

ABBY G. FRAZIER

Curriculum Vitae

Fellow
East-West Center
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EDUCATION

- Ph.D. 2016, University of Hawai'i at Mānoa, Geography.
Advisor: Thomas W. Giambelluca
Dissertation: *The influence of large-scale modes of climate variability on spatiotemporal rainfall patterns and vegetation response in Hawai'i.*
- M.A. 2012, University of Hawai'i at Mānoa, Geography.
Advisor: Thomas W. Giambelluca
Thesis: *Month-Year Rainfall Maps of the Hawaiian Islands.*
- B.S. (cum laude) 2008, University of Vermont, Mathematics. Dean's List.
- B.A. (magna cum laude) 2008, University of Vermont, Geography, Economics. Phi Beta Kappa.

EXPERIENCE

- 2018 to present **Fellow**, East-West Center, Research Program, Honolulu, HI
- 2016 to 2018 **Post-doctoral Research Geographer**, USDA Forest Service, Institute of Pacific Islands Forestry, Pacific Southwest Research Station, Hilo, HI
- 2012 to 2013 **Lecturer**, Department of Geography, University of Hawai'i at Mānoa, Honolulu, HI
- 2009 to 2016 **Graduate Research Assistant**, Department of Geography, University of Hawai'i at Mānoa, Honolulu, HI
- 2008 to 2009 **GIS Analyst**, Schlosser Geographic Systems, Inc., Seattle, WA

PUBLICATIONS

Refereed Journal Articles

11. Mora, C, Spirandelli D, Franklin EC, Lynham J, Kantar MB, Miles W, Smith CZ, Freel K, Moy J, Louis LV, Barba EW, Bettinger K, **Frazier AG**, Colburn IX JF, Hanasaki N, Hawkins E, Hirabayashi Y, Knorr W, Little CM, Emanuel K, Sheffield J, Patz JA, and Hunter CL. The broad threat to humanity from ongoing greenhouse gas emissions. *Accepted. Nature Climate Change.*

10. Longman, RJ, Giambelluca TW, Nullet MA, **Frazier AG**, Kodama K, Crausbay SD, Krushelnycky PD, Cordell S, Clark MP, Newman AJ, and Arnold JR (2018). Compilation of climate data from heterogeneous networks across the Hawaiian Islands. *Scientific Data* 5(180012), doi:10.1038/sdata.2018.12.
9. **Frazier AG**, Elison Timm O, Giambelluca TW, and Diaz HF (2018). The influence of ENSO, PDO and PNA on secular rainfall variations in Hawai'i. *Climate Dynamics* 51(5-6), 2127-2140, doi: 10.1007/s00382-017-4003-4.
8. **Frazier AG**, and Giambelluca TW (2017). Spatial trend analysis of Hawaiian rainfall from 1920 to 2012. *International Journal of Climatology* 37(5), 2522–2531, doi: 10.1002/joc.4862.
7. Krushelnycky, PD, Starr F, Starr K, Longman RJ, **Frazier AG**, Loope LL, and Giambelluca TW (2016). Change in trade wind inversion frequency implicated in the decline of an alpine plant. *Climate Change Responses* 3(1), doi: 10.1186/s40665-016-0015-2.
6. **Frazier AG**, Giambelluca TW, Diaz HD, and Needham HL (2016). Comparison of Geostatistical Methods to Spatially Interpolate Month-Year Rainfall for the Hawaiian Islands. *International Journal of Climatology* 36(3), 1459-1470, doi: 10.1002/joc.4437.
5. Mora C, **Frazier AG**, Longman RJ, Dacks RS, Walton MM, Tong EJ, Sanchez JJ, Kaiser LR, Stender YO, Anderson JM, Ambrosino CM, Fernandez-Silva I Giuseffi LM, and Giambelluca TW (2014). Mora *et al.* reply. *Nature* 511, E5-E6, doi: 10.1038/nature13524.
4. Crausbay SD, **Frazier AG**, Giambelluca TW, and Hotchkiss SC (2014). Moisture status during a strong El Niño explains a tropical montane cloud forest's upper limit. *Oecologia* 175, 273-284, doi: 10.1007/s00442-014-2888-8.
3. *Mora C, **Frazier AG**, Longman RJ, Dacks RS, Walton MM, Tong EJ, Sanchez JJ, Kaiser LR, Stender YO, Anderson JM, Ambrosino CM, Fernandez-Silva I Giuseffi LM, and Giambelluca TW (2013). The projected timing of climate departure from recent variability. *Nature* 502, 183-187, doi: 10.1038/nature12540. (Aug. 2018 citations: 378)
 *Media coverage by *New York Times*, *Washington Post*, *LA Times*, *Global News*, *The Globe and Mail*, *Sydney Morning Herald*, *Scientific American*, *Wall Street Journal*, *Huffington Post*, *National Geographic News*, *Times of India*, *Jakarta Globe*, *Christian Science Monitor*, *The Daily Climate*, and others.
2. Giambelluca, TW, Chen Q, **Frazier AG**, Price JP, Chen YL, Chu PS, Eischeid JK, and Delparte DM (2013). Online Rainfall Atlas of Hawai'i. *Bulletin of the American Meteorological Society* 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1. (Aug. 2018 citations: 238)
1. Longman RJ, Giambelluca TW, and **Frazier AG** (2012). Modeling clear-sky solar radiation across a range of elevations in Hawai'i: Comparing the use of input parameters at different temporal resolutions. *Journal of Geophysical Research* 117: D02201, doi: 10.1029/2011JD016388.

Other Publications

1. Giambelluca, TW, Shuai X, Barnes ML, Alliss RJ, Longman RJ, Miura T, Chen Q, **Frazier AG**, Mudd RG, Cuo L, and Businger AD (2014). Evapotranspiration of Hawai'i. Final report submitted to the US Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai'i.

Manuscripts in Review or in Final Preparation

- Longman, RJ, **Frazier AG**, Newman AJ, Giambelluca TW, Schanzenbach D, Kagawa-Viviani A, Needham H, Arnold JR, and Clark MP. High-resolution gridded daily rainfall and temperature for the Hawaiian Islands (1990-2014). *In Review*.
- Frazier, AG**, Giardina CP, Keener V, Giambelluca TW, Trauernicht P, and others. "Chapter 5: Management Options in Response to Drought: Hawai'i and US Pacific Islands". USFS General Technical Report Chapter. *In Review – US Forest Service Internal*.
- Frazier, AG**, Giambelluca TW, Oki DS, Keener V, Trauernicht P, Giardina CP, and others. "Hawai'i Drought Synthesis". *In preparation*.
- Balzotti, CS, Asner GP, Giardina CP, and **Frazier AG**. Influences of drought and vegetation type on long-term trends in photosynthetic vegetation of Hawaii Island. *In preparation*.
- Frauendorf, TC, MacKenzie RA, Tingley RW, **Frazier AG**, Riney MH, El-Sabaawi RW. Evaluating ecosystem effects of predicted changes in flow on tropical island stream ecosystems using high spatial and temporal sampling regimes. *In preparation*.
- Frazier, AG**, Crausbay SD, Brewington L, and Giambelluca TW. Characterizing vegetation response to drought at the forest line in Hawai'i. *In preparation*.
- Ramirez, AR, Crausbay SD, Betancourt J, Bradford J, Cartwright J, Cross M, Enquist C, **Frazier AG**, Hall K, Littell J, Luce C, Palmer R, Rangwala I, Thompson L, and Carter S. "Unfamiliar territory: emerging threats and opportunities for ecological drought research and management in the U.S.". *In preparation*.
- Frazier, AG**, Giambelluca TW, and Diaz HF. "Identifying the Fingerprints of ENSO and PDO: A Spatial Analysis of Seasonal Rainfall Anomalies in Hawai'i". *In preparation*.

SCHOLARSHIPS, GRANTS, & FELLOWSHIPS:

- 2018 Pacific Islands Climate Adaptation Science Center (PICASC) proposal, May 2018, \$285,293 (pending).
Principal Investigators: C.P. Giardina, A.G. Frazier, and T.W. Giambelluca. Title: "Co-production of drought analyses with managers of National Park and US Fish and Wildlife Service natural resources in Hawai'i"
- 2018 USDA Climate Hub proposal, April 2018, \$40,000 (not funded).
Principal Investigators: C.P. Giardina, A.G. Frazier, and T.W. Giambelluca. Title: "Management co-production of drought products in Hawaii: A pilot project"

- 2018 USDA Forest Service, Western Wildlands Environmental Threat Assessment Center (WWETAC), March 2018, \$120,000 (not funded).
Principal Investigators: A.G. Frazier, C.P. Giardina, and T.W. Giambelluca. Title: *“Ecological Vulnerability to Drought in Hawaii”*
- 2017 USDA Climate Hub proposal, April 2017, \$40,000 (funded).
Principal Investigators: C.P. Giardina, A.G. Frazier, and T.W. Giambelluca. Title: *“Ecological Vulnerability to Drought and Wildfire – a Retrospective Analysis”*
- 2017 Strategic Environmental Research and Development Program (SERDP) pre-proposal, January 2017, \$1,196,000 (not funded).
Principal Investigators: A.G. Frazier and C.P. Giardina. Title: *“An Ecosystem Management Decision Support Tool to Assess and Manage Wildfire Vulnerability and Water Resources under Climate Variability and Change”*
- 2015 Graduate Student Organization of University of Hawai‘i at Mānoa Travel Award
- 2015 Great Lakes National Scholarship for STEM students (\$2,500)
- 2014 Graduate Student Organization of University of Hawai‘i at Mānoa Travel Award
- 2013 U.S. Geospatial Intelligence Foundation (USGIF) Scholarship (\$5,000)
- 2013 Hawai‘i Geographic Information Coordinating Council (HIGICC) Mark Lierman Memorial Scholarship (\$1,000)

AWARDS & HONORS

- 2016 Best Presentation at the Geography Symposium, University of Hawai‘i at Mānoa Department of Geography
- 2015 American Geophysical Union (AGU) Outstanding Student Paper Award (OSPA) Winner – Hydrology Section, Fall Meeting 2015
- 2014 Award for Best Graduate Student Publication, University of Hawai‘i at Mānoa Department of Geography
- 2012 Accepted to the Climate Science Center summer school at the International Arctic Research Center in Fairbanks, AK
- 2012 H. J. Wiens Memorial Award for a graduating MA or PhD student, University of Hawai‘i at Mānoa Department of Geography

PROFESSIONAL PRESENTATIONS

Invited Talks

- Oct. 2017 Keynote Speaker, Environment Hawai‘i Annual Dinner, Hilo, HI. Title: *“Climate Change Impacts in Hawaii”*
- Oct. 2017 Hawai‘i Drought Council Meeting, Honolulu, HI. Title: *“Rainfall Variability and Drought in the Hawaiian Islands”*

- Sep. 2017 National Climate Change and Wildlife Science Center (NCCWSC) 2017 Ecological Drought Webinar Series. Title: "Rainfall Variability and Drought in the Hawaiian Islands"
- Sep. 2017 National Oceanic and Atmospheric Administration (NOAA) GIS mini-symposium, Honolulu, HI. Title: "Geospatial Climate products for Hawai'i"
- Jun. 2017 USDA Forest Service Seminar, Washington D.C. Title: "Drought in the Hawaiian Islands"
- Jun. 2017 Hawai'i Extension Climate Forum, Honolulu, HI. Title: "Climate of Hawai'i"

- May 2017 Department of Defense (DoD) Natural Resource Compliance course, Marine Corps Base Hawai'i. Title: "Climate Change in Hawai'i"
- Mar. 2017 National Climate Change and Wildlife Science Center (NCCWSC) / Climate Science Center (CSC) Workshop "Ecological Drought in the main Hawaiian Islands", Honolulu, HI. Title: "Drought in Hawai'i: State of the Science"
- Nov. 2016 West Hawai'i Forum: Hawai'i's Climate Change Challenge, Kailua-Kona, HI. Title: "Climate Change Impacts in Hawai'i"
- Nov. 2016 USDA Forest Service Institute of Pacific Islands Forestry Seminar, Hilo, HI. Title: "Characterizing Drought and Vegetation Response at the Forest Line"
- Sep. 2014 Sonoma Technology, Inc. (STi) Webinar, Honolulu, HI. Title: "The projected timing of climate departure from recent variability"
- Aug. 2014 Pacific Islands Climate Change Cooperative (PICCC) Webinar Series, Honolulu, HI. Title: "Mapping Hawaiian Rainfall Trends since 1920"
- Jul. 2014 ThinkTech Hawaii TV, Honolulu, HI. Title: "Mapping Hawai'i's Water Resources – Hawai'i's new Evapotranspiration, Solar, and Climate websites"

Campus or Departmental Talks

- May 2016* University of Hawai'i at Mānoa Department of Geography Symposium. Title: "Characterizing Vegetation Response to Drought at the Forest Line in Hawai'i" ***Winner – Best Presentation**
- May 2016 Pacific Islands Climate Science Center (PICSC) Climate Science Symposium. Title: "Characterizing Vegetation Response to Drought at the Forest Line in Hawai'i"
- May 2015 University of Hawai'i at Mānoa Department of Geography Inaugural Symposium. Title: "Rainfall Trends through Time: A Running Trend Analysis of Hawaiian Rainfall"
- Feb. 2015 Pacific Islands Climate Science Center (PICSC) Climate Science Symposium. Title: "Does drought determine the upper limit of cloud forest?"
- Nov. 2013 Joint Institute for Marine and Atmospheric Research (JIMAR) Symposium, Honolulu, HI. Title: "The projected timing of climate departure from recent variability"
- Oct. 2013 University of Hawai'i at Mānoa Department of Biology Seminar Series, Honolulu, HI. Title: "The projected timing of climate departure from recent variability"

- Oct. 2013 University of Hawai‘i Leeward Community College Seminar, Pearl City, HI. Title: “The projected timing of climate departure from recent variability”
- Mar. 2013 US-Japan Joint Seminar on Catchment Hydrology and Forest Biogeochemistry, Honolulu, HI. Title: “Spatial rainfall patterns of ENSO and PDO in Hawai‘i”
- Feb. 2013 University of Hawai‘i at Mānoa Department of Meteorology Seminar Series, Honolulu, HI. Title: “The Changing Spatial Patterns of Hawaiian Rainfall: Identifying the fingerprints of ENSO, PDO, and Climate Change”
- Apr. 2012 University of Hawai‘i at Mānoa Department of Geography Lecture Series, Honolulu, HI. Title: “Rainfall in Hawai‘i: Month-year maps and trend analysis from 1920-2007”

Conferences & Meetings

- Aug. 2018 Workshop on Drought in the USAPI - Impacts, Resilience, and Management, Honolulu, HI. Title: “Climate Variability in the Pacific: Temporal & Spatial Considerations for Drought”
- Jul. 2018 Hawai‘i Conservation Conference, Honolulu, HI. Title: “Hawai‘i Drought Synthesis”
- Jun. 2018 Hawai‘i Ecosystems Meeting, Hilo, HI. Title: “Ecological Drought Workshop and Upcoming Drought Products for Hawai‘i”
- Dec. 2017 American Geophysical Union (AGU) Fall Meeting, New Orleans, LA. Title: “Analysis of Gridded SPI in Hawai‘i from 1920 to 2012 and Management Responses to Drought”
- Jun. 2017 Hawai‘i Ecosystems Meeting, Hilo, HI. Title: “Analyzing gridded SPI in Hawai‘i from 1920 to 2012: A comprehensive drought synthesis”
- Jun. 2017 Workshop on Using High Resolution Paleoclimate Reconstructions Since AD 1500 in Support of Research on Environmental/Societal Change in Hawai‘i, Honolulu, HI. Title: “Drought in Hawai‘i: State of the Science and Current Efforts”
- Dec. 2016 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. Title: “Characterizing Drought and Vegetation Response at the Forest Line in Hawai‘i”
- Dec. 2015* American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. Title: “Rainfall Trends through Time: A Running Trend Analysis of Hawaiian Rainfall” ***Winner – AGU Outstanding Student Paper Award**
- Jul. 2015 Hawai‘i Ecosystems Meeting, Hilo, HI. Title: “Rainfall Trends through Time: A Running Trend Analysis of Hawaiian Rainfall”
- Dec. 2014 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. Title: “The influence of ENSO and PDO on secular rainfall variations in Hawai‘i”
- Jun. 2014 Hawai‘i Ecosystems Meeting, Hilo, HI. Title: “Mapping Hawaiian Rainfall Trends in Hawai‘i since 1920”
- Dec. 2013 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. Title: “Mapping Hawaiian Rainfall Trends”

- Apr. 2013 Association of American Geographers (AAG) Annual Meeting, Los Angeles, CA. Title: “Mapping Hawaiian Rainfall Trends”
- Dec. 2012 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. Title: “Spatial rainfall patterns of ENSO and PDO in Hawai‘i”
- Mar. 2012 Hawai‘i Pacific GIS Conference, Honolulu, HI. Title: “Online Rainfall Atlas of Hawai‘i”
- Dec. 2011 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. Title: “Rainfall in Hawai‘i: Month-year maps and trend analysis from 1920-2007”
- Jul. 2011 Hawai‘i Ecosystems Meeting, Hilo, HI. Title: “2011 Rainfall Atlas of Hawai‘i”
- Dec. 2010 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA. Title: “Month-Year Rainfall Maps of the Hawaiian Islands”
- Jul. 2010 Hawai‘i Ecosystems Meeting, Hilo, HI. Title: “Monthly Rainfall Maps of the Hawaiian Islands”

Conference Sessions/Meetings Organized

- Aug. 2018 Workshop Title: “Drought in the USAPI - Impacts, Resilience, and Management”, Honolulu, HI, August 14-15, 2018.
Co-Sponsors: U.S. Geological Survey National Climate Adaptation Science Center, the Department of the Interior Pacific Islands Climate Adaptation Science Center, and the USDA Institute of Pacific Islands Forestry.
- Jul. 2018 Hawai‘i Conservation Conference Symposium, Honolulu, HI.
Title: “Drought in Hawai‘i: State of the Science and Management across Sectors”. Primary Convener: A.G. Frazier.
- Dec. 2017 American Geophysical Union (AGU) Fall Meeting, New Orleans, LA.
Title: “H34D: Tropical Drought, Floodplains and Ecological Sustainability”.
Primary Convener: A.G. Frazier
Co-Conveners: T. Giambelluca, and T. Sinha

TEACHING & MENTORING EXPERIENCE

- Lecturer** – University of Hawai‘i at Mānoa, Department of Geography 2012-2013
- Geography 101, “The Natural Environment”
- Undergraduate Intern Supervisor**
 - 1 female student, University of British Columbia, NCAR Daily Climate Maps 2017, 2018
 - 1 female student, St. Olaf College, Forest Line, Haleakalā National Park, Maui 2015
 - 1 female student, University of Hawai‘i at Mānoa, Rainfall Atlas update 2013
 - 1 male student, University of Hawai‘i at Mānoa, Evapotranspiration Project 2013
- Peer Mentor** for incoming graduate students, University of Hawai‘i at Mānoa, Department of Geography 2013-2016
- Tutor** – University of Hawai‘i at Mānoa, Department of Biology 2013-2014
- Zoology 631: “Biometry”

Teaching Assistant - University of Vermont, Burlington, VT,
- Geography Department: Geography 040 “Weather, Climate & Landscapes” 2007-2008
- Physics Department: Astronomy 005 “Exploring the Cosmos” 2005-2008

SERVICE & MEETINGS

Invited participant at “Drought in the USAPI - Impacts, Resilience, and Management”
Workshop, Honolulu, HI August 14-15, 2018

Reviewer:

*Physical Geography, International Journal of Climatology, Water, Remote Sensing,
EcoAdapt, USGS, Journal of Hydrometeorology*
(see Publons page: <https://publons.com/author/1234772/abby-frazier#profile>)

Invited participant at USGS Caribbean Drought Workshop, May 30-31, 2018, San Juan, PR

Invited participant at Hawai‘i Stream Conservation Meeting, Aug. 1, 2017, Honolulu, HI

Invited participant at USGS Climate Science Center writing workshop in Annapolis, MD,
June 13-15, 2017

Technical Contributor to 4th National Climate Assessment, Pacific Islands Chapter

Technical Team for Climate Change Monitoring Network proposal, Pacific Islands Climate
Change Cooperative (PICCC)

Invited participant at Hawai‘i Downscaling Workshop, Honolulu, HI April 11-12, 2017

Invited participant at University of Hawai‘i Climate Center meeting, Honolulu, HI, April 3,
2017

Invited participant at National Forest Service Drought Meeting, San Antonio, TX, March 21-
23, 2017

Volunteer:

Regional Climate Change and Environmental Response in Hawai‘i Workshop, 2014
HaleNet Climate Network 25th Anniversary Meeting, 2013
Pacific Island Regional Climate Assessment (PIRCA) Forum, 2012
Hawai‘i Pacific GIS conference, 2012

Press & Science Outreach Training with COMPASS, 2013

Student representative to Graduate Admissions Committee, UHM Geography, 2012

Maintain Rainfall Atlas of Hawai‘i & ET websites; respond to email inquiries, 2011-present

Graduate Student Organization (GSO) representative for UHM Geography, 2010-2011