Melissa Chapman

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Education

2018 – 2023 **Ph.D., UC Berkeley** Environmental Science, Policy, and Management.
Dissertation: *From individual decisions to international agreements: Addressing biodiversity loss in an age of algorithms*

2010 – 2014 **B.Sc. Yale University** Ecology and evolutionary biology.
Thesis: *Assessing patterns of malaria risk: Environmental and social determinants of endemicity across Burkina Faso and Kenya.*

Positions

2023-present **National Center for Ecological Analysis and Synthesis (NCEAS)** Director's Postdoctoral Fellow

Climate Change AI (CCAI) Core team

2022-present **International Institute of Applied Systems Analysis (IIASA)** Visiting Research Scholar

2021 – 2023 **Data Intensive Social Science Lab** Teaching Fellow

2020 – 2023 **Resources Legacy Fund** Lead scientific writer for California's Pathways to 30x30 Initiative

2015 – 2018 **Woodwell Climate Research Center** Research Assistant II

Publications

[Google Scholar] | **[ORCID]**

In review

1. **Chapman**, **M.**, Goldstein, B., Schell, C., Boettiger, C., & et al. (nd). *Human histories shape the biodiversity data that decides our future (in review at science).*
2. **Chapman**, **M.**, Jung, M., Boettiger, C., Ringwald, L., Leclère, D., Gusti, M., … Visconti, P. (nd). *Meeting european conservation and restoration targets under future land-use demands (in prep).* Retrieved from https://github.com/milliechapman/EU-restoration-prioritization
3. Jung, M., Alagador, D. A., **Chapman**, **M.**, Hermoso, V., Kujala, H., O'Connor, L., … Visconti, P. (nd). *An assessment of the state of conservation planning in europe (in review at philosphical transactions of the royal society b).* doi:10.31219/osf.io/8x2ug
4. Oliver, R., **Chapman**, **M.**, Emery, N., Gillespie, L., Gownaris, N., Leiker, S., … Zimmerman, N. (n.d.). *Opening a conversation on responsible environmental data science in the age of generative ai (in review at environmental data science).*

Peer-reviewed articles

1. Ellis-Soto, D., **Chapman**, **M.**, & Locke, D. (2023). Uneven biodiversity sampling across redlined urban areas in the united states. *Nature Human Behavior (In press).* doi:10.1038/s41562-023-01688-5

2. Montealegre-Mora, F., Laperolerie, M., **Chapman**, **M.**, Keller, A., & Boettiger, C. (2023). Pretty darn good control: When are approximate solutions better than approximate models? *Bulletin of Mathematical Biology*. doi:10.1007/s11538-023-01198-5

3. **Chapman**, **M.**, Boettiger, C., & Brashares, J. S. (2023). Leveraging private lands to meet 2030 biodiversity targets in the united states. *Conservation Science and Practice*. doi:0.1111/csp2.12897

4. **Chapman**, **M.**, Xu, L., Lapeyrolerie, M., & Boettiger, C. (2023). Bridging adaptive management and reinforcement learning for more robust decisions. *Philosophical Transactions of the Royal Society B*. doi:10.1098/rstb.2022.0195

5. Hasting, Z., **Chapman**, **M.**, Ocloo, X., Stenger, K., & Hunt, L. (2023). Trends in agroforestry research over four decades *co-first author. *Elementa (Accepted)*.

6. Kurz, D., Middleton, A. D., **Chapman**, **M.**, Van Houtan, K. S., Wilkinson, C., Withey, L., & Brashares, J. (2023). Including rural america in academic conservation science. *Frontiers in Conservation Science*. doi:10.3389/fcosc.2023.1227227/full

7. Moravek, J., Andrews, L. R., Serota, M. W., Dorcy, J. A., **Chapman**, **M.**, Wilkinson, C. E., … Brashares, J. S. (2023). Centering 30x30 conservation initiatives on freshwater ecosystems. *Frontiers in Ecology and the Environment*. doi:10.1002/fee.2573

8. Scoville, C., Faxon, H., **Chapman**, **M.**, & et al. (2023). Environment, society and machine learning. *Handbook on the Sociology of Machine Learning (In press)*.

9. Estein, C., **Chapman**, **M.**, Schell, C., Lowy, N., & Gerson, J. (2022). Demystifying the graduate school application process. *Bulletin of the Ecological Society of America*. doi:10.1002/bes2.2029

10. Calhoun, K. L., **Chapman**, **M.**, Tubbesing, C., McInturff, A., Gaynor, K. M., Van Scoyoc, A., … Brashares, J. (2022). Spatial overlap of wildfire and biodiversity in california highlights gap in non-conifer fire research and management. *Diversity and Distributions*, *28*(3), 529–541. doi:https://doi.org/10.1111/ddi.13394

11. **Chapman**, **M.**, Wiltshire, S., Baur, P., Bowles, T., Carlisle, L., Castillo, F., … Karp, D. et al. (2022). Social-ecological feedbacks drive tipping points in farming system diversification. *One Earth*, *5*(3), 283–292. doi:https://doi.org/10.1016/j.oneear.2022.02.007

12. Dowd, S., **Chapman**, **M.**, Koehn, L. E., & Hoagland, P. (2022). The economic tradeoffs and ecological impacts associated with a potential mesopelagic fishery in the california current. *Ecological Applications*, e2578. doi:https://doi.org/10.1002/eap.2578

13. Lapeyrolerie, M., **Chapman**, **M.**, Norman, K. E., & Boettiger, C. (2022). Deep reinforcement learning for conservation decisions. *Methods in Ecology and Evolution*. doi:https://doi.org/10.48550/arXiv.2106.08272

14. **Chapman**, **M.**, Oestreich, W. K., Frawley, T. H., Boettiger, C., Diver, S., Santos, B. S., … Chand, K. et al. (2021). Promoting equity in the use of algorithms for high-seas conservation. *One Earth*, *4*(6), 790–794. doi:https://doi.org/10.1016/j.oneear.2021.05.011

15. **Chapman**, **M.**, Scoville, C., Lapeyrolerie, M., & Boettiger, C. (2021). Power and accountability in reinforcement learning applications to environmental policy. *The Thirty-Sixth Annual Conference on Neural Information Processing Systems (NeurIPS 2021)*. doi:10.48550/arXiv.2205.10911

16. Kitzes, J., Blake, R., Bombaci, S., **Chapman**, **M.**, Duran, S. M., Huang, T., … Oestreich, W. K. et al. (2021). Expanding neon biodiversity surveys with new

instrumentation and machine learning approaches. *Ecosphere*, *12*(11), e03795. doi:https://doi.org/10.1002/ecs2.3795

17 Nagy, R. C., Balch, J. K., Bissell, E. K., Cattau, M. E., Glenn, N. F., Halpern, B. S., … **Chapman**, **M.** et al. (2021). Harnessing the neon data revolution to advance open environmental science with a diverse and data-capable community. *Ecosphere*, *12*(12), e03833. doi:https://doi.org/10.1002/ecs2.3833

18 Ordway, E. M., Elmore, A. J., Kolstoe, S., Quinn, J. E., Swanwick, R., Cattau, M., … **Chapman**, **M.** et al. (2021). Leveraging the neon airborne observation platform for socio-environmental systems research. *Ecosphere*, *12*(6), e03640. doi:https://doi.org/10.1002/ecs2.3640

19 Roe, S., Streck, C., Beach, R., Busch, J., **Chapman**, **M.**, Daioglou, V., … Engelmann, J. et al. (2021). Land-based measures to mitigate climate change: Potential and feasibility by country. *Global Change Biology*, *27*(23), 6025–6058. doi:https://doi.org/10.1111/gcb.15873

20 Scoville, C., **Chapman**, **M.**, Amironesei, R., & Boettiger, C. (2021). Algorithmic conservation in a changing climate. *Current Opinion in Environmental Sustainability*, *51*, 30–35. doi:https://doi.org/10.1016/j.cosust.2021.01.009

21 **Chapman**, **M.**, Walker, W. S., Cook-Patton, S. C., Ellis, P. W., Farina, M., Griscom, B. W., & Baccini, A. (2020). Large climate mitigation potential from adding trees to agricultural lands. *Global change biology*, *26*(8), 4357–4365. doi:https://doi.org/10.1111/gcb.15121

22 Griscom, B. W., Busch, J., Cook-Patton, S. C., Ellis, P. W., Funk, J., Leavitt, S. M., … **Chapman**, **M.** et al. (2020). National mitigation potential from natural climate solutions in the tropics. *Philosophical Transactions of the Royal Society B*, *375*(1794), 20190126. doi:https://doi.org/10.1098/rstb.2019.0126

23 Oestreich, W. K., **Chapman**, **M.**, & Crowder, L. B. (2020). A comparative analysis of dynamic management in marine and terrestrial systems. *Frontiers in Ecology and the Environment*, *18*(9), 496–504. doi:https://doi.org/10.1002/fee.2243

24 Samndong, R. A., Bush, G., Vatn, A., & **Chapman**, **M.** (2018). Institutional analysis of causes of deforestation in redd+ pilot sites in the equateur province: Implication for redd+ in the democratic republic of congo. *Land Use Policy*, *76*, 664–674. doi:https://doi.org/10.1016/j.landusepol.2018.02.048

25 Cunningham, C., Chen, W. C., Shorten, A., McClurkin, M., Choezom, T., Schmidt, C. P., … **Chapman**, **M.** et al. (2014). Impaired consciousness in partial seizures is bimodally distributed. *Neurology*, *82*(19), 1736–1744. doi:https://doi.org/10.12122FWNL.0000000000000404

26 Galvin, B. D., Li, Z., Villemaine, E., Poole, C. B., **Chapman**, **M.**, Pollastri, M. P., … Carlow, C. K. (2014). A target repurposing approach identifies n-myristoyltransferase as a new candidate drug target in filarial nematodes. *PLoS neglected tropical diseases*, *8*(9), e3145. doi:https://doi.org/10.1371/journal.pntd.0003145

Fellowships and Grants

2023
- **Peccei Award**, International Institute of Applied Systems Analysis (IIASA) (approx. $7,000)
- **Moore Foundation**, (research funding written into larger grant) (approx. $7,000)
- **Departmental Research Fellowship**, University of California Berkeley ($17,000)

Fellowships and Grants (continued)

2022
- **International Institute of Applied Systems Analysis (IIASA) Summer Fellowship**, Funded through the National Academy of Science ($7,000)
- **Data Science Teaching Fellowship**, Funded through the UC Berkeley Social Science Data-Lab ($5,000)
- **Artificial Intelligence, Ethics, and Society (AIES-22) Conference Student Award**, Funded through the National Science Foundation ($1500)
- **Environmental Data Science Summit travel grant** ($800), NCEAS (delayed to 2023 due to COVID)

2021
- **SESYNC Graduate Student Pursuit: Co- PI** (project link) (approx. $35,000)

2020
- **Berkeley Center For Technology, Society, and Policy Fellowship** (project link) ($4,000)

2018
- **NSF National Research Traineeship** Environment and Society: Data sciences for the 21st Century ($32,000)
- **NSF Graduate Research Fellowship Program** Honorable Mention.

2014
- **Foreign Language Area Studies (FLAS) Fellowship: Kiswahili** ($35,000 over two awards)

Teaching and Mentoring

Mentor & Co-organizer	Climate Change AI In-Person Summer School (2023)
Co-organizer	Climate Change AI Virtual Summer School (2023)
Data Science Fellow & Instructor	UC Berkeley Social Science Data Lab; (1) Data wrangling (2) Deep learning in Python (3) Introduction to R, and (4) Data visualization (2022-2023)
Graduate Student Instructor	UC Berkeley; ESPM 157: Data Science for Global Change Ecology (2020)
Graduate Student Mentor	UC Berkeley; Fung Fellowship Conservation and Technology Course (2022)
Guest Lectures	Stanford University; Introduction to conservation planning and practice (2023)
	Stanford University; Introduction to conservation planning and practice (2022)
	Trinity College; U.S. Environmental Policy, Partisanship, and the Global Climate Crisis (2022)
	UC Berkeley; Conservation and Technology (2022)
	Middlebury Institute of International Studies; International Marine Science and Policy (2022)
	Middlebury Institute of International Studies; Ecological Analysis (2022)
Research Mentor	Undergraduate Research Apprentice Program (URAP) (2020-2022)
	Undergraduate Honors Thesis Program (2019-2022)
Technical Mentor	IPAM; Public Policy Course (2017)
Undergraduate Instructor	Yale University; Physics I (2014)
	Yale University; Organic Chemistry II (2013)

Policy Documents and White Papers

2022
- **Pathways to 30x30 California: Accelerating Conservation of California's Nature**, Scientific/Technical Writer [**PDF**]
- **Conserving California: Advancing Science in Support of 30x30**, Scientific Writer and Facilitator [**PDF**]
- **California's Pathways to 30x30: Conserving Freshwater Ecosystems**, Legislative Summary; Lead Scientific Writer [**PDF**]
- **California's Pathways to 30x30: Expanding Access to Nature**, Legislative Summary; Contributing Scientific Writer [**PDF available upon request**]
- **California's Pathways to 30x30: Working Lands and Other Effective Conservation Measures (OECMs)**, Legislative Summary; Contributing Scientific Writer [**PDF available upon request**]
- **California's Pathways to 30x30: Partnering with California Native American Tribes**, Legislative Summary; Contributing Scientific Writer [**PDF available upon request**]

2021
- **Advancing 30x30 and Protecting Biodiversity**, Lead Scientific Writer [**PDF**]

2018
- **Prioritizing Areas for Reforestation of Private Lands in the Brazilian Amazon**. Policy Brief. [**PDF**]

2016
- **Analysis of National Circumstances in the Context of REDD+ and Identification of REDD+ Abatement Levers in Papua New Guinea** Report produced by the Wildlife Conservation Society. [**PDF**]

Working Groups

2024
- Data Justice Workshop (Invited presentation)

2022-2023
- Ethics and Practices of Algorithmic Conservation Reading Group **(link)** *Co-founder/organizer*

2023
- Environmental Data Science Innovation Summit (ESIIL)
- Environmental Data Science Summit (NCEAS)

2022
- AI-Assisted Decision-Making for Conservation (Harvard Center for Research on Computing and Society)

2019-2021
- Ecological Forecasting Initiative *Student Working Group Co-chair and Co-founder*

2021
- UC Berkeley Data and Environment Working Group *Co-founder*
- Bioinformatics and Community Science Round Table steering committee, California Biodiversity Network
- Culturally Relevant Education in Environmental Data Science (CREEDS) Workshop

2020
- SESYNC Cyberinfrastructure Summer Institute
- NIMBioS Adaptive Management Tutorial
- People, Land, and Ecosystems: Leveraging NEON for Socio-Environmental Synthesis

2019
- National Ecological Observation Network (NEON) Science Summit
- Advancing Integrated Process-Based Modeling of Socio-Environmental Systems (SESYNC)
- Graduate Student Workshop on Socio-Environmental Synthesis (SESYNC)

Working Groups (continued)

- Ecological Forecasting Initiative Summer Course

2017 - Mathematical Ecology Working Group: Woods Hole, MA

Professional Service and Outreach

2023 - Climate Change AI Core Team

2022 - Graduate Programs Committee student representative (ESPM, UC Berkeley)

2021-2022 - Graduate Admission Committee student representative (ESPM, UC Berkeley)

2018-2021 - UC Berkeley Graduate Student Association (GSA)

2019-2021 - Letters to a Pre-scientist: *Volunteer*

2018-2021 - Bay Area Scientists in Schools (BASIS): *Instructor*

Selected Presentations

2023 - **Chapman, M**. Addressing biodiversity loss in an age of algorithms. *International Institute for Applied Systems Analysis (invited seminar).*

2022 - **Chapman, M**, Jung, M., and Visconti, P.. Multiscale prioritization of conservation and restoration measures to meet 2030 biodiversity targets in the EU. *IIASA Summer Symposium* [**Slides**]

- **Chapman, MS**, Boettiger, C, and Brashares, J. Potential contributions of private lands to U.S. 2030 biodiversity targets. *ESA 2022* [**Slides**]
- **Chapman, MS**. Climate mitigation and biodiversity contributions of land conservation and management (as part of a panel on "Ecologists Perspectives on COP26") *ESA 2022.* [**Slides**]
- **Chapman, MS**. Governing AI Applications To Monitoring and Managing Our Global Environmental Commons. *AAAI/ACM conference on Artificial Intelligence, Ethics, and Society (AIES 2022).* [**Slides**]

2021 - **Chapman, M.**, Schell, C., Brashares, J. "30x30: The New Conservation". Breakthroughs Magazine Virtual Series. [**Recording**]

- **Chapman, M.**. Pathways to 30x30: Accelerating Conservation of California's Nature. California Biodiversity Network Bioinformatics and Conservation Planning round table.
- **Chapman, M.**, Boettiger, C. From data to decisions: Algorithms, power, and effective ocean management. UN FAO global forum on AI for a digital blue Planet. [**Recording**]

2020 - **Chapman, M.**. Large climate mitigation from adding trees to agricultural lands. The Nature Conservancy Seminar Series (Invited Talk).

- **Chapman, M.**. Large climate mitigation from adding trees to agricultural lands. Woodwell Climate Research Center Friday Seminar Series (Invited Talk).
- **Chapman, M.**, et al. Tipping points in diversified farming systems. Ecological Society of America 2020 Meeting. Contributed Talk. [**Recording**]

2018 - **Chapman, M.**, and Walker, W. (2018). A Global Analysis of Woody Aboveground Carbon Storage in Crop and Pasture lands. AGU Fall Meeting. (Presentation)

Reviewer

Journals	Nature Ecology and Evolution, Trends in Ecology and Evolution, Methods in Ecology and Evolution, Nature communication, Conservation biology, International forestry review
Grants	Climate Change AI Innovation Grant

Skills

Languages	Native English, Basic Spanish and Kiswahili
Coding	R, Python, SQL, LaTeX, Google Earth Engine, ArcGIS
Statistics	Spatial statistics, Hierarchical Bayesian modeling, Decision processes