MBARI shares latest tech innovations for visualizing ocean life and ecosystems at Marine Imaging Workshop

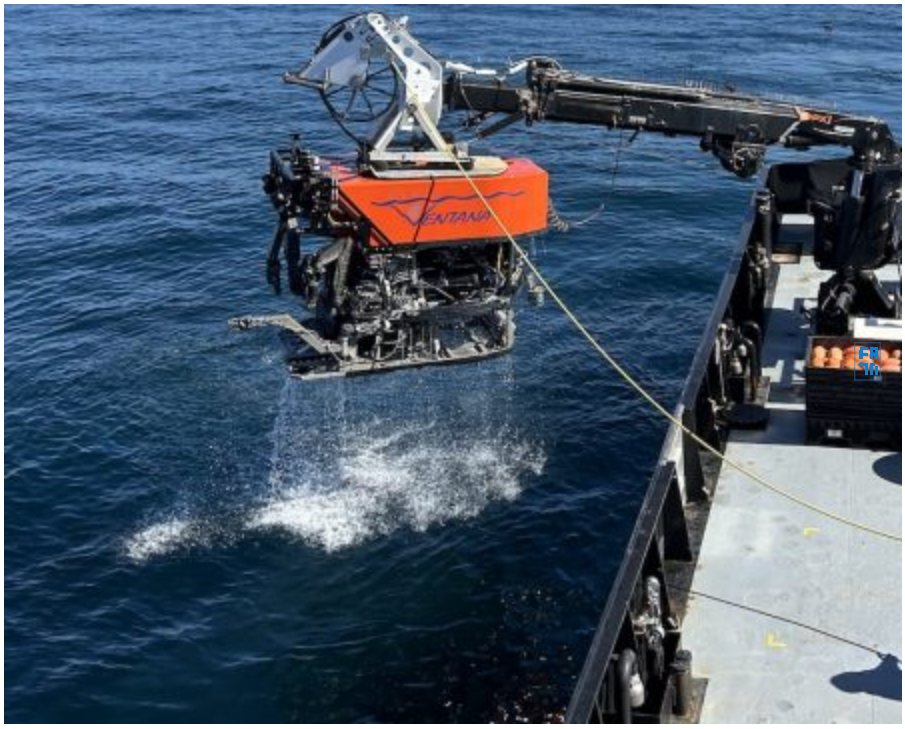
MBARI researchers have developed advanced imaging systems to visualize the ocean and its inhabitants. The Marine Imaging Workshop provided an opportunity to share MBARI's tech innovations with scientists and engineers from around the world. Image: © 2022 MBARI

> The Fifth Marine Imaging Workshop offered MBARI researchers the opportunity to share their expertise with their peers from around the world. Image: Joost Daniels © 2024 MBARI

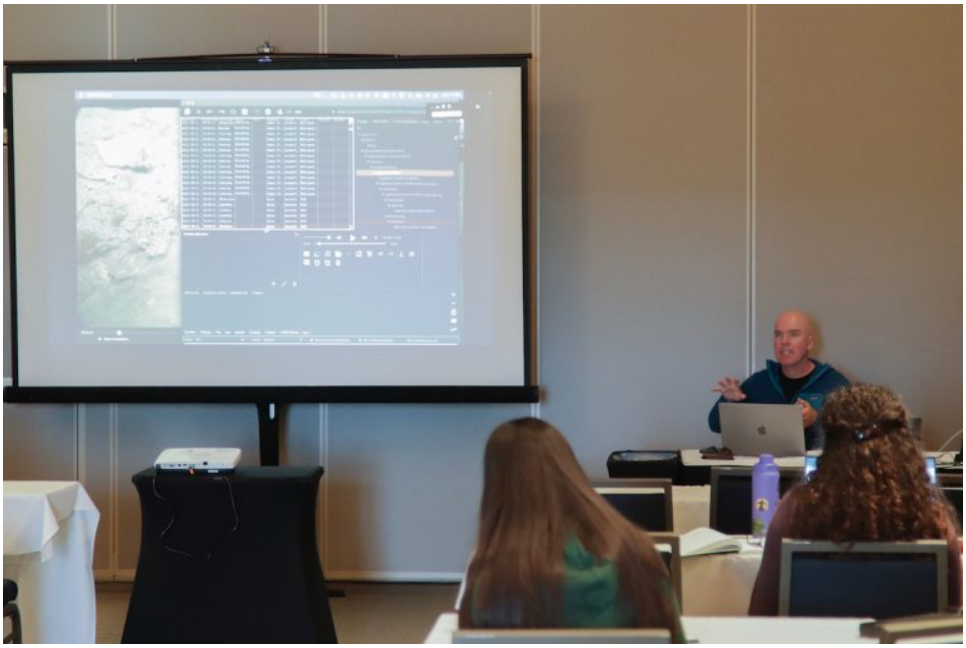
MBARI is at the forefront of ocean technology, advancing innovative solutions to visualize and understand the ocean, its inhabitants, and its ecosystems. We develop tools to assess ocean health and track how human actions affect marine life and environments.

Since 1988, MBARI's underwater robots have captured nearly 30,000 hours of deep-sea footage. This visual archive is a vital resource for studying the ocean. MBARI software engineers developed the Video Annotation and Research System (VARS) to help experts in our Video Lab annotate and analyze this trove of underwater video footage. Researchers at MBARI and our collaborators around the world have access to millions of annotations that can be sorted and retrieved by specific animal observations, each tagged with their associated depth, location, and environmental conditions. This carefully labeled imagery also helps train AI to identify marine life, further accelerating marine discovery. Our partnership with the FathomNet Program and data contributions to the FathomNet Database further enhances our ocean exploration and discovery.

MBARI engineers develop systems to visualize the ocean in exciting new ways. Advanced laser instruments from the Bioinspiration Lab have revealed the complex structure of delicate gelatinous organisms. A sensor suite designed by the Seafloor Mapping Lab combines light and acoustics to visualize the seafloor at a centimeter scale. Drifting cameras developed by the Carbon Flux Ecology Team document sinking particles of organic material to fill in the gaps in our understanding of the ocean-climate connection. These technologies are among the many MBARI tools that enable researchers to observe both individual animal behaviors and complex ecological interactions.



MBARI's deep-sea imagery is crucial to the institute's education and outreach efforts. The SciComm Team and Video Lab create engaging videos about MBARI's work that highlight the important role the ocean plays for all life on Earth. By sharing these productions on MBARI's social media platforms, we seek to inspire the next generation of ocean explorers. MBARI imagery is also integral to FathomVerse. Bridging research and public engagement, this mobile game developed as part of the FathomNet Program invites ocean enthusiasts to collaborate with scientists to train AI to identify marine life.



MBARI Software Engineer Brian Schlining led an interactive workshop about the Video Annotation and Research System (VARS), sharing a comprehensive overview of the software infrastructure and guiding users through the process of setting up and running a VARS system for use at their institution. Image: Marike Pinsonneault © 2024 MBARI

Collaboration is essential for maximizing the potential of science and technology to help us understand the ocean. As a leader in marine science and technology, MBARI shares our tech innovations with our peers worldwide. This week, MBARI hosted the Fifth Marine Imaging Workshop, sharing our latest technology developments with over a hundred scientists and engineers from around the world.

Supported by the Institute of Electrical and Electronics Engineers' Oceanic Engineering Society (IEEE OES), with additional funding from the Gordon and Betty Moore Foundation, Schmidt Ocean Institute, Boxfish Robotics, and SubC Imaging, the Marine Imaging Workshop fosters an environment where researchers, enthusiasts, and industry professionals can engage with cutting-edge ocean imaging techniques, explore data analysis, and discuss the application of AI to support ocean exploration. By bringing together participants from diverse backgrounds and disciplines, the Marine Imaging Workshop promotes knowledge-sharing and collaboration. In over a dozen presentations, hands-on workshops, and posters, MBARI researchers shared their expertise in image analysis, data collection methodologies, effective data management and dissemination, and more.

Sharing MBARI research, data, technology, and expertise at events like the Marine Imaging Workshop helps the ocean exploration community grow its capacity to measure and monitor ocean health. Together with our peers, we are working to advance imaging technology to collect visual data about ocean health. The information the marine science and technology community gathers can ultimately guide responsible stewardship of the ocean and its resources.

Story by Science Communication Fellow Marike Pinsonneault

For additional information or images relating to this article, please email pressroom@mbari.org.

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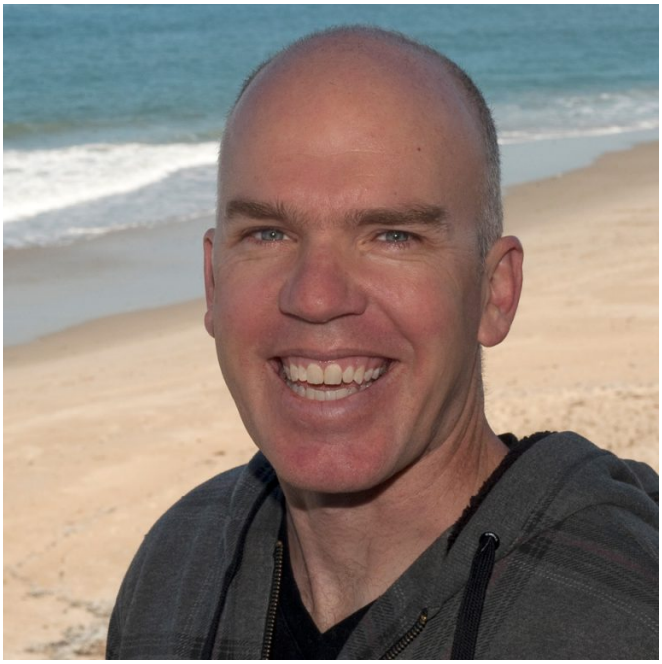

Brian Schlining
Senior Software Engineer

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