

Curriculum Vitae
LAURA BREWINGTON

East-West Center
1601 East West Road
Honolulu, HI 96822-1601

brewingl@eastwestcenter.org
Office: (808) 944-7233
Mobile: (808) 353-5400

EDUCATION

University of North Carolina at Chapel Hill

Chapel Hill, NC USA

PhD Geography, 2011

University of North Carolina at Chapel Hill

Chapel Hill, NC USA

BS Biostatistics, 2001

RESEARCH INTERESTS

Climate change adaptation, Island conservation and development, Biosecurity, Geospatial analysis, Protected areas, Remote sensing, Geographic Information Systems, Land use/land cover change

APPOINTMENTS

2021– Research Professor, Arizona State University Global Institute of Sustainability and Innovation, Honolulu, HI

2020–21 Visiting Scientist, Health and Biosecurity, the Commonwealth Scientific and Industrial Research Organisation, Darwin, Australia

2020– Core Team Member, the Pacific Regional Invasive Species and Climate Change Management Network, East-West Center, Honolulu, HI

2020– Co-Lead Investigator, the Pacific Regional Integrated Sciences and Assessments Program, East-West Center, Honolulu, HI

2020– Affiliate Researcher, University of Hawai‘i Water Resources Research Center, Honolulu, HI

2019– Investigator, Development of Drought Analyses with Managers of National Park and US Fish and Wildlife Service Natural Resources in Hawai‘i, East-West Center, Honolulu, HI

2018– Lead Investigator, International Research and Applications Project, East-West Center, Honolulu, HI

2016–20 Principal Investigator, the Pacific Regional Integrated Sciences and Assessments program, East-West Center, East-West Center, Honolulu, HI

2016–18 Co-Investigator, Impacts of Climate Change on Honolulu Board of Water Supply and Planning Strategies for Mitigation, East-West Center, Honolulu, HI

2013–19 Program Manager, the Pacific Regional Integrated Sciences and Assessments program, East-West Center, East-West Center, Honolulu, HI

2013– Research Fellow, East-West Center, Honolulu, HI

2012–13 Post-Doctoral Researcher, Center for Galapagos Studies, University of North Carolina at Chapel Hill, Chapel Hill, NC

2011–12 Biosecurity and Quarantine Fellow, WildAid, Inc., Galapagos, Ecuador

2010 Graduate Research Assistant, Center for Galapagos Studies, University of North Carolina at Chapel Hill, Chapel Hill, NC

2009 Graduate Research Assistant, Department of Geography, University of North Carolina at Chapel Hill, Chapel Hill, NC

2006–11 NSF-IGERT Pre-doctoral Trainee in Population and Environment, Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC
 2002–06 Biostatistician and Geospatial Analyst, Rho Inc., Chapel Hill, NC
 2001–02 Biostatistician, Pharmacyclics Inc., Sunnyvale, CA

GRANTS & FELLOWSHIPS

2022–27 Enhancing Climate Information and Knowledge Services for Resilience in 5 Island Countries of the Pacific Ocean (UN Environment Programme/Green Climate Fund): \$1,155,971
 2021–26 The Pacific RISA Phase IV: Building Equitable and Just Climate Solutions for Pacific Island Resilience to Compound Disasters and Extreme Events (US National Oceanic and Atmospheric Administration): \$7,010,696
 2020–21 Pacific RISA: Building International Adaptation and Resilience to a Changing Climate in the Pacific Islands (US National Oceanic and Atmospheric Administration): \$700,000
 2020–21 Foreign Assistance for Pacific Islands (US Department of State, Bureau of Oceans and International and Scientific Affairs): \$529,000
 2019–21 Development of Drought Analyses with Managers of National Park and US Fish and Wildlife Service Natural Resources in Hawai‘i (US Department of Interior Pacific Islands Climate Adaptation Science Center): \$285,293
 2019–20 Advancing Best Practices for the Analysis of the Vulnerability of Military Installations in the Pacific Basin to Coastal Flooding under a Changing Climate (US Department of Defense Strategic Environment and Research Development Program): \$26,000
 2018–20 Climate, Health, and Migration in Pacific Islands (US National Oceanic and Atmospheric Administration International Research and Applications Project): \$477,079
 2018–20 ‘Ike Wai: Securing Hawai‘i’s Water Future (US National Science Foundation): \$15,000
 2017–20 Synthesis of Drivers, Patterns, and Trajectories of LCLUC in Island Ecosystems (NASA LCLUC Synthesis Program): \$30,000
 2016–19 The Pacific Islands Regional Climate Assessment Sustained Assessment Specialist (US Department of Interior Pacific Islands Climate Adaptation Science Center): \$99,740
 2015–20 The Pacific RISA: Supporting Integrated Decision Making Under Climatic Variability and Change in Hawai‘i and the US-Affiliated Pacific Islands (US National Oceanic and Atmospheric Administration): \$4,246,800
 2015–17 Impacts of Climate Change on Honolulu Board of Water Supply and Planning Strategies for Mitigation (Water Research Foundation): \$266,667
 2014–15 Development of an Integrated, Island-Relevant Concept of Landscape Conservation Design for the LCC Network (US Fish and Wildlife Service, Implementing Strategic Habitat Conservation): \$32,245
 2011–12 Quarantine and Biosecurity Fellowship (WildAid, Inc.): \$24,000
 2010 UNC Graduate School Tuition Incentive Scholarship (University of North Carolina at Chapel Hill): \$18,000
 2009–10 Inter-American Foundation Grassroots Development Program (Inter-American Foundation): \$20,000
 2009 Off-Campus Dissertation Research Fellowship (University of North Carolina at Chapel Hill): \$7,350
 2007–09 Research Residencies for Field Research, Carolina Population Center (University of North Carolina at Chapel Hill): \$8,800
 2008 Pre-Dissertation Field Research Grant (University of North Carolina at Chapel Hill Institute for the Study of the Americas): \$1,000
 2006–11 NSF-IGERT Traineeship in Population and Environment, Carolina Population Center (National Science Foundation Integrative Graduate Education and Research Traineeship): \$109,500

RESEARCH PROJECTS

The Pacific RISA Phase IV: Building Equitable and Just Climate Solutions for Pacific Island Resilience to Compound Disasters and Extreme Events

Position: Co-Lead Investigator. Status: Ongoing

Affiliation: Arizona State University & East-West Center, Honolulu, HI

- Enhance Pacific ecological security through research and coordination with the Pacific Regional Invasive Species and Climate Change (RISCC) management network
- Evaluate the effects of scenario-based groundwater recharge change on availability under future climate change
- Lead peer-to-peer knowledge exchanges between the County of Kaua‘i and other Hawai‘i or regional jurisdictions to facilitate a better understanding the risks and impacts associated with compound climate hazards of interest
- Track program- and project-focused metrics of equity, justice, and inclusion across all research activities

Advancing Best Practices for the Analysis of the Vulnerability of Military Installations in the Pacific Basin to Coastal Flooding under a Changing Climate

Position: Spatial Analyst. Status: Ongoing

Affiliation: East-West Center, Honolulu, HI

- Integrate geographic, biophysical, and infrastructure data for five Pacific and coastal US military installations for analysis within a GIS modeling environment
- Test model outputs using pre-defined sea level rise scenarios to show impacts of sea level rise on critical infrastructure and mission readiness
- Provide estimates of event magnitude and frequency that will assist Department of Defense managers in assessing and responding to anticipated impacts

Development of Drought Analyses with Managers of National Park and US Fish and Wildlife Service Natural Resources in Hawai‘i

Position: Investigator. Status: Ongoing

Affiliation: East-West Center, Honolulu, HI

- Conduct detailed survey of Hawai‘i land managers and their approaches to drought and wildfire management
- Identify perceptions of drought and drought-related threats to regional water resources, document management actions during drought, identify lessons learned that may be useful to other land managers statewide

International Research and Applications Project: Climate, Health, and Migration in Pacific Islands

Position: Lead Investigator. Status: Ongoing.

Affiliation: East-West Center, Honolulu, HI

- Identify and provide climate information and services to the Marshall Islands health sector in support of the development of a climate early warning system
- Track and map migration flows from the Marshall Islands to other regions in the Pacific through analysis and publication of existing climate and migration survey data
- Provide information and promote partnerships in the Hawai‘i healthcare sector by improving coordination between local, national, and regional entities

The Pacific Regional Integrated Sciences and Assessments (RISA): Supporting Integrated Decision Making Under Climatic Variability and Change in Hawai‘i and the US-Affiliated Pacific Islands

Position: Investigator. Status: Ongoing.

Affiliation: East-West Center, Honolulu, HI

- Support the integration of flexible processes in policy and planning for building adaptive capacity to climate variability and change in diverse Pacific island settings
- Engage regularly with decision makers in crafting the most usable climate scenarios based on downscaled climate data appropriate at small island scales
- Develop decision support tools that quantify, map, and value ecosystem services from land and sea
- Evaluate program effectiveness throughout the region as justification for decision-making and new research directions, as well as funding sources

Pacific Islands Regional Climate Assessment (PIRCA)

Position: Investigator. Status: Ongoing.

Affiliation: East-West Center, Honolulu, HI

- Coordinate with PIRCA collaborators and others to contribute to the National Climate Assessment
- Prepare materials and lead chapter writing for PIRCA release
- Document cross-sectoral case studies of regional climate adaptation measures
- Evaluate appropriate case studies for inclusion in the PIRCA and ground-truth the accurate representation and utility of indicator variables

‘Ike Wai: Securing Hawai‘i’s Water Future

Position: Spatial Analyst. Status: Complete.

Affiliation: East-West Center, Honolulu, HI

- Develop spatially explicit land cover scenarios for potential future land cover in the Pearl Harbor (Oahu Island) and Hualalai (Hawai‘i Island) aquifer systems, as inputs to a hydrology model to evaluate groundwater recharge under future climate and management decisions

Impacts of Climate Change on Honolulu Board of Water Supply and Planning Strategies for Mitigation

Position: Investigator. Status: Complete.

Affiliation: East-West Center, Honolulu, HI

- Use scenario planning and groundwater modeling to improve resilience to climate change impacts for the Honolulu Board of Water Supply on the island of Oahu
- Work with the USGS to provide climatic and hydrologic modeling results to inform the study on expected changes to temperature, precipitation, water availability, sea level rise, and salt water intrusion as a result of climate change
- Assess vulnerabilities regarding water balance, historical water quality, and infrastructure risks and reliability
- Develop management and treatment strategies to address anticipated changes in climate and their impacts on the Honolulu Board of Water supply and its assets

The Maui Groundwater Project

Position: Investigator. Status: Complete.

Affiliation: East-West Center, Honolulu, HI

- Evaluate stakeholder needs for climate change information in water resource decision-making on Maui Island, HI

- Develop spatially explicit land cover scenarios for potential future Maui land cover, as inputs to a hydrology model to evaluate groundwater recharge under future climate and management decisions
- Identify how uncertainty about climate information influences stakeholder understanding about climate change, and preferences about management solutions

Development of an Integrated, Island-Relevant Concept of Landscape Conservation Design for the LCC Network

Position: Analyst. Status: Complete.

Affiliation: East-West Center, Honolulu, HI

- Identify and categorize key ecological, social, and conservation management differences and similarities between islands and continental systems that are relevant to achieving sustainable landscapes/seascapes at regional scales
- Develop a conservation framework that integrates planning processes for both terrestrial and marine resources that is consistent with the LCC Network Vision and Mission, and that connects landscape conservation design (LCD) efforts for islands and mainland LCCs
- Develop LCD guidelines, definitions, and goals appropriate for islands that are consistent with the SIAS metrics for LCD

Galapagos Island Coastal Vulnerability and Modeling of Linked Human-Environment Interactions

Position: Postdoctoral Researcher. Status: Complete.

Affiliation: Center for Galapagos Studies at the University of North Carolina at Chapel Hill

- Build geospatial databases and conduct interdisciplinary analysis to characterize human and natural processes and interactions that govern coastal vulnerability and resilience
- Determine how stresses vary over wide-ranging temporal and spatial scales, analyze their impacts, and isolate key factors that lead to vulnerability in human-environmental systems
- Deploy remote sensing and modeling techniques as decision-making tools for environmental sustainability

Quarantine Operations, Biosecurity, and Port Optimization

Position: Biosecurity and Quarantine Fellow. Status: Complete.

Affiliation: WildAid, Inc., Galapagos, Ecuador

- Evaluate cargo shipping procedures, in collaboration with Ecuadorian institutions, including the Ministries of Environment and Transportation, Galapagos National Park and the Galapagos Inspection and Quarantine System
- Provide training in geospatial analysis to Galapagos National Park Service and Charles Darwin Research Station personnel
- Develop port and shipping protocols that meet international biosecurity standards for island territories

Species Invasions and Human Migration in the Galapagos Islands of Ecuador

Position: Doctoral student. Status: Complete.

Affiliation: Department of Geography, Center for Galapagos Studies, and the Carolina Population Center at the University of North Carolina at Chapel Hill; the Inter-American Foundation; Galapagos, Ecuador

- Evaluate the drivers and effects of conservation policies, including efficacy of protected areas, the introduction, control, and eradication of non-native species, and human migration and tourism
- Carry out vegetation surveys and transects of invasive plant species as ground truth data for time-series remote sensing analysis of land use/land cover change
- Conduct qualitative and quantitative analysis of in-depth interviews and brief surveys with over 100 policy makers, stakeholders, and members of rural households

Frontier Migration and the Rural Environment in Ecuador

Position: Research Assistant. Status: Complete.

Affiliation: Department of Geography and the Carolina Population Center at the University of North Carolina at Chapel Hill, the National Institutes of Health

- Build geospatial datasets from agricultural census data to link with demographic information from rural areas within the Amazon Basin of Ecuador
- Develop and test measures of environmental quality from satellite imagery and other spatial datasets and compared them with survey data from households on environmental conditions
- Conduct time-series spatial and statistical analysis methods for parameterizing land use/land cover change models

PUBLICATIONS

- Frazier, A.G., Crausbay S.D., **Brewington, L.**, & Giambelluca, T.W. (In preparation). Characterizing drought and vegetation response at the forest line in Hawai'i.
- Frazier, A.G., Giardina, C.P., Giambelluca, T., **Brewington, L.**, Chen, Y-L., Helweg, D., Keener, V., Longman, R., Lucas, M., Mair, A., Reyes, J., Yelenik, S.G., & Trauernict, C. (In review). A century of spatial and temporal patterns of drought in Hawai'i across hydrological, ecological, and socioeconomic scales. *Water Resources Research*.
- Hoffmann, B., Faulkner, C., & **Brewington, L.** (Accepted). Field quantifications of probability of detection and search patterns to form protocols for the use of detector dogs for eradication assessments. *Ecology and Evolution*.
- Brewington, L.**, Kokame, K., & Lewis, N. (2021). Climate change, health, and migration in the Pacific: A case study of the Marshall Islands. *AsiaPacific Issues*, 149: 1–8.
- Marra, J., Courtney, C., & **Brewington, L.** (2021). *The Pacific Islands Climate Storybook*. Honolulu, HI: The Pacific Regional Integrated Sciences and Assessments Program. www.pacificrisa.org/pacific-islands-climate-storybook/
- Bremer, L.L., Elshall, A.S., Wada, C.A., **Brewington, L.**, Delevaux, J.M.S., El-Kadi, A.I., Voss, C.I., & Burnett, K.M. (2021). Effects of land cover and watershed protection futures on sustainable groundwater management in a heavily utilized aquifer in Hawai'i (USA). *Hydrogeology Journal*. <http://dx.doi.org/10.1007/s10040-021-02310-6>.
- Shuler, C., **Brewington, L.**, & El-Kadi, A.I. (2021). A participatory approach to assessing groundwater recharge under future climate and land-cover scenarios, Tutuila, American Samoa. *Journal of Hydrology: Regional Studies*, 34: 100785. <https://doi.org/10.1016/j.ejrh.2021.100785>
- Brewington, L.** (2020). Transitions and drivers of land use/land cover change in Hawai'i: A case study of Maui. In S.J. Walsh, D. Riveros-Iregui, J. Acre-Navarro, & P.H. Page (Eds), *Land Cover/Land Use Change on Islands: Social & Ecological Threats to Sustainability*. Heidelberg: Springer, pp. 89–117. doi: 10.1007/978-3-030-43973-6.
- Pizzitutti, F., **Brewington, L.**, & Walsh, S.J. (2020). Human and natural environments, Island of Santa Cruz, Galapagos: A model-based approach to link land cover/land use changes to direct and indirect socio-economic drivers of change. In S.J. Walsh, D. Riveros-Iregui, J. Acre-Navarro, & P.H. Page (Eds), *Land Cover/Land Use Change on Islands: Social & Ecological Threats to Sustainability*. Heidelberg: Springer, pp. 183–203. doi: 10.1007/978-3-030-43973-6.
- Walsh, S.J., Bilsborrow, R.E., **Brewington, L.**, Shao, Y., Mattei, H., Nazario, J.A., Laso, F., Page, P.H., Frizzelle, B.G., & Pizzitutti, F. (2020). Social-ecological drivers of land cover/land use change on islands: A synthesis of the patterns and processes of change. In S.J. Walsh, D. Riveros-Iregui, J. Acre-Navarro, & P.H. Page (Eds), *Land Cover/Land Use Change on Islands: Social & Ecological Threats to Sustainability*. Heidelberg: Springer, pp. 63–88. doi: 10.1007/978-3-030-43973-6.
- Brewington, L.**, Keener, V., & Mair, A. (2019). Simulating land cover change impacts on groundwater recharge under selected climate projections, Maui, Hawai'i. *Remote Sensing*, 11 (24): 3048.

- Frazier, A. & **Brewington, L.** (2020). Current changes in alpine ecosystems of Pacific Islands. In *Encyclopedia of the World's Biomes*. Amsterdam: Elsevier, pp. 607–619. <https://doi.org/10.1016/B978-0-12-409548-9.11881-0>.
- Brewington, L.** (2018). Stakeholder perceptions of invasive species and participatory remote sensing in the Galapagos Islands. In M. Lourdes Torres & C. Mena (Eds), *Understanding Invasive Species in the Galapagos Islands: From the Molecular to the Landscape*. Heidelberg: Springer, pp. 175–192.
- Brewington, L.**, Keener, V., Finucane, M., & Eaton, P. (2017). Participatory scenario planning for climate change adaptation using remote sensing and GIS. In S. Walsh (Ed), *Remote Sensing for Societal Benefits*. Amsterdam: Elsevier, pp. 236–252. doi: <http://dx.doi.org/10.1016/B978-0-12-409548-9.10434-8>.
- S.J. Walsh, Page, P.H., **Brewington, L.**, Bradley, J.R., & Mena, C.F. (2017). A beach vulnerability framework for the Galapagos Islands: Fusion of World-View 2 imagery, 3-D laser scanner data & unmanned aerial vehicles. In S. Walsh (Ed), *Remote Sensing for Societal Benefits*. Amsterdam: Elsevier, pp. 159–175. doi: <http://dx.doi.org/10.1016/B978-0-12-409548-9.10434-8>.
- Corlew, L.K., Keener, V., Finucane, M., **Brewington, L.**, & Nunn, R. (2015). Using social network analysis to assess communications and develop networking tools among climate change professionals across the Pacific Islands region. *Psychosocial Intervention*, 24: 133–146.
- Brewington, L.**, Burgett, J., Poe, A., & Murry, B. (2015). *Lessons Learned From the Island LCCs: Toward Best Practices to Address Unique LCD Challenges*. Washington, DC: US Fish and Wildlife Service.
- Brewington, L.**, Frizzelle, B.G., Walsh, S.J., Mena, C.F., & Sampedro, C. (2014). Remote sensing of the marine environment: Challenges and opportunities in the Galapagos Islands of Ecuador. In J. Denkinger & L. Vinueza (Eds), *The Galapagos Marine Reserve*. Heidelberg: Springer, pp.109–136.
- Brewington, L.**, Engie, K., Walsh, S.J., & Mena, C.F. (2013). Collaborative learning and global education: Studying human-environment interactions in the Galapagos Islands. *Journal of Geography*, 112: 179–192.
- Brewington, L.** (2013). The double bind of tourism in Galapagos society. In S.J. Walsh & C.F. Mena (Eds), *Social, Terrestrial, and Marine Interactions in the Galapagos Islands: Frameworks and Perspectives*. Heidelberg: Springer, pp. 105–125.
- Brewington, L.** (2013). Mapping invasion and eradication of feral goats in the Alcedo region of Isabela Island, Galapagos. *International Journal of Remote Sensing*, 34(7): 2286–2300.
- Brewington, L.**, Rosero, O., Bigue, M., & Cervantes, K. (2012). *The Quarantine Chain: Establishing an Effective Biosecurity System to Prevent the Introduction of Invasive Species into the Galapagos Islands*. San Francisco: WildAid, Inc.
- Brewington, L.** (2011). The role of agriculture in Galapagos Island conservation. *Grassroots Development*, 32: 52–56.
- Walsh, S.J., McCleary, A.L., Heumann, B.W., **Brewington, L.**, Raczkowski, E.J., & Mena, C.F. (2010). Community expansion and infrastructure development: Implications for human health and environmental quality in the Galapagos Islands of Ecuador. *Journal of Latin American Geography*, 9(3): 137–159.
- Brewington, L.** & McCleary, A.L. (2009). From cultivation to crisis: Invasive guava on Isabela Island in the Galapagos Archipelago of Ecuador. In M. Wolff & M. Gardener (Eds), *Proceedings of the Galapagos Science Symposium 2009*. Puerto Ayora: Charles Darwin Foundation, pp. 139–142.

DATASETS

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- Brewington, L.**, Bremer, L.L., Rotzoll, K., & Elshall, A.S. (2020). *Data of effects of land cover and watershed protection futures on sustainable groundwater management in Hawai'i* (Version v1.0). Available from Zenodo: <http://doi.org/10.5281/zenodo.3930544>. Honolulu, HI: East-West Center, University of Hawai'i, US Geological Survey Pacific Islands Water Science Center.

Brewington, L. (2019). *Maui Future Land Cover Scenarios*. Vector Digital Data Set (Polygon; Version v1.1). Available from: https://www.pacificrisa.org/wp-content/uploads/2020/04/Maui_future_land_cover_scenarios_v1-1.zip. Honolulu, HI: East-West Center.

Brewington, L. (2015). *Maui Future Land Cover Scenarios*. Vector Digital Data Set (Polygon; Version v1.0). Available from: http://www.pacificrisa.org/wp-content/uploads/2015/10/Maui_future_land_cover_scenarios.zip. Honolulu, HI: East-West Center.

SERVICE & MEMBERSHIP

Association of American Geographers (AAG)
American Association for the Advancement of Science (AAAS)
Pacific Invasives Partnership (PIP)
Population Association of America (PAA)
American Statistical Association (ASA)
East-West Center Institutional Review Board (IRB)

FIELD RESEARCH METHODS

Qualitative/quantitative: Interviews, participant observation, surveys
Spatial: GPS data collection, correction, calibration, vegetation transects, monitoring plots, field sampling

COMPUTING

General software: Microsoft Office, Adobe
Analytical software: SAS, STATA, Matlab, Atlas.ti
Database: Microsoft Access
Remote Sensing and GIS software: ERDAS Imagine, ArcGIS, ENVI, Quantum GIS

LANGUAGES

English: Native
Spanish: Fluent (reading, writing, and conversation)
French: Basic (reading, writing, and conversation)
Samoan: Basic (reading, writing, and conversation)