

Aurora Ke‘alohilani Kagawa-Viviani

EDUCATION

PhD, Geography and Environment
 University of Hawai‘i at Mānoa, Honolulu HI
 Advisor: Thomas W. Giambelluca
 Dissertation: Ecohydrology of change: dynamics of climatological, hydrological, and ecological change across Hawai‘i’s landscapes

Master of Science, Botany with Ecology, Evolution, and Conservation Biology specialization
 University of Hawai‘i at Mānoa, Honolulu HI
 Advisor: Lawren Sack
 Thesis: Variation in species and stand level water use for native forest and non native timber plantation in Hōnaunau, Hawai‘i

Bachelor of Science, Environmental Engineering
 Massachusetts Institute of Technology, Cambridge MA

PROFESSIONAL AND RESEARCH EXPERIENCE (SELECTED)

Aug-Dec 2020 **Lecturer**, Water and Society (GEO 305/SUST 315), UH Mānoa Department of Geography and Environment, Honolulu, HI

June-Dec 2020 **Research Assistant**, Nakula NAR cloud water interception research, US Geological Survey (PIs: Lucas Fortini, Stephanie Yelenik)

2013-2020 **Graduate Student**, UH Mānoa Department of Geography and Environment, Honolulu, HI (Advisor: TW Giambelluca)

2017-2020 **Research Assistant**, UHM Department of Geography and Environment, Honolulu, HI (Supervisor: TW Giambelluca): Transpiration characteristics of native and non-native plants at a mesic forest site in Mākaha Valley, O‘ahu, Hawai‘i

2017 **Research Assistant**, Pacific Islands Climate Change Cooperative, Honolulu, HI (Supervisor: L Fortini): Determining climate controls on plant growth using dendrometers

2011- 2013 **Educational Specialist**, Kapi‘olani Community College, Honolulu HI (PI: L Pagotto)
 Indigenous Knowledge in Engineering/NSF Pre-Engineering Education Collaborative

2011 **Environmental Specialist**, SWCA Corporation, Honolulu HI (Principal: J Ford)

2008- 2010, **Field Research Technician and Education/Outreach Coordinator**
 2011- 2012 Hawai‘i Biocomplexity Project, Stanford University, Kohala HI (PI: P Vitousek)

2008 **Water Resources Intern**, Kamehameha Schools Land Assets Division, Honolulu HI (Supervisor: TK Duarte)

2005-2006 **Graduate Research Assistant**, “Dynamic Effects of Native vs Non Native Vegetation on the Ecohydrology of a Hawaiian Rainforest,” UH Mānoa Water Resources Research Center, Honolulu HI (PI: TK Duarte)

COMPETITIVE GRANTS, AWARDS, & FELLOWSHIPS

June 2020 The Funders Network: Partners for Places Mini Grant for “Community Driven and Tech-supported Water Planning for Hawaiian Homesteads” (\$8,857)

2019 UHM Geography and Environment Department Outstanding Graduate Student Publication

2018-2019 Ford Foundation Dissertation Fellowship

2014- 2017 Ford Foundation Predoctoral Fellowship

2017 Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI) Instrumentation Discovery Travel Grant

- 2017 UHM Geography Department Symposium Best Oral Presentation Award
2017 Integrated Carbon and Water for Ecological and Biogeochemical Synthesis (ICWEBS)
Workshop student scholarship
2017 UHM Office of Graduate Education (OGE) Dean's Achievement Scholarship
2015-2016 Abraham Pi'ianai'a Scholarship
2016 UHM Graduate Student Organization Travel Grant
2016 UHM Geography Department Seed Grant
2015 UHM Geography Department Travel Award

PUBLICATIONS (SELECTED, *peer reviewed)

1. **Kagawa-Viviani AK**, CM Litton, DR Sandquist, S Cordell. Diverging strategies enable persistence of native dry forest trees under grass invasion and removal. *In prep.*
2. **Kagawa-Viviani AK**, Y Miyazawa, M Nullet, TW Giambelluca. 2020. Transpiration in native and non-native forest in upper Mākaha valley, O'ahu. Final report for Honolulu Board of Water Supply, Honolulu, Hawai'i. Submitted 10 April 2020.
3. ***Kagawa-Viviani, AK** and TW Giambelluca. 2020. Spatial patterns and trends in surface air temperatures and implied changes in atmospheric moisture across the Hawaiian Islands, 1905-2017. *Journal of Geophysical Research: Atmospheres*. DOI: 10.1029/2019JD031571
4. ***Westerband, AC, AK Kagawa-Viviani, KK Bogner, DW Beilman, TM Knight, and KE Barton**. 2019. Seedling drought tolerance and functional traits vary in response to the timing of water availability in a keystone Hawaiian tree species. *Plant Ecology*. DOI: 10.1007/s11258-019-00917-0
5. ***Longman, RJ, AG Frazier, AJ Newman, TW Giambelluca, D Schanzenbach, A Kagawa-Viviani, H Needham, J Arnold, MP Clark**. 2019. High-resolution gridded daily rainfall and temperature for the Hawaiian Islands (1990-2014). *Journal of Hydrometeorology*. DOI: 10.1175/jhm-d-18-0112.1
6. **Vaughan, MB, W Kinney, JK Fu, A Kagawa-Viviani, F Koethe, C Geslani, LML Charlie, NK Farrant, E Cadiz, and J Muratsuchi**. 2019. "Kahale'ala, Halele'a: Fragrant, Joyful Home, a Visit to Anini, Kaua'i." In HK Aikau and VV Gonzalez (Eds.), *Detours: A Decolonial Guide to Hawai'i*, 96-106. Durham; London: Duke University Press. DOI:10.2307/j.ctv11smvj.18
7. ***Kagawa-Viviani, AK, NK Lincoln, S Quintus, MP Lucas, TW Giambelluca**. 2018. Spatial patterns of seasonal crop production suggest coordination within and across dryland agricultural systems of Hawai'i Island. *Ecology and Society* 23(3): 20. DOI: 10.5751/ES-10369-230320
8. ***Wright, C, A Kagawa-Viviani, C Gerlein-Safdi, GM Mosquera, M Poca, H Tseng, KP Chun**. 2018. Advancing ecohydrology in the changing tropics: perspectives from early career scientists. *Ecohydrology* 11(3): e1918. DOI: 10.1002/eco.1918
9. **Kagawa-Viviani AK**. Dec 2017. Analysis of climate controls to native plant growth. Draft report submitted to Lucas Fortini, Pacific Islands Climate Change Cooperative, Honolulu, Hawai'i.
10. **Lincoln NK, A Kagawa-Viviani, K Marshall, and PM Vitousek**. 2017. Observations of sugarcane and knowledge specificity in traditional Hawaiian cropping systems. In R Murphy (Ed.), *Sugarcane*. Hauppauge, New York: Nova Science Publishers. ISBN: 978-1-53610-898-9
11. ***Marshall, K, C Koseff, AL Roberts, A Lindsey, AK Kagawa-Viviani, NK Lincoln and PM Vitousek**. 2017. Restoring people and productivity to Puanui: challenges and opportunities in the restoration of an intensive rain-fed Hawaiian field system. *Ecology and Society* 22 (2): 23. DOI: 10.5751/ES-09170-220223
12. **Kagawa-Viviani AK, T Kawamata Ryan**. 2016. Moving beyond cultural sensitivity: Developing culturally responsive programs for and with Native engineers. In S Burckhard and J Kant (Eds.), *The PEEC experiment: Native Hawaiian and Native American engineering education*. Brookings, SD: South Dakota State University Jerome J. Lohr College of Engineering. http://openprairie.sdstate.edu/cvlee_book/1/
13. **Kagawa-Viviani, AK**. August 2016. Untangling 'uala: toward re-diversifying and re-placing sweet potato in the Hawaiian landscape. Final report submitted to E Kūpaku Ka 'Āina, Hawai'i. DOI: 10.13140/RG.2.2.26819.86565/1

14. ***Kagawa AK** and P Vitousek. 2012. The ahupua‘a of Puanui: a resource for understanding Hawaiian rain-fed agriculture. *Pacific Science* 66. DOI: 10.2984/66.2.6
15. ***Kagawa AK**, L Sack, TK Duarte, and SA James. 2009. Native forest conserves water relative to timber plantation: species and stand-level traits influence Hawaiian forest water use. *Ecological Applications* 19: 1429-1443. DOI: 10.1890/08-1704.1

PRESENTATIONS (*oral)

Professional Meetings

- 2019 **Kagawa-Viviani AK** and TW Giambelluca. Drying of the lower atmosphere influences spatial patterns of warming across the Hawaiian Islands. eLightning poster presented at the American Geophysical Union Fall Meeting, San Francisco, CA. (12/12/2019)
- 2019 Our Science, Our Way Collective. Native scientists in action: networks to reduce indigenous STEM grad student isolation, facilitate peer-to-peer exchange, and advance visions of “pono science.” American Geophysical Union Fall Meeting, San Francisco, CA. (12/12/2019)
- 2019 ***Kagawa-Viviani AK**, Y. Miyazawa, M. Nullet, TW Giambelluca. Following water and carbon in a Mākaha guava stand. Hawai‘i Ecosystems Meeting, Hilo, HI. (7/1/2019)
- 2019 **Kagawa-Viviani AK**, CM Litton, DR Sandquist, S Cordell. Diverging strategies enable persistence of lama and alaha‘e under grass invasion and removal. Nāhelehele Dryland Forest Symposium, Hilo, HI. (3/27/2019)
- 2018 **Kagawa-Viviani AK**, Y Miyazawa, M Nullet, TW Giambelluca. Beyond transpiration: transformative invasive tree traits contribute to altered ecosystems and hydrological processes. American Geophysical Union Fall Meeting, Washington, DC. (12/13/2018, eLightning poster)
- 2018 Lin Z, D Kim-Hak, BN Popp, N Wallsgrave, **A Kagawa-Viviani** and J Johnson. Development and evaluation of a spectral analysis method to eliminate organic interference with cavity ring-down measurements of water isotope ratios, European Geophysical Union General Assembly, Vienna, Austria (4/13/2018)
- 2017 Lin Z, D Kim-Hak, BN Popp, N Wallsgrave, **A Kagawa-Viviani** and J Johnson. Development and evaluation of a spectral analysis method to eliminate organic interference with cavity ring-down measurements of water isotope ratios, American Geophysical Union Fall Meeting, New Orleans, LA (12/15/2017)
- 2017 ***Kagawa-Viviani AK**. Some ecohydrological observations in water-limited systems of Hawai‘i. Hawai‘i Ecosystems Meeting, Hilo, HI. (6/30/2017)
- 2017 ***Kagawa-Viviani AK**, CM Litton, DR Sandquist, S Cordell. Ecohydrology of grass invasion and restoration efforts at Ka‘ūpūlehu dry forest, Hawai‘i. UH Mānoa Geography Symposium, Honolulu, HI. (5/5/2017)
- 2017 **Kagawa-Viviani AK**, CM Litton, DR Sandquist, and S Cordell. Differential tropical dry forest tree responses to rainfall pulses with nonnative grass invasion. Integrated Carbon and Water for Ecological and Biogeochemical Synthesis (ICWEBS) Workshop, Stevenson, WA. (2/27/2017)
- 2016 **Kagawa-Viviani AK** and T Giambelluca. Landscapes of change: A review of ecohydrology research in Hawaii, AGU Chapman Conference on Emerging Issues in Tropical Ecohydrology, Cuenca, Ecuador. (6/6/2016)
- 2015 **Kagawa-Viviani AK** and T Giambelluca. Historical Air Temperatures Across the Hawaiian Islands, American Geophysical Union Fall Meeting, San Francisco, CA. (12/18/2015)
- 2011 ***Kagawa AK**. Transpiration Variability Across Species and Forest Stands in Hawai‘i. Hawai‘i Conservation Conference, Honolulu, HI. (*Invited*)
- 2011 ***Kagawa AK**. ‘Ike aku, ‘ike mai. Hawai‘i Ecosystems Project Annual Meeting, Hilo, HI.
- 2009 ***Kagawa AK**, Vitousek P. Bringing Kohala Gardens Back to Life: The Puanui Experiment. Society for Hawaiian Archaeology Annual Meeting, Honolulu, HI.
- 2009 ***Kagawa AK**. Reverse Engineering in the Kohala Field System. Hawai‘i Ecosystems Project Annual Meeting, Hilo, HI.
- 2008 ***Kagawa AK**, Sack L, Duarte K, James SA. Does native forest conserve water? Species composition and stand structure influence water use for a Hawaiian wet forest. Ecological Society of America Annual Meeting, Milwaukee, WI.

- 2007 ***Kagawa AK**, Sack L, Duarte K, James SA. Does Hawaiian native forest conserve water? Lower uptake rates at tree and stand scale by *Metrosideros polymorpha* relative to plantation species. American Geophysical Union Fall Meeting, San Francisco, CA.

Community Presentations

- 2019/12/21 **Kagawa-Viviani AK**. Indigenizing design thinking. Ka Maka 'Īnana design and venture ideation workshops, Honolulu, HI. (*Invited*)
- 2019/09/21 **Kagawa-Viviani AK**. Purple Prize Kilo Hōkū keynote speech. 2019 Purple Prize Demo Day, Honolulu, HI. (*Invited*)
- 2018/04/06 **Kagawa-Viviani AK**. Guided by 'uala, powered by GIS: Using climate data to explore seasonal planting from Kohala to Ka'ū. Lāhui Hawai'i Research Conference, Honolulu, HI.
- 2017/08/04 **Kagawa-Viviani AK**. 'Uala: He 'uala ka 'ai ho'ōla koke i ka wī. Kōkua Kalihi Valley Roots Program, Kalihi, HI. (*Invited*)
- 2016/08/25 **Kagawa-Viviani AK**. 'Uala: He 'uala ka 'ai ho'ōla koke i ka wī. Indigenous Crop Biodiversity Festival, Kahului, HI. (*Invited*)
- 2015/08/22 **Kagawa-Viviani AK**. 'Uala: He 'uala ka 'ai ho'ōla koke i ka wī. Maui Nui Botanical Garden Workshop Series, Kahului, HI. (*Invited*)
- 2012/06/13 **Kagawa AK**. 'Uala: 'Ike, mo'olelo, uses, propagation and a model plant for local ecoliteracy. Kū 'Āina Pā Summer Intensive, Waimea (Kamuela), HI. (*Invited*)

Invited Panel Discussions

- 2019/07/09 Hawai'i Conservation Conference Opening Plenary Panel – “Kāne and Kanaloa Are Coming: How Will We Receive Them? A Kānaka Take on Climate Change and Indigenous Resilience”
- 2019/04/11 Hawai'i Museums Association Conference: “Hawaiian Perspectives on Science and Culture”
- 2018/10/20 UHM Sea Grant Community-Researcher Partnerships Workshop: “Methods to Methodology: Discussion of incorporating indigenous frameworks into graduate work”
- 2017/03/16 Sustainability Summit: “Meeting of Wisdoms”
- 2017/01/25 UHM Center for Teaching Excellence: “Connecting Science & Culture”
- 2010/08/04 Hawai'i Conservation Conference: “Conservation Land and Culture: Creating Conservation and Cultural Alliances”

TEACHING AND MENTORING

Teaching

- 2013- 2014 Teaching Assistant, UHM, Geography of Hawai'i (GEOG 368)
- 2009- 2010 Volunteer Instructor, Kohala High School, place- and culture- based science pilot program
- 2008 Instructor, UHM, Botany and IGERT programs, Intro to R workshops

Guest Lectures

- 2020/10/15 Pono Science (HWST 631): Climate change and Indigenous voices
- 2019/10/09 Ethnobotany (BOT 105): A lifelong side project: 'Uala
- 2019/04/22 Hawaiian Archaeology (ANTH 464): Guided by 'uala, powered by GIS
- 2016/10/26 Indigenous Cropping Systems Seminar (TPSS 431): He 'uala ka 'ai ho'ōla koke i ka wī
- 2015/09/03 Resources Management (BOT 350): A [Hawaiian] Perspective on Conservation

Mentoring

Undergraduate students: Elizabeth Winnicki (UH Mānoa/USC), Angelica Melone (UH Mānoa, PIPES), Mahina Patterson (UH Hilo, PIPES), Cricket Dean (Prescott College), Guilherme Flandoli Romeiro (University of São Paulo)

SERVICE AND LEADERSHIP (SELECTED)

- Service to field:** ad hoc reviewer for Pacific Conservation Biology, Functional Ecology, Pacific Science
- 2019- present AGU Ecohydrology Technical Committee: Student/Post Doc Relations Subcommittee
- 2017- present DS/PS reading group facilitator
- 2017- 2019 UHM Graduate Student Organization Elections Chair (2017) and Committee (2018-19)
- 2017- 2018 Engaging Community to Restore Wetland Kalo and Study Water Recharge, volunteer
- 2017- 2018 UHM Geography GSO representative
- 2015- 2016 UHM Geography graduate student-faculty liaison
- 2012- 2016 Hawai'i Science Teachers Association board member (liaison)

- 2011- 2014 Hawaiian Islands Science student group founding member
- 2011- 2014 Ulu Mau Puanui volunteer, 'uala cultivar research and documentation
- 2006- 2013 Science and engineering fair judge-district, regional, state competitions (HSSEF)
- 2011- 2012 Hawai'i Conservation Conference Nahululeihiwakuipapa (emerging professionals) session co-coordinator
- 2010- 2011 MIT Science and Engineering Program for Teachers Hawai'i coordinator
- 2009- 2010 Kohala education programs volunteer: Kohala Elementary Discovery Garden, Kohala High School, Ka Hana No'eau youth mentorship program
- 2007- 2008 Mālama i Ke Kai Mokauea Island restoration project volunteer
- 2006- 2008 Farrington High and Kamehameha Schools biology resource
- 2008- 2009 UHM IGERT Program associate
- 2006- 2008 UHM R/Math Biology Group

EVENTS ORGANIZED/FACILITATED (SELECTED)

- 2017 Methods in Stable Isotope Ecohydrology workshop. Co-designed and organized a workshop focused on methods for extraction and analysis of environmental waters for isotopic analysis of δD and $\delta^{18}O$. Invited speakers: J Johnson (Carnegie) and B Popp (UH Mānoa). UH Mānoa campus, Honolulu, HI. Sponsored by CUAHSI/NSF as part of the IDTG program. (8/15-16, 2017)
- 2014 CBSFA: Community-Based Subsistence Fishing Areas and the Future of Hawai'i's Nearshore Fisheries. Led coordination of roundtable in collaboration with other grad students and student group KaPA'A, sponsored by COSEE-IE. UH Mānoa campus, Honolulu, HI. (4/16/2014)
- 2014 Traditional Marine Resource Management: An Open Forum. As a member of informal group Hawaiian Islands Science (HI Sci), led logistics planning of large public forum at ASLO Ocean Science Meeting, Honolulu, HI, sponsored by COSEE-IE. (2/27/2014)
- 2013 Maoli Engineering and Science in Education. Mentored colleague in coordinating high school student-oriented workshop at MA'O Farms, Wai'anae, HI. HI Sci event sponsored by COSEE-IE. (10/26/2013)
- 2013 Water Resources and Climate Change in Hawai'i. Led organization and facilitation of public "fishbowl" discussion, UH Mānoa campus, Honolulu, HI. HI Sci event sponsored by COSEE-IE. (3/21/2013)
- 2012 Ma Ka Hana Ka 'IKE: Assisted coordination of inaugural student symposium for Indigenous Knowledge in Engineering program. Windward Community College, Kāne'ohe, HI. Sponsored by NSF-PEEC, UHM College of Engineering, UH System (8/15/2012)

COURSES AND CERTIFICATES

- 2015 Stable Isotope Biogeochemistry and Ecology ("Iso-Camp"), Salt Lake, UT
- 2014 Northwest Climate Science Center Climate 2014 Bootcamp, Silver Falls, OR
- 2010 Organization for Tropical Studies/Pan American Advanced Studies Institute: *Expanding the frontier of tropical ecology through embedded sensors*, La Selva, Costa Rica
- 2003 Massachusetts Engineer-in-Training Certificate #20367, Boston, MA

SKILLS

Computing: data wrangling, analysis, and visualization: fluent in R statistical programming environment/language, familiar with Matlab, Python, Minitab, SigmaPlot; statistical techniques: linear models, model selection, mixed effect models, time series; ImageJ, ArcGIS; collaboration: Git/Github, Open Science Framework, ftp and cloud-based file sharing, scheduling apps, Zoom/Skype, Slack

Technical fieldwork: micrometeorological sensing and data acquisition systems (Campbell and Onset systems), various sap flow methods, ecophysiological measurements (leaf traits and gas exchange with LI-6400xt); familiar with vadose zone soil moisture/tension protocols, sampling and analyses for meteoric waters and soil/plant tissue natural abundance stable isotopes, water quality methods, ecological sampling and surveying: GPS operation, fluency with Hawaiian plant genera

Labwork: plant growth analysis (mass and leaf area measurement protocols), microscopy and image processing, basic molecular biology protocols, spectrophotometry, phytoplankton and plant tissue culturing; familiar with sample prep for IRMS/EA-CRDS stable isotope analyses and mass spectrometer/spectroscopy theory

Social science: familiar with basic qualitative methods, interviewing, program evaluation, Hawai'i water law, Native Hawaiian traditional and customary practices

Aurora K. Kagawa-Viviani

PROFESSIONAL AFFILIATIONS

American Geophysical Union (2007-present)

Ecological Society of America (2008-present)

Association of Tropical Biology (2017-present)

Society for Ecological Restoration (2019-present)