

# KATHERINE MILLAGE

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## EDUCATION

<b>Master of Environmental Science and Management</b> Bren School of Environmental Science & Management, UCSB   Santa Barbara, CA Coastal Marine Resources Management specialization	2014 - 2016
<b>Bachelor of Arts in Biochemistry</b> University of San Diego   San Diego, CA <i>Cum laude</i> ; Honors Program Graduate	2009 - 2013

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## RESEARCH EXPERIENCE

<b>Associate Specialist</b> Environmental Markets Lab / The Sustainable Fisheries Group, UCSB   Santa Barbara, CA <i>Develop and implement scientific analyses supporting a wide range of regulatory actions:</i> <ul style="list-style-type: none"><li>- Design structural bio-economic models and empirical analyses to apply to real-world fisheries management and conservation policies to analyze potential economic, biological, and social impacts.</li><li>- Highly skilled in programming using R, and experienced in the implementation of data science and modeling approaches involving spatial and timeseries data.</li><li>- Extensive experience related to Pacific Island tuna fisheries, fisheries subsidies, marine protected areas, and conservation finance.</li></ul> <i>Communicate research findings to diverse audiences:</i> <ul style="list-style-type: none"><li>- Regularly present results to scientific collaborators and other community stakeholders and publish findings in peer-reviewed articles and white-papers.</li><li>- Develop interactive web-based applications using Shiny to facilitate the sharing of data products and to aid in the communication of results to non-technical audiences.</li><li>- Developed two Shiny apps related to fisheries subsidies that are currently being used to support the ongoing negotiations at the World Trade Organization.</li><li>- Conducted focus groups with small groups of WTO delegates and presented the final apps to an audience of more than 150+ WTO negotiating group participants.</li></ul>	2016 - Present
<b>Consultant</b> Ocean Analytics   Goleta, CA <i>Assessed impacts of management interventions related to bycatch in longline fisheries:</i> <ul style="list-style-type: none"><li>- Leveraged fishery data on the catch rates of bycatch species by different fleets to provide recommendations related to potential leakage (transfer effects) associated with various management interventions.</li></ul>	2016

- Participated in working groups with scientists and policy-makers from the National Marine Fisheries Service and other agencies and other fishery stakeholders to review alternate policy options and discuss likely impacts.
- Gained familiarity with laws and regulations pertaining to management of fisheries in the United States as well as those pertaining to regional fisheries management organizations.

### **Fisheries Consultant**

2015

Conservation International Costa Rica | San Jose, Costa Rica

#### ***Collaborated with fishers and other stakeholders and designed a modeling approach:***

- Met with fishermen, processors, seafood buyers, and NGOs involved in the Costa Rican snapper fishery to discuss challenges of the Marine Stewardship Council and Fair Trade USA certification processes and perceived benefits of successful completion.
- Developed and executed a deterministic bio-economic model to explore potential impacts of the Fair Trade USA certification on fish stocks and players at different points along the supply chain for the small-scale snapper fishery.

#### ***Prepared reports summarizing management recommendations:***

- Prepared a fisheries management plan with recommendations for improving data quality, remedying policy problems, and reducing illegal fishing in the pelagic longline fishery.

### **Waterfront Assistant**

2013 - 2014

School for Field Studies, Center for Marine Studies | Turks and Caicos Islands

#### ***Planned and executed marine research projects:***

- Planned and executed a data collection program for local conch and lobster fisheries to provide standardized landings data.
- Collected field data underwater on scuba and snorkel to evaluate the community structure and incidence of disease and bleaching among stony corals, monitor conch and lobster populations inside and outside of marine protected areas, assess juvenile lemon shark habitat utilization, and estimate sea turtle migration routes.

#### ***Managed project logistics, communicated results, and conducted outreach:***

- Managed logistics for scuba and snorkel operations for multiple research projects.
- Summarized project results and management recommendations in written reports to project advisors and performed weekly outreach events to communicate findings orally to members of the local community.

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## **PEER-REVIEWED PUBLICATIONS**

### **Published**

Millage, K. D., Villaseñor-Derbez, J. C., Bradley, D., Burgess, M. G., Lenihan, H. S., & Costello, C. (2021). Self-financed marine protected areas. *Environmental Research Letters*, 16(12). <https://doi.org/10.1088/1748-9326/ac3439>

Sumaila, U. R., Skerritt, D. J., Schuhbauer, A., Villasante, S., Cisneros-Montemayor, A. M., Sinan, H., Burnside, D., ... Millage, K. D., ... Zeller, D. (2021). WTO must ban harmful fisheries subsidies. *Science*, 374(6567), 544-544. <https://doi.org/10.1126/science.abm1680>

Halpern, B. S., Maier, J., Lahr, H. J., Blasco, G., Costello, C., Cottrell, R. S., Deschenes, O., Ferraro, D. M., Froehlich, H. E., McDonald, G. G., **Millage, K. D.**, & Weir, M. J. (2021). The long and narrow path for novel cell-based seafood to reduce fishing pressure for marine ecosystem recovery. *Fish and Fisheries*, 13.

Ovando, D., Libecap, G. D., **Millage, K. D.**, & Thomas, L. (2020). Coasean Approaches to Address Overfishing: Bigeye Tuna Conservation in the Western and Central Pacific Ocean. *Marine Resource Economics*, 36(1), 91–109. <https://doi.org/10.1086/711853>

Costello, C., **Millage, K.**, Eisenbarth, S., Galarza, E., Ishimura, G., Rubino, L. L., Saccomanno, V., Sumaila, U. R., & Strauss, K. (2020). Ambitious subsidy reform by the WTO presents opportunities for ocean health restoration. *Sustainability Science*. <https://doi.org/10.1007/s11625-020-00865-z>

Galloway, M. M., Powelson, M. H., Sedehi, N., Wood, S. E., **Millage, K. D.**, Kononenko, J. A., Rynaski, A. D., & De Haan, D. O. (2014). Secondary Organic Aerosol Formation during Evaporation of Droplets Containing Atmospheric Aldehydes, Amines, and Ammonium Sulfate. *Environmental Science & Technology*, 48(24), 14417–14425. <https://doi.org/10.1021/es5044479>

Kua, J., Galloway, M. M., **Millage, K. D.**, Avila, J. E., & De Haan, D. O. (2013). Glycolaldehyde Monomer and Oligomer Equilibria in Aqueous Solution: Comparing Computational Chemistry and NMR Data. *The Journal of Physical Chemistry A*, 117(14), 2997–3008. <https://doi.org/10.1021/jp312202j>

## In Review & In Prep

**Millage, K. D.**, Saccomanno, V. R., Warham, M. M., Rubino, L. L., Schuhbauer, A., Sumaila, U. R., & Costello, C. (*In Review*). SubsidyExplorer: A decision-support tool to improve our understanding of the ecological and economic effects of reforming fisheries subsidies. *PLOS ONE*.

Plantinga, A., **Millage, K. D.**, Bradley, D., O'Reilly, E., Bieri, T., Holmes, N., & Wilson, J. (*In Prep*). *How to pay for ecosystem services*.

Cabral, R. B., **Millage, K. D.**, Bradley, D., Mayorga, J., & Costello, C. (*In Prep*). *A global network of marine protected areas for dive tourism*.

**Millage, K. D.**, Cabral, R. B., Ladner, I., Mayorga, J., Bradley, D., & Costello, C. (*In Prep*). *Financing ocean protection through existing and emerging markets*.

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## OTHER WORKS

### Shiny Apps

2021 SubsidyExplorer: A decision-support tool to improve our understanding of the ecological and economic effects of reforming fisheries subsidies: <http://www.subsidyexplorer.org/>

The Distant Water Fishing Atlas: <http://www.dwfsubsidyatlas.org/>

Herramienta de Proyección para las Pesquerías de la Anchoqueta, Caballa y Jurel en Perú: <https://kmillage.shinyapps.io/allocation-tool/>

- 2020 NutriCast: A web-based tool to explore forecasted nutritional gains from marine fisheries and mariculture reforms under climate change: <https://emlab-ucsb.shinyapps.io/nutricast/>
- 2019 ACP Atlas of Distant Water Fishing: <https://emlab-ucsb.shinyapps.io/SubsidyAtlasACP/>
- 2018 Cost and Performance Drivers of Electronic Fisheries Monitoring: An interactive toolkit to explore cost and performance tradeoffs of implementing electronic monitoring in fisheries: <https://emlab-ucsb.shinyapps.io/EM-toolkit/>

### **Working Papers, Conference Papers, & Reports**

- 2021 Millage, K., Rosenfeld, A., O'Reilly, E., Bradley, D. *Ocean mitigation programs in California: An overlooked opportunity for conservation financing?*
- 2020 Millage, K., Bone, J., Brewster, C., Bradley, D., Costello, C. *Opportunities for Management Interventions in the Longline Fishery of the Federated States of Micronesia (FSM): Findings and Discussion.*
- Ovando, D., Libecap, G. D., Millage, K. D., & Thomas, L. (2020). *Coastal Approaches to Ending Overfishing: Bigeye Tuna Conservation in the Western and Central Pacific Ocean* (Working Paper No. 27801; Working Paper Series). National Bureau of Economic Research. <https://doi.org/10.3386/w27801>
- 2018 Millage, K., Graybiel, J., Rubino, L. L., Costello, C. *Cost and Performance Drivers of Electronic Fisheries Monitoring.*
- 2016 Millage, K., Tsukayama, L., Owashi, B., Clemence, M., Burgess, M. G., Gaines, S. D. *Bycatch Transfer Effects Following Decline in the United States Pelagic Longline Fleet.*

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## **SKILLS & TRAINING**

### **Programming & Software**

Skilled in the use of R, QGIS, ArcGIS, GitHub, Microsoft Office, and Adobe Creative Cloud; experience with C, LaTeX, JMP, MATLAB, SQL, and various products within the Google Cloud Platform (BigQuery, Compute Engine, Earth Engine).

### **Diving & Medical Training**

SCUBA instructor (PADI MSDT #307711); AAUS scientific diver (60' certification); CPR, first-aid, AED, and oxygen administration instructor (Emergency First Response).