

IRIS STEWART-FREY

Professor

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Education

Ph.D., Hydrology, Stanford University

B.S., Geology and Geophysics, University of Hawai'i

Professional Appointments

- 08/21–present **Professor**, Department of Environmental Studies and Sciences, Santa Clara University, Santa Clara, CA
- 06/14–6/17 **Department Chair**, Department of Environmental Studies and Sciences, Santa Clara University, Santa Clara, CA
- 09/13–07/21 **Associate Professor**, Department of Environmental Studies and Sciences, Santa Clara University, Santa Clara, CA
- 09/06–08/13 **Assistant Professor**, Environmental Studies Institute, Santa Clara University, Santa Clara, CA (on parental leave 09/06 – 08/07)
- 12/04–05/06 **Visiting Scientist, U.S. Geological Survey**, Water Resources Division, Menlo Park, CA.
- 03/05–06/05 **Adjunct Lecturer**, Department of Civil Engineering, Santa Clara University, Santa Clara, CA.
- 07/02–06/03 **Program Director**, International Ph.D. Program Environment and Water (ENWAT), Universität Stuttgart, Department of Civil and Environmental Engineering, Germany.
- 12/00–07/04 **Postdoctoral Researcher and NOAA visiting scientist**, Scripps Institution of Oceanography, Climate Research Division, La Jolla, CA.

Peer-Reviewed Publications

***designates student authors**

Stewart IT, *Healey L, LaBarbera K, *Li H, Scullen JC, Wang Y, Wenny D., 2021. Long term success in riparian restoration does not prevent avian declines in the southern San Francisco Bay Area. *Ecological Restoration*, in review.

Bacon CM, Kelley L, **Stewart IT**, 2021. How institutions and gender shape access to food and water during lean times in Nicaragua, *Ecology and Society*, in press.

- Stewart IT**, Maurer EP, Stahl K, *Joseph K, 2021. Recent evidence for warmer and drier growing seasons in climate sensitive regions of Central America from multiple global data sets. *International Journal of Climatology*. 2021 Aug 9.
- Bacon CM, Sundstrom WA, **Stewart IT**, Maurer E, Kelley LC. Towards smallholder food and water security: Climate variability in the context of multiple livelihood hazards in Nicaragua. *World Development*. 2021 Jul 1;143:105468.
- Stewart IT**, *Clow GL, *Graham AE, Bacon CM, 2020. Disparate air quality impacts from roadway emissions on schools in Santa Clara County (CA). *Applied Geography*. 2020 Dec 1;125:102354.
- Stewart IT**, *Rogers J, *Graham A, 2019. How to allocate water under severe drought and climate change? Disparate impacts of the recent severe drought on environmental flows and water supplies in Central California. *J of Hydrol X*. 2020 Apr 1;7:100054.
- Stewart IT**, *Engl ME, *Parchem CP, 2019. Effect of climate warming and drought on urban stream temperatures in a semiarid, seasonal system. *Jour. Am. Water Res. Assoc. (JAWRA)*, 2020 Aug; 56(4):551-67.
- Maurer EP, *Roby N, **Stewart IT**, and Bacon CM, 2017. Projected twenty-first-century changes in the Central-American mid-summer drought using statistically downscaled climate projections. *Regional Environmental Change*, <https://doi.org/10.1007/s10111>.
- Bacon CM, Sundstrom W, **Stewart IT**, and *Beezer D, 2017. Vulnerability to Cumulative Hazards: Coping with the Coffee Leaf Rust Outbreak, Drought, and Food Insecurity in Nicaragua, *World Development* (93): 136-152.
- Ayers J, Ficklin DL, Letsinger SL, **Stewart IT**, Strunk M, 2016. Comparison of CMIP3 and CMIP5 projected hydrologic conditions over the Upper Colorado River Basin. *International Journal of Climatology*, doi:10.1002/joc.2015.4594
- Ficklin DL, Letsinger SL, **Stewart IT**, Maurer EP, 2016. Assessing differences in snowmelt-dependent hydrologic projections using CMIP3 and CMIP5 climate forcing data for the western United States. *Hydrology Research*, doi:10.2166/nh.2015.101
- Stewart IT**, Ficklin, DL, *Carrillo CA, *McIntosh R., 2015. 21st century increases in the likelihood of extreme hydrologic conditions for the mountainous basins of the Southwestern United States. *Journal of Hydrology*, 529, 340-353.
- Stewart IT**, Bacon CM, *Burke WD, 2014. The uneven distribution of environmental burdens and benefits in Silicon Valley's backyard, *Applied Geography* 55, 1-12
- Ficklin, DL, Barnhart BL, Knouft JH, **Stewart IT**, Maurer EP, Letsinger LP, and Whittaker GW, 2014. Climate change and stream temperature projections in the Columbia River Basins: biological implications of spatial variation in hydrologic drivers. *Hydrology and Earth System Sciences*, 18(1), 4897-4912, 2014, www.hydrol-earth-syst-sci.net/18/4897/2014/
- Ficklin DL, **Stewart IT**, Maurer EP, 2013. Climate change impacts on streamflow and subbasin-scale hydrology in the Upper Colorado River Basin. *PLoS ONE* 8(8): e71297. doi:10.1371/journal.pone.0071297

- Stewart IT**, 2013. Connecting physical watershed characteristics to climate sensitivity for California mountain streams. *Climatic Change*, 116:133–148, doi:10.1007/s10584-012-0567-5.
- Stewart IT**, *Purner EE, *Guzman PD, 2013. Socioeconomic disparities in the provision of school gardens in Santa Clara County, California. *Children, Youth and Environments* 23(2) 127-153.
- Ficklin, DL, **Stewart IT**, Maurer EP, 2013. Effects of climate change on water quality in the Sierra Nevada mountain range in California. *Wat. Resour. Res.* 49:2765-2782, doi:10.1002/wrcr.20248
- Ficklin DL, **Stewart IT**, Maurer EP, 2012. Projections of 21st century Sierra Nevada local hydrologic flow components using an ensemble of General Circulation Models. *Jour. Am. Water Res. Assoc. (JAWRA)*, 1-21. doi: 10.1111 /j.1752-1688.2012.00675.x
- Ficklin DL, **Stewart IT**, Maurer EP, 2012. Effects of projected climate change on the hydrology in the Mono Lake Basin, California. *Climatic Change*, doi: 10.1007/s10584-012-0566-6
- Ficklin DL, Luo Y, **Stewart IT**, Maurer EP, 2012. Development and application of a hydroclimatological stream temperature model within SWAT. *Water Resources Research. Vol 48, W01511*, doi:10.1029/2011WR011256.
- *Fritze H, **Stewart IT**, Pebesma EJ, 2011. Shifts in Western North American snowmelt runoff regimes for the recent warm decades. *J. Hydromet.* doi: 10.1175/2011JHM1360.1
- Stewart IT**, 2009. Changes in snowpack and snowmelt runoff for key mountain regions. *Hydrologic Processes* 23:78-94.
- Lundquist JD, **Stewart IT**, Dettinger MD, Cayan DR. 2008. Variability and trends in spring runoff in the western United States, Chapter 5 in *Climate Warming in Western North America: Evidence and Environmental Effects*, Ed: F. Wagner, University of Utah Press.
- Peterson DH, **Stewart IT**, Murphy F. 2008. Principal hydrologic responses to climatic and geologic variability in the Sierra Nevada, California. *Estuary and Watershed Science*, 6(1) (February 2008), Article 1113.
- Maurer EP, **Stewart IT**, Bonfils C, Duffy PB, Cayan DR, 2007. Detection, attribution, and sensitivity of trends towards earlier streamflow in the Sierra Nevada, *J. Geophys. Res.*, 112, D11118, doi:10.1029/2006JD008088.
- Cayan DR, Dettinger MD, **Stewart IT**, Knowles N, 2005. Recent changes toward earlier springs – Early sings of climate warming in western North America: *Watershed Management Council Newsletter*, Spring 2005, 13 p.
- Peterson DH, Smith R, **Stewart IT**, Knowles N, Soulard C, Hager S, 2005. Snowmelt discharge characteristics, Sierra Nevada, California. *USGS Scientific Investigations Report 2005-5056*, <http://pubs.water.usgs.gov/sir2005-5056/>.
- Stewart IT**, Cayan DR, Dettinger MD, 2005. Changes towards earlier streamflow timing across western North America, *J. Climate*, 18:1136-1155.

- Stewart IT**, Cayan DR, Dettinger MD, 2004. Changes in snowmelt runoff timing in western North America under a 'Business as Usual' climate change scenario, *Climatic Change*, 62:217-232.
- Stewart IT**, Loague K, 2004. Assessing groundwater vulnerability in the San Joaquin Valley (CA) with the type transfer function model, *J. Environm. Qual.*, 33:1487-1498.
- Stewart IT.**, Loague K, 2003. Development of type transfer functions for regional-scale non-point-source groundwater vulnerability assessments, *Water Resour. Res.*, 39(12):1359.
- Stewart IT**, Loague K, 1999. A type transfer function approach for regional-scale pesticide leaching assessments. *J. Environ. Qual.* 28:378-387.
- Loague K, Abrams RH, Davis SN, Nguyen A, **Stewart IT**, 1998. A case study simulation of DBCP groundwater contamination in Fresno County, California. 2. Transport in the saturated subsurface. *J. Contam. Hydrol.* 29:137-163.

Other Publications

- Stewart IT, 2018. Op-Ed: Climate change a major culprit in fires devastating the western U.S. Carried by 25 publications, including the Los Angeles Times, Tampa Bay Times, and the Minneapolis Star Tribune.
- Raphael, C., Bacon, C., & **Stewart-Frey, I.** (2018). Strengthening engaged scholarship for environmental and social justice (Part 1). Ecojesuit.
- Raphael, C., Bacon, C., & **Stewart-Frey, I.** (2018). Strengthening engaged scholarship for environmental and social justice (Part 2). Ecojesuit.
- Stewart IT, 2018. Greening the growing deserts, *Explore Magazine*, Santa Clara University, Spring 2016.

Research Grants and Fellowships

External Grants

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| 08/20 – 02/21 | Freiburg Institute for Advanced Studies (FRIAS) |
| 09/19 – 12/20 | Deutsche Forschungsgemeinschaft (German Research Foundation) Grant STA 632/6-1 <i>Drought in tropical regions - do we over- or underestimate drought with methods and indices developed in other climates?</i> |
| 01/20 - 12/20 | Subaward on CalEPA Environmental Justice Grant: Greening Community Resilience: Access to Parks in Modesto's Riverside Communities |
| 6/1/21 – 9/15/21 | Clare Booth Luce fellowship (mentor for Lilah Foster): Groundwater Pollution Effects on Household Wells in Disadvantaged Underserved Communities in Stanislaus County (CA) |

- 6/1/20 – 9/15/20 **Clare Booth Luce Fellowship** (mentor for Claire Pavelka): The impact of climate change and changes in riparian habitat on bird populations in California.
- 6/1/19 – 6/1/20 **Clare Booth Luce fellowship** (mentor for Jackie Rogers): Effect of stream temperature and flow characteristics on Chinook salmon populations in the Tuolumne River under climate variability and change.
- 09/15 – 09/19 **NSF RUI Research Grant** (PI: C Bacon, co-PIs I Stewart, E Maurer, W Sundstrom), *Coping with Food and Water Insecurity: Producing Vulnerability or Resilient Responses to the Coffee Leaf Rust Outbreak and Mesoamerican Drought?*
- 08/17 - 06/18 **deNardo Foundation Grant** (PIs: I Stewart and S. McKenzie: Mapping Health)
- 6/1/16 – 9/15/17 **Clare Booth Luce Fellowship** (mentor for Claire Parchem): The Impact of Drought Conditions on Urban Streams
- 09/09 – 09/12 **U.S. EPA STAR Research Grant** (PI: I Stewart, co-PI E Maurer) *Impact of climate change on stream water quantity and quality in the Western U.S.*

Internal Grants

Hackworth Water justice

- 02/20 – 06/21 Hackworth Faculty Grant, *An ethical framework and to minimize, mitigate, and distribute environmental risks in the city of Modesto.*
- 09/19 – 06/20 Hackworth Grant (mentor for Jackie Rogers) *How just is water allocation under drought in the Bay Area*
- 09/18 – 06/19 Hackworth Grant (mentor for James Wang) *The Ethics of Geoengineering*
- 06/15 – 06/17 Thriving Neighbors Grant, *The Distribution of Environmental Pollution near Santa Clara County Schools: Patterns in Exposure and Community-Based Response.* Co-PIs Bacon and Stewart-Frey.
- 06/14 – 06/16 Provost's Grant, *Developing tools to detect changes in shade grown coffee areas using remotely sensed databases. Using Google Earth for a geospatial analysis of shade-grown coffee in northwestern Nicaragua* (with C Bacon)
- 06/13 – 06/15 Roelandt Grant. *What factors strengthen food security and resilience to global climate change among Nicaragua's small scale farmers?* With C Bacon, E Maurer, W Sundstrom
- 06/13 – 06/17 Provosts' Sustainability Research Initiative Grant Funded 3 projects, our portion involves the *geospatial mapping and analysis of development patterns surrounding the Santa Clara Mission.* With L Kealhofer, and L Panich, other projects by M Bezanson, J Farnsworth, and V Matzek
- 01/11 – 06/12 Center for Science Technology and Society grant *Spatial analysis of environmental burdens in Santa Clara County.* With C Bacon.

06/11 – 06/13 Provosts' Sustainability Research Initiative Grant, *An action research partnership for Environmental and Food Justice in San Jose*. With L Gray, C Bacon, L Kealhofer, G Gullette)

Fellowships and Awards

09/16-06/18 Bannan Institute Fellow
09/07-08-12 Clare Booth Luce Professor
12/00-12/03 NOAA/UCAR Postdoctoral Research Fellowship
09/98-09/00 EPA STAR Doctoral Student Fellowship
09/98-09/00 NSF Student Fellowship
09/98-09/99 Theresa Heinz Fellowship for Environmental Research
09/96-09/97 National Science Foundation Doctoral Student Fellowship

Courses

- ENVS 199B Special Topics: An Assessment of Near Roadway Air Pollution, The Eco-Benefits of Conserved Water, Assessing Restoration Success
- ENVS 197 Special Topics: Matlab in Hydro-climate analysis
- ENVS 197 Special Topics: Preparation for the ESRI Desktop Associate Certification Exam
- ENVS 197 Special Topics: Hydroclimate Analysis
- ENVS 161 Water Security
- ENVS 160 Water Resources L&L
- ENVS 117 Intermediate GIS (Fall 2015)
- ENVS 116 Introduction to GIS
- ENVS 115 GIS in the Environmental Sciences L&L
- ENVS 101 Senior
- ENVS 23 L&L Introduction to Earth Systems
- ENVS 20 The Water Wars of California L&L

Service and Synergistic Activities

- Co-coordinator, Environmental Justice and the Common Good Initiative, Santa Clara University (2019-present)
- Co-organizer of Regional Environmental Justice Network for Northern California 2019 – present)
- Environmental Studies and Sciences Department Chair (2014-17)
- Science Advisor for the Tuolumne River Trust (2020 – present)
- Associate Editor, Journal of the American Water Resources Association (2016-present)
- Faculty Affairs Committee (2017 – 2021)
- Grievance Committee (2021 – present)
- Coordinated Program Review (2016-17)

- Faculty hiring committees 2010, 2011, 2014, 2015 (chair), lecturer hiring committees (2007-09, 2014-17)
- Mentor to 30+ undergraduate research students
- Organizing committee for “Our common home” conference in response to the papal encyclical “Laudato Si” at Santa Clara University (Summer and Fall 2015)
- Organizing committee for “Environmental Justice and the Common Good” conference at Santa Clara University (May 2019)
- Built and managed the GIS computer lab of the Environmental Studies Institute at Santa Clara University (2007 – 10) & ongoing coordinator
- Faculty advisor for student clubs, Global Water Brigades (2008-2009) and Green Club
- Bannon Institute scholar (2016-18)
- Ignatian Faculty Forum participant (2016 – 2019)
- Faculty Senate Representative
- Reviewer for Water Resources Research, Journal of Climate, Journal of Environmental Quality, Climatic Change, Journal of the American Water Resources Association, Journal of Hydrology, Geophysical Research Letters, Environmental Management
- Session and panel organizer at AGU conference and others (i.e. AAG)
- Tenure reviewer (outside expert)
- Postdoctoral advisor
- Expert witness for AB32, the California Greenhouse Gas Lawsuit on behalf of the State of California and several Environmental Organizations (2006 – 08)
- Guest editor for Climatic Change (2011 – 12)
- Judge, Tech Awards, Santa Clara, CA (2011-2012)
- Reviewer for the PAN Pesticide Database (2007)
- Inclusive excellence postdoctoral program working group (2017)
- Global Social Benefit Intern mentor
- Community outreach for environmental education in preK-6 classes
- Consulting and volunteer work for the Santa Clara Creeks Coalition, Guadalupe River Park Conservancy, Tuolumne River Trust, Friends of Mission Peaks Regional Park
- Advisor to the ‘Energy Project’ (Sound Vision Productions) (2008)
- USGS volunteer (2008 -2010)
- AGU media advisor volunteer (2009)