

Tracey Mangin

Environmental Markets Lab (emLab)

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In a nutshell

I am an environmental data scientist who studies how ecological systems, human behavior, and policy choices intersect to shape environmental and socioeconomic outcomes. My research spans bioeconomic modeling, spatial data analysis, and large-scale data synthesis, and emphasizes transparent, collaborative, and reproducible science. My work has appeared in *Nature*, *PNAS*, *Science Advances*, and *Nature Sustainability*, and I have contributed applied analyses to the California Environmental Protection Agency, the High Level Panel for a Sustainable Ocean Economy, and others. A full list of my publications can be found on my [Google Scholar page](#).

Education

2011-2013 M.S in Environmental Science and Management, Bren School of Environmental Science & Management, University of California, Santa Barbara.
Specialization: Economics and Politics of the Environment

2005-2009 B.A. in Philosophy and Environmental Studies, Santa Clara University.

Professional experience

2021-pres. Senior Data Scientist, emLab, UC Santa Barbara

2017-2021 Researcher, emLab, UC Santa Barbara

2014-2018 Research Consultant, Ocean-Analytics

2014-2015 Assistant Researcher, Sustainable Fisheries Group (now emLab)

2014 Fisheries Science Fellow, Rare

2013-2014 Asst. to Program Manager, Latin American Fisheries Fellowship Program, Bren School

Peer-reviewed publications

Published

2025 Plantinga, A.J., Abowd, L., **Mangin, T.** and O'Reilly, E., 2025. New Estimates of the Costs of Managing Forests to Increase Carbon Storage. *Climate Change Economics*.

Liddell, T., Boser, A.S., Orofino, S., **Mangin, T.** and Carleton, T., 2025. stagg:: A data pre-processing R package for climate impacts analysis. *Environmental Modelling & Software*, 183, p.106202.

2024 Willis-Norton, E., **Mangin, T.**, Schroeder, D.M., Cabral, R.B. and Gaines, S.D., 2024. A synthesis of socioeconomic and sociocultural indicators for assessing the impacts of offshore renewable energy on fishery participants and fishing communities. *Marine Policy*, 161, p.106013.

2023 Deshmukh, R., Weber, P., Deschenes, O., Hernandez-Cortes, D., Kordell, T., Lee, R., Malloy, C., **Mangin, T.**, Meng, M., Sum, S. and Thivierge, V., 2023. Well setbacks limit

- California's oil supply with larger health benefits and employment losses than excise and carbon taxes. *Nature Energy*, pp.1-3.
- Deshmukh, R., Weber, P., Deschenes, O., Hernandez-Cortes, D., Kordell, T., Lee, R., Malloy, C., **Mangin, T.**, Meng, M., Sum, S. and Thivierge, V., 2023. Equitable low-carbon transition pathways for California's oil extraction. *Nature Energy*, pp.1-13.
- Free, C.M., **Mangin, T.**, Wiedenmann, J., Smith, C., McVeigh, H. and Gaines, S.D., 2023. Harvest control rules used in US federal fisheries management and implications for climate resilience. *Fish and Fisheries*, 24(2), pp.248-262.
- 2021 McDonald, G.G., Costello, C., Bone, J., Cabral, R.B., Farabee, V., Hochberg, T., Kroodsmas, D., **Mangin, T.**, Meng, K.C. and Zahn, O., 2021. Reply to Swartz et al.: Challenges and opportunities for identifying forced labor using satellite-based fishing vessel monitoring. *Proceedings of the National Academy of Sciences*, 118(19).
- Deschenes, O., Deshmukh, R., Lea, D., Meng, K., Weber, P., Cobian, T., Hernandez Cortes, D., Lee, R., Malloy, C., **Mangin, T.**, Meng, M., Oliver, M., Sum, S., Thivierge, V., Uppal, A., Kordell, T., et al. (2021). Enhancing equity while eliminating emissions in California's supply of transportation fuels. Zenodo. <https://doi.org/10.5281/zenodo.4707966>
- McDonald, G.G., Costello, C., Bone, J., Cabral, R.B., Farabee, V., Hochberg, T., Kroodsmas, D., **Mangin, T.**, Meng, K.C. and Zahn, O., 2021. Satellites can reveal global extent of forced labor in the world's fishing fleet. *Proceedings of the National Academy of Sciences*, 118(3).
- 2020 Costello, C., Cao, L., Gelcich, S., Cisneros-Mata, M.Á., Free, C.M., Froehlich, H.E., Golden, C.D., Ishimura, G., Maier, J., Macadam-Somer, I., **Mangin, T.**, et al. 2020. The future of food from the sea. *Nature*, 588(7836), pp.95-100.
- Oremus, K.L., Bone, J., Costello, C., García Molinos, J., Lee, A., **Mangin, T.** and Salzman, J., 2020. Governance challenges for tropical nations losing fish species due to climate change. *Nature Sustainability*, 3(4), pp.277-280.
- Free, C.M., **Mangin, T.**, Molinos, J.G., Ojea, E., Burden, M., Costello, C. and Gaines, S.D., 2020. Realistic fisheries management reforms could mitigate the impacts of climate change in most countries. *PloS one*, 15(3), p.e0224347.
- 2019 Kritzer, J.P., Costello, C., **Mangin, T.** and Smith, S.L., 2019. Responsive harvest control rules provide inherent resilience to adverse effects of climate change and scientific uncertainty. *ICES Journal of Marine Science*, 76(6), pp.1424-1435.
- Cisneros-Mata, M.A., **Mangin, T.**, Bone, J., Rodriguez, L., Smith, S.L. and Gaines, S.D., 2019. Fisheries governance in the face of climate change: Assessment of policy reform implications for Mexican fisheries. *PloS one*, 14(10), p.e0222317.
- Alzugaray, R., Puga, R., Valle, S., Morales, O., Grovas, A., López, L., Kleisner, K., Boné, E., **Mangin, T.**, Kritzer, J. and Fujita, R., 2019. Un enfoque multiinstitucional para modelar el beneficio bioeconómico de perspectivas de manejo pesquero en Cuba.
- Miller, S., Rassweiler, A., Dee, L., Kleisner, K.M., **Mangin, T.**, Oliveros-Ramos, R., Tam, J., Chavez, F.P., Ñiquen, M., Lester, S.E. and Burden, M., 2019. Optimal harvest responses to environmental forecasts depend on resource knowledge and how it can be used. *Canadian Journal of Fisheries and Aquatic Sciences*, 76(9), pp.1495-1502.

2018 **Mangin, T.**, Costello, C., Anderson, J., Arnason, R., Elliott, M., Gaines, S.D., Hilborn, R., Peterson, E. and Sumaila, R., 2018. Are fishery management upgrades worth the cost?. *PLoS one*, 13(9), p.e0204258.

Mangin, T., Cisneros-Mata, M.Á., Bone, J., Costello, C., Gaines, S.D., McDonald, G., Rodriguez, L., Strauss, C.K. and Zapata, P., 2018. The cost of management delay: The case for reforming Mexican fisheries sooner rather than later. *Marine Policy*, 88, pp.1-10.

Gaines, S.D., Costello, C., Owashi, B., **Mangin, T.**, Bone, J., Molinos, J.G., Burden, M., Dennis, H., Halpern, B.S., Kappel, C.V. and Kleisner, K.M., 2018. Improved fisheries management could offset many negative effects of climate change. *Science advances*, 4(8), p.eaao1378.

2016 McDonald, G.**, **Mangin, T.****, Thomas, L.R.** and Costello, C., 2016. Designing and financing optimal enforcement for small-scale fisheries and dive tourism industries. *Marine Policy*, 67, pp.105-117. ** denotes shared first authorship

In Prep

Deshmukh, R., Meng, K., Weber, P., Lea, D., Deschenes, O., **Mangin, T.**, Hernandez Cortes, D., Lee, R., Malloy, C., O., Cobian, T., Meng, M., Thivierge, V., et al. Distributional and climate impacts of low-carbon transition pathways for California's oil refining.

Data Science Skills

R and RStudio

Spatial analyses (vector, raster), ShinyApp development, R Markdown, Git/GitHub, bioeconomic modeling, data analysis and visualization, statistics

Git & GitHub

<https://github.com/traceybit>

Other

SQL, QGIS, InVEST, Google Earth Engine, Google BigQuery

Data science leadership

2020 Into to data.table R package, EcoDataScience training session

2019 GitHub for Collaboration, EcoDataScience training session

2018 Rebus package for working with strings in R, R-Ladies session

Contract employment

2022 Ocean-Analytics. "Harvest control rules used in U.S. federal fisheries and implications for climate resilience." Free, C.M, **Mangin, T.**, McVeigh, H., Smith, C., & Gaines, S.D.

2021 Covington & Burling LLP. Estimated economic ecosystem service benefits from land use decisions using InVEST and other ecosystem valuation models. Plantinga, A. & **Mangin, T.**

2019 Eco-Analytics. "Economic and Environmental Implications of Sand Trade in Asia." Costello, C., Deschenes, D., **Mangin, T.**, and Eddy, N.

2017 Eco-Analytics. "'Underfishing' and its Possible Drivers." Costello, C. & **Mangin, T.**

- 2017 The Nature Conservancy. “Review of fishery reform elements in cases of successful fisheries management reform.” **Mangin, T.**
- 2013 Environmental Defense Fund. Conducted research on marine area closures and quota managed fisheries in New Zealand and Australia.

Awards and scholarships

- 2011 Joanne and Gary Hunt Prize in Environmental Law & Policy, Bren School
- 2009 Lucky Hinkle Sustainability Award, Santa Clara University
- 2005 Preferred Scholarship, Santa Clara University
- 2005 Sister Elizabeth Barber Award