

CALIFORNIA OCEAN SCIENCE TRUST

20 years of partnership for California's ocean



REFLECTIONS ON THE STRONG INTEGRATION OF SCIENCE AND MARINE POLICY AT THE START OF A NEW DECADE

For those who depend on California's ocean, whether it's Dungeness crab fishermen on Bodega Bay or whale-watching tour operators off the coast of San Diego, Spring is often a time of reflection and renewal; providing the public access to the ocean's plenty, and its beauty is always on their minds. **For the Board and staff of California Ocean Science Trust, our 20-year anniversary provides an important opportunity to renew our commitment and offer hope for the next chapter with a new vision for the coming decades.**

We are proud to share highlights of our work since 2000 when the California Ocean Resources Stewardship Act (CORSA) catalyzed the creation of the California Ocean Science Trust (OST). Recognizing the deep expertise in California's scientific community, our founding legislation was a bold move to create an independent trusted voice - in a new and very different non-governmental organization - that could put science to work to accelerate progress towards our State's vision of a healthy and productive coast and ocean.

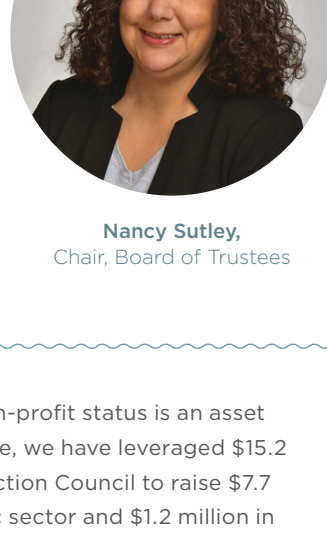
We exist in the boundary between the different worlds of science and ocean management; by definition, our success is the success of our partnerships and our shared progress. We are grateful to the many scientists, government policy-makers and resource managers, non-profit leaders, and community members who have supported, challenged, and collaborated with us. The bold experiment is working, but there is more to do.

In 20 years, much has changed and evolved. California's marine science academic community continues to strengthen, with the world-class California State University and University of California systems driving a rise in applied research, technological development, and novel solutions. Climate change has made its presence known in a profound way, revealing ocean acidification, sea-level rise, and other threats we could not have imagined in 2000. **Advances in science and communication have afforded us the ability to rapidly infuse policy-making with scientific knowledge, meeting the urgency of the moment.** The notion that science should inform policy is not universal at all levels of government, underscoring why California is a special place and one we are proud to call home.

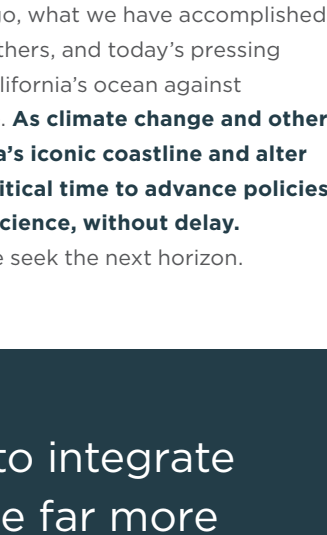
With our partners, we have achieved tangible impact on government investment in science, legislative action,

and policy directives. Our non-profit status is an asset to California; since 2008 alone, we have leveraged \$15.2 million from the Ocean Protection Council to raise \$7.7 million from the philanthropic sector and \$1.2 million in additional government funding.

In the stories below, we will dive beneath the surface to share more about the work we are doing and the values that motivate us to speak up for a resilient ocean. We will tell you about our genesis 20 years ago, what we have accomplished in partnership with so many others, and today's pressing call-to-action to safeguard California's ocean against impacts of a changing climate. **As climate change and other influences redefine California's iconic coastline and alter local ecosystems, now is a critical time to advance policies informed by the realities of science, without delay.** We hope you will join us as we seek the next horizon.



Liz Whiteman, Executive Director



Nancy Sutley, Chair, Board of Trustees

"California academic researchers are working to integrate their science into ocean policy in ways that are far more effective and creative than two decades ago. Rapid and accurate information sharing between climate scientists and decision-makers is needed now more than ever."

DR. TESSA HILL, PROFESSOR, UNIVERSITY OF CALIFORNIA, DAVIS

OST'S ORIGIN STORY: COMBINING SCIENTIFIC RIGOR WITH LOCAL KNOWLEDGE

The Pacific Ocean defines California. Californians care deeply about the ocean. The ocean inspires us, nurtures us, and feeds us.

In 2000, former Assemblymember Fred Keeley of Santa Cruz introduced what became the California Ocean Resources Stewardship Act (CORSA), calling on the Secretary of Natural Resources to create an organization that would "encourage coordinated, multi-agency, multi-institution approaches to ocean resource science." This organization became known as the Ocean Science Trust (OST).

"We wanted to take a new approach and form a group comprised of scientists who would provide independent advice and recommendations to government decision-makers. Ocean Science Trust has proven its worth many times over."

— Bill Craven, Former Chief Consultant, Senate Committee on Natural Resources and Water

The timing was important. CORSA followed on the heels of two seminal pieces of ocean legislation: the Marine Life Management Act (MLMA) in 1998, which transformed state fisheries management, and the Marine Life Protection Act (MLPA) in 1999, which called for the creation of a science-based marine protected area (MPA) network spanning the entire California coast. Together, all three pieces of legislation recognized that ocean habitats, fisheries, and communities were declining, and were a call to action.

Californians were in broad agreement about the goal: we wanted to bring back productive, sustainable fisheries, and a healthy ocean rich with life. But there were sharp - sometimes acrimonious - disagreements as to how to get there.

"Science-informed policy does not happen by accident. It's absolutely essential that we have an entity that is in this transition space. You need people who are trained to make connections between the policy makers and the science realm."

— Amber Mace, Executive Director, California Council on Science and Technology

Scientific information could serve as a gathering point, transcending differences in values and objectives. "We had always been struck by the lack of true engagement between the academic community and the decision-making community on these critical issues," said Mark Gold, Deputy Secretary for Oceans and Coastal Policy, California Natural Resources Agency. Or as Gary Griggs, Distinguished Professor of Earth Sciences, UC Santa Cruz, put it, "Historically, scientists were in one corner, and policy makers in another corner."

In 2007, the MPA Monitoring Enterprise was launched as a public-private partnership within OST to design and implement an innovative monitoring program for what would become, five years later, California's globally-unique network of 124 marine protected areas. Explicitly housing this initiative within OST - and by default outside of government and outside of academia - created a unique opportunity to design a monitoring program in a public setting; inviting scientists, fishermen, coastal citizens, and managers to share their interests and perspectives.

The resulting baseline monitoring plans guided the investment of \$16 million in public funds, capturing a socioeconomic and ecological snapshot of the whole coast; an investment that will serve California in perpetuity. **New partnerships and collaborations formed the heart of the effort, with the first ocean program in the State to include traditional ecological knowledge and important roles for community and citizen scientists, fishermen, and coastal residents in collecting data alongside academic scientists.**

"Region by region, California's commitment to ocean stewardship and our commitment to scientific monitoring is giving us an unprecedented science foundation on which to make decisions about the future of our oceans. And the data and results are available to everyone."

— John Laird, Former Secretary of Natural Resources, California Natural Resources Agency

The future of our oceans depends on what we do today. Certainly, the planet's oceans face challenges on a global scale. **Working in partnership with government agencies, community stakeholders, and scientists, we have demonstrated that people can create solutions to these problems that work on the local scale and still retain scientific rigor.** Good data can satisfy the needs of scientists and help provide information most useful to local communities and decision-makers.

Maintaining this balance will help ensure that our ocean stays healthy and resilient into the future.

"California is a long-standing leader on science-based ocean conservation. The urgency of the climate crisis has other states and nations increasingly looking to California for innovative policy solutions on a range of coastal and ocean issues."

KAITILIN GAFFNEY, DIRECTOR, OCEAN, COAST AND FISHERIES PROGRAM, RESOURCES LEGACY FOUNDATION

BY THE NUMBERS



PROTECTING OUR FISHERIES AGAINST AN INVISIBLE THREAT

The problem was invisible, mysterious and devastating.

For as long as people have lived along the Pacific coastline, they have harvested shellfish, like oysters. Beginning in 2010, oyster farmers in Washington state suffered massive die-offs of their crop, putting multi-generation, family-owned companies out of business. Would the same mysterious malady strike California? Were abalone and Dungeness crab also at risk?

The culprit? Ocean acidification. Pollution from our cars and smokestacks changed the water chemistry along the West Coast of North America, as carbon dioxide emitted into the atmosphere was drawn into ocean waters. Nutrient run-off and land-use changes exacerbated the problem. In some places, the water had become too corrosive to allow young oysters to grow healthy shells. There was no reason to think California's waters were immune.

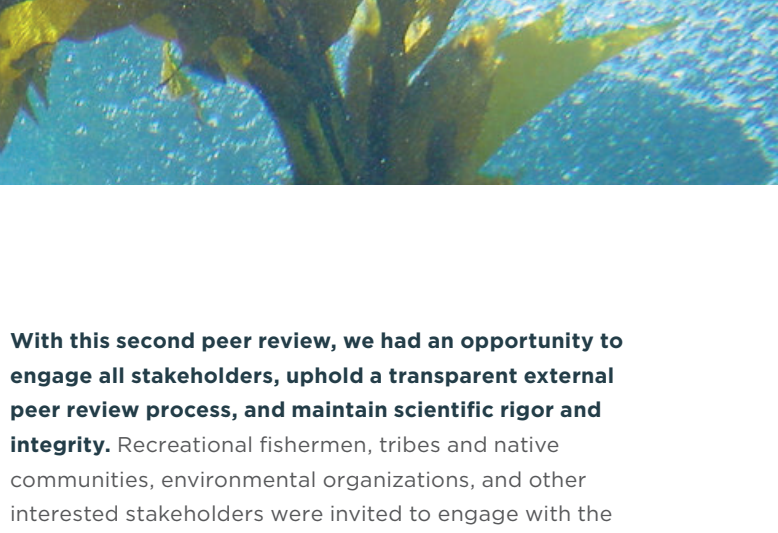
"Our ocean is experiencing unprecedented changes, from coastal areas to deep submarine canyons, that present a significant threat to ocean health -- as well as to human lives and livelihoods. We need rapid response teams that bring together science experts, policy leaders and community members to advance science-based solutions."

— Margaret Spring, Chief Conservation and Science Officer, Monterey Bay Aquarium

Time was of the essence. But scientists still had many unanswered questions.

Public pressure was mounting for California's government to be ready to act and defend against this invisible threat. But who, specifically, should act? And what should they do? A sober look at the rapidly evolving science was needed.

In 2012, the Ocean Protection Council called on California Ocean Science Trust to convene an expert panel to synthesize current scientific understanding of changing ocean chemistry, including ocean acidification and hypoxia, and make recommendations for policy and management action. Unveiled in early 2016, the West Coast Ocean Acidification and Hypoxia Science Panel



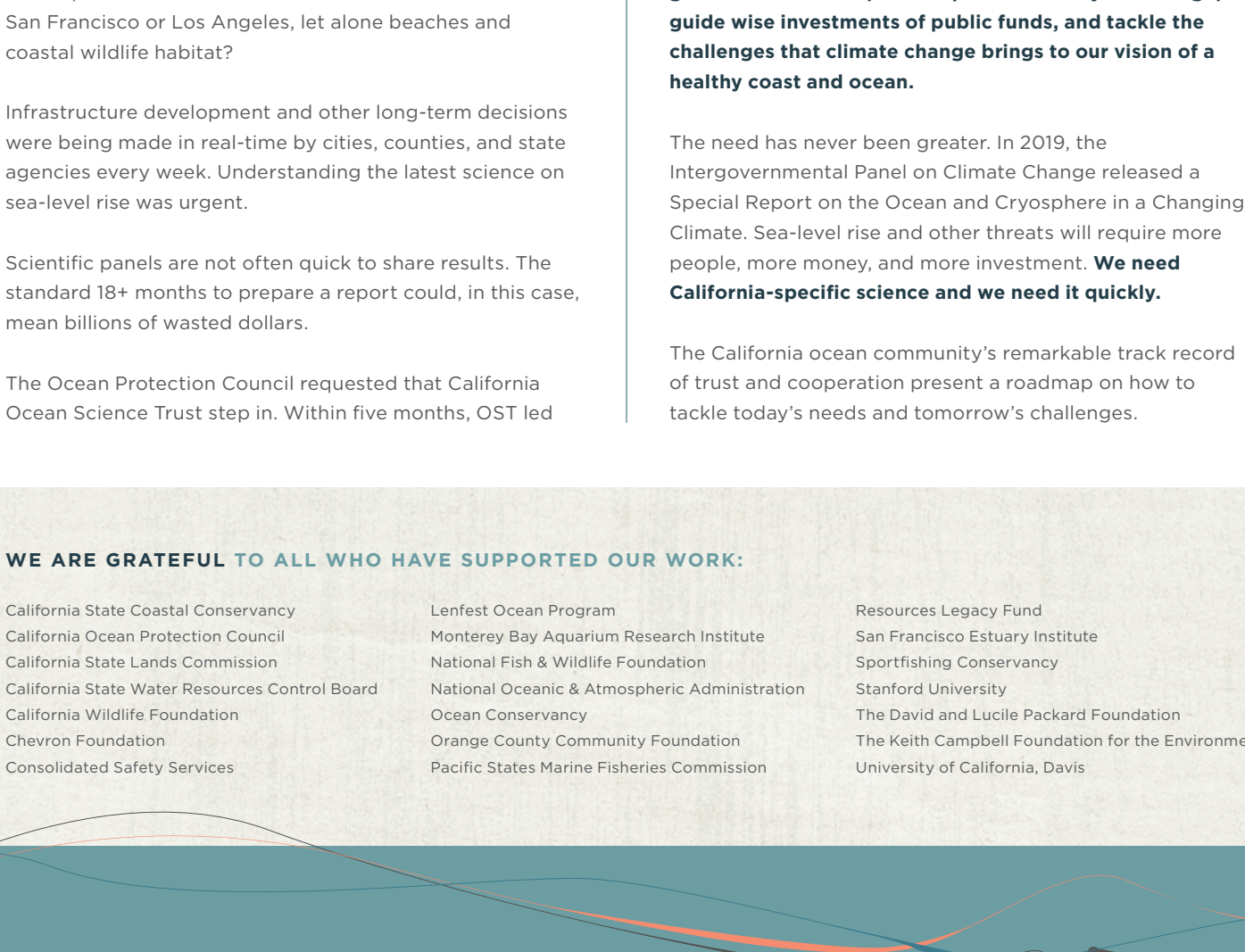
provided the first science-based roadmap for action for the tri-state region.

Armed with this scientific information, Oregon and California joined Washington in passing new laws, exploring new management options, and investing in continued research to tackle these growing threats. In California, Ocean Science Trust supported our partner, the Ocean Protection Council, in developing a comprehensive policy Action Plan for the state. **Today, we serve as the Secretariat of the legislatively-mandated Ocean Climate Assessment and Hypoxia Science Task Force to provide continuous scientific research and policy guidance to relevant agencies governing ocean and coastal resources potentially affected by ocean acidification and hypoxia.**

Beyond identifying potential threats and impacts, we are taking an overwhelming global problem and synthesizing the emerging science to find solutions from land and sea. From improving water quality, to safeguarding vulnerable species, these solutions will help our local fishermen adapt to rapidly changing ocean chemistry, with benefits flowing from resilient shorelines to resilient coastal communities.

Today, we are collaborating with ecologists and social scientists in California and Oregon to better understand how shellfish farmers and Dungeness crabbers - representing some of the most lucrative fisheries and aquaculture operations along the coast - can prepare for the future and continue to thrive.

TIMELINE 2000-2020



RED ABALONE: A ROADMAP FOR ENGAGING LOCAL COMMUNITIES

Traditionally, coastal Native tribes have viewed the health of abalone populations as a bellwether of the health of our ocean overall. For centuries, indigenous people have sustainably harvested abalone for subsistence, ceremony, and adornments. In recent decades, the story of our approach to protecting red abalone provides a blueprint for how scientists can engage local communities to restore something sacred and valuable. **As always, the story begins with partnership.**

In 2016, OST gathered a panel of scientific experts to look into the density estimate methods for the recreational red abalone fishery, at the request of the California Department of Fish and Wildlife (CDFW). Four years later, we convened another expert panel to review management strategies for red abalone, and by this time, California's North Coast had changed significantly. Kelp forests were disappearing due to rising ocean temperatures and the explosion of voracious purple urchins. California's Fish and Game Commission reached the difficult decision to suspend the red abalone recreational fishery in 2018, later extending that closure through April 2021.

At that moment CDFW was tasked with managing a fishery that was depleted primarily due to broad environmental changes beyond the immediate world of fishing. The scientists we convened to review management strategies had to take into account not just the scientific integrity of the strategies but whether they were sufficient to address these broader changes in ocean health.

With this second peer review, we had an opportunity to engage all stakeholders, uphold a transparent external peer review process, and maintain scientific rigor and integrity. Recreational fishermen, tribes and native communities, environmental organizations, and other interested stakeholders were invited to engage with the peer review panel directly, to learn more about the peer review approach and to contribute science questions. At the end of the peer review process, we shared the review panel's findings and answered questions from stakeholders. In October 2018, OST presented the final report and its findings to the Fish and Game Commission on behalf of the peer review panel.

Common practice holds that a scholarly peer review doesn't have fishermen and other community members at the table. By involving a broader constituency we created a product-and a process-that nonprofits, government, and fishermen not only respected, but contributed their substantial expertise to, so that the best science could inform the best policy to protect our shared marine and cultural resources.

"Ocean Science Trust bridges the divide between the latest marine science and the use of this information to better manage California's unparalleled coastal resources and biodiversity. With the climate crisis causing rapid changes, the need to make these connections quickly has never been greater."

DR. MARK GOLD, DEPUTY SECRETARY FOR OCEANS AND COASTAL POLICY, CALIFORNIA NATURAL RESOURCES AGENCY

THE FUTURE OF CALIFORNIA'S COASTLINE IS BEING SET TODAY

Californians love the ocean. Millions of us visit the coast and beaches to spend time with friends and family. We have also invested billions in bridges, highways, airports and businesses close to the Pacific Ocean. **Our actions today will decide how we and our children's children cope with rising seas.**

In 2016, then-Governor Jerry Brown was stopped cold by a news story: an enormous ice sheet in Antarctica had collapsed into the sea - one example of a phenomenon that duplicated itself around the world as global temperatures climbed.

Brown wondered, what do rising ocean levels mean for California's investments in power plants, highways, bridges, and airports? What does this mean for coastal cities like San Francisco or Los Angeles, let alone beaches and coastal wildlife habitat?

Infrastructure development and other long-term decisions were being made in real-time by cities, counties, and state agencies every week. Understanding the latest science on sea-level rise was urgent.

Scientific panels are not often quick to share results. The standard 18+ months to prepare a report could, in this case, mean billions of wasted dollars.

The Ocean Protection Council requested that California Ocean Science Trust step in. Within five months, OST led

a panel of nationally-renowned scientists to develop a comprehensive analysis of the potentially catastrophic impacts of ice melt and the growing body of science on sea level change.

New sea-level rise probability scenarios, mapped out for the whole California coastline, set the stage for innovative statewide policy with guidelines for how agencies, cities, and counties could address the myriad of problems posed by rising seas.

California's universities - in the UC and CSU systems - as well as universities across the US, have an immense brain trust to draw upon. **Building trusted partnerships between academic scientists, community stakeholders, and government leaders, we can produce timely knowledge, guide wise investments of public funds, and tackle the challenges that climate change brings to our vision of a healthy coast and ocean.**

The need has never been greater. In 2019, the Inter-governmental Panel on Climate Change released a Special Report on the Ocean and Cryosphere in a Changing Climate. Sea-level rise and other threats will require more people, more money, and more investment. **We need California-specific science and we need it quickly.**

The California ocean community's remarkable track record of trust and cooperation present a roadmap on how to tackle today's needs and tomorrow's challenges.

WE ARE GRATEFUL TO ALL WHO HAVE SUPPORTED OUR WORK:

- California Coastal Conservancy
- California Ocean Protection Council
- California State Lands Commission
- California State Water Resources Control Board
- California Wildlife Foundation
- Chevron Foundation
- Consolidated Safety Services
- Leffert Ocean Program
- Monterey Bay Aquarium Research Institute
- National Fish & Wildlife Foundation
- National Oceanic & Atmospheric Administration
- Ocean Conservancy
- Orange County Community Foundation
- Pacific States Marine Fisheries Commission
- Resources Legacy Fund
- San Francisco Estuary Institute
- Sportfishing University
- Stanford Conservancy
- The David and Lucile Packard Foundation
- The Keith Campbell Foundation for the Environment
- University of California, Davis

Join us in accelerating progress to a healthy coast and ocean.

oceansciencetrust.org