

## About MARE

Fisheries around the world are in danger of collapse.

According to a Pew Oceans Commission Report, our oceans are “in crisis.” The U.S. Commission on Ocean Policy asserts that our failure to properly manage our oceans is “putting our future at risk.”

To address and reverse this alarming situation, policy makers and fisheries managers need consistent, reliable marine species, habitat and ecosystem data on an ongoing basis. They need to be able to track changes in fish populations over time, as well as the effects of conservation measures, including marine protected area (MPA) designations. This, in turn, requires the ability to see and work in underwater environments—which, beyond diver depths, means enlisting technology and engineering support.

Marine Applied Research and Exploration (MARE) provides just such deepwater engineering and offshore operations expertise. Founded as a nonprofit, 501c3 organization in 2003, our mission is to help protect and restore the ocean’s invaluable, yet threatened resources by enabling science-based marine conservation efforts.



# MARE

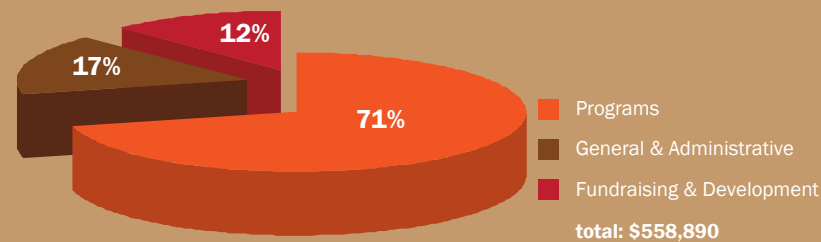
## MARINE APPLIED RESEARCH AND EXPLORATION

*Illuminating the Oceans' Unknowns*

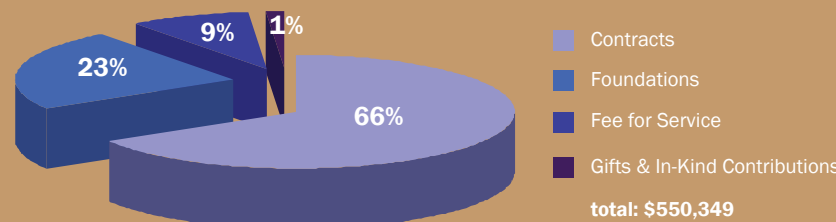


### Statement of Activities, FY2010

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#### INCOME



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### Message from the President

I am struck by all we have accomplished this year.

Our staff completed 10 highly successful cruises (85 days at sea!) and brought back encouraging news. We saw Yellow Eye and adult Cow Cod—both listed as threatened species. We also saw juvenile Canary Rockfish, an over-fished species on the verge of being “threatened.” In a rocky area of Estero Bay, we saw formidable recovery just six years after it was closed to fishing, and we observed Dungeness Crab cheek to claw under the world-renowned Mavericks big wave surf site—who knew?

We also moved to a new Point Richmond office with far better access to San Francisco Bay for testing our equipment. We opened an office in Eureka, CA that is expanding our services to include ROV data processing, and we created and hired three new staff positions.

California will soon have a unified network of marine protected areas (MPAs). Oregon is not far behind, and Washington is working toward the same goal. But fish

don’t recognize these anthropogenic borders, and we still know relatively little about marine ecosystems—even coastal ones. To understand the impact of these MPAs and manage them for maximum benefit, we need a far better understanding of how coastal ocean ecosystems work, which requires far more visual data. We need to see what is happening in these ecosystems over time.

MARE is proud to be helping supply these critical data and to have completed work in all three of the California MPA zones established to date—the Channel Islands, the Central Coast, and the North Central Coast. We thank our tremendous partners, funders and donors for enabling our work.

Sincerely,

Dirk Rosen  
MARE President and Founder

## MARE is Growing

During 2010, MARE opened a satellite office in Eureka, CA, hired three new staff positions, and purchased a Phantom Series remotely operated vehicle (ROV)—all of which will further expand our capacity to help marine managers and scientists “see” beyond diver depths.

The Eureka office established MARE’s capacity to process ROV data. It is also providing ROV upgrades and offshore operations assistance, making these services more convenient for Oregon and Washington researchers.

Andy Laueremann, our new ROV Operations Supervisor, is running the Eureka office. Andy is a marine biologist with over a decade of ROV-based marine survey experience. He was

integral to the development of the ROV sampling design and protocols adopted by the California Department of Fish and Game (CDFG). He also supervised the successful completion of CDFG’s annual ROV surveys from 2006 to 2010.

Yuko Yokozawa is our new GIS and Data Manager, and AJ Reiter is our new Junior Engineer.

The Phantom Series ROV is one designed and developed by MARE President Dirk Rosen and Senior Engineer and Board Member David Jeffrey in their previous lives at Deep Ocean Engineering. It will serve as a backup to our current vehicle, as well as enable us to schedule back to back and concurrent work.

## MARE to Co-Chair National Marine Technology Workshop

In February 2011, MARE will co-convene a national workshop that will examine the capabilities, limitations, operational considerations, and cost of available technologies for visual surveys of seafloor communities.

The workshop will be held at the Monterey Bay Aquarium Research Institute. Its overarching goal is to stretch limited undersea research and monitoring budgets by identifying the most cost effective and efficient technologies for specific observational needs, and identifying gaps in available technologies.

“Successful, cost-effective resource management requires a thorough understanding of those resources,” explains Skyli McAfee, Executive Director of the California Ocean Science Trust and a member of the workshop Steering Committee. “In turn, this necessitates a coordinated and systematic approach to acquiring critical data. This workshop will address exactly that.”

MARE Board Member Ed Ueber conceived the workshop. It will be co-chaired by Dirk Rosen, MARE; Jennifer Reynolds, University of Alaska Fairbanks and NOAA West Coast & Polar Regions Undersea Research Center; and Mary Yoklavich, NOAA/NMFS Southwest Fisheries Science Center.

## MARE at California and the World Ocean 2010

MARE President Dirk Rosen at California and the World Ocean 2010 along with California Ocean Protection Council Executive Director Amber Mace (center) and MPLA Process Facilitator Eric Poncelet (left). During the conference, MARE and its partners presented a poster detailing the results of our finfish surveys in the Channel Islands MPAs.



## Quest for Better Trawling Methods

MARE continued working with The Nature Conservancy and Cal State University Monterey Bay on a five-year Trawl Impact and Recovery Survey. By determining how trawling alters the seafloor and how quickly it recovers, the Morro Bay-based study will enable fisheries managers to develop regulations that allow fishermen to catch economically important fish while ensuring that fish stocks are not depleted.

This year, we completed three data collection cruises before and after trawling. “What struck us,” reports MARE President Dirk Rosen, “is how different each survey of the same study plots was and how dynamic the ocean is, even over a flat, muddy bottom that varies by just four meters depth over a 12 kilometer range. Different animals dominated the seafloor on each cruise.

During one of our cruises, we had time for surveys of Church Rock in Estero Bay, which was shut to fishing six years ago. “We were extremely pleased to see that this habitat seems to be recovering rapidly,” says Rosen. “We saw numerous schools of large fish—the largest I have seen anywhere, rivaled only by schools out of Point Arena where there is less fishing pressure.” We hope to further document this recovery in the future.



## MARE Begins North Central Coast MPA Monitoring

In July 2010, MARE began conducting baseline fish and invertebrate surveys in California’s newly established North Central Coast Marine Protected Areas (MPAs)—those which run from Pillar Point just north of Half Moon Bay up the Sonoma Coast to Point Arena, including the Farallon Islands.

The surveys were exceptionally successful, resulting in 280 hours of seafloor video and some 8,600 high resolution digital still images, some of which you see on these pages. They will provide information needed to determine whether and how MPAs are protecting ecosystems and biodiversity, as well as guide future MPA management decisions.

MARE, along with our science partner, Dr. James Lindholm of Cal State University Monterey Bay, was awarded this three-year project by the California Ocean Protection Council and Sea Grant. We are working from the *Donna Kathleen*, a fishing vessel owned and operated by Tim Maricich. Tim is a spot prawn fisher who lost his fishing grounds due to MPA closures.

## Restoring Monterey Bay

In September 2010, MARE helped remove lost fishing gear from the Monterey Bay National Marine Sanctuary. MARE staff retrofitted the Sanctuary’s Phantom ROV with a serial multiplexer, imaging sonar and high definition video still camera. Additionally, MARE ROV Operations Supervisor Andy Laueremann operated the ROV during this two week cruise, which brought up 400 feet of rockfish gill nets, two crab pots, one prawn trap and 600 pounds of lead weights.

“Working closely with MARE and the other partners was crucial to the success of this cruise,” says Karen Grimmer, Monterey Bay National Marine Sanctuary Deputy Superintendent and cruise leader. “The MARE team provided the intensive technical support necessary to keep the ROV and its components online throughout the cruise, including an HD video camera which resulted in some stunning images and video taken within remote deepwater habitats.”

Lost fishing gear kills fish and marine mammals long after it sinks to the bottom of the ocean. Long gill nets and trawling gear often float up into the water column, continuing to “ghost fish” the species they were designed to capture, as well as entangling and killing other wildlife such as birds and marine mammals. Lost crab and shrimp pots often harm vital habitat by scouring and scraping the seafloor as they are moved by large winter waves.

*Photos courtesy of MARE/TNC/IfAME/MBNMS. From top to bottom: Juvenile Yellow Eye, a threatened species, observed in the Monterey Bay National Marine Sanctuary during a site characterization survey; Data collection team in front of the Farallon Islands during our North Central Coast MPA surveys; Slender Sole and Brittle Star observed at one of our Trawl Survey sites in Estero Bay; Spot Prawn trap removed during the lost fishing gear cruise in Monterey Bay.*