

# Dr. Emily J. Francis

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## Education

2013 B.A., Magna cum Laude, Ecology and Evolutionary Biology | Princeton University  
2019 Ph.D, Environmental Earth System Science | Stanford University

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## Appointments

2024 - present Assistant Professor | Colorado State University, Dept. of Forest and Rangeland Stewardship  
2022 - 2023 Research Assistant Professor | University of New Mexico, Dept. of Biology  
2021 - 2022 Postdoctoral Fellow | University of New Mexico, Dept. of Biology  
2019 - 2021 Postdoctoral Fellow | University of Texas at Austin, Dept. of Integrative Biology  
2014 Research Intern | Smithsonian Tropical Research Institute

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## External Grants

2023-2025 Joint Fire Science Program \$360,188  
Title: [Co-development of geospatial data products to support treatment planning and monitoring in the upper Rio Grande Watershed](#)  
PI: Matthew D. Hurteau  
Co-Principal Investigators: **Emily Francis** and Gavin Jones  
Collaborator/Contributor: Harold Zald  
Institutional PI (CSU): **Emily Francis**, CSU amount: \$252,751

2022-2024 Environmental Defense Fund \$391,313  
Title: Quantifying the realizable carbon potential of western US forests  
PI: Matthew D. Hurteau  
Co-Principal Investigators: **Emily Francis** and Chang Gyo Jung

2023-2025 NASA ECOSTRESS Science and Applications Team \$309,054  
Title: Water-balance succession following wildfires in Great-Basin shrublands  
PI: Scott T. Allen  
Co-Principal Investigator: Andrew Felton  
Collaborators: Beth Newingham and **Emily Francis**

2015-2017	Save the Redwoods League Title: Redwood Leaf Trait Mapping for Drought Vulnerability Assessment Principal Investigator: Gregory P. Asner Co-Investigator: <b>Emily J. Francis</b> (lead writer)	\$25,000
2016-2017	USGS Southwest Climate Adaptation Science Center <a href="#">Title: Leaf to Landscape: Understanding and Mapping Forest Vulnerability to Hotter Droughts</a> Principal Investigator: Koren R. Nydick Cooperator/Partner: Anthony Ambrose, Gregory P. Asner, Wendy Baxter, Adrian J. Das, Todd Dawson, <b>Emily Francis</b> , Roberta E. Martin, Nathan L. Stephenson	\$249,577

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### Small Grants, Fellowships, and Awards

2023	NSF Workshop on Forest Resiliency and Data Synthesis, Travel Grant	\$500
2019	NSF NEON-ESA Early Career Scholar, Travel Grant	\$1,220
2015-2018	Stanford Graduate Fellowship in Science and Engineering	\$230,908
2017	Stanford Earth, Energy, and Environmental Sciences Certificate for Outstanding Achievement in Mentoring	\$300
2015	NSF Graduate Research Fellowship Program Honorable Mention	
2014	Smithsonian Tropical Research Institute Internship Grant	\$2,400
2013	Clean Air Cool Planet Climate Fellowship on Whitebark Pine Mortality in the Absaroka-Beartooth Wilderness Area, MT	\$5,000
2012	Princeton Senior Thesis Research Grant	\$500
2011	Princeton Hellenic Studies Internship Grant	\$2,000

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### Publications

2023	Atkins, J.W., Bhatt, P., Carrasco, L., <b>Francis, E.J.</b> , Garabedian, J.E., Hakkenberg, C.R., Hardiman, B.R., Jung, J., Koirala, A., LaRue, E.A., Oh, S., Shao, G., Shugart, H.H., Spiers, A., Stovall, A.E.L., Surasinghe, T.D., Tai, X., Zhai, L., Zhang, T., and Krause, K. 2023. Integrating forest structural diversity measurement into ecological research. <i>Ecosphere</i> , 14:e4633.
	<b>Francis, E.J.</b> Pourmohammadi, P., Steel, Z.L., Collins, B.M., and Hurteau, M.D. 2023. Proportion of forested area burned at high severity increases

with increasing forest cover and connectivity in western US watersheds. *Landscape Ecology* 38, 2501-2518.

**Francis, E.J.** Lutz, J.A., and Farris, C.E. 2023. Elevated mortality rates of large trees allow for increased frequency of intermediate trees: a hypothesis supported by demographic model comparison with plot and LiDAR data. *Forest Ecology and Management*, 540: 121035.

2020 **Francis, E.J.**, Asner, G.P., Mach, K.J., and Field, C.B. 2020. Landscape scale variation in the hydrologic niche of California coast redwood. *Ecography*, 43: 1305-1315.

Nelson, R., **Francis, E.**, Berry, J., Cornwell, W., and Anderegg, L. 2020. The role of climate niche, geofloristic history, habitat preference and allometry on wood density within a California plant community. *Forests* 11 (1): 105

2019 **Francis, E.J.**, and Asner, G.P. 2019. High-resolution mapping of redwood (*Sequoia sempervirens*) distributions in three Californian Forests. *Remote Sensing* 11 (3): 1-19.

2018 Martin, R.E, Asner, G.P., **Francis, E.J.**, Ambrose, A., Baxter, W., Das, A., Vaughn, N.R., Paz-Kagan, T., Dawson, T.E, Nydick, K.R., and Stephenson, N.L. 2018. Remote measurement of canopy water content in giant sequoias (*Sequoiadendron giganteum*) during drought. *Forest Ecology and Management* 419-420: 279-290.

Ambrose, A. Dawson, T., Baxter. W., Martin, R., **Francis, E.**, Asner. G.P., Nydick, K.R., and Dawson, T.E. 2018. Leaf and crown-level adjustments help giant sequoias maintain favorable water status during severe drought. *Forest Ecology and Management* 419-420: 257-267.

Lalonde, S. J., Mach, K.J., Anderson, C.M., **Francis, E.J.**, Sanchez, D.L., Stanton, C.Y., Turner, P.A., and Field, C.B. 2018. Forest management in the Sierra Nevada provides limited carbon storage potential: an expert elicitation. *Ecosphere*. 9(7):1-15.

2017 **Francis, E.J.**, Muller-Landau, H.C., Wright, S.J., Iida, Y., Visser, M., Fletcher, C., Rahman, A.K, and Hubbel, S.P. 2017. Quantifying the role of wood density in explaining interspecific variation in growth of tropical trees. *Global Ecology and Biogeography* 26: 1078-1087.

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## Invited Talks

2023 **Francis, E.J.** Quantifying changing forest disturbance regimes. UC Santa Barbara Ecology, Evolution and Marine Biology Seminar Series. Santa Barbara, CA.

- 2022 **Francis, E.J.** Understanding Changing Dynamics of Forest Structure, Composition, and Disturbance. The Ohio State University, School of Environment and Natural Resources.
- 2019 **Francis, E.J.** Quantifying the role of hydrology in redwood distributions at the landscape scale. San Francisco State University Department of Geography. San Francisco, CA.
- 2018 **Francis, E.J.** The roles of trait and environmental variation in forest ecology. Department of Integrative Biology Special Seminar Series, University of Texas at Austin. Austin, TX.
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### Contributed Talks

- 2023 **Francis, E.J.,** Pourmohammadi, P., Steel, Z.L., Collins, B.M., and Hurteau, M.D. Proportion of forest area burned at high-severity increase with increasing forest cover and connectivity in western US watersheds. Ecological Society of America Annual Meeting. Portland, OR.
- 2020 **Francis, E.J.,** Lutz, J.A., and Farrior, C.E. Integrating LiDAR measurements of canopy structure, forest inventory data, and a simple forest dynamics model to understand fundamental drivers of forest canopy structure. American Geophysical Union Fall Meeting, Remote Meeting.
- 2018 **Francis, E.J.,** Muller-Landau, H.C., Wright, S.J., Iida, Y., Visser, M., Fletcher, C., Rahman, A.K, and Hubbel, S.P. Quantifying the role of wood density in explaining interspecific variation in growth of tropical trees. Ecological Society of America Meeting, New Orleans, LA.
- 2017 **Francis, E.J,** and Asner, G.P. The Roles of Fog and Topography in Redwood Forest Hydrology. American Geophysical Union Fall Meeting, New Orleans, LA.
- 2013 **Francis, E.J.,** Grigri, M.\*, Logan, J.A., and MacFarlane, W. Ground-truthing an aerial survey of Whitebark pine mortality in the Absaroka-Beartooth Wilderness. Whitebark Pine Society Annual Meeting, Bozeman, MT. \*first two authors contributed equally.
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### Teaching

- 2019 Guest Lecturer. Ecosystems of California. Stanford University Undergraduate Course. Professors: Dr. Chris Field and Dr. Nona Chiariello.
- 2017 Teaching Assistant. Ecophysiology. Stanford University Graduate and Undergraduate Course. Professors: Dr. Alexandra Konings and Dr. Joe Berry.
- 2016 Teaching Assistant. Stanford Wrigley Hawaii Program in Earth Sciences, Life Sciences, and Hawaiian Culture. Professor: Dr. Peter Vitousek.

2011 Teaching Assistant. Marine Biology. Princeton University and Bermuda Institute of Ocean Sciences Undergraduate Course. Professors: Dr. James Gould and Dr. Samantha de Putron

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## **Mentoring**

2019-2020 Rebecca Nelson. Undergraduate Researcher. Role: Contributing Mentor to Primary Mentor: Dr. Leander Anderegg. Currently a PhD student at UC Davis in the Graduate Group in Ecology.

2018 Torel Beard. Ecological Society of America Strategies for Ecology, Education, Diversity, and Sustainability (SEEDS) Program. Role: Mentor during the Ecological Society of America Annual Meeting. Currently a laboratory technician at Michigan State University.

2017 Talia Trepte. Stanford Earth Summer Undergraduate Research Program (SESUR). Role: Mentor for summer (June-September) research internship. Results presented at the SESUR conference in October 2017. Currently a masters student in Stanford in the Earth Systems program and a Communications Assistant at the Natural Capital Project.

2016 Jackie Mogensen. Stanford Earth Summer Undergraduate Research Program (SESUR). Role: Mentor for summer (June-September) research internship. Results presented at the SESUR conference in October 2016. Currently a reporter covering science and health at Mother Jones.

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## **Reviewer**

Journals Forest Ecology and Management, Journal of Applied Ecology, Functional Ecology, Frontiers in Ecology and the Environment, Geophysical Research Letters, Remote Sensing Applications: Society and Environment, Remote Sensing of Environment, PLOS One, Proceedings of the National Academy of Sciences

Funding Agencies National Science Foundation (Ad hoc reviewer)

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## **Outreach: Land Managers and Communities**

2019 Invited Speaker, Muir Woods National Park Monthly Staff Meeting.

2019 Invited Speaker, Peninsula Open Space Trust Staff Meeting.

2019 Invited Speaker. Grassroots Ecology California Naturalist Program.

2018 Invited Speaker. Patagonia Technology and Environmental Research Event Series.

2018 Invited Speaker. Grassroots Ecology Summer Internship Program.

2018 Speaker, Save the Redwoods League Staff Meeting.

2014 Member. Jasper Ridge Advisory Committee.

- 2014 Guest Lecturer (in Spanish). Smithsonian Tropical Research Institute Summer Program for Panamanian College Students.
- 2013 Presenter. North Star Academy Charter School 8th grade Science Class.
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### Public Engagement with Journalists

- 2023 Sempervirens Fund. [Redwoods and Climate.](#)
- 2020 National Park Service. [Coast Redwoods vs. Climate Change.](#)
- 2020 EurekAlert. [Airborne mapping sheds light on climate sensitivity of California redwoods.](#)
- 2019 The Revelator, Newsletter for the Center for Biology Diversity. [Can California's Iconic Redwoods Survive Climate Change?](#)
- 2014 Al Jazeera America. [California Drought Crippling the Mighty Giant Sequoias.](#)
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### Working Groups

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|------|---|------------|
| 2023 | Forest Resiliency Data Synthesis Working Group                          | CU Boulder |
| 2020 | Exploring New Dimensions of Forest Ecosystems with Structural Diversity | Remote     |