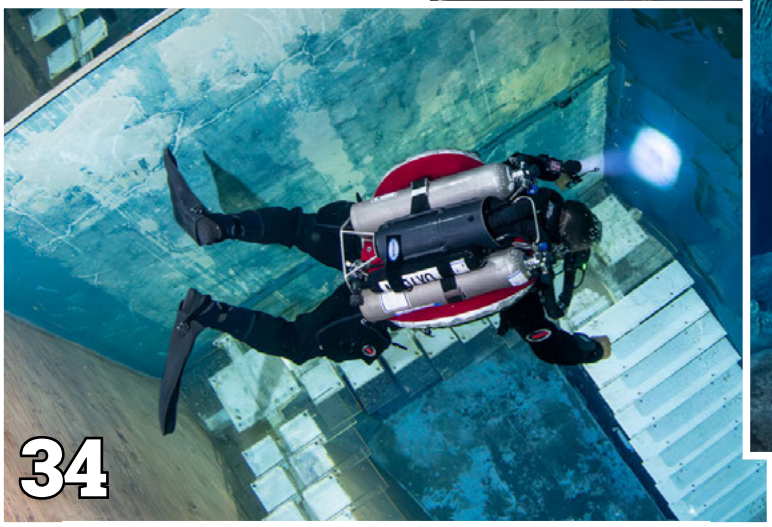
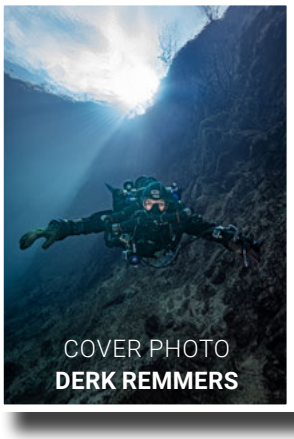





COVER PHOTO
DERK REMMERS

HQ CORNER

A bold leap into next-gen

After several years of development, GUE has released GUE Mastery Learning™—the first iteration of its online learning platform with modules for the Fundamentals and Performance Diver. The platform offers much more than mere online material. With GUE Mastery Learning™, GUE has entered a new dimension of personalized and adaptive learning opportunities for its trainees. It is our privilege to introduce you to GUE Mastery Learning™, which is powered by the Area9 Rhapsode Capable™ suite of technologies.

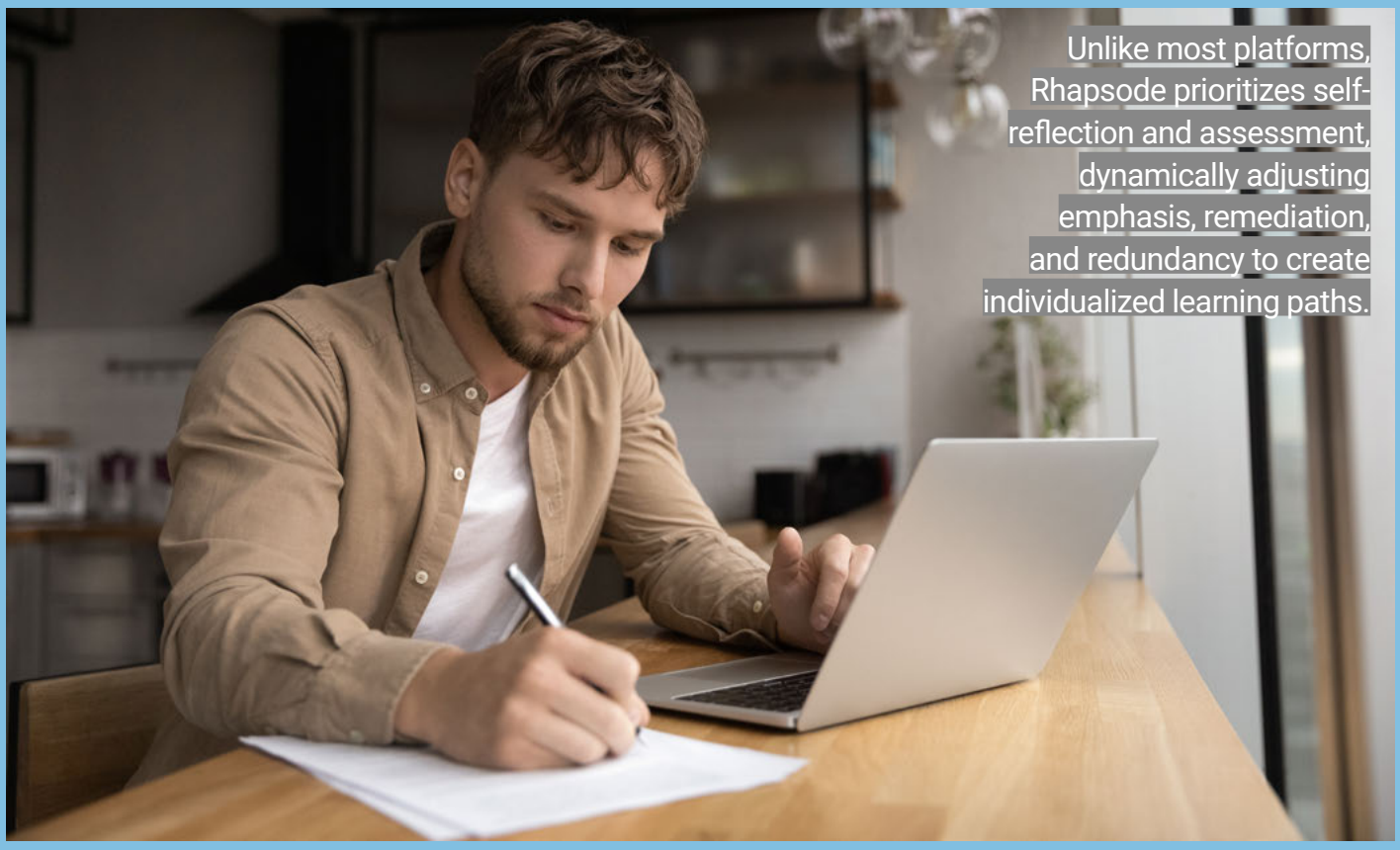
Underlying GUE Mastery Learning™ is Area9 Rhapsode Capable™—the world's first multi-dimensional adaptive learning platform. It is cloud-based, with responsive design (i.e., works on all platforms and screen sizes), and it is heavily leveraging many different types of artificial intelligence, robotics and analytics.

While technologically cutting-edge, it is built on the simple premise that a learning platform should start with the learner, giving everyone the opportunity to maximize their potential to grow and be productive. Using the latest in learning science, powerful artificial intelligence, and an intuitive user interface, Area9 Rhapsode™ provides all the capabilities needed to deliver optimal learning outcomes and retention as well as drive behavior change. So far, Area9's adaptive and personalized technologies have been used by dozens of millions of learners in schools, universities and corporations in more than 185 countries for everything from anatomy to financial compliance. Leveraging the power of Area9 Rhapsode Capable™, GUE has been able to develop modern education for the scuba diving industry and, with it, to bring our organization to the absolute forefront of education.

Area9 Rhapsode™ is based on a four-dimensional education framework. This framework focuses on creating a multifaceted, mastery-based approach to learning that emphasises the cognitive and psychological skills needed to manage complex diving and exploration safely. These four dimensions are knowledge, skills, character, and meta-learning. What do those dimensions mean for GUE-trained divers and GUE trainees?

TEXT **ULRIK JUUL CHRISTENSEN & DOROTA CZERNY**
PHOTOS **BORI BENNETT**

eration of GUE education



Unlike most platforms, Rhapsode prioritizes self-reflection and assessment, dynamically adjusting emphasis, remediation, and redundancy to create individualized learning paths.

KNOWLEDGE Divers at all levels must develop a deep understanding of the science and mechanics of diving. The "why" behind each concept is crucial to understanding and galvanizing the critical components that influence a diver's decision-making underwater.

SKILLS Divers must master basic diving skills, including precision trim and buoyancy control, multiple kicks, stability, and control. They must also develop keen problem-solving skills specific to complex or even emergency scenarios, meticulous planning and communication skills, team dynamics, situational awareness, and risk assessment skills.

CHARACTER More advanced diving requires resilience, self-discipline, and poise under pressure. Character traits like accountability, patience, honesty, and humility (i.e., acknowledging the limits of personal skill and environmental challenges) are essential, as they help divers approach dives with a responsible attitude. Perseverance, fairness, and ethical responsibility ensure divers respect environmental conservation as well as the safety and well-being of other divers. It is critical that GUE fosters a safety-oriented culture. The "gradient" here is 80/20: 80% Character/20% Skills is what will make GUE divers uniquely competent.

META-LEARNING Divers must learn to understand and reflect on personal progression, limitations, and responses to stress. Meta-learning involves developing self-awareness about one's physical and mental responses to diving conditions. It allows divers to manage fear, stay focused, and adjust to unexpected events underwater.

Personalization

The secret to Rhapsode's success and, thus, that of GUE Mastery Learning™ is personalization. Rhapsode uses many factors, such as progressive measures of proficiency, confidence, time, and self-awareness, to accurately measure each learner's weak and strong areas and identify any misconceptions they may hold. Rather than simply presenting learning content, as almost all other platforms do, Rhapsode extensively uses self-reflection and self-assessments. In real-time, it determines where to put more emphasis, where to remediate, and where to save time by avoiding redundant content the learner already knows. Resulting learning experiences are unique to each learner and determined automatically despite using the same underlying content. Everyone will go from A to B, but how they get there is different and individualized.

> **"As access to GUE Mastery Learning™ is granted to trainees while enrolled in GUE courses, each can return to the platform and refresh their knowledge at any time.**

The platform approaches learning more smartly and intelligently: it enables trainees to learn and retain information more efficiently and effectively while providing a detailed overview of learners' knowledge and knowledge gaps. Doing so makes the learning experience far more efficient; it becomes a powerful addition to other learning methods because it serves as an "always available tutor," providing the right information at the right time, including refreshing learning to "make it stick."

The platform offers in-depth learning analytics that include a detailed outline of learning progress, estimated time to completion, most challenging learning objectives, and metacognitive skills (actual knowledge vs. perceived knowledge). This instant feedback enables learners, teachers, and subject matter experts (SMEs) who build the content to understand better where they should focus their efforts.

The journey

GUE Mastery Learning™ is based on the concept of the flipped classroom: it reverses traditional teaching such that trainees learn foundational content at home at their own pace. As it works on all types of devices, the trainee can complete GUE coursework any time, anywhere the internet is available.

GUE has three main goals in adopting the flipped classroom learning architecture: Trainees will enjoy more hands-on and in-water time with GUE instructors. This creates access to more in-class dive opportunities. Our courses historically evolved from the need for in-water performance, confidence, and comfort. We always strived to extend in-water time versus lectures, which, in the past, was very challenging due to the amount of knowledge that needed to be conveyed to each trainee. With the adaptive principles behind GUE Mastery Learning™, trainees can take all the time needed to learn the theory. Instructors can avoid late evening, long lectures and allow trainees to absorb basic content at their own

FACT FILE // WHY AREA9?

Area9 is located in the prefrontal lobe of our brain and is involved in short-term memory, evaluating recency, overriding automatic responses, verbal fluency, error detection, auditory verbal attention, inferring the intention of others, inferring deduction from the spatial imager, inductive reasoning, attributing intention, sustained attention involved in counting a series of auditory stimuli. Smply said it's for learning and adaptation to new situations and interactions.

Strengthen learning by focusing on the instructor's dive and exploration experience, using class time for discussions, knowledge application, and hands-on training.

PHOTO **BORI BENNETT**

pace. Trainees will understand and retain more than traditional lecturing (which is limited by a predominant one-directional information flow). Students will learn during the course more quickly, as they will arrive prepared. This preparation is not merely theoretical; rather, trainees will have an understanding of what they should expect, which will reduce common sentiments of intimidation and anxiety. Trainees will feel more engaged from the start of the course.

Naturally, this will challenge instructors to answer educated questions early in the course, "connect the dots," and lead the trainees towards critical "a-ha" moments. This allows trainees to have emotionally intense experiences, which will prepare them for their future diving endeavors.

Adaptive learning will facilitate deeper foundational understanding and maintenance of relevant knowledge. As access to GUE Mastery Learning™ is granted to trainees while enrolled in GUE courses, each can return to the platform and refresh their knowledge at any time. As divers progress through GUE training, they will not need to listen to the same lecture in each class. They will test retention and understanding of previously attained knowledge and add new concepts associated with their course. For example, if a student signs up for the a Cave 1 class, they will review the gas management module from the Fundamentals program in the form of an individualized refresher test, which will be based on their performance history in this module during the Fundamentals course (and actually in any other GUE course the student has completed on the platform). Based on this, the platform will start adding relevant cave gas management content and test for its comprehension. In the end, the student will not only learn new things but refresh their basics, too. This, again, will shorten the time spent on the theoretical part and allow divers to be involved in learning diving while diving.

Grit

We can drive the development of grit through an even stronger focus on the instructor as the source of inspiration by providing a personal

FACT FILE // NO EXAMS

One of the most prominent changes to the programs is that the final theory exams are gone. The new mastery learning architecture monitors the development of competencies at very high resolution and granularity as the learning decays over time. The high-frequency formative assessment allows for elimination of the written tests, as the written tests as the learners are continuously assessed, but with the primary goal of aiding the learning process. In this model, you can only fail if you quit. There are only two grades: top grade… or incomplete!

context from the instructor's diving and exploration career and activities. In-class time with a GUE instructor should be dedicated to applying knowledge through discussions in the context of the instructor's extensive dive experience, practical skills, and dive training ahead. This model encourages active learning and allows instructors to provide more personalized guidance and support during class. It shifts the focus from passive content delivery (informing) to fostering more profound understanding and practical application (inspiring). By preparing for the in-person time with the instructor, students arrive ready to engage and discuss, making in-person time more interactive and impactful–and getting to the skills and character (leadership, resilience, situational awareness, curiosity, etc.) development much sooner.

Deliberate practice

The transpiring concept throughout each of these innovative learning principles is "deliberate practice." See Anders Ericsson: *PEAK – How to Master Almost Anything*, 2016. Deliberate practice is a highly structured and intentional practice aimed at improving performance in a specific skill or area. Unlike general practice, which may involve repeating an activity, deliberate practice involves focused efforts on tasks beyond one's current abilities, with immediate feedback and adjustments for improvement.

> **Theory discussions are still important, but they should be much shorter, more focused, and centred on practical application, dive planning, and the context relevant to the instructors' experience as more advanced divers and explorers.**

Deliberate practice requires effort and consistency and often involves pushing oneself out of a comfort zone to tackle difficult aspects of a skill. This approach is commonly seen in fields like sports, music, and other top-performers such as physicians or special forces but applies to any area where high-level proficiency is desired.

Deliberate practice has four principal characteristics:

Clear goals are specific but challenging. They target areas for improvement rather than merely repeating what's already known. Students have to understand not just what to practice but why they must practice it.

Focused attention means practice with minimal distractions to maximize learning and retention. This is provided not only by a well-chosen underwater classroom but also by the freedom to learn in a collaborative, not strictly competitive, environment.

Immediate feedback, either from an instructor or through self-assessment, is needed to identify mistakes and refine techniques promptly. In the water, this refers to active teaching when the instructor provides immediate feedback and confirmation of progress while underwater and allows students to implement the feedback

straight away. Of course, the post-dive feedback sessions on the surface are essential, but the impact of active underwater teaching is invaluable.

Reflection and adjustment means analyzing performance to refine skills, allowing for continuous improvement over time. This occurs through video debriefings during class, post-dive and post-class debriefings, and teaching self-evaluation. It rests on the promotion of teamwork for self and team improvement. This is critical not only for courses but for any form of more advanced activities like exploration diving or project diving, as humility, open-mindedness and learning from one's own and team's struggles and mistakes will make a definite impact on both success and safety.

The long-term goal is to eliminate all lectures in which the instructor presents a pre-made presentation. Theory discussions are still important, but they should be much shorter, more focused, and centred on practical application, dive planning, and the context relevant to the instructors' experience as more advanced divers and explorers. Now, the instructor's personal dive experience, project participation, exploration, diverse environments and teams are critical to becoming the inspirational educator, guide, coach and mentor we aim for.

With this new, powerful tool, GUE is striving to educate a new generation of divers, instructors, explorers, and leaders of the industry whose goal will be continuous development, improvement, and growth. ■

Ulrik Juul Christensen

Ulrik Juul Christensen is a Danish entrepreneur, educator, avid scuba diver, CCR diver, underwater photographer, and instructor. He is the CEO of Area9 Lyceum, which has been pioneering personalized learning platforms that use adaptive technology to shape learning to individual learners. With his background as a medical doctor, he has spent three decades in human factors, simulation, and debriefing research as well as high impact/high stakes learning. More than 50 million learners from middle school to physicians have been using Area9's platforms. Christensen serves on the boards of several companies and organizations, including the Technical University of Denmark (DTU) and GUE.

www.masterydiving.com

Dorota Czerny

Dorota Czerny is a highly experienced diver who fell in love with the ocean in 1996. She transitioned from teaching at a university to teaching scuba diving due to her passion for the sport. As Vice President of Global Underwater Explorers, she is highly skilled in technical, cave, and rebreather diving, and is dedicated to developing the organization's educational component. Her focus is on creating a new generation of explorers and young scientists with GUE's NextGen Scholarship program. Dorota's dedication to diving education extends beyond her work with GUE as she actively explores caves and wrecks around the world.

RESTORING HISTORY & ECOSYSTEMS

Curtis and Jim work to cut the net free of the stern torpedo tube.

PHOTO **TIANYI LU**

TEXT **GÖZDE AKBAYIR & JIM BABOR**
PHOTOS **ANGIE BIGGS, TIANYI LU & KIAN FARIN**

– *THE* UB-88 *CLEANUP PROJECT*

The *UB-88*, a World War I German Type UB III submarine, rests quietly on the ocean floor off the California coast, bearing witness to over a century of history. Surrendered to the United States on November 26, 1918, the submarine traveled across the Atlantic and through the Panama Canal before being intentionally sunk during naval exercises on January 3, 1921. Today, it lies approximately 12 km/7.5 mi south of San Pedro, California, at a depth of about 58 m/190 feet. As the only known German U-boat on the U.S. West Coast, the *UB-88* serves as both a historical wreck and an artificial reef.

In 2024, this remarkable wreck became the focus of a major environmental cleanup effort aimed at removing ghost fishing nets, which endangered marine species and obscured the site. Over five intensive days in December 2024, Ghost Diving USA volunteers worked to restore this underwater landmark, remove hazardous material, and promote marine conservation.

PHOTO **ANGIE BIGGS**

Angie, Juan, Shane, and Daniel with the 700 kg/1500 lb section of net recovered on day three.

The groundwork for the *UB-88* cleanup project started months earlier, in January 2024, with a series of survey dives that laid the foundation. These dives were crucial for assessing the wreck's condition and understanding the extent of the ghost net problem. During the first dive on January 24, the team captured thousands of images to document the site in detail and to begin the process of making a photogrammetry model of the wreck.

Further dives in February and April built on this work, refining the data and completing a thorough visual survey. Divers carefully mapped the wreck, noting how nets were tangled within its structure and buried in the surrounding sand. These efforts provided the team with a clear understanding of the challenges ahead and formed the basis for planning the December cleanup operation.

> **"Building the right team was just as important as securing resources. A dedicated 12-person dive team was assembled, including technical open-circuit and JJ-CCR rebreather divers, along with five safety divers.**

Planning and preparations

Preparation for the *UB-88* cleanup project took months of planning and logistical coordination. With the operation scheduled for December 16-20, securing the necessary resources and assembling a capable team was a top priority. Two vessels, the *Giant Stride* and the *Bottom Scratcher*, captained by Jim Simmerman and Kevin Bell, respectively, were secured to serve as the project's base of operations.

Funding and support came from a diverse group of sponsors and collaborators, including Healthy Seas and Hyundai Motor America. Healthy Seas, a foundation dedicated to addressing the issue of marine litter, particularly fishing nets, works to promote healthier seas and repurpose waste into innovative products through collaboration with partners. Hyundai Motor America's involvement as a main sponsor underscored their commitment to environmental sustainability and marine conservation. Their contributions, along with numerous grants and private donations, made this cleanup project possible.

Building the right team was just as important as securing resources. A dedicated 12-person dive team was assembled, including technical open-circuit and JJ-CCR rebreather divers, along with five safety divers. They were supported by a nine-member surface team that handled essential logistics. Jamie Mitchell from Zen Dive Co. ensured a steady supply of tanks and gas, while the surface operations ran smoothly thanks to a collective effort from everyone involved.

As part of the preparation, the photogrammetry model created earlier in the year played a crucial role. It was used to produce a 3D-printed model of the site and the wreck, which helped the team plan every aspect of the cleanup. The model was also utilized during briefings to visualize the wreck's structure and the placement of ghost nets. Beyond its practical use, the model serves as a powerful outreach tool, bringing the

Norbert and Jung work to free a section of net.

PHOTO **KIAN FARIN**

underwater world of *UB-88* to life for a wider audience.

With the logistics in place, a strong team ready, and a clear action plan, the stage was set for the *UB-88* cleanup operation.

Staging and documentation

The operation kicked off early on December 16, with the team setting off on a 90-minute journey to the *UB-88* wreck site. Ghost Diving USA CEO and President Jim Babor led a detailed briefing to outline the day's objectives. To help orient team members less familiar with the site, the 3D-printed model created from earlier photogrammetry work played a pivotal role in pre-dive briefings. The focus for Day 1 was twofold: staging equipment for the upcoming net removal dives and initiating a substrate study, led by Norbert Lee, to evaluate the ecological impact of ghost nets on the submarine wreck.

During their 35-minute bottom time, the divers captured critical baseline photographs to document the wreck's pre-cleanup condition. Divers used a custom hang bar for secure decompression stops in the open water of the busy shipping channel.

Full-scale net removal

Day 2 kicked off with the team diving into full-scale net removal. To avoid overcrowding in the tight underwater space, the teams worked in shifts.

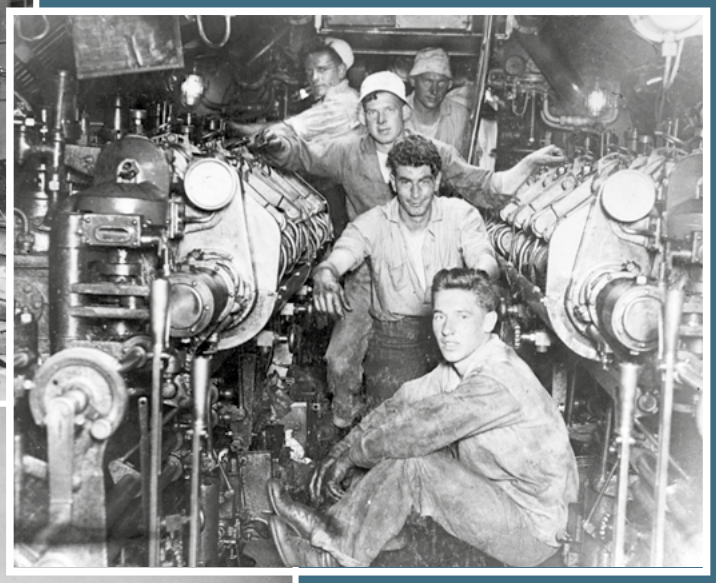
Team 1 started by carefully moving fragile marine life, like *Metridiums*, out of the work area. They then attached lift bags to sections of the nets to prepare for removal. Team 2 focused on clearing the nets from the port and starboard sides, with David making a special effort to free fish and crabs trapped in the debris. Team 3 worked on cutting the lower sections of the net.

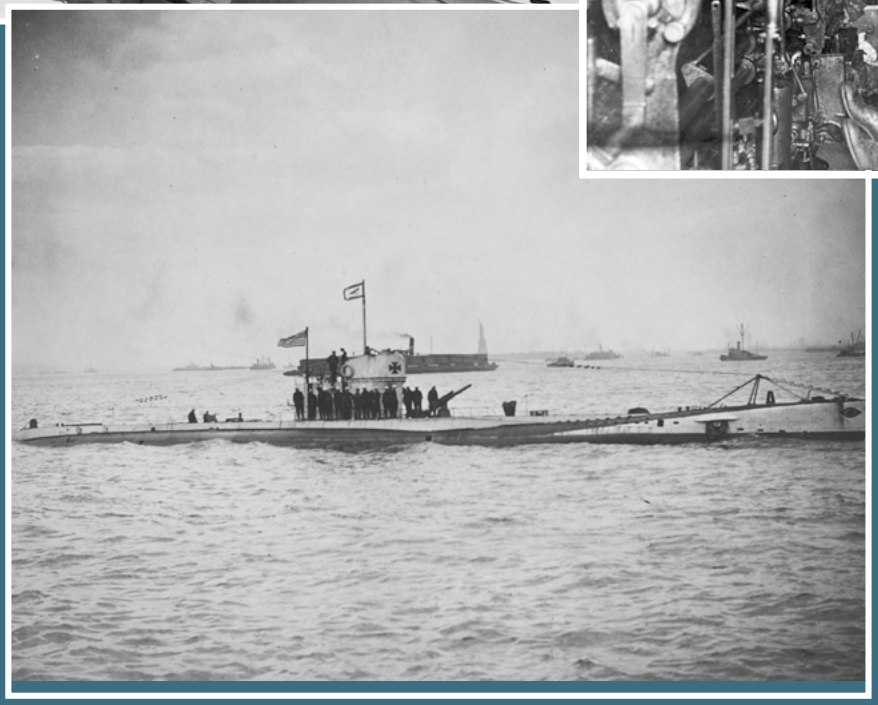
FACT FILE // HISTORY OF *UB-88*

UB-88, a German submarine from World War I, was built in 1917 and commissioned in 1918. Armed with torpedo tubes and a deck gun, she was designed for stealth and assigned to the I U-Flotille Flandern based in Zeebrugge, Belgium. During her active service, *UB-88* sank several Allied vessels, including the British steamer *Princess Maud* and the Swedish *Dora*. Despite facing intense counterattacks, *UB-88* successfully completed her missions.

After Germany's surrender in 1918, *UB-88* was handed over to the U.S. as part of a Victory Bond drive and to study German submarine technology. She toured U.S. ports to promote war bonds before being decommissioned in 1920 and scuttled in 1921.

Rediscovered in 2003 near Long Beach, California, *UB-88*'s wreck has since become an important historical and archaeological site, offering insights into World War I submarine warfare.





The German WWI submarine *UB-88* sank several Allied ships before being surrendered in 1918. Used in U.S. Victory Bond tours, it was scuttled in 1921.

> **Day 2 kicked off with the team diving into full-scale net removal. To avoid overcrowding in the tight underwater space, the teams worked in shifts.**

A section of net, showcasing the challenging conditions divers faced, as Jim prepares the bottom section for lift bags.


PHOTO TIANYI LU
GHOST DIVING
global mission

FACT FILE // SCIENTIFIC STUDY

TEXT **NORBERT LEE**

Abandoned, lost, or discarded fishing gear (ALDFG), also known as ghost nets, can cause significant harm to marine environments. These nets result in unintentional fishing (when marine life becomes trapped), ingestion of microplastics by wildlife, smothering of benthic organisms, and surface damage from the nets moving in the water. In Southern California, where Ghost Diving USA operates, strong tidal currents contribute to the movement of ghost nets, which scrape against shipwrecks and ocean floors, causing further ecological harm and disrupting the habitat of benthic communities.

The *UB-88* Cleanup Project aimed to evaluate the impact of removing ghost nets and whether doing so could help restore habitats by allowing new life to settle on surfaces previously affected by the nets. The goal was to see if removing the nets from the torpedo tube and other areas would support ecological recovery by creating space for marine life to return.

During the *UB-88* cleanup, the team focused on a ghost net located on the submarine's aft torpedo tube. This net, suspended by a float, was frequently moved by currents, causing abrasion on the tube's surface. This presented a valuable opportunity to compare affected areas with those not impacted by the nets, offering insights into how ghost nets damage surfaces and whether removal could encourage recovery.

The *UB-88* Cleanup Project aimed to monitor changes at the wreck site while minimizing disturbance. Before removing the ghost nets, the team marked their original positions. A visible line was then installed across the torpedo tube to serve as a reference, with stations set at intervals using numbered markers, or "cookies." The team set up five stations in areas impacted by the ghost nets and five in unaffected areas.

To track changes, the team used 0.5 x 0.5-meter photo quadrats to capture images of invertebrates and assess the coverage of colonial invertebrates in each area. These images were critical in documenting the condition of the site before and after net removal.

While the study provided valuable insights, it was limited by the small area affected by the nets, as well as the challenges of working at a depth of nearly 61 m/200 ft. To better understand the long-term effects, the team plans to return periodically, if funding allows, to continue monitoring changes. This ongoing research could form the foundation for a more extensive marine conservation project, providing important data on how ecosystems recover after ghost net removal and informing future efforts to clear marine debris.

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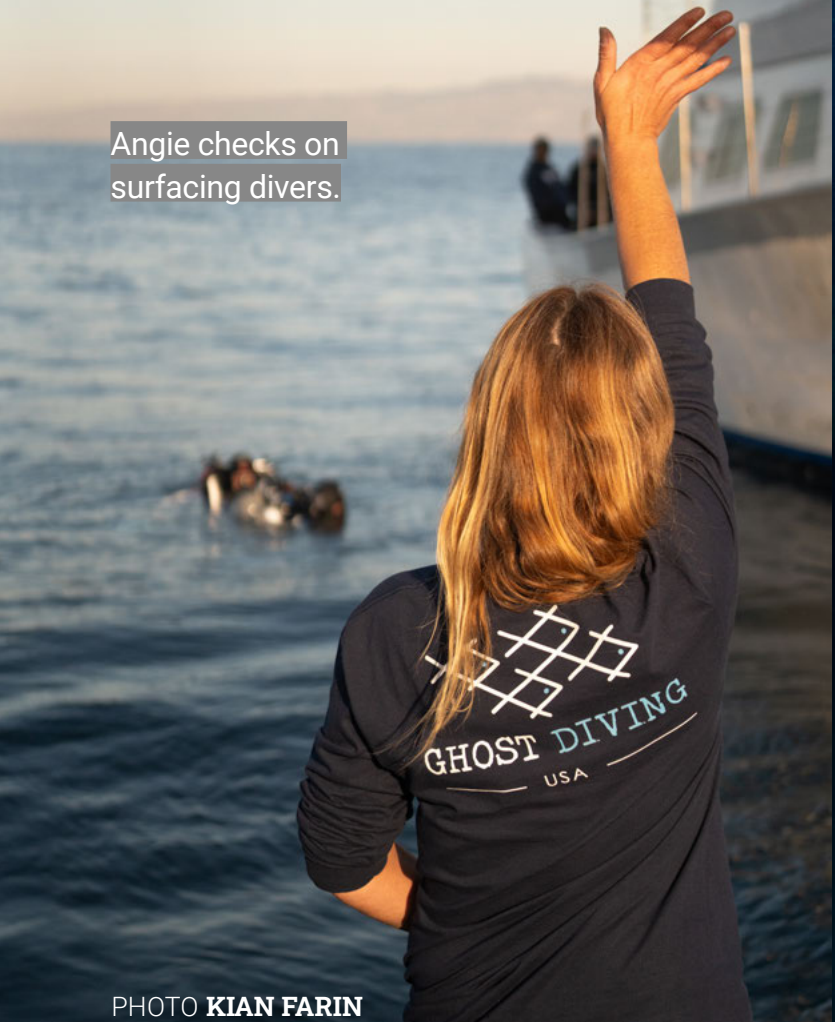
PHOTO **KIAN FARIN**



Angie checks on surfacing divers.

PHOTO **KIAN FARIN**

Lift bags staged and ready on the bottom section of net.

PHOTO **TIANYI LU**

The highlight of the day was successfully removing a 225 kg/500 lb section of fishing net. The *Giant Stride*, serving as a chase boat, recovered the net once it surfaced, while safety divers helped keep everything running smoothly underwater by checking on the working divers at their 21 m/70 ft and 6 m/20 ft decompression stops and taking extra equipment from the working divers as needed. This marked the first big milestone of the cleanup, with the team's coordination and teamwork really standing out.

Record-breaking haul

The team faced one of their toughest challenges on Day 3: removing the largest entangled net on the *UB-88* and clearing the torpedo tube.

During their dives, the teams tackled a massive 680 kg/1,500 lb fishing net—marking the largest single haul in the team's history. The size and weight of the net turned this achievement into a true test of teamwork. To coordinate this day of diving the first team descended to stage final lift bags on the massive amount of net. Thirty minutes later the cutting team, which consisted of Karim, Curtis, and Jim descended and started cutting for their planned bottom time of 35 minutes.

Despite the effort and complexity, the results were worth it. By the end of the day, the wreck was completely free of ghost nets. The remaining net now lay on the sand, beneath the stern of the wreck.

Remaining hazards

Day 4 shifted the focus from large-scale net removal to addressing remaining hazards and documenting the environmental impact. Some nets still posed a risk due to their buoyancy in the sand, creating potential entanglement hazards for marine life. The divers carefully gathered these remnants into one area and secured them with lift bags for easier removal later. The teams also secured sections of net rope cinches to bundle large sections, attaching lift bags with the plan to return on the final day and cut as much net free as possible.

One major challenge the team faced was from steel cables tangled within the nets, but

they made steady progress in preparing the site. Meanwhile, Norbert and the science team continued documenting the wreck, photographing both the untouched and damaged parts.

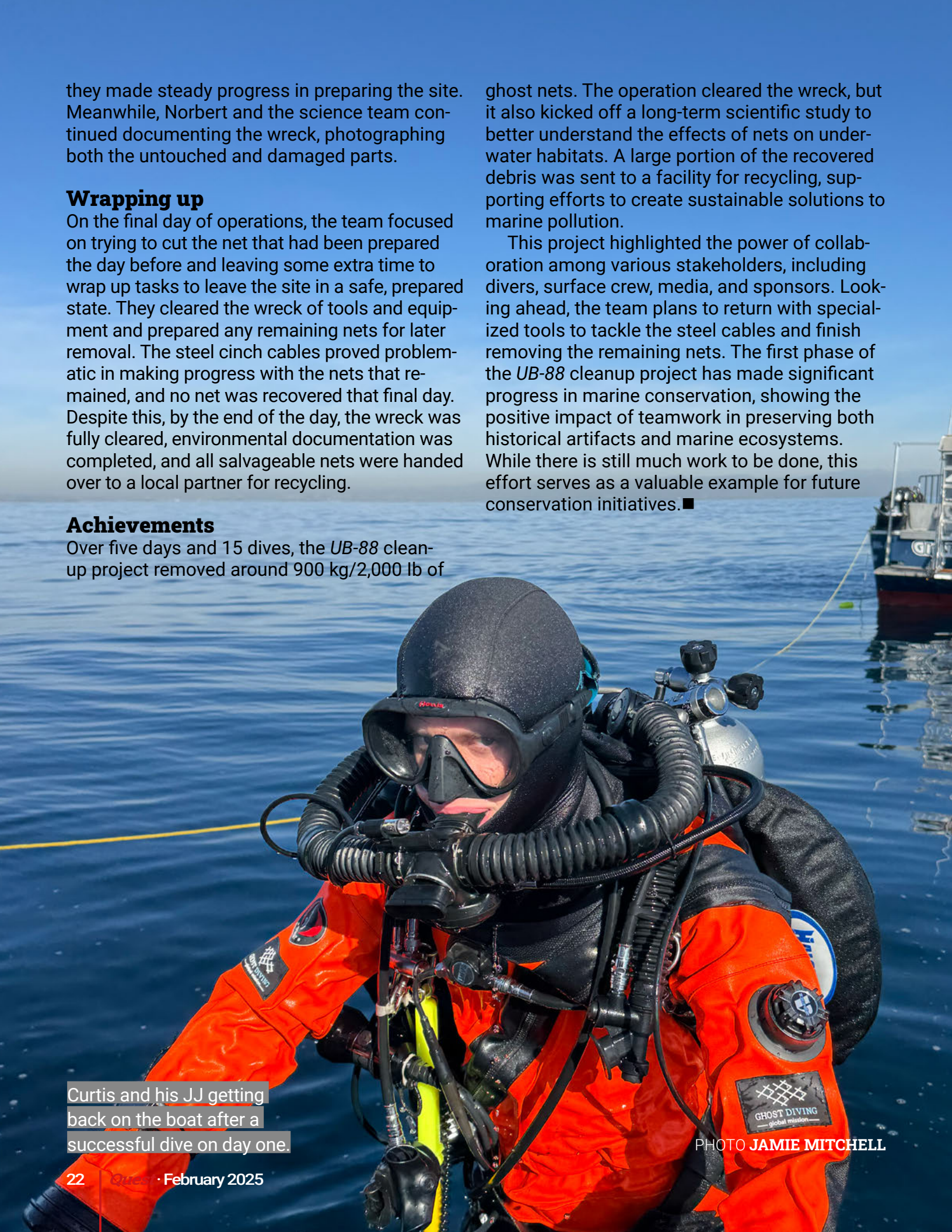
Wrapping up

On the final day of operations, the team focused on trying to cut the net that had been prepared the day before and leaving some extra time to wrap up tasks to leave the site in a safe, prepared state. They cleared the wreck of tools and equipment and prepared any remaining nets for later removal. The steel cinch cables proved problematic in making progress with the nets that remained, and no net was recovered that final day. Despite this, by the end of the day, the wreck was fully cleared, environmental documentation was completed, and all salvageable nets were handed over to a local partner for recycling.

Achievements

Over five days and 15 dives, the *UB-88* cleanup project removed around 900 kg/2,000 lb of ghost nets. The operation cleared the wreck, but it also kicked off a long-term scientific study to better understand the effects of nets on underwater habitats. A large portion of the recovered debris was sent to a facility for recycling, supporting efforts to create sustainable solutions to marine pollution.

This project highlighted the power of collaboration among various stakeholders, including divers, surface crew, media, and sponsors. Looking ahead, the team plans to return with specialized tools to tackle the steel cables and finish removing the remaining nets. The first phase of the *UB-88* cleanup project has made significant progress in marine conservation, showing the positive impact of teamwork in preserving both historical artifacts and marine ecosystems. While there is still much work to be done, this effort serves as a valuable example for future conservation initiatives.■



Curtis and his JJ getting back on the boat after a successful dive on day one.

PHOTO **JAMIE MITCHELL**

PHOTO **KIAN FARIN**

TEAM MEMBERS
Angie Biggs, Curtis Wolfslau, Daniel Pio, David Watson, Jamie Mitchell, Jim Babor, Juan Torres, Jung-han Hsieh, Karim Hamza, Katie McWilliams, Kian Farin, Laurie Dickson, Mark Self, Michael Gasbarro, Nir Maimon, Norbert Lee, Rene Tetter, Shane McWilliams, Symeon Delikaris Manias, Tianyi Lu, Yury Velikanau & Katie Papac

Gözde Akbayir

Gözde Akbayir is the Media & Marketing Manager for Ghost Diving USA and the Marketing Coordinator for GUE. With over 15 years of experience managing a dive center, travel agency, and marketing initiatives, she brings her extensive expertise and love for the ocean to her work. Certified as a trimix instructor, and CCR and cave diver, Gözde specializes in digital marketing, community management, and content creation within recreational and technical diving. She holds degrees in management and finance, which complement her professional focus. Originally from Türkiye and now residing in Malta with her family, Gözde draws constant inspiration from the sea. Through her roles with Ghost Diving USA and GUE, she is dedicated to supporting marine conservation efforts and amplifying awareness of environmental initiatives.

Jim Babor

Jim Babor is a classical musician and has been a member of the Los Angeles Philharmonic since 1993. Jim is also a professor at the University of Southern California Thornton School of Music. He is also an accomplished technical and cave diver and holds certifications from GUE for cave, technical, and rebreather diving.

As for Ghost Diving, Jim has been very generous in donating his time since 2012. He is the current CEO of Ghost Diving USA and has helped propel the organization into one of the most active chapters in the world, as well as aided in the establishment of Ghost Diving USA, an official 501(c)(3) nonprofit corporation, to further the cleanup of coastline around the USA.

GUE PREMIUM DIVE CENTERS

Area 9 Mastery Diving – Kralendijk, Bonaire
➲ www.masterydiving.com

Base1 – Sardinia, Italy
➲ www.baseone.it

Deep Dive Dubai – Dubai, UAE
➲ www.deepdivedubai.com

Dive Centre Bondi – Bondi, NSW, Australia
➲ www.divebondi.com.au

Duikcentrum de Aalscholvers – Tilburg, Netherlands
➲ www.aalscholvers.nl

Eight Diving – Des Moines, WA, USA
➲ www.8diving.com

Exploration Diver – Hangzhou, China
➲ www.facebook.com/qiandaolake

Extreme Exposure – High Springs, FL, USA
➲ www.extreme-exposure.com

Islas Hormigas – Cabo de Palos, Spain
➲ www.islashormigas.com

Living Oceans – Singapore
➲ www.livingoceans.com.sg

Scuba Academie – Vinkeveen, Netherlands
➲ www.scuba-academie.nl

Tech Korea – Incheon, South Korea
➲ www.divetechkorea.com

Third Dimension Diving – Tulum, Q. Roo, Mexico

➲ www.thirddimensiondiving.com

Zero Gravity – Quintana Roo, Mexico

➲ www.zerogravity.com.mx

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GUE DIVE CENTERS

Buddy Dive Resort – Bonaire
➲ www.buddydive.com

Dive Alaska – Anchorage, AK, USA
➲ www.divealaska.net

Faszination-Tauchsport – Sauerlach, Germany
➲ www.faszination-tauchsport.de

KrakenDive – Tossa de Mar, Spain
➲ www.krakendive.com

Living Oceans Malaysia – Kuala Lumpur, Malaysia
➲ www.livingoceans.com.my

Moby Tek Dive Center – Pahang, Malaysia
➲ www.moby-tek.com

Paragon Dive Group – Arizona, USA
➲ www.paragondivestore.com

Plongée Nautilus – Quebec City, QC, Canada
➲ www.plongeenautilus.com

Scuba Adventures – Plano, TX, USA
➲ www.scubaadventures.com

Scuba Seekers – Dahab, Egypt
➲ www.scubaseekers.com

Tauchservice Münster – Münster, Germany
➲ www.tauchservice.info

Tech Asia – Puerto Galera, Philippines

➲ www.techasia.ph

Unique Diving Center – Shanghai, China

➲ www.uniquediving.cn

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