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Personal Information

Birthplace: Waltham, Massachusetts, USA
Family status: Married, two children

Education

B.S. (cum laude) 1974, University of Miami, Florida, Major: Physical Geography; Minor: Mathematics
M.A. 1977, University of Miami, Geography, Major: Climatology
Ph.D. 1983, University of Hawai'i at Manoa, Geography, Major: Climatology

Thesis & Dissertation

M.A. Thesis: "Spatial Analysis of Temporal Precipitation Variation in West Africa" Advisor: Harm J. deBlij, University of Miami, 1977.
Ph.D. Dissertation: "Water Balance of the Pearl Harbor--Honolulu Basin, 1946-1975" Advisor: Jen-hu Chang, University of Hawai'i at Manoa, 1983.

Positions

Professor, Department of Geography, University of Hawai'i at Manoa, July 1996-present; Associate Professor, 1990-1996; Assistant Professor, 1986-1990.
Visiting Researcher, Multiple Cropping Centre, Chiang Mai University, Thailand, December 1992-May 1993.
Consulting Climatologist, Centro de Pesquisa Agroflorestal da Amazonia Oriental, Empresa Brasileira de pesquisa Agropecuaria, Belem, Brazil, September-November 1992.
Assistant Researcher, Water Resources Research Center, University of Hawai'i at Manoa, June 1983-August 1986.
Postdoctoral Researcher, Department of Meteorology, University of Hawai'i at Manoa, 1984-1985.
Climatologist and Computer Programmer, Pacific Weather Inc., Honolulu, Hawai'i, 1981-1984.
Administrative Assistant, Department of Geography, University of Hawai'i at Manoa, 1981.

UH Affiliations

Cooperating Graduate Faculty, Department of Natural Resources and Environmental Management Faculty, Water Resources Research Center

Editorial Board Service

Land Use and Water Resources Research, 2000-present
Basic and Applied Ecology, 2000-present

Courses and Seminars Taught

Implications of Global Change, Climate Change, Water in the Environment, Introduction to Climatology, Agricultural Climatology, Physical Geography, Physical Geography Laboratory, Graduate Seminar in Climatology, Graduate Seminar in Biogeography

Honors

College Distinguished Research Award, 2005-2006
College Excellence in Research Award, University of Hawai'i, 2001-2002
Presidential Citation for Meritorious Teaching, University of Hawai'i, May 1990.

Administrative Service

University of Hawai'i Office of Research Services Advisory Council: member 2006-07.
University of Hawai'i Faculty Housing Committee: member 2005
University Research Council: member 2005
University of Hawai'i Tenure and Promotion Review Committee: chair 2001-02
University of Hawai'i Council on Program Reviews: subcommittee member 2000-01
University of Hawai'i Honors and Awards Committee: member 1990-91
University of Hawai'i Association of Research Investigators: Executive Committee member, 2003
College of Social Sciences Curriculum Committee: member 1990-92; chair 1991-92
College of Social Sciences/Social Science Research Institute Research Council: member 1999-2003, 2005-08
College of Arts and Sciences Global Change Curriculum Committee: member 1990-92
Department Graduate Chair: 2007-08
Departmental Personnel Committee (elected): member 1988-92, 1993-95, 1997-99, 2000-06, 2007-08; chair or co-chair 1998-99, 2001-02, 2003-04
Departmental Graduate Program Committee: student member 1978-81; member 1986-91, 1993-96 and 2004-05; chair 1993-94 and 1995-96
Departmental Graduate Program/Admissions Committee: member 2000-2001
Departmental Curriculum Committee: member 1987-88, 1991-92, 1995-96, and 2005-06
Departmental Library and Publications member 1987-88
Departmental Equipment, Budget, and Space Committee: member 1986-87
Departmental Student--Faculty Programs Committee: member 1986-87
Departmental Administrative Assistant: 1981
Seminar Series Coordinator, Water Resources Research Center: 1986

Languages

English (native speaker)
Thai (conversational)
Spanish (reading ability)

BIBLIOGRAPHY

[Bracketed items below are hyperlinks which may be accessed from
<http://webdata.soc.hawaii.edu/climate/Vita/Vita.html>]

Refereed Articles and Contributions to Books

- Giambelluca, T.W., DeLay, J.K., Nullet, M.A., Scholl, M.A., and Gingerich, S.B. Accepted. Interpreting canopy water balance and fog screen observations: Separating cloud water from wind-blown rainfall at two contrasting forest sites in Hawai'i. In J.O. Juvik, L.A. Bruijnzeel, F.N. Scatena, and P. Bubb (eds.) *Mountains in the Mist: Science for Conserving and Managing Tropical Montane Cloud Forests*.
- DeLay, J.K., and Giambelluca, T.W. Accepted. History of cloud water interception research in Hawai'i. In J.O. Juvik, L.A. Bruijnzeel, F.N. Scatena, and P. Bubb (eds.) *Mountains in the Mist: Science for Conserving and Managing Tropical Montane Cloud Forests*.
- Ziegler, A.D., Giambelluca, T.W., Nullet, M.A., Sutherland, R.A., Tantasarin, C., Vogler, J.B., and Negishi, J.N. 2009. Throughfall in an evergreen-dominated forest stand in northern Thailand: Comparison of mobile and stationary methods. *Agricultural and Forest Meteorology* 149: 373-384, doi:10.1016/j.agrformet.2008.09.002.
- Giambelluca, T.W., Martin, R.E., Asner, G.P., Huang, M., Mudd, R.G., Nullet, M.A., DeLay, J.K., and Foote, D. 2009. Evapotranspiration and energy balance of native wet montane cloud forest in Hawai'i. *Agricultural and Forest Meteorology* 149: 230-243, doi:10.1016/j.agrformet.2008.08.004.
- Arcand, N., Kagawa, A.K., Sack, L., and Giambelluca, T.W. 2008. Scaling of frond form in Hawaiian tree fern *Cibotium glaucum*: Compliance with global trends and application for field estimation. *Biotropica* 40: 686-691, doi:10.1111/j.1744-7429.2008.00434.x.
- Giambelluca, T.W., Diaz, H.F., and Luke, M.S.A. 2008. Secular temperature changes in Hawai'i. *Geophysical Research Letters* 35, L12702, doi:10.1029/2008GL034377.
- Cuo, L., Giambelluca, T.W., Ziegler, A.D., and Nullet, M.A. 2008. The roles of roads and agricultural land use in altering hydrological processes in Nam Mae Rim Watershed, northern Thailand. *Hydrological Processes*, doi:10.1002/hyp.7039.
- Guardiola-Claramonte, M., Troch, P., Ziegler, A.D., Giambelluca, T.W., Vogler, J.B., and Nullet, M.A. 2008. Local hydrological effects of introducing non-native vegetation in a tropical catchment. *Ecohydrology* 1: 13-22, doi:10.1002/eco.3.
- Bucci, S.J., Scholz, F.G., Goldstein, G., Hoffmann, W.A., Meinzer, F.C., Franco, A.C., Giambelluca, T.W., and Miralles-Wilhelm, F. 2008. Controls on stand transpiration and soil water utilization along a tree density gradient in a neotropical savanna. *Agricultural and Forest Meteorology* 148: 839-849, doi:10.1016/j.agrformet.2007.11.013.
- Scholl, M.A., Giambelluca, T.W., Gingerich, S.B., Nullet, M.A., and Loope, L.L. 2007. Cloud water in windward and leeward mountain forests: The stable isotope signature of orographic cloud water. *Water Resources Research* 43, W12411, doi:10.1029/2007WR006011.
- Ziegler, A.D., Giambelluca, T.W., Sutherland, R.A., Nullet, M.A., and Vien, T.D. 2007. Soil translocation by weeding on steep-sloped swidden fields in northern Vietnam. *Soil and Tillage Research* 96: 219-233, doi:10.1016/j.still.2007.06.009.
- Ebel, B.A., Loague, K., Dietrich, W.E., Montgomery, D.R., Torres, R., Anderson, S.P., and Giambelluca, T.W. 2007. Near-surface hydrologic response for a steep, unchanneled catchment near Coos Bay, Oregon: 1. Sprinkling Experiments. *American Journal of Science* 307: 678-708.
- Ziegler, A.D., Giambelluca, T.W., Plondke, D., Leisz, S., Tran, L.T., Fox, J., Nullet, M.A., Vogler, J.B.,

- Truong, D.M., and Vien, T.D. 2007. Hydrological consequences of landscape fragmentation in mountainous northern Vietnam: Buffering of Hortonian overland flow. *Journal of Hydrology* 337: 52-67.
- Cao, G., Giambelluca, T.W., Stevens, D., and Schroeder, T. 2007. Inversion variability in the Hawaiian trade wind regime. *Journal of Climate* 20: 1145-1160.
- Cuo, L., Giambelluca, T.W., Ziegler, A.D., Nullet, M.A. 2006. Use of the distributed hydrology soil vegetation model to study road effects on hydrological processes in Pang Khum Experimental Watershed, northern Thailand. *Forest Ecology and Management* 224: 81-94.
- Ziegler, A.D., Tran, L.T., Giambelluca, T.W., Sidle, R.C., Sutherland, R.A., Nullet, M.A., Vien, T.D. 2006. Effective slope lengths for buffering hillslope surface runoff in fragmented landscapes in northern Vietnam. *Forest Ecology and Management* 224: 104-118.
- Ziegler, A.D., Negishi, J., Sidle, R.C., Preechapanaya, P., Sutherland, R.A., Giambelluca, T.W., Jaiaree, S. 2006. Reduction of stream sediment concentration by a riparian buffer: filtering of road runoff in disturbed headwater basins of montane mainland southeast Asia. *Journal of Environmental Quality* 35: 151-162.
- Giambelluca, T.W. 2005. Land use and water resources under a changing climate. Chapter 189 in M.G. Anderson and J.J. McDonnell (eds.), *Encyclopedia of Hydrological Sciences, Volume 5*. John Wiley and Sons, Chichester, U.K.
- Giambelluca, T.W. 2005. Trade winds and the trade wind inversion. In J.E. Oliver (ed.), *Encyclopedia of World Climatology*, Springer, New York, pp. 731-732.
- Ziegler, A.D., Giambelluca, T.W., Sutherland, R.A., Nullet, M.A., Yarnasarn, S., Pinthong, J., and Jaiaree, S. 2004. Toward understanding the cumulative impacts of roads in agricultural watersheds of northern Thailand. *Agriculture, Ecosystems, and Environment* 104: 145-158. [\[Abstract\]](#)
- Ziegler, A.D., Giambelluca, T.W., Tran, L.T., Vana, T.T., Nullet, M.A., Fox, J., Vien, T.D., Pinthong, J., Maxwell, J.F., and Evett, S. 2004. Hydrological consequences of landscape fragmentation in mountainous Northern Vietnam: evidence of accelerated overland flow generation. *Journal of Hydrology* 287: 124-146. [\[Abstract\]](#)
- Giambelluca, T.W., Ziegler, A.D., Nullet, M.A., Dao, T.M., and Tran, L.T. 2003. Transpiration in a small tropical forest patch. *Agricultural and Forest Meteorology* 117: 1-22. [\[Abstract\]](#)
- Giambelluca, T.W. 2002. Hydrology of altered tropical forest. *Hydrological Processes* 16: 1665-1669.
- Ziegler, A.D., Giambelluca, T.W., Sutherland, R.A. 2002. Improved method for modelling sediment transport on unpaved roads using KINEROS2 and dynamic erodibility. *Hydrological Processes* 16: 3079-3089.
- Ziegler, A.D., Giambelluca, T.W. Sutherland, R.A. 2001. Erosion prediction on unpaved mountain roads in northern Thailand: validation of dynamic erodibility modelling using KINEROS2. *Hydrological Processes* 15: 337-358. [\[Abstract\]](#)
- Ziegler, A.D., Giambelluca, T.W. Sutherland, R.A. Vana, T.T. and Nullet, M.A. 2001. Horton overland flow contribution to runoff on unpaved mountain roads: A case study in northern Thailand. *Hydrological Processes* 15: 3203-3208. [\[Abstract\]](#)
- Ziegler, A.D., Sutherland, R.A., Giambelluca, T.W. 2001. Interstorm surface preparation and sediment detachment by vehicle traffic on unpaved mountain roads. *Earth Surface Processes Landforms* 26: 235-250 (invited). [\[Abstract\]](#)
- Ziegler, A.D., Sutherland, R.A., Giambelluca, T.W. 2001. Acceleration of Horton overland flow and erosion in an upland agricultural watershed in northern Thailand. *Geomorphology* 41: 249-262. [\[Abstract\]](#)
- Melcher, P.J., Cordell, S., Jones, T., Scowcroft, P.G., Niemczura, W., Giambelluca, T.W., and Goldstein, G. 2000. Supercooling capacity increases from sea level to tree line in the Hawaiian tree species *Metrosideros polymorpha*. *International Journal of Plant Science* 161: 369-379. [\[Abstract\]](#)
- Giambelluca, T.W., Nullet, M., Ziegler, A.D., and Tran, L. 2000. Latent and sensible energy flux over

- deforested land surfaces in the eastern Amazon and northern Thailand. *Singapore Journal of Tropical Geography* 21: 107-130. [\[Abstract\]](#).
- Ziegler, A.D., Sutherland, R.A., Giambelluca, T.W. 2000. Partitioning total erosion on unpaved roads into splash and hydraulic components: influence of surface preparation and dynamic erodibility. *Water Resources Research* 36: 2187-2791. [\[Abstract\]](#)
- Ziegler, A.D., Warren, S.D., Perry, J.L., and Giambelluca, T.W. 2000. Reassessment of revegetation strategies for Kaho`olawe Island, Hawai`i. *Journal of Range Management* 53: 106-112.
- Ziegler, A.D., Sutherland, R.A., and Giambelluca, T.W. 2000. Runoff generation and sediment production on unpaved roads, footpaths, and agricultural land surfaces in northern Thailand. *Earth Surface Processes and Landforms* 25: 519-534. [\[Abstract\]](#)
- Ziegler, A.D., Chun-Smith, A.A., Perry, J.L., Egan, J.R., Garcia, S.K.N., and Giambelluca, T.W. 2000. Assessment of the Native Hawaiian Plant Society Restoration Projects, Kaho`olawe, Island, Hawai`i. *Ecological Restoration* 18: 26-33.
- Giambelluca, T.W., Fox, J., Yarnasarn, S., Onibutr, P., and Nullet, M.A. 1999. Dry-season radiation balance of land covers replacing forest in northern Thailand. *Agricultural and Forest Meteorology* 95: 53-65. [\[Abstract\]](#)
- Woodcock, D.W., Perry, J.L., and Giambelluca, T.W. 1999. Occurrence of indigenous species in a middle-elevation Melaleuca plantation on O`ahu (Hawaiian Islands). *Pacific Science* 53: 159-167.
- Giambelluca, T.W., and Schroeder, T.A. 1998. Climate. In S.P. Juvik, J.O. Juvik, and T.R. Paradise (eds.), *Atlas of Hawai`i*. University of Hawai`i Press. [\[Book information\]](#)
- Loope, L.L. and Giambelluca, T.W. 1998. Vulnerability of island tropical montane cloud forests to climate change, with special reference to East Maui, Hawaii. *Climatic Change* 39: 503-517.
- Ziegler, A.D., and Giambelluca, T.W. 1998. Influence of revegetation efforts on hydrologic response and erosion, Kaho`olawe Island, Hawai`i. *Journal of Land Degradation and Development* 9: 189-206.
- Ziegler, A.D., and Giambelluca, T.W. 1997. Importance of rural roads as sources areas for runoff in mountainous areas of northern Thailand. *Journal of Hydrology* 196: 204-229. [\[Abstract\]](#)
- Giambelluca, T.W., Holscher, D., Bastos, T.X., Frazão, R.R., Nullet, M.A., and Ziegler, A.D. 1997. Observations of albedo and radiation balance over post-forest land surfaces in eastern Amazon Basin. *Journal of Climate* 10: 919-928. [\[Abstract\]](#).
- Giambelluca, T.W., Ridgley, M.A., and Nullet, M.A. 1996. Water balance, climate change, and land-use planning in the Pearl Harbor Basin, Hawai`i. *International Journal of Water Resources Development* 12: 515-530. [\[Text\]](#)
- Giambelluca, T.W., Tran, L.T., Ziegler, A.D., Menard, T.P., and Nullet, M.A. 1996. Soil-vegetation-atmosphere processes: Simulation and field measurement for deforested sites in northern Thailand. *Journal of Geophysical Research (Atmospheres)* 101: 25,867-25,885. [\[Text\]](#)
- Goldstein, G., Drake, D.R., Melcher, P., Giambelluca, T.W., and Heraux, J. 1996. Photosynthetic gas exchange and temperature-induced damage in seedlings of the tropical alpine species *Argyroxiphium sandwicense*. *Oecologia* 106: 298-307.
- Loague, K., Bernknopf, R.L., Green, R.E., and Giambelluca, T.W. 1996. Uncertainty of groundwater vulnerability assessments for agricultural regions in Hawaii: Review. *Journal of Environmental Quality* 25: 475-490. [\[Text\]](#)
- Giambelluca, T.W., Loague, K., Green, R.E., and Nullet, M.A. 1996. Uncertainty in recharge estimation: Impacts on groundwater vulnerability assessments for the Pearl Harbor Basin, O`ahu, Hawai`i. *Journal of Contaminant Hydrology* 23: 85-112.
- Giambelluca, T.W. 1996. Tropical land cover change: Characterizing the post-forest land surface. In T.W. Giambelluca and A. Henderson-Sellers (eds.), *Climate Change: Developing Southern Hemisphere Perspectives*. John Wiley and Sons, UK, pp. 293-318. [\[Book information\]](#)
- Loague, K., Lloyd, D., Giambelluca, T.W., Nguyen, A., and Sakata, B. 1996. Land misuse and hydrologic response: Kaho`olawe, Hawai`i. *Pacific Science* 50: 1-35.

- Loague, K., Miyahira, R.N., Green, R.E., Oki, D.S., Giambelluca, T.W., and Schneider, R.C. 1995. Chemical leaching near the Waiawa Shaft, Oahu, Hawaii: 2. Modeling results. *Ground Water* 33: 124-138.
- Loague, K., Miyahira, R.N., Oki, D.S., Green, R.E., Schneider, R.C., and Giambelluca, T.W. 1994. Chemical leaching near the Waiawa Shaft, Oahu, Hawaii: 1. Field experiments and laboratory analysis. *Ground Water* 32: 986-996.
- Melcher, P.J., Goldstein, G., Meinzer, F.C., Minyard, B., Giambelluca, T.W., and Loope, L. 1994. Determinants of thermal balance in the Hawaiian giant rosette plant, *Argyroxiphium sandwicense*. *Oecologia* 98: 412- 418.
- Giambelluca, T., and Sanderson, M. 1993. The water balance and climatic classification. Chapter 4, M. Sanderson, ed., *Prevailing Trade Winds, Weather and Climate in Hawai'i*, University of Hawai'i Press, Honolulu, x+126 pp.
- Giambelluca, T. 1993. Climate and groundwater. Chapter 5, Part IV., M. Sanderson, ed., *Prevailing Trade Winds, Weather and Climate in Hawai'i*, University of Hawai'i Press, Honolulu, x+126 pp.
- Giambelluca, T.W., McKenna, D., and Ekern, P.C. 1992. An automated recording atmometer: 1. Calibration and testing. *Agricultural and Forest Meteorology* 62: 109-125.
- Giambelluca, T.W., and Nullet, D. 1992. An Automated recording atmometer: 2. Evaporation measurement on a high elevation transect in Hawaii. *Agricultural and Forest Meteorology* 62: 127-138.
- Giambelluca, T.W., and Nullet, D. 1992. Evaporation at high elevations in Hawaii. *Journal of Hydrology* 136:219-235.
- Ridgley, M.A., and Giambelluca, T.W. 1992. Linking water balance simulation and multiobjective programming: land-use plan design in Hawaii. *Environment and Planning B* 19: 317-336.
- Nullet, D., and Giambelluca, T.W. 1992. Radiation climatology through the trade-wind inversion on the lee slope of Haleakala, Maui, Hawaii. *Physical Geography* 13: 66-80.
- Giambelluca, T.W., and Nullet, D. 1991. Influence of the trade-wind inversion on the climate of a leeward mountain slope in Hawaii. *Climate Research* 1: 207-216.
- Ridgley, M.A., and Giambelluca, T.W. 1991. Drought, groundwater management and land use planning: the case of central Oahu, Hawaii. *Applied Geography* 11: 289-307.
- Nullet, D., and Giambelluca, T.W. 1990. Winter evaporation on a mountain slope, Hawaii. *Journal of Hydrology* 112: 257-265.
- Loague, K.M., Green, R.E., Giambelluca, T.W., Liang, T.C., and Yost, R.S. 1990. Impact of uncertainty in soil, climatic, and chemical information in a pesticide leaching assessment. *Journal of Contaminant Hydrology* 5: 171-194.
- Loague, K.M., Giambelluca, T.W., Green, R.E., Liu, C.C.K., Liang, T.C., and Oki, D.S. 1989. Simulation of organic chemical movement in Hawaii soils with PRZM: 2. Predicting deep penetration of DBCP, EDB, and TCP. *Pacific Science* 43: 362-383.
- Oki, D.S., and Giambelluca, T.W. 1989. Groundwater contamination by nematicides: Influence of recharge timing under pineapple crop. *Water Resources Bulletin* 25: 285-294.
- Giambelluca, T.W., Nullet, D., and Nullet, M.A. 1988. Agricultural drought on south-central Pacific islands. *Professional Geographer* 40: 404-415.
- Nullet, D., and Giambelluca, T.W. 1988. Risk analysis of seasonal agricultural drought on low Pacific islands." *Agricultural and Forest Meteorology* 42: 229-239.
- Oki, D.S., and Giambelluca, T.W. 1987. DBCP, EDB, and TCP contamination of groundwater in Hawaii. *Ground Water* 25: 693-702.
- Giambelluca, T.W., and Oki, D.S. 1987. Temporal disaggregation of monthly rainfall data for water balance modeling. In S.I. Solomon, M. Beran, and W. Hogg (eds.), *The Influence of Climate Changes and Climatic Variability on Hydrological Regime and Water Resources*. IAHS Press, UK, 255-267.
- Giambelluca, T.W. 1986. Land use effects on the water balance of a tropical island. *National Geographic*

Papers In Review

- Asner, G.P., Huang, M., Giambelluca, T.W., Martin, R.E., Nullet, M., Mudd, R., and DeLay, J. In review. Climate and carbon in montane native Hawaiian Rainforests. Submitted to *Geophysical Research Letters*.
- Giambelluca, T.W., Scholz, F.G., Bucci, S.J., Meinzer, F.C., Goldstein, G., Hoffmann, W.A., Franco, A.C., and Buchert, M.P. In review. Evapotranspiration and energy balance of Brazilian savannas with contrasting tree density. Submitted to *Agricultural and Forest Meteorology*.

Book

- Giambelluca, T.W., and Henderson-Sellers, A. (eds.) 1996. *Climate Change: Developing Southern Hemisphere Perspectives*. John Wiley and Sons, UK. xii+475 pp. [\[Book information\]](#)

Non-Refereed Articles

- Giambelluca, T.W., and Luke, M.S.A. 2007. Climate change in Hawai'i's mountains. *Mountain Views* 1(2): 13-18.
- Ziegler, A.D., T.W. Giambelluca. 2004. First-order analysis of overland flow buffering in an ungauged fragmented upland basin. Erosion Prediction of Ungauged Basins (PUBs): Integrating Methods and Techniques. Proceedings of the IUGG2003, the XXIII General Assembly of the International Union of Geodesy and Geophysics, Sapporo, Japan, June 30 to July 11, 2003. IAHS publ. no. 279.
- Ziegler, A.D., Giambelluca, T.W., Sutherland, R.A., Nullet, M., Pinthong, J., Yarnasarn, S., Vana, T., and Jaiarree, S. 2003. Hydrological and erosional impacts of road and land-cover change in small mountainous watershed in northern Thailand. *Journal of Agriculture* (Thailand) 19: 1-11. (In Thai with English abstract)
- Fox, J., Rambo, T., Donovan, D., Le T.C., Giambelluca, T., Ziegler, A., Plondke, D., Tran D.V., Leisz, S., and Dao, M.T.. 2003. Linking household and remotely sensed data for understanding forest fragmentation in northern Vietnam. In J. Fox, R.R. Rindfuss, S.J. Walsh, and V. Mishra (eds.), *People and the Environment: Approaches for Linking Household and Community Surveys to Remote Sensing and GIS*, Kluwer Academic Publishers: Norwell, MA, pp. 201-221.
- Ziegler, A.D., Giambelluca, T.W., and Sutherland, R.A. 2002. Estimation of basin sediment flux in the Pang Khum Experimental Watershed in northern Thailand: the contributions of roads and agricultural lands. Case study 28. Land-Water Linkages in Rural Watersheds. 18 September - 28 October 2000. Land and Water Development Division, Food and Agricultural Organization of the United Nations.
- Ziegler, A.D., Sutherland, R.A., Giambelluca, T.W. 1999. Rainfall simulation experiments to investigate runoff generation and sediment transport on various landuse types in northern Thailand. *Geographical Journal, Geographical Association of Thailand* 24 (2): 1-34.
- Nakao, P., Perry, L.J., Chun-Smith, A.A., Giambelluca, T.W., and Ziegler, A.D. 1998. Status of *Erythrina sandwicensis* in the NifTAL experiment site, Kaho'olawe, Hawai'i: A reassessment. *Newsletter of the Hawaiian Botanical Society* 36:57,59-63.
- Ziegler, A.D., and Giambelluca, T.W. 1997. Simulation of runoff and erosion on mountainous roads in northern Thailand: a first look. Human Impact on Erosion and Sedimentation, Proceedings of Rabat Symposium S6, April 1997, IAHS Publication no. 245, pp. 21-29.
- Ziegler, A.D., and Giambelluca, T.W. 1997. Hydrologic change and accelerated erosion in northern Thailand: Simulating the impacts of rural roads and agriculture. *Explorations in Southeast Asian*

Papers In Preparation

- Giambelluca, T.W., and Cuo, L. In preparation. A digital climate map system for Hawai'i.
- Giambelluca, T.W., Scholz, F.G., Bucci, S.J., Hoffmann, W.A., Meinzer, F.C., Goldstein, G., and Buchert, M.P. In preparation. Evapotranspiration and energy balance of Brazilian savannas with contrasting tree density.
- Mudd, R.G., Giambelluca, T.W., and DeLay, J.K. In preparation. Water storage and evaporation by epiphytes in native and invaded tropical montane cloud forests in Hawai'i.
- Giambelluca, T.W., DeLay, J.K., Nullet, M.A., Scholl, M.A., and Gingerich, S.B. In preparation. Cloud water interception at two tropical montane cloud forest sites in Hawai'i.
- Giambelluca, T.W., Nullet, M.A., Loope, L.L., Ong, L. In preparation. The climate of Haleakala, Maui, Hawai'i.
- Giambelluca, T.W., Ziegler, A.D., Nullet, M.A., and Vana, T.T. In preparation. Observations of energy and water fluxes in Pang Khum Experimental Watershed, Chiang Mai, Thailand.
- Larkin, E., Giambelluca, T.W., Ziegler, A.D., Sutherland, R.A., Nullet, M.A. In preparation. Radiation balance of forested and cultivated land in northern Thailand.
- Giambelluca, T.W., Chun-Smith, A., Garcia, S., Egan, J., Higashino, P., and Ziegler, A.D. In preparation. Effectiveness of planted *Tamarix aphylla* tree lines as shelter belts on Kaho'olawe Island, Hawai'i.

Conference and Workshop Papers

- Giambelluca, T.W., DeLay, J.K., Asner, G.P., Martin, R.E., Nullet, M., Huang, M., Mudd, R.G., and Takahashi, M. 2008. Stand structural controls on evapotranspiration in native and invaded tropical montane cloud forest in Hawai'i. American Geophysical Union Fall Meeting, San Francisco, December, 2008.
- Huang, M., Asner, G.P., and Giambelluca, T.W. 2008. Carbon dynamics of montane native Hawaiian rainforests under climate change. American Geophysical Union Fall Meeting, San Francisco, December, 2008. Presented by Maoyi Huang.
- Giambelluca, T.W. 2008. Hydrological change in montane mainland SE Asia: Influences of new directions in land cover change. Keynote address at the Asia Forest Workshop, Phnom Penh, Cambodia, November, 2008. (Invited)
- Giambelluca, T.W. 2008. Global change threats to hydrology and terrestrial ecosystems: Impacts of global warming and species invasion in Hawai'i. NSF EPSCoR Workshop on Water Dynamics, Burlington, Vermont, November 2008. (Invited)
- Giambelluca, T.W. 2008. Recent historical temperature and trade-wind inversion variations in Hawai'i. Forum on Climate Change in Hawai'i, Hawai'i Conservation Alliance, Honolulu, March, 2008.
- Giambelluca, T.W., Asner, G.P., Martin, R.E., Nullet, M., Huang, M., DeLay, J.K., Mudd, R.G., and Takahashi, M. 2007. Impacts of alien tree invasion on evapotranspiration in tropical montane cloud forest in Hawai'i. American Geophysical Union Fall Meeting, San Francisco, December, 2007.
- Guardiola-Claramonte, M., Fox, J., Giambelluca, T.W., Sen, O., Troch, P., Vogler, J., and Ziegler, A.D. 2007. Changing land use, Thailand to China: Where the rubber meets the road. International Conference on Sustainability Science for Watershed Landscapes, East-West Center, Honolulu, November 2007. Presented by Maite Guardiola-Claramonte. (Invited)
- Giambelluca, T.W. 2007. Atmospheric water. Symposium on The State of Hydrological Science in Hawai'i. Water Resources Research Center, University of Hawai'i at Mānoa, Honolulu, August, 2007. (Invited)

- Giambelluca, T.W., Asner, G.P., Martin, R.E., Nullet, M., Huang, M., DeLay, J.K., Mudd, R.G., and Takahashi, M. 2007. Hydrology of native and invaded tropical montane cloud forest in Hawai'i. XXIV General Assembly of the International Union of Geodesy and Geophysics (IUGG), Perugia, Italy, July, 2007.
- Giambelluca, T.W., Asner, G.P., Martin, R.E., DeLay, J.K., Mudd, R.G., Nullet, M., and Takahashi, M. 2006. Microclimate and hydrology of native cloud forest in Hawai'i Volcanoes National Park. American Geophysical Union Fall Meeting, San Francisco, December, 2006.
- Mudd, R.G. and Giambelluca, T.W. 2006. Epiphyte water retention and evaporation in native and invaded tropical montane cloud forests in Hawai'i. American Geophysical Union Fall Meeting, San Francisco, December, 2006. Presented by Ryan Mudd.
- Benner, S.G., Ziegler, A.D., Tantasirin, C., Lu, X., and Giambelluca, T. 2006. Quantifying stream flux of carbon, nitrogen, and phosphorus, in a tropical watershed, Mae Sa, Thailand. American Geophysical Union Fall Meeting, San Francisco, December, 2006. Presented by S.G. Benner.
- DeLay, J.K., Giambelluca, T.W., and Juvik, J.O. 2006. Canopy water balance of an elfin cloud forest at Alakahi, Hawaii. American Geophysical Union Fall Meeting, San Francisco, December, 2006. Presented by John DeLay.
- Scholl, M.A., Giambelluca, T.W., Gingerich, S.B., and Shanley, J.B. 2006. Use of stable isotope ratios to estimate the cloud-water component of the water balance in localities with orographic clouds. American Geophysical Union Fall Meeting, San Francisco, December, 2006. Presented by Martha Scholl.
- Giambelluca, T.W., Ziegler, A.D., Larkin, E., Cuo, L., Nullet, M.A. 2006. Radiation and water balances in a tropical catchment undergoing land-cover conversion in northern Thailand. Third Asia Pacific Association of Hydrology and Water Resources Conference, Bangkok, October, 2006.
- Ziegler, A.D., Giambelluca, T.W., Nullet, M.A., and Tantasirin, C. 2006. Throughfall in disturbed tropical forest in northern Thailand. Third Asia Pacific Association of Hydrology and Water Resources Conference, Bangkok, October, 2006.
- Giambelluca, T. 2006. Progress in tropical montane cloud forest hydrology research in Hawai'i: 2006. Hawai'i Ecosystems Project Meeting, Hawai'i Volcanoes National Park, Hawai'i, July, 2006.
- Giambelluca, T., Ziegler, A., Nullet, M., and Guardiola-Claramonte, M. 2006. Field hydrology. Honolulu meeting of the project, "The Role of Land-Cover Change in Montane Mainland SE Asia in Altering Regional Hydrological Processes Under a Changing Climate," Honolulu, June 2006.
- Giambelluca, T. 2005. Tropical montane cloud forest hydrology research in Hawai'i. Hawai'i Ecosystems Project Meeting, Kea'au, Hawai'i, July, 2005.
- Giambelluca, T., Fox, J., Nijssen, B., Sen, Omer, Ziegler, A., Nullet, M., Vogler, J., Guardiola-Claramonte, M., and Wang, Y. 2005. The role of land-cover change in montane mainland SE Asia in altering regional hydrological processes under a changing climate. NASA Land Cover-Land Use Meeting, College Park, MD, January 2005.
- Giambelluca, T., DeLay, J., Nullet, M., Scholl, M., and Gingerich, S. 2004. Cloud water interception at two tropical montane cloud forest sites in Hawai'i. American Geophysical Union Fall Meeting, San Francisco, December, 2004.
- Giambelluca, T., DeLay, J., Nullet, M., Scholl, M., and Gingerich, S. 2004. Cloud water interception in Hawai'i. Mountains in the Mist: Science for Conserving and Managing Tropical Montane Cloud Forests, Waimea, Hawai'i, August 2004. (Invited)
- Giambelluca, T., Ziegler, A., Nullet, M., and Guardiola-Claramonte, M. 2004. Field hydrology. Mae Sa meeting of the project, "The Role of Land-Cover Change in Montane Mainland SE Asia in Altering Regional Hydrological Processes Under a Changing Climate," Chiang Mai, Thailand, July 2004.
- Cuo, L., Giambelluca, T.W., Ziegler, A.D., and Nullet, M.A. 2003. Using Distributed-Hydrology-Soil-Vegetation Model to study road effects on stream flow and soil moisture. American Geophysical Union Fall Meeting, San Francisco, December, 2003. *Eos Trans. AGU*, 84(46), Fall Meet. Suppl.,

- Abstract H51A-07. Presented by Lan Cuo.
- Ziegler, A.D., Giambelluca, T.W., Sutherland, R.A., and Nullet, M.A. 2003. Bedload transport in a tropical headwater catchment. American Geophysical Union Fall Meeting, San Francisco, December, 2003. *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract H51F-06. Presented by Alan Ziegler.
- Scholl, M.A., Gingerich, S.B., Giambelluca, T.W., Nullet, M.A., and Loope, L.L. 2003. Quantifying the Role of Cloud Water in the Hydrology of Two Montane Forest Sites on East Maui, Hawai'i. American Geophysical Union Fall Meeting, San Francisco, December, 2003. *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract H32E-04. Presented by Martha Scholl.
- Giambelluca, T.W. 2003. Developing a listening post in the tropical Pacific: sensitivity of Hawaiian high-elevation and aquatic ecosystems to global change, climatological aspects. Biological Resources Discipline, U.S. Geological Survey, Global Change Program Meeting, Phoenix, March 2003.
- Giambelluca, T.W. 2003. Changing land, changing water: How land-cover change affects hydrological processes in rural tropical watersheds. Rural Livelihoods and Biological Resources Workshop, Cornell University, April 2003. (Invited)
- Giambelluca, T.W. 2003. How well do we know our most important water source? Uncertainties in the water balance of Hawaiian forests. Conference on Scientific, Regulatory and Cultural Factors Influencing Water and Environmental Issues in Tropical Pacific Islands, Honolulu, January 2003. (Invited)
- Giambelluca, T.W. 2002. Hydrologic cycle of altered tropical forest: How water movement is affected by secondary succession and landscape fragmentation. The 1st RIHN Forum, Kyoto, Japan, May 2002. (Invited)
- Scholl, M.A., Gingerich, S.B., Giambelluca, T.W., Nullet, M.A., and Loope, L.L. 2002. The role of fog in ecosystem hydrology: results of preliminary investigations using stable isotopes of water in Hawaiian cloud forests. American Geophysical Union Spring Meeting, Washington, D.C., May 2002. Presented by Martha Scholl.
- Giambelluca, T.W., Ziegler, A.D., Nullet, M.A., and Dao, T. 2001. Spatial Variation in Transpiration within a Small Forest Patch in Hoa Binh, Northern Vietnam. American Geophysical Union Fall Meeting, San Francisco, December, 2001.
- Cuo, L., Giambelluca, T.W., Ziegler, A.D., Sutherland, R.A., Nullet, M.A., Larkin, E.D., and Vana, T.T. 2001. Application of Distributed Hydrology-Soil-Vegetation Model in Pang Khum Experimental Watershed, Chiang Mai Province, Thailand. American Geophysical Union Fall Meeting, San Francisco, December, 2001. Presented by Lan Cuo.
- Restom, T., Giambelluca, T., and Goldstein, G. 2001. The effects of species composition on canopy interception in a reforested watershed. Ecological Society of America 86th Annual Meeting, Madison, Wisconsin, August 2001. Presented by Teresa Restom.
- Giambelluca, T.W., Ziegler, A.D., and Sutherland, R.A. 2001. Influence of Shifting Agriculture and Rural Roads on Watershed Processes in Pang Khum, Chiang Mai, Thailand. International Symposium on Watershed Management, Chiang Mai, Thailand, March, 2001. (Invited)
- Giambelluca, T.W., Ziegler, A.D., Nullet, M.A., and Cuo, L. 2001. Energy and Water Fluxes at Pang Khum Experimental Watershed, Chiang Mai Province, Thailand. GAME-Tropics Workshop, Phuket, Thailand, March 2001.
- Ziegler, A.D., Giambelluca, T.W., and Sutherland, R.A. 2001. An improved methodology for modeling sediment transport on unpaved mountain roads. Chapman Conference on State-of-the-Art Hillslope Hydrology, Sunriver, Oregon, October, 2001. Presented by Alan Ziegler.
- Ziegler, A.D., Pinthong, J., Giambelluca, T.W., Sutherland, R.A., Nullet, M.A. 2001. Understanding the influence of roads on runoff generation in an upland watershed in northern Thailand. Chapman Conference on Hillslope Hydrology (AGU), Bend Oregon, October, 2001. Presented by Alan Ziegler.
- Ziegler, A.D., T.W. Giambelluca, TT Vana, M.A. Nullet. 2001. Alteration of hydrological flowpaths by

- landcover fragmentation in the Da River basin, northern Vietnam. Chapman Conference on Hillslope Hydrology (AGU), Bend Oregon, Oct 8-12, 2001. Presented by Alan Ziegler.
- Torres, R., Dietrich, W.E., Montgomery, D.R., Anderson, S.P., Giambelluca, T.W., and Loague, K. 2001. Unsaturated-saturated zone interactions in a steep unchanneled valley. Chapman Conference on State-of-the-Art Hillslope Hydrology, Sunriver, Oregon, October, 2001. Presented by Ray Torres.
- Ziegler, A.D. and Giambelluca, T.W. 2001. Alteration of hydrological flow paths by fragmentation: Tat Hamlet, Da River Watershed, northern Vietnam. Symposium IV, Rio de Janeiro, September 2001. Presented by Alan Ziegler.
- Ziegler, A.D., Giambelluca, T.W., and Sutherland, R.A. 2001. Modeling road sediment transport with KINEROS2. 2001. Soil Erosion for the 21st Century - An International Symposium, Honolulu, January 3-5, 2001. Presented by Alan Ziegler.
- Ziegler, A.D., Giambelluca, T.W., and Sutherland, R.A. 2000. Toward understanding road-related erosional impacts in mountainous watersheds in northern Thailand: The importance of Horton overland flow in road runoff generation. American Geophysical Union Fall Meeting, San Francisco, 15-19 December, 2000. [\[poster\]](#) [\[draft\]](#).
- Giambelluca, T.W., Ziegler, A.D., Tran, L.T., Sutherland, R.A., and Nullet, M.A. 1999. How changing land-use is modifying hydrologic processes in mountainous areas of Southeast Asia, Environmental services and land use change: Bridging the gap between policy and research in Southeast Asia, Chiang Mai, Thailand, June 1999. (Invited).
- Ziegler, A.D., Sutherland, R.A., and Giambelluca, T.W. 1999. Field rainfall simulation experiments to investigate runoff generation and sediment transport on mountainous roads in northern Thailand, Environmental services and land use change: Bridging the gap between policy and research in Southeast Asia, Chiang Mai, Thailand, June 1999. (Invited).
- Giambelluca, T.W. 1999. Influences of landscape fragmentation on hydrological processes, Hoa Binh, Vietnam, 95th Annual Meeting of the Association of American Geographers, Honolulu, March 1999. [\[Abstract\]](#)
- Giambelluca, T.W. 1999. Modeling land-atmosphere interaction over tropical forests: lessons from the field, PILPS Strategy Forum, Honolulu, February 1999 (Invited).
- Ziegler, A.D., Sutherland, R.A., and Giambelluca, T.W. 1999. Surface preparation processes and sediment detachment by vehicular traffic on unpaved mountainous roads in northern Thailand (poster). American Geophysical Union Fall Meeting, San Francisco, 13-17 Dec 1999. Presented by A. Ziegler.
- Ziegler, A.D., Sutherland, R.A., and Giambelluca, T.W. 1999. Sediment production on an unpaved road in northern Thailand: Preliminary results of field rainfall simulation. 95th Annual Meeting of the Association of American Geographers, Honolulu, March 1999. Presented by Alan Ziegler. [\[Abstract\]](#)
- Menard, T.P., and Giambelluca, T.W. 1999. Effects of a dry period on *Metrosideros polymorpha* near the montane cloud forest treeline in Hawai'i. 95th Annual Meeting of the Association of American Geographers, Honolulu, March 1999. Presented by Trae Menard. [\[Abstract\]](#)
- Ziegler, A.D., Sutherland, R.A., and Giambelluca, T.W. 1999. Sediment production on unpaved road surfaces in northern Thailand: Preliminary results of field rainfall simulation. Presented at the 2nd International Conference on Land Degradation: Meeting the Challenges of Land Degradation in the 21st Century, Khon Kaen, Thailand, January 1999. Presented by Alan Ziegler.
- Menard, T.P., and Giambelluca, T.W. 1998. Water balance of a montane cloud forest treeline during a rainless period. Presented at the 1998 Hawai'i Conservation Conference, Honolulu, July 1998. Presented by Trae Menard. [\[Abstract\]](#)
- Giambelluca, T.W. 1998. Reality check: Observing processes at small scales, First SEA/BASINS Partner Workshop, Chiang Rai, Thailand, November 1998 (Invited).
- Giambelluca, T.W. 1998. Influence of forest fragmentation on watershed functions in northern Vietnam-Hydrological objective: Quantifying the influences of patch size on watershed hydrology, 1998

- Water and Watersheds Program Review, EPA/NSF Partnership for Environmental Research, Corvallis, Oregon, January 1998 (Invited).
- Giambelluca, T.W., and Ziegler, A.D. 1997. Influence of long-term land cover change on river flow in northern Thailand. In *Tropical Forestry in the 21st Century*, Vol. 6, Watershed Management for the Future., Proceedings of the FORTROP'96 International Conference, Nov. 1996, Kasetsart Univ., Bangkok, Thailand. pp. 1-20.
- Ziegler, A.D., and Giambelluca, T.W. 1997. A preliminary simulation of hydrologic change and accelerated erosion resulting from road expansion in mountainous northern Thailand. In *Tropical Forestry in the 21st Century*, Vol. 6, Watershed Management for the Future., Proceedings of the FORTROP'96 International Conference, Nov. 1996, Kasetsart Univ., Bangkok, Thailand. pp. 211-226.
- Ziegler, A.D. and Giambelluca, T.W. 1996. Runoff generation on mountainous roads in northern Thailand. 28th International Geographical Congress, The Hague, The Netherlands, August 1996. Presented by Alan Ziegler.
- Giambelluca, T.W., and Ziegler, A.D. 1996. Climatological and hydrological implications of land cover change in highland Southeast Asia. In *Proceedings of the Montane Mainland Southeast Asia in Transition Symposium*, Chiang Mai University, Thailand, 12-16 November 1995, pp. 181-205.
- Ziegler, A.D., and Giambelluca, T.W. 1996. Horton overland flow generation on rural roads: a preliminary investigation of runoff and accelerated soil erosion in northern Thailand. In *Proceedings of the Montane Mainland Southeast Asia in Transition Symposium*, Chiang Mai University, Thailand, 12-16 November 1995, pp. 206-232.
- Giambelluca, T.W. 1996. Radiative characteristics of post-forest land surfaces in eastern Amazon Basin, 28th International Geographical Congress, The Hague, The Netherlands, August 1996.
- Giambelluca, T.W. 1995. Climatic impacts of deforestation: Field measurements in Northern Thailand, 28th Pacific Science Congress, Beijing, China, June 1995.
- Loope, L.L. & T.W. Giambelluca (1995). "Vulnerability of island tropical cloud forests to climate change, with special reference to East Maui, Hawaii." World Wildlife Fund Workshop on Potential Impacts of Climate Change on Tropical Forest Ecosystems, San Juan, Puerto Rico, April 1995. (Invited Presentation)
- Loague, K., Bernknopf, R.L., Giambelluca, T.W., and Green, R.E. 1995. The impact of data uncertainty upon regional scale leaching assessments of non-point source pollutants. In *Applications of GIS to the Modeling of Non-Point Source Pollutants in the Vadose Zone*, ASA-CSSA-SSSA Bouyoucos Conference, Riverside, CA, 1-3 May 1995, pp. 494-535.
- Giambelluca, T.W., Ridgley, M., and Nullet, M. 1994. Land-use planning and water resources in Hawaii under climate change. In *Proceedings, International Symposium on Water Resources Planning in a Changing World*, International Hydrological Programme of UNESCO, Bundesanstalt fur Wasserkunde, IHP/OHP Sekretariat, Koblenz, Karlsruhe, Germany, 28-30 June 1994, sec. III 107-116.
- Giambelluca, T.W. 1993. Land use, hydrology, and climate, Coupled Climate System Modelling: A Southern Hemisphere Perspective, Climatic Impacts Centre, Macquarie University, Australia, February 1993 (Invited).
- Sa, T., Holscher, D., Carvalho, C., Giambelluca, T.W., and Bastos, T.X. 1993. Micrometeorological and ecophysiological evaluation of secondary vegetation--a step to improve agroforestry systems in the Brazilian eastern Amazon. Ecophysiology of Tropical Intercropping, INRA, Centre de Recherches Agronomiques Antilles-Guyane, Guadaloupe, French Antilles, Dec. 1993. Presented by Tatiana Sa.
- Sa, T., Carvalho, C., Holscher, D., and Giambelluca, T.W. 1993. Relacoes hidricas de componentes de vegetacoes secundarias do nordeste paraense. IV Congresso Brasileiro de Fisiologia Vegetal, Fortaleza, Brazil, July 1993. Presented by Tatiana Sa.
- Bastos, T.X., Giambelluca, T.W., Pacheco, N.A., and Sa, T. 1993. O uso do atmometro Ekern para

- estimar evapocao em areas miuito chuvosas na Amazonia: resultados preliminares. VIII Congresso Brasileiro de Agrometeorologia, Porto Alegre, Brazil, July 1993. Presented by Therezinha Bastos.
- Green, R.E., Loague, K., Yost, R.S., Giambelluca, T.W., and Miles, C.J. 1992. Uncertainty considerations for pesticide leaching assessments with statewide application--Hawaii experience. Beltsville Conference, May 1992. Presented by Richard Green.
- Giambelluca, T., Minyard, W., and Loope, L. 1992. A study of elevational patterns of climate on leeward slope of East Maui, Hawaii. Ninth Annual Pacific Climate Workshop, Pacific Grove, California, April 1992. Presented by Lloyd Loope.
- Ulmer, W.C., and Giambelluca, T.W. 1992. Adjustment of AVHRR cloud detection, radiation based models due to volcanic emissions from the 1991 eruption of Mount Pinatubo. AGU Chapman Conference on Climate, Volcanism, and Global Change, March 1992. Presented by Warren Ulmer.
- Giambelluca, T.W. 1992. Recharge variability and uncertainty issues, Fifth Meeting of the Committee on Techniques for Assessing Ground Water Vulnerability, Water Science and Technology Board, National Research Council, Oahu, Hawaii, January 1992 (Invited).
- Giambelluca, T.W. 1991. Climate data analysis, Hawaii Climate Data/Use Workshop, Commission on Water Resource Management, Hawai'i Department of Land and Natural Resources, Honolulu, October 1991 (Invited).
- Giambelluca, T.W. 1991. Climate astride the trade-wind inversion on a Hawai'i mountain slope, Association of American Geographers Annual Meeting, Miami, April 1991.
- Giambelluca, T.W. 1991. Uncertainty in pesticide leaching potential. In *Proceedings of the National Conference on Irrigation and Drainage Engineering*, American Society of Civil Engineers, Honolulu, 22-26 July 1991.
- Giambelluca, T.W. 1990. Drought occurrences in Hawai'i, Hawai'i Section--American Water Works Association 16th Annual Conference, Honolulu, May 1990 (Invited).
- Giambelluca, T.W. 1990. Water recharge, development, and xeriscaping, Outdoor Water Conservation: A Xeriscape Symposium, Honolulu, March 1990 (Invited).
- Giambelluca, T.W. 1989. Groundwater recharge of the Pearl Harbor-Honolulu aquifer under three scenarios of climatic change, International Seminar on Climatic Fluctuations and Water Management, Cairo, Egypt, December 1989.
- Loague, K.M., Green, R.E., Liang, T.C., and Giambelluca, T.W. 1988. Uncertainty in a pesticide assessment for the Pearl Harbor Basin, Oahu, Hawaii. Abstract: *Eos* 69(44):1197-1198.
- Giambelluca, T.W., and Oki, D.S. 1988. Assessing the hazard of groundwater contamination by agrochemicals. Abstract: *26th International Geographical Congress, Abstracts, Volume 1*, p. 206.
- Giambelluca, T.W. 1988. Analyzing agricultural drought in the Pacific, Abstract: *1988 Association of American Geographers Annual Meeting, Program and Abstracts*, p. 62.
- Liu, C.C.K., Loague, K.M., Green, R.E., Liang, T.C., and Giambelluca, T.W. 1987. Predicting deep penetration of EDB, DBCP, and TCP in Hawaii with PRZM. Abstract: *Eos* 68(44):1197-1198.
- Giambelluca, T.W. 1987. Influence of time interval size on water balance computations. 1987. Abstract: *Association of American Geographers Annual Meeting, Program and Abstracts*, p. 32.
- Giambelluca, T.W. 1987. Groundwater recharge in agricultural areas. In *Toxic Organic Chemicals in Hawaii's Water Resources*. College of Tropical Agriculture and Human Resources, University of Hawai'i at Manoa, Honolulu.
- Giambelluca, T.W. 1987. Water resources versus land development in Hawaii. In *Proceedings, Symposium on Hawaii/Okinawa Water Resources*, held in Naha, Okinawa, Japan, 13 January 1987.
- Giambelluca, T.W., and Nullet, M.A. 1985. Ridge regression to adjust rainfall normals to a common base period, Abstract: *Eos* 66(46):888.
- Oki, D.S., and Giambelluca, T.W. 1985. Pesticide contamination of the basal lens of the Pearl Harbor Aquifer of Oahu, Hawaii, Abstract: *Eos* 66(46):888.
- Giambelluca, T.W. 1985. Effects of land use on ground water recharge in southern O`ahu, Hawai'i.

Abstract: *Eos* 66(18):275.

Giambelluca, T.W. 1985. Computer Simulation of Southern O`ahu Ground Water Recharge for Past, Present, and Future Land Use Scenarios, Hawai`i Section/American Water Works Association Annual Conference, Honolulu, May 1985 (Invited).

Giambelluca, T.W. 1983. Topographically-based interstation interpolation of extreme rainfall on O`ahu, Hawai`i, Abstract: *Eos* 64(45):701.

Reports

Izuka, S.K., Giambelluca, T.W., and Nullet, M.A. 2005. Potential evapotranspiration on Tutuila, American Samoa. U.S. Geological Survey Scientific Investigations Report 2005-5200, 40 pp.

Izuka, S.K., Giambelluca, T.W., Nullet, M.A., and Asalele, F. 2003. Microclimate data from an evapotranspiration station at Cape Matatula, Tutuila, American Samoa. Contribution to the Climate Monitoring and Diagnostics Laboratory Biennial Report.

Giambelluca, T.W., Vana, T.T., and Egan, J.R. 2001. Vegetation of the tamarisk windbreak area, Kaho`olawe, Hawai`i, 2001. Report to the Kaho`olawe Island Reserve Commission, Wailuku, Hawai`i.

Giambelluca, T.W., Ziegler, A.D., Nullet, M.A., and Dao, T.M. 2001. Transpiration in a small forest patch. Section 6, NSF final report of project DEB-9613613, "Influence of forest fragmentation on watershed functions in northern Vietnam". [\[Text\]](#)

Ziegler, A.D., Giambelluca, T.W., Plondke, D., Vana, T.T., Fox, J., Vien, T.D., Nullet, M.A., and Evett, S. 2001. Near surface hydrologic response in a fragmented landscape. Section 7, NSF final report of project DEB-9613613, "Influence of forest fragmentation on watershed functions in northern Vietnam". [\[Text\]](#)

Ziegler, A.D., Giambelluca, T.W., and Sutherland, R.A. 2000. Thailand Roads Project: Overview and initial findings. NSF report for project 9614259, "Hydrologic change and accelerated erosion in mountainous tropical watersheds: the impact of rural roads". [\[Text\]](#)

Ziegler, A.D., Giambelluca, T.W., Sutherland, R.A., Vana, T.T., Ko, D., Malaspino, P., and Lind, E. 1998. Erosion control effectiveness of a coral-based gravel surfacing material, Schofield Barracks, O`ahu, Hawai`i. Technical Report 1998-AZ02, Geomorphological Laboratory, Department of Geography, University of Hawai`i Manoa. Prepared for Integrated Training Area Management Range Division, U.S. Army Schofield Barracks, O`ahu, Hawai`i.

Giambelluca, T.W., Egan, J., Garcia, K., Perry, L., Richardson, F., Smith, A., Ziegler, A.D. 1997. Lessons learned: Kaho`olawe restoration efforts prior to 1996. Report to the Kaho`olawe Island Reserve Commission, Honolulu, Hawai`i.

Minyard, B., Giambelluca, T.W., and Nullet, D. 1994. Elevational patterns of climate on the leeward slope of East Maui, Hawaii. Technical Report 92, Cooperative National Parks Resources Study Unit and Haleakala National Park, 57 pp.

Giambelluca, T.W., and Loague, K. 1992. The spatial variability of near-surface soil hydraulic properties for Kaho`olawe: A preliminary investigation. Consultant Report No. 4, Kaho`olawe Island Conveyance Commission.

Giambelluca, T.W., Nullet, M.A., Ridgley, M.A., Eyre, P., Moncur, J., and Price, S. 1991. Drought in Hawai`i. Report, Division of Water and Land Development, Hawai`i Department of Land and Natural Resources, Honolulu, xix+232 pp.

Ridgley, M.A., and Giambelluca, T.W. 1991. Urbanization, land-use planning, and groundwater management on central Oahu, Hawaii. Special Report, Water Resources Research Center, University of Hawai`i, Honolulu.

Oki, D.S., Miyahira, R.N., Green, R.E., Giambelluca, T.W., Lau, L.S., Mink, J.F., Schneider, R.C., and

- Little, D.N. 1990. Assessment of the potential for groundwater contamination due to proposed urban development in the vicinity of the U.S. Navy Waiawa Shaft, Pearl Harbor, Hawaii. Special Report 03.02.90, Water Resources Research Center, University of Hawai'i at Manoa, Honolulu, xix+455 pp.
- Giambelluca, T.W. 1988. Water balance section in: Review and re-evaluation of groundwater conditions in the Pearl Harbor Groundwater Control Area, Oahu, Hawaii, by J.F. Mink, G.A.L. Yuen, and J.Y.C. Chang. Report R78, Board of Land and Natural Resources, Department of Land and Natural Resources, State of Hawai'i. 93 pp + App.
- Giambelluca, T.W., and Oki, D.S. (Contributing authors) 1987. In Organic chemical contamination of O'ahu groundwater, by L.S. Lau, Technical Report 181, Water Resources Research Center, University of Hawai'i at Manoa, Honolulu. xviii + 153 pp.
- Giambelluca, T.W., Leung, C.K., and Konda, R. 1987. Hawai'i groundwater data base. Special Report 12:18:87, Water Resources Research Center, University of Hawai'i at Manoa, Honolulu, iii + 1130 p.
- Giambelluca, T.W., Nullet, M.A., and Schroeder, T.A. 1986. Hawaii Rainfall Atlas, Report R76, Hawai'i Division of Water and Land Development, Department of Land and Natural Resources, Honolulu. vi + 267 p.
- Giambelluca, T.W., and Oki, D.S. 1985. (Contributing authors) In: Subsurface water quality: Organic chemical contamination of O'ahu groundwater, ed. by L.S. Lau, Special Report 7.0:85, Water Resources Research Center, University of Hawai'i at Manoa, Honolulu. viii + 147 p.
- Oki, D.S., and Giambelluca, T.W. 1985. Subsurface water and soil contamination data base for State of Hawai'i. Special Report 7:85, Water Resources Research Center, University of Hawai'i at Manoa, Honolulu. vii + 92 p. + computer printout.
- Giambelluca, T.W., Lau, L.S., Fok, Y.S., and Schroeder, T.A. 1984. Rainfall frequency study for O'ahu. Division of Water and Land Development, Department of Land and Natural Resources, State of Hawai'i. 232 p.
- Giambelluca, T.W., Lau, L.S., Fok, Y.S., and Schroeder, T.A. 1983. Rainfall frequency study for O'ahu, Option 1--Preparation of rainfall frequency maps. Special Report 9:23:83, Water Resources Research Center, University of Hawai'i at Manoa. v + 5 p.
- Giambelluca, T.W. 1983. Water balance of the Pearl Harbor--Honolulu basin, Hawai'i, 1946--1975. Technical Report 151, Water Resources Research Center, University of Hawai'i at Manoa. xi + 151 p.
- Haraguchi, P., and Giambelluca, T.W. 1982. Drought Report: South Kohala-Hamakua, Island of Hawaii, March-November 1981. Circular C89, Division of Water and Land Development, Department of Land and Natural Resources, State of Hawai'i. v + 58 p.

Instructors' Manuals

- Giambelluca, T.W. 1981. Instructors' manual to accompany *Geography: Regions and Concepts*, text book by Harm J. deBlij. John Wiley and Sons, New York. 143 p.
- Giambelluca, T.W. 1980. Instructors' manual to accompany *The Earth: A Topical Geography*, text book by Harm J. deBlij. John Wiley and Sons, New York. 158 p.

Unpublished Manuscripts

- Giambelluca, T.W. 1986. The structure of cirrus surges in the tropical central and eastern Pacific during January and February 1979.
- Giambelluca, T.W. 1981. The Geographical Distribution of Daily Rainfall Frequency Characteristics on Oahu, Hawai'i.

Seminar and Colloquium Presentations

- Regional Environmental Change in Hawai'i: Climatic and Ecological Threats. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, September 2008.

Some hydrological impacts of alien tree invasion in Hawai'i. Seminar presentation at the Institute for Pacific Island Forestry, US Forest Service, Hilo, July 2008.

Climate change and species invasion: Dual threats to Hawai'i's ecological and hydrological well being. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, September 2007.

Hydrological impacts of alien tree invasion in Hawai'i's wet forests. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, September 2006.

Land-atmosphere processes in tropical watersheds. Seminar, Department of Civil and Environmental Engineering, University of Washington, June 2006.

Estimating recharge in Hawai'i. Water Resources Research Center Seminar Series, University of Hawai'i at Manoa, December 2005.

Land cover change, climate change, and ecological change: Research challenges in tropical environments. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, September 2005.

Hydrological and ecological importance of cloud water interception in Hawai'i. Department of Botany Seminar Series, University of Hawai'i at Manoa, October 2004

Climatic and hydrological impacts of land-cover change in montane mainland Southeast Asia. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, October 2004.

Fieldwork/analysis in Vietnam on transpiration edge effect and hydrological impacts of forest fragmentation. Water Group, University of Hawai'i at Manoa, November 2003.

Hydrology of tropical montane cloud forests. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, October 2003.

From forests to trees: Hydrological effects of the spatial scale of vegetation heterogeneity. Hydrogeology Seminar Series, Department of Geological and Environmental Sciences, Stanford University, March 2003.

Hydrologic cycle of altered tropical forest. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, September 2002.

Issues in tropical land-atmosphere interaction. Seminar, Department of Meteorology, University of Hawai'i at Manoa, February 2002.

Determining the contribution of fog water interception to the hydrological cycle in Hawai'i mountain environments. Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, November, 2001.

Hydrological effects of landscape fragmentation in a tropical montane environment, Northern Vietnam Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, October, 2000.

Studying land-atmosphere interaction: Field research in Hawai'i, Brazil, Thailand, and Vietnam, Seminar, Department of Meteorology, University of Hawai'i at Manoa, February 1999..

Developing a listening post for global change in the tropical Pacific, Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, October, 1998.

Conducting research in remote areas: Dealing with surprises, Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, October, 1997.

Characterization of land surface-atmosphere interaction over deforested tropical areas, Seminar, Department of Meteorology, University of Hawai'i at Manoa, February 1997.

Hakioawa to Pang Khum: The road back from land degradation, Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, September, 1996.

Comparing simulated and measured land surface-atmosphere interaction: Validating model experiments of tropical deforestation effects on climate, Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, November, 1995.

Climatological monitoring of natural areas, Brown Bag Lunch Presentation, The Nature Conservancy of Hawai'i, October 1994.

Tropical land cover change: Characterizing the post-forest land surface, Faculty Seminar Series, Department of Geography, University of Hawai'i at Manoa, September, 1994.

How tropical deforestation affects climate: Land surface-atmosphere interaction, The Centre for Environmental and Resource Studies in association with Landcare, University of Waikato, Hamilton, New Zealand, July 1994.

Aquifer recharge in Hawai'i: Sensitivity to changes in land use and climate, Water Resources Research Center Seminar Series, University of Hawai'i at Manoa, May 1994.

Microclimate of deforested land in Northern Thailand, Department of Botany Seminar Series, University of Hawai'i at Manoa, April 1994.

Energy and water exchange characteristics of deforested lands in northern Thailand: preliminary field results, Multiple Cropping Centre, Chiang Mai University, Chiang Mai, Thailand, May 1993.

Effect of land use on radiative properties and soil hydraulic characteristics in tropical areas, Centro de Pesquisa Agroflorestal da Amazonia Oriental, Empresa Brasileira de pesquisa Agropecuaria, Belem, Brazil, November 1992.

Radiation balance and soil hydraulic conductivity for cultivated areas and secondary vegetation in Para, FCAP University, Belem, Brazil, November 1992.

Preliminary assessment of global warming impacts on Oahu water resources, Graduate Ocean Policy Seminar, Marine Options Program, University of Hawai'i at Manoa, April 1992.

The implications of land use on hydrologic relationships: Kahoolawe, Hawai'i, Soil Science Seminar, University of California at Berkeley, March 1992.

The Setting: Hawaii's Climate and Hydrology, Hawai'i Interagency Workshop on Erosion, Sediments, and Water Quality, Honolulu, May 1990.

Modeling the Risk of Groundwater Contamination by Pesticides, Thursday Colloquium, Department of Geography, University of Hawai'i at Manoa, Honolulu, September 1988.

Rainfall and Drought in Hawaii and the Pacific Islands, First Water Resources Research Center Conference, Honolulu, January 1988.

Teaching Meteorology to Geographers, Weekly Seminar, Department of Meteorology, University of Hawai'i at Manoa, Honolulu, November 1987.

Development of a Revised Rainfall Atlas of Hawai'i, Joint Seminar, Department of Meteorology and Water Resources Research Center, University of Hawai'i at Manoa, Honolulu, October 1986.

Essentials of Water Balance Modeling, Artificial Intelligence Working Group, Department of Agronomy and Soil Science, University of Hawai'i at Manoa, Honolulu, September 1986.

Pesticides in the Groundwater in Hawaii, Invited Lecture, Great Lakes Institute, University of Windsor, Ontario, Canada, May 1986.

DBCP, EDB, and TCP in Hawai'i Groundwater: Spatial and Temporal Characteristics, Thursday Colloquium, Department of Geography, University of Hawai'i at Manoa, Honolulu, March 1986.

Structure of Cirrus Surges in the Central and Eastern North Pacific During January and February 1979 (SOP1), Joint Institute of Marine and Atmospheric Research Annual Review, Honolulu, January 1985.

Techniques for Determining the Distribution of Extreme Rainfall on O'ahu, Seminar, Water Resources Research Center, University of Hawai'i at Manoa, Honolulu, March 1984.

Water Balance of the Pearl Harbor-Honolulu Basin, Seminar, Department of Geography, San Diego State University, San Diego, December 1983.

Water Balance of the Pearl Harbor-Honolulu Basin, Seminar, Department of Geography, Louisiana State University, Baton Rouge, December 1983.

Water Balance of the Pearl Harbor-Honolulu Basin, Joint Colloquium, Water Resources Research Center and Department of Geography, University of Hawai'i at Manoa, Honolulu, May 1983.

Grants and Contracts

Revision of the Rainfall Atlas of Hawai'i. 2008-2010. Principal Investigator. Funded by the US Army

Corps of Engineers and the State Commission on Water Resources. \$266,641.

The Expansion of Rubber and Its Implications for Water and Carbon Dynamics in Montane Mainland Southeast Asia. 2008-2011. Co-Principal Investigator (Institutional PI). Funded by the National Aeronautics and Space Administration. \$826,820 (\$509,010).*

Improving Water Resource Assessment in Hawai'i by Using LiDAR Measurements of Canopy Structure to Estimate Rainfall Interception. 2008-2009. Principal Investigator. Funded by U.S. Geological Survey, Water Resources Research Institute Program. \$20,978.

Hydrological Impacts of *Miconia calvescens* in Hawai'i. 2007-2008. Principal Investigator. Funded by the US Fish and Wildlife Service. \$57,372.

Sensitivity of Pacific Island tropical montane cloud forests to climate change. 2004-2009. Principal Investigator. Funded by the U.S. Geological Survey Biological Resources Discipline Global Change Research Program. \$1,000,000 (\$324,679).

The role of land-cover change in montane mainland Southeast Asia in altering regional hydrological processes under a changing climate. 2004-2007. Co-Principal Investigator. Funded by the National Aeronautics and Space Administration. \$900,000 (\$425,086).*

Hydrology of tropical montane cloud forest in Hawai'i. 2003-2007. Principal Investigator. Funded by the National Science Foundation. \$424,682.

Pacific rim corrosion research: Phase I. 2003-2006. Collaborator. Funded by the Department of Defense. \$1,151,000 (\$147,987).*

Quantifying the importance of fog drip to ecosystem hydrology and water resources in windward and leeward tropical montane cloud forests on East Maui, Hawai'i. 2001-2003. Co-Principal Investigator. Funded by USGS Water Resources Division. \$171,252 (\$64,540).* [\[Project WEB page\]](#)

Microclimate of Hawaiian forests in relation to the biocomplexity of introduced avian diseases. 2001-2003. Principal Investigator. Funded by the USGS Biological Resources Division. \$50,000.

Tamarisk windbreak revisited. 2001. Principal Investigator. Funded by the Kaho'olawe Reserve Commission. \$9,792.

Impacts of Forest Harvesting on Soil Hydraulic Characteristics at the Hakalau Timber Harvest Project Site. 2001-2003. Co-Principal Investigator. Funded by the County of Hawai'i Department of Research and Development. \$6,885.

Evapotranspiration study for Tutuila, American Samoa. 1999-2003 (expected to be extended through 2004 pending funding availability). Principal Investigator. Funded by USGS Water Resources Division. \$26,500

Hydrologic change in mountainous tropical watersheds: The roles of roads and deforested land surfaces in altering watershed function and accelerating soil erosion. 2000-2003. Principal Investigator. Funded by the National Science Foundation. \$239,743.

Water economy of neo-tropical savanna ecosystems: The impact of hydraulic lift, partitioning of soil water and changes in land use. Co-investigator. 2000-2003. Funded by the National Science Foundation. \$489,322 (\$80,382).*

Model acquisition and validation of DHSVM: A pilot study of the impacts of landcover change on watershed hydrology. 2000-2001. Principal Investigator. Funded by the University Research Council, University of Hawai'i at Manoa. \$13,928

* For projects involving other PIs, funding specifically for work by Giambelluca and his team is shown in parentheses.

* For projects involving other PIs, funding specifically for work by Giambelluca and his team is shown in parentheses.

Developing a listening post in the tropical Pacific: Sensitivity of Hawaiian high-elevation and aquatic ecosystems to global change. 1999-2003. Co-Principal Investigator. Funded by USGS Biological Resources Division Global Change Research Program. \$954,555 (\$187,772). * [\[Project WEB page\]](#)

Hydrologic change and accelerated erosion in mountainous tropical watersheds: The impact of rural roads. 1997-99. Principal Investigator. Funded by the National Science Foundation. \$300,000. [\[Project WEB page\]](#)

Influence of forest fragmentation on watershed functions in northern Vietnam. 1997-99. Co-Principal Investigator. Funded by the National Science Foundation and the Environmental Protection Agency. \$418,749 (\$143,155). * [\[Project WEB page\]](#).

Measuring and modeling accelerated erosion on unpaved roads, O'ahu, Hawai'i. 1996-97. Principal Investigator. Funded by the University Research Council, University of Hawai'i at Manoa. \$14,000.

Investigation of erosion on unpaved roads in northern Thailand. 1996-97. Principal Investigator. University of Hawai'i International Agreements Fund. \$1,000.

Lessons learned: Kaho'olawe restoration efforts prior to 1996. 1996. Principal Investigator. Funded by the Kaho'olawe Island Reserve Commission. \$34,950.

Determination of sediment contribution from unpaved roads within a tropical watershed. 1995-2000. Principal Investigator. EPA Fellowship for Alan Ziegler.

Potential evaporation estimate for Kahuku, O'ahu. 1995-97. Principal Investigator. Funded by the U.S. Geological Survey. \$21,817.

Installation of climate station at Kealialuna, Kaho'olawe. 1994. Principal Investigator. Funded by the Protect Kaho'olawe Fund. \$3,600.

Impacts of forest conversion on energy and water exchange properties in Northern Thailand. 1992-93. Principal Investigator. Funded by the National Geographic Society. \$18,245.

Characterization of the impacts of land-use change on land surface properties in Northern Thailand. 1992-93. Principal Investigator. Funded by the University of Hawai'i /East-West Center Collaborative Grant. \$15,000.

Soil infiltration field study of Kaho'olawe, Hawai'i. 1992. Principal Investigator. Funded by the Kaho'olawe Island Conveyance Commission. \$17,150.

Environmental impact assessment for Hakioawa watershed restoration project. 1991. Principal Investigator. Funded by the Protect Kaho'olawe 'Ohana. \$5,000.

To install and monitor 4 new climate stations along Kalapawili Ridge on the northeastern rim of Haleakala, Maui. 1990-92. Co-Investigator. Funded by the National Park Service. \$45,000.

Groundwater management and central Oahu urbanization. 1990-92. Co-Principal Investigator. Funded by the U.S. Geological Survey. \$24,074.

Quantification of appurtenant water rights for lands in Hawai'i. 1989-93. Principal Investigator. Funded by the U.S. Geological Survey and the State of Hawai'i. \$104,860.

Annual and diurnal cycles in evaporation on a mountain slope, Hawai'i. 1989-90. Principal Investigator. Funded by the U.S. Geological Survey and the State of Hawai'i. \$20,117.

Hawaii climate laboratory. 1989-90. Principal Investigator. Funded by the National Science Foundation Instrument and Laboratory Improvement Program with matching from the University of Hawai'i at Manoa. \$37,105.

Compact disk data access for climatology instruction. 1988-89. Principal Investigator. Funded by University of Hawai'i at Manoa Educational Improvement Fund Mini-Grant. \$1,325.

Evaporation modeling and measurement. 1988-89. Principal Investigator. Funded by USGS. \$6,000.

Development of Hawai'i Department of Health Interactive Water Contamination Database. 1987-88. Principal Investigator. Funded by Department of Health, State of Hawai'i, and U.S. Environmental Protection Agency. \$21,700.

Water and Energy Balance Field Measurement: Maui Transect Pilot Study. 1987-88. Principal Investigator. Funded by University Research Council, Research and Training Revolving Fund

Awards, University of Hawai'i a Manoa. \$4,900.

Pesticide Contamination Data Base Update. 1986-87. Principal Investigator. Funded by Department of Health, State of Hawai'i. \$12,182.

Water Balance for Reassessment of Pearl Harbor Sustainable Yield. 1987. Principal Investigator. Funded by Mink and Yuen, Inc. \$6,000.

Drought In Hawaii. 1986-90. Principal Investigator. Funded by U.S. Geological Survey and Division of Water and Land Development, Department of Land and Natural Resources, State of Hawai'i. \$83,082.

Sand Island Infaunal Data Base. 1986. Principal Investigator. Funded by City and County of Honolulu. \$1,500.

Hawaii Rainfall Atlas. 1984-86. Principal Investigator. Funded by Division of Water and Land Development, Department of Land and Natural Resources, State of Hawai'i. \$47,293.

Subsurface Water Quality. 1984-1986. Co-Investigator. Funded by State of Hawai'i and U.S. Environmental Protection Agency. \$10,000.

Pacific Island Rainfall Deficiencies. 1984-86. Co-Principal Investigator. Funded by East West Center-University of Hawai'i Collaborative Grant and Water Resources Research Center Annual Allotment. \$16,298.

Southern Oahu Groundwater Recharge Assessment 1984-85. Principal Investigator. Funded by U.S. Geological Survey. \$3,500.

Water Balance of the Pearl Harbor-Honolulu basin, 1946-1975. 1981-83. Co-Investigator. Funded by Office of Water Research and Technology, U.S. Department of the Interior. \$11,214.