

# PAUL C. SELMANTS

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## EDUCATION

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- 2007 Ph.D. (with distinction), Forest Science, Northern Arizona University. Adviser: Steve Hart  
2000 M.S., Botany, University of Wyoming. Adviser: Dennis Knight  
1996 B.S., Botany, Miami University of Ohio.

## APPOINTMENTS

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- 2012-present Junior Research Faculty, Department of Natural Resources and Environmental Management, University of Hawaii at Manoa.  
2008-2011 Postdoctoral Scholar, Environmental Studies Department, University of California, Santa Cruz. Adviser: Erika Zavaleta  
2007-2008 Postdoctoral Research Associate, Cottonwood Ecology Group, Northern Arizona University. Advisers: Steve Hart and Tom Whitham  
1996-1997 Director, Forfar Field Station, Andros Island, Bahamas.

## GRANTS AND AWARDS

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- 2014 Selected participant, National Center for Ecological Analysis and Synthesis – Open Science for Synthesis Training for Early Career Scientists  
2014 (pending) NRCS Soil Survey Collaborative Research Project (Co-I with S. Crow, C. Litton, C. Giardina, J. Deenik) \$120,000  
2014 Faculty Travel Award, University Research Council, UH Manoa \$2,000  
2009-11 Kearney Foundation Grant (Co-I with E. Zavaleta, P. Koch, Z. Tzankova) \$233,175  
2003-06 U.S. E.P.A. Science To Achieve Results (STAR) Graduate Fellowship \$105,000  
2003-04 ARCS Foundation Graduate Fellowship \$6,000  
2002-03 Merriam-Powell Center for Environmental Research Graduate Fellowship \$7,500  
1998-00 USDA Forest Service Administrative Cost Share Agreement - \$40,000

## PUBLICATIONS

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Peer-Reviewed Journal Articles (\*undergraduate first author):

Bothwell, LD\*, **PC Selmants**, CP Giardina and C.M. Litton (2014). Leaf litter decomposition rates increase with rising mean annual temperature in Hawaiian tropical montane wet forests. *PeerJ*: in review.

**Selmants, PC**, CM Litton, CP Giardina and GP Asner (2014). Ecosystem carbon storage does not vary with mean annual temperature in Hawaiian tropical montane wet forests. *Global Change Biology* 20, 2927-2937

**Selmants, PC**, ES Zavaleta and AA Wolf (2014). Realistic diversity loss and variation in soil depth independently affect community-level plant nitrogen use. *Ecology* 95, 88-97

Sullivan, BW, **PC Selmants** and SC Hart (2013) Does dissolved organic carbon regulate biological methane oxidation in semiarid soils? *Global Change Biology* 19, 2149-2157

- Esch, EH\*, DL Hernandez, JR Pasari, RSG Kantor and **PC Selmants** (2013) Response of soil microbial activity to grazing, nitrogen deposition, and exotic cover in a serpentine grassland. *Plant and Soil* 366, 671-682
- Selmants, PC**, ES Zavaleta, JR Pasari and DL Hernandez (2012) Realistic species losses reduce invasion resistance in a California serpentine grassland. *Journal of Ecology* 100, 723-731
- Vallano, DM, **PC Selmants** and ES Zavaleta (2012) Simulated nitrogen deposition enhances the performance of an exotic grass relative to native serpentine grassland competitors. *Plant Ecology* 213, 1015-1026
- Sullivan, BW, **PC Selmants** and SC Hart (2012) New evidence that high potential nitrification rates occur in soils during dry seasons: are microbial communities active during dry seasons? *Soil Biology and Biochemistry* 53, 28-31
- Dijkstra, P, JJ Balder, **PC Selmants**, SC Hart, GW Koch, E Schwarz and BA Hungate (2011) Modeling soil metabolic processes using isotopologue pairs of position-specific <sup>13</sup>C-labeled glucose and pyruvate. *Soil Biology and Biochemistry* 43, 1848-1857
- Dijkstra, P, JC Blankinship, **PC Selmants**, SC Hart, GW Koch, E Schwartz and BA Hungate (2011) Probing carbon flux patterns through soil microbial metabolic networks using parallel position-specific tracer labeling. *Soil Biology and Biochemistry* 43, 126-132
- Selmants, PC** and SC Hart (2010) Phosphorus and soil development: Does the Walker and Syers model apply to semiarid ecosystems? *Ecology* 91, 474-484
- Fischer, DG, SC Hart, JA Schweitzer, **PC Selmants**, and TG Whitham (2010) Soil nitrogen availability varies with plant genetics across diverse river drainages. *Plant and Soil* 331, 391-400
- Selmants, PC** and SC Hart (2008) Substrate age and tree islands influence carbon and nitrogen dynamics across a semiarid retrogressive chronosequence. *Global Biogeochemical Cycles* 22, GB1021, doi:10.1029/2007GB003062
- Selmants, PC**, SC Hart, SI Boyle, CA Gehring, and BA Hungate (2008) Restoration of a ponderosa pine forest increases soil CO<sub>2</sub> efflux more than either water or nitrogen additions. *Journal of Applied Ecology* 45, 913-920
- Hungate, BA, SC Hart, **PC Selmants**, SI Boyle, and CA Gehring (2007) Soil responses to management, increased precipitation, and added nitrogen in ponderosa pine forests. *Ecological Applications* 17, 1352-1365
- Hart, SC, **PC Selmants**, SI Boyle, and ST Overby (2006) Carbon and nitrogen cycling in southwestern ponderosa pine forests. *Forest Science* 52, 683-693
- Hart, SC, CA Gehring, **PC Selmants**, and RJ Deckert (2006) Carbon and nitrogen elemental and isotopic patterns in macrofungal sporocarps and trees in semi-arid forests of the southwestern USA. *Functional Ecology* 20, 42-51
- Selmants, PC**, SC Hart, SI Boyle, and JM Stark (2005) Red alder (*Alnus rubra*) alters community-level soil microbial function in conifer forests of the Pacific Northwest, USA. *Soil Biology and Biochemistry* 37, 1860-1868
- Selmants, PC** and DH Knight (2003) Understory species composition 30-50 years after clearcutting of coniferous forests in southeastern Wyoming. *Forest Ecology and Management* 185, 275-289
- Book Chapters:
- Pasari, JR, **PC Selmants**, H Young, J O'Leary, and ES Zavaleta (2011) Nitrogen Enrichment. Pages 488-492 in *Encyclopedia of Biological Invasions*, D. Simberloff and M. Rejmanek (Eds.). University of California Press, Berkeley, CA

**Selmants, PC**, A Elseroad, and SC Hart (2003) Soils and Nutrients. In: *Ecological Restoration of Southwestern Ponderosa Pine Forests*, P. Friederici (Ed.). Island Press, Washington, DC

## TEACHING

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Mentoring and Advising:

- 2014 Undergraduate student Anthony Tornito (University of Guam) **NSF-PIPES independent research project mentor**. The influence of rising temperature on leaf area index of tropical montane wet forests in Hawaii.
- 2014 Undergraduate student Denis Sene (UH Manoa). **NSF-PIPES independent research project mentor**. Litterfall from mature *Metrosideros polymorpha* trees across a mean annual temperature gradient in Hawaiian montane wet forests.
- 2012 Undergraduate student Lori Bothwell (UH Hilo). **NSF-PIPES independent research project mentor**. Leaf litter decomposition in tropical wet forests along a mean annual temperature gradient. Manuscript in review at *PeerJ*.
- 2011 Undergraduate student Elise Rheiner (UC Santa Cruz). **Environmental Studies independent research project mentor**. Germination of the invasive grass *Lolium multiflorum* on serpentine and non-serpentine soil.
- 2010 Undergraduate student Matt Meckel (UC Santa Cruz). **Ecology & Evolutionary Biology independent research project mentor**. Influence of seed size on germination rates of native annual and perennial serpentine grassland species.
- 2010 Undergraduate student Rebecca John (UC Santa Cruz). **Environmental Studies senior thesis adviser**. Do leaf traits predict decomposition rates of native annual and perennial serpentine grassland species?

Full Courses:

- 2015 **Instructor, Science Writing and Communication** (CBES 694), University of Hawaii at Hilo. New course developed for TCBS graduate program, to be taught Spring 2015.
- 2008 **Instructor, Principles of Ecosystem Ecology** (BIO/FOR 479), Northern Arizona University. Designed and co-instructed with Paul Dijkstra.
- 2003 **Instructor, Sustainable Forestry** (FOR 298), Northern Arizona University. New course developed and co-instructed with Dylan Fischer and Jill Clifton.
- 1998 **Teaching Assistant, Introductory Biology Laboratory** (BIO 1010), University of Wyoming. Introductory Biology for non-majors.
- 1997 **Director, Forfar Field Station**, Andros Island, Bahamas. Field instructor/group leader: island biogeography, plant communities, medicinal/economic botany.

Guest Lectures:

- 2014 'Climate change and forest carbon balance', General Ecology (BIO 281), University of Hawaii at Hilo. Course Instructor, Rebecca Ostertag.
- 2013 'Ecosystems and biogeochemistry', Principles of Conservation Biology & Environmental Science (CBES 600), University of Hawaii at Hilo. Course Instructor, Rebecca Ostertag.
- 2012 'Biodiversity and ecosystem functioning', Ecosystem Ecology (NREM 680), University of Hawaii at Manoa. Course Instructor, Creighton M. Litton.
- 2007 'Phosphorus and micronutrients', Ecology and Management of Forest Soils (FOR 213), Northern Arizona University. Course Instructor, Steve Hart.
- 2006 'Acidity and salinity', Ecology and Management of Forest Soils (FOR 213), Northern Arizona University. Course Instructor, Steve Hart.

- 2006 'Plant nutrient use', Principles of Ecosystem Ecology (BIO/FOR 479) Northern Arizona University. Course Instructors, Bruce Hungate and Steve Hart.
- 2002 'Ecological water relations', Ecology (BIO 326), Northern Arizona University. Course Instructor, Nancy Collins Johnson.
- 2002 'Biological nitrogen fixation', Ecology and Management of Forest Soils (FOR 213), Northern Arizona University. Course Instructor, Steve Hart.
- 1999 'Ordination and Community Analysis', Vegetation Ecology (BOT 5700), University of Wyoming. Course Instructor, Dennis Knight.

## PRESENTATIONS

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### Invited Talks:

- Carbon cycling and storage along a mean annual temperature gradient: how will Hawaiian native wet forests respond to climate change? University of Hawaii at Hilo, October 2012.
- Incorporating realism into a biodiversity-ecosystem functioning experiment. University of Hawaii at Manoa, May 2012.
- Nutrient cycling and soil development: Does the Walker and Syers model apply to semiarid ecosystems? University of California, Merced, February 2009.
- Biogeochemical cycling during soil development: Does the Walker and Syers model apply to semiarid ecosystems? University of California, Santa Cruz, October 2008.

### Contributed talks & posters (first author):

- Soil bacterial communities are resistant to rising temperature in Hawaiian montane wet forests (talk) Ecological Society of America Annual Meeting, August 2014.
- Baseline and projected future carbon stocks and fluxes in terrestrial ecosystems of Hawaii (talk) Hawaii Conservation Conference, July 2014.
- Ecosystem carbon storage does not vary across a 5.2°C mean annual temperature gradient in Hawaiian tropical montane wet forests (talk) Ecological Society of America Annual Meeting, August 2012.
- Carbon cycling and storage along a mean annual temperature gradient in Hawaiian wet tropical forests (talk) Hawaii Ecosystems Meeting, July 2012.
- Realistic species losses reduce nitrogen uptake and nitrogen use efficiency in a California serpentine grassland (talk) Ecological Society of America annual meeting, August 2011.
- Foliar chemistry governs the abundance and activity of soil chemoautotrophs: indirect genetic interactions across three domains of life (talk) 8<sup>th</sup> Annual Stanford/UC Santa Cruz Species Interaction Workshop, December 2010.
- Realistic species losses disproportionately reduce productivity in a California serpentine grassland (talk) Ecological Society of America annual meeting, August 2010.
- Indirect genetic effects of a foundation tree species on the abundance and activity of soil ammonia oxidizers (talk) Ecological Society of America Annual Meeting, August 2009.
- Surface soil phosphorus dynamics along a three million year volcanic substrate age gradient in northern Arizona (talk) Ecological Society of America annual meeting, August 2006.
- Carbon, nitrogen, and phosphorus dynamics along a three million year volcanic soil age gradient in northern Arizona (talk) Ecological Society of America annual meeting, August 2005.
- Nitrogen cycling across an Arizona semiarid woodland soil chronosequence (poster) Ecological Society of America Annual Meeting, August 2003.
- Red alder (*Alnus rubra*) alters community-level soil microbial function in conifer forests of the Pacific Northwest (poster) Soil Science Society of America annual meeting, November 2002.

Understory plant species composition 30–50 years after clearcutting coniferous forests of southeastern Wyoming (poster) Ecological Society of America Annual Meeting, August 1999.

## WORKING GROUPS

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2014 USGS Carbon Assessment of Hawaii. Funded Contributor.

2013 Ecology of tropical montane forests, NSF Research Coordination Network. Participant.

## SERVICE

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2013 *ad-hoc* reviewer, NSF Division of Environmental Biology – Population & Community Ecology Program

2013 Panel Reviewer, U.S. Department of Energy Terrestrial Ecosystem Science Program

2012 Presider, Contributed Oral Session at Ecological Society of America Annual Meeting

2012 Associate Faculty Member, F1000 (f1000.com)

2011 Coordinator and Presider, 5<sup>th</sup> Biennial UC Santa Cruz Plant Research Symposium

2011 Internal reviewer for Stanford University Synchrotron Radiation Light Source (SSRL)

2009 *ad-hoc* reviewer, NSF Division of Environmental Biology – Ecosystem Science Program

Peer reviewer for: *Biogeochemistry*, *Ecological Applications*, *Ecology*, *Ecology Letters*, *Forest Ecology and Management*, *Functional Ecology*, *Isotopes in Environmental and Health Studies*, *Journal of Applied Ecology*, *Journal of the Royal Society Interface*, *Oecologia*, *Plant Ecology & Diversity*, *PLOS One*, *Soil Biology and Biochemistry*, *Soil Science Society of America Journal*.

## PROFESSIONAL MEMBERSHIPS

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American Geophysical Union

Ecological Society of America

Soil Science Society of America

## OTHER EXPERIENCE

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Climb Aloha certified tree climber

OMC certified outboard engine mechanic

PADI certified rescue diver