

Stanford | Center for Ocean Solutions

The Stanford Center for Ocean Solutions catalyzes research innovation and action to improve the health of the oceans for the people who depend on them most.





Oceans are vital to humanity and to all life on earth, but they are under escalating pressures from climate change, acidification, overexploitation and pollution. Globally, billions of people rely on healthy oceans to provide a range of benefits including food, jobs, coastal protection and cultural identity. Sustainable management of these resources is essential for ensuring that these benefits continue to be available to communities most at risk. To address the challenges facing the oceans, we need innovative solutions that draw on local knowledge, cutting-edge technology and rigorous research.

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We Are

The Stanford Center for Ocean Solutions (COS) capitalizes on Stanford's broad and deep expertise in ocean science and in the many other disciplines crucial to developing ocean solutions including engineering, computer science, political science, design and business. Our core team of researchers and fellows partner with other research institutions, national and international non-governmental organizations (NGOs), businesses and governments, as well as established and emerging leaders in the data revolution.

Our Approach

We link knowledge to action by combining research with partnerships to develop solutions for implementation. We convene researchers and practitioners to identify priorities, match ocean challenges with technological capabilities and create avenues for action. We are particularly interested in opportunities to bring together groups of experts and decision-makers in a "skunkworks" approach, which uses intensive collaborations to develop and test solutions and identify ways to get solutions to scale. Outcomes of these collaborations can include catalyzing new businesses, policy changes and empowering communities that depend on the oceans. As a university-based center, we integrate education and training into all of our work.

Initiatives in our Portfolio

- Managing Ocean Risks
- Oceans and the Future of Food
- Harnessing Technology for Small-Scale Fisheries
- Addressing Illegal Fishing (IUU) and Labor Abuses in Fisheries
- Strengthening Ocean Protection & Food Security in the Western Pacific
- Exploring Emerging Opportunities for a Digital Ocean

Managing Ocean Risks



We have assembled a team of Stanford faculty and colleagues at Oxford University and the Ocean Conservancy to develop a suite of models and data analyses to investigate the impacts of multiple stressors in the ocean. The first application of these tools is to assess risks in the Arctic. Our goal is to provide new insights into risks and tipping points and identify interventions that could prepare for and mitigate ecosystem shifts in that rapidly changing region. This vibrant collaboration involves working with stakeholders and decision-makers to explore their challenges in facing the combination of these threats. We are also partnering with Georgia Tech, Scripps and the Smithsonian Ocean Portal in the Oceans Visions Initiative, aimed at bringing scientists, engineers and stakeholders together to develop and implement ocean-based climate solutions to reduce ocean risks.



Oceans and the Future of Food



In collaboration with Stanford's Center on Food Security and the Environment and Springer Nature, publisher of Nature and many of the world's leading research, education and professional journals, we are bringing together diverse researchers and policymakers to frame a research agenda that illuminates the dynamics and trends in the global food system that will affect the health of the oceans and their role in food security. Our goals are to help build a community of scholars and decision-makers working together to address these questions and to bring new insights to global policy dialogues.

Harnessing Technology for Small-Scale Fisheries



Small-scale fisheries are a vital source of food and livelihoods for many developing country communities. New technologies—ranging from remote sensing to facial recognition to smartphones—have the potential to enable more sustainable management, but those capabilities are not generally adapted or available to small-scale fishing communities. We are working with NGO and private sector leaders, tech innovators and fishers to identify promising efforts, gaps and opportunities for bringing technologies to small-scale fisheries and the communities that depend on them.



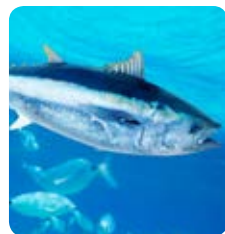
Addressing Illegal Fishing (IUU) and Labor Abuses in Fisheries



We are bringing together experts, companies and stakeholders to address the UN Sustainable Development Goal 14's commitment to end illegal, unreported and unregulated (IUU) fishing. In this effort, COS is collaborating with the World Economic Forum and the Friends of Ocean

Action to develop tools that provide transparency across the supply chain and enable robust and effective traceability, and to engage governments and companies in taking action to screen illegal seafood out of their ports and supply chains. We are also partnering with the International Seafood Sustainability Foundation (ISSF), composed of companies that account for 85% of the canned tuna industry and human rights experts to develop and implement a strategy to eradicate labor abuse across the tuna trade.

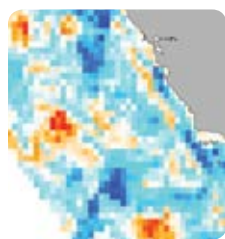
Strengthening Ocean Protection and Food Security in the Western Pacific



We are applying our “skunkworks” model to support the government of Palau in implementing its commitment to protect 80% of its Exclusive Economic Zone. At the request of the government, we are convening a working group of Palauan and international experts to address the interlinked challenges of marine protection, managing nearshore and pelagic fisheries and broader food policy. Under the guidance of a committee of high-level government decision-makers, the working group will work together intensively through 2020 to provide analyses of these challenges and develop management options. With the involvement of experts from the broader region, we expect that this work will also help lay the groundwork for helping other Pacific Island nations address similar challenges.



Exploring Emerging Opportunities for a Digital Ocean



Running through all of our work is a broader interest in leveraging technological innovations to address ocean challenges. Our work on environmental DNA (eDNA) uses filtered water samples to capture and then identify DNA from organisms present in an ecosystem. These capabilities show potential as a monitoring and stock assessment tool. In the projects described above, we are also exploring the use of remote sensing and machine learning to track ocean change in the Arctic and the western Pacific, and applying diverse technologies to address challenges in small-scale fisheries management and reduce IUU fishing.

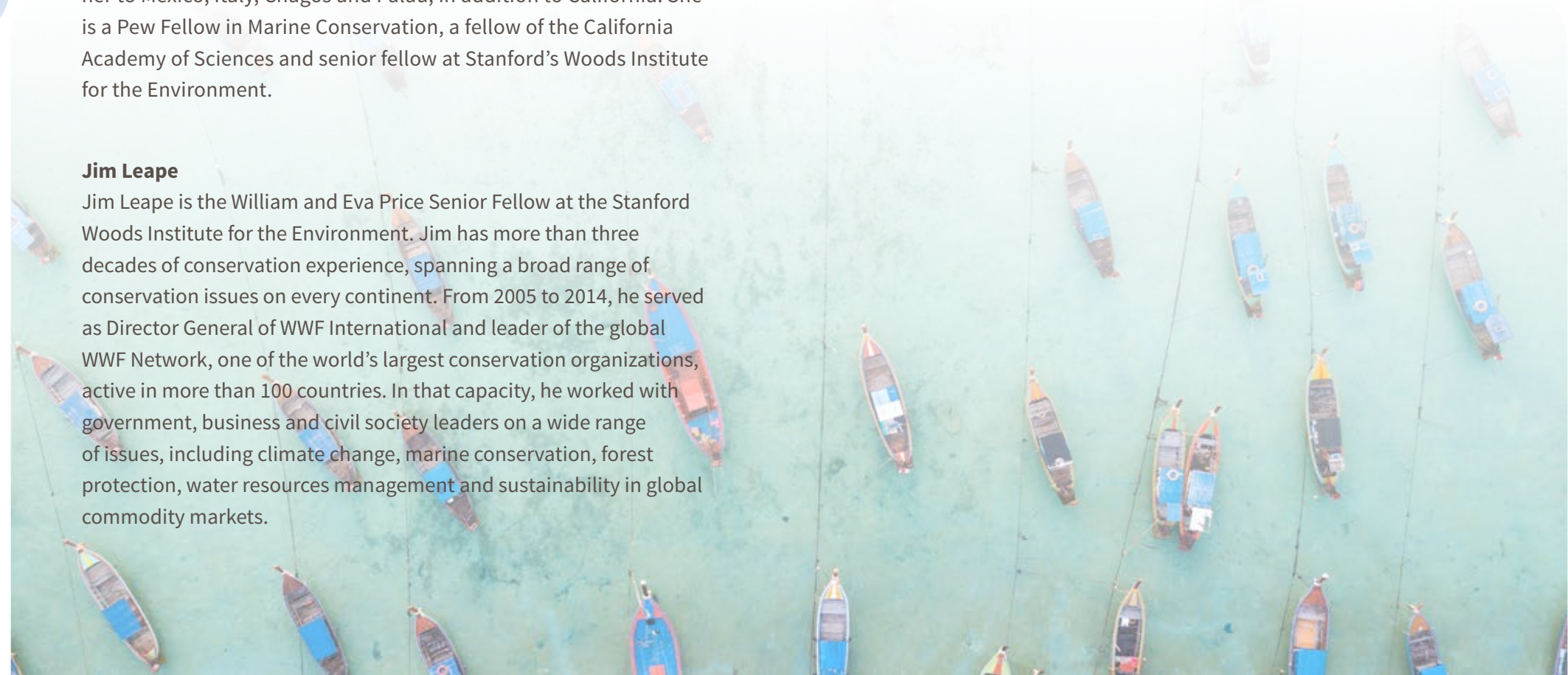
OUR LEADERSHIP

Fio Micheli

Fiorenza Micheli is the David and Lucile Packard Professor of Marine Science, based at Stanford’s Hopkins Marine Station. Fio’s research focuses on the processes shaping marine communities and incorporating this understanding in marine management and conservation. She investigates climatic impacts and the resilience of small-scale fisheries, the impacts of coastal hypoxia and ocean acidification on marine species and communities and the design and function of Marine Protected Areas. Her current research takes her to Mexico, Italy, Chagos and Palau, in addition to California. She is a Pew Fellow in Marine Conservation, a fellow of the California Academy of Sciences and senior fellow at Stanford’s Woods Institute for the Environment.

Jim Leape

Jim Leape is the William and Eva Price Senior Fellow at the Stanford Woods Institute for the Environment. Jim has more than three decades of conservation experience, spanning a broad range of conservation issues on every continent. From 2005 to 2014, he served as Director General of WWF International and leader of the global WWF Network, one of the world’s largest conservation organizations, active in more than 100 countries. In that capacity, he worked with government, business and civil society leaders on a wide range of issues, including climate change, marine conservation, forest protection, water resources management and sustainability in global commodity markets.



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