

SAMUEL B. ST. CLAIR

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RESEARCH INTERESTS

community ecology, plant physiological ecology; plant invasions; herbivory and plant defense; plant and ecosystem responses to climate change; fire ecology; pollination

EDUCATION

Ecological and Molecular Plant Physiology, Penn State University, Ph.D (2004)
Botany, Brigham Young University, M.S. (1999)
Botany, Brigham Young University, B.S. (1998)
Statistics, Brigham Young University, Minor (1998)
Spanish, Brigham Young University, Minor (1998)

PROFESSIONAL EXPERIENCE

Associate Professor, Dept. of Plant & Wildlife Sciences, Brigham Young University (2013-present)
Assistant Professor, Dept. of Plant & Wildlife Sciences, Brigham Young University (2007-2013)
Postdoctoral Researcher, University of California Berkeley (2005-2007)
Postdoctoral Researcher, Stanford University, Carnegie Institution of Washington (2004-2005)

AWARDS AND SERVICE

Brigham Young University Endowed Young Scholar Award (\$25,000) (2014-2017)
Karl and Mollie Butler Endowed Young Scholar Award (\$25,000) (2013-2016)
BYU College of Life Sciences Outstanding Research Award (\$3000) (2016)
BYU Plant and Wildlife Sciences Dept. Outstanding Research Award (\$1000) (2018)
Associate Editor: *Forest Ecology and Management* (2018-present)
Associate Editor: *Rangeland Ecology and Management* (2011-2015)
Associate Editor: *PLoS ONE* (2011-2015)
Guest Editor: special issue on aspen forests, *Forest Ecology & Management* (July 2013)
Member of the University Faculty Advisory Committee (Faculty Senate) (2011-2014)
Plant and Wildlife Sciences Department Executive Committee Member (2015-present)
Chair of BYU Environmental Science program (2015-present)
Chair of the Roger Sant Endowment for a Sustainable Environment
Chair of the Science Advisory Panel for the Western Aspen Alliance (2009-2014)
Faculty: National Fire Institute; Tucson, AZ (held annually)

Study Abroad Program Director: Ecuador (2014), Australia-NZ-Fiji (2016), Africa (2017), Ecuador/Peru (2018)

PUBLICATIONS (73 peer-reviewed publications, 1490 Google Scholar citations)

*graduate (46) and #undergraduate (20) co-authorships mentored in the St. Clair lab

Bishop T, Munson S, Gill R, Belnap J, St. Clair SB (2019) Spatiotemporal patterns of cheatgrass invasion in the Colorado Plateau National Parks. *Landscape Ecology*, in review

*Maxwell J, Rhodes A, St. Clair SB (2019) Human altered disturbance patterns and forest succession: impacts of ungulate herbivory and competition. *Oecologia*, in review

St. Clair SB, *Bishop T (2019) Loss of biotic resistance and high propagule pressure promote invasive grass-fire cycles. *Journal of Ecology*, accepted.

*Day J, #Birrell J, #Terry T, St. Clair SB (2019) Comparisons of invertebrate community responses to fire and rodent activity in the Mojave and Great Basin deserts. *Ecology and Evolution*, accepted pending revision.

*Rhodes A, #Fitch C, St. Clair SB (2019) Ungulate herbivory is correlated with reductions in aspen growth rates and recruitment. *Rangeland Ecology and Management*, accepted.

*Maxwell J, #Call A, St. Clair SB (2019) Wildfire and topography impacts on snow accumulation and retention in montane forests. *Forest Ecology and Management* 432: 256-263

*Horn KJ et al. (2018) Varying responses of 94 tree species to nitrogen and sulfur deposition across the conterminous U.S. PLoS ONE, 13: 1-19 e0205296

*Rhodes A, Larsen R, *Maxwell J, St. Clair SB (2018) Temporal patterns of ungulate herbivory and phenology of aspen regeneration and defense. *Oecologia*, 188:707-719

*Call A, St. Clair SB (2018). Timing and mode of simulated ungulate herbivory alter aspen defense strategies. *Tree Physiology* 38: 1476-1485

*Day J, *Bishop T, St. Clair SB (2018) Fire and rodents alter ant community abundance and diversity in a semi-arid desert. *Ecosphere*: 9(7): 1-14, e02344.

Gill R, *O'Connor R, *Rhodes A, *Bishop T, Laughlin D. St. Clair SB (2018) Niche opportunities for invasive annual plants in dryland ecosystems are controlled by disturbance, trophic interactions, and rainfall. *Oecologia* 187: 755-765.

*Rhodes A, Larsen R, *Maxwell J, St. Clair SB (2018) Differential effects of cattle, mule deer, and elk herbivory on forest regeneration and recruitment. *Forest Ecology and Management* 422: 273-280.

*Rhodes A and St. Clair SB (2018) Measures of browse damage and ungulate abundance to quantify impacts on aspen forest regeneration. *Ecological Indicators* 89: 648-655.

- St. Clair SB and Hoines J (2018) Reproductive ecology and stand structure of Joshua tree forests across climate gradients of the Mojave Desert. *PloS ONE* e0193248 13: 1-14.
- Heroy K, St. Clair SB, Rogers PC, Villalba JJ (2018). The influence of the foodscape on quaking aspen stand condition and use by ungulates. *International Journal of Forest Animal and Fisheries Research* 2: 50-63.
- Heroy K, St. Clair SB, Burrit B, Durham S, Villalba J (2018) Nutritional state and secondary compounds influence trembling aspen (*Populus tremuloides*) intake by lambs. *Applied Animal Behavior Science*: 206: 39-51.
- *Horn KJ and St. Clair SB (2017) Wildfire and exotic grass invasion alter plant productivity in response to climate variability in the Mojave Desert. *Landscape Ecology* 32: 635-646.
- *Horn KJ, *Bishop T, St. Clair SB (2017) Precipitation timing and soil heterogeneity regulate the invasion potential of red brome. *Biological Invasions* 19: 1339-1350.
- *Sharp Bowman T, McMillan B, St. Clair SB (2017) Rodent herbivory differentially affects mortality rates of 14 native plant species with contrasting life history and growth form traits. *Oecologia* 186: 465-473
- *Call A and St. Clair SB (2017) Outbreak of Drepanopeziza fungus in aspen forest and variation in stand susceptibility: leaf functional traits, compensatory growth and phenology *Tree Physiology* 37: 1198-1207
- *Rhodes AC, Anderson V, St. Clair SB (2017) Ungulate herbivory alters leaf functional traits and recruitment of regenerating aspen. *Tree Physiology* 37: 402-413.
- *Rhodes AC and St. Clair SB (2017) Herbivory impacts of elk, deer and cattle on aspen forest recruitment along gradients of stand composition, topography and climate *Forest Ecology and Management* 397: 39-47.
- *Sharp Bowman T, McMillan B, St. Clair SB (2017) Rodent herbivory and fire differentially affect plant species recruitment based on variability in life history traits *Ecosphere* e02016 8 (12): 1-10.
- *Sharp Bowman T, McMillan B, St. Clair SB (2017) A comparison of the effects of fire on rodent abundance and diversity in the Great Basin and Mojave Deserts. *PLoS ONE* e0187740 12 (11): 1-12
- *Lybbert A, St. Clair SB (2017) Wildfire and floral herbivory alter reproduction and pollinator mutualisms of Yuccas and Yucca Moths. *Journal of Plant Ecology* 10: 851-858.
- *Lybbert A, #Taylor J, #Defranco A, St. Clair SB (2017) Reproductive success of wind, generalist, and specialist pollinated plant species following wildfire in desert landscapes. *International Journal of Wildland Fire* 26: 1030-1039
- Heroy K, St. Clair SB, Burrit B, Villalba J (2017) Plant community chemical composition influences Trembling Aspen (*Populus Tremuloides*) intake by sheep *Journal of Chemical Ecology* 43: 817-830.
- St. Clair SB, *O'Connor R, Gill R, McMillan B (2016) Biotic resistance and disturbance: rodent consumers regulate post-fire plant invasions and increase plant community diversity. *Ecology* 97: 1700-1711.

*Rhodes AC, #Barney T, St. Clair SB (2016) Stand composition, tree proximity and size have minimal effects on leaf function of coexisting aspen and subalpine fir. PLoS ONE 11(4): 1-12.

Rogers PC, St. Clair SB (2016) Quaking Aspen in Utah: Integrating Recent Science with Management. Rangelands 38: 266-272.

Chambers J., Germino M., Belnap J., Brown C., Schupp E., St. Clair SB (2016) Plant community resistance to invasion by *Bromus* species- the roles of community attributes. In Exotic brome grasses in arid and semi arid ecosystem of the western US: causes, consequences and management implications (eds: Germino, Chambers, Brown). Springer.

*Horn K, #Wilkinson J, #White S, St. Clair SB (2015). Desert wildfire impacts on plant community function. Plant Ecology 216: 1623-1634.

*Horn K, #Nettles R, St. Clair SB (2015). Germination response to temperature and moisture to predict distributions of the invasive grass red brome and wildfire. Biological Invasions 17: 1849-1857.

Villalba J, Burritt E, St. Clair SB. (2014) Aspen (*Populus tremuloides* Michx.) Intake and preference by mammalian herbivores: the role of plant secondary compounds and nutritional context. Journal of Chemical Ecology, 40: 1135-1145.

*Wan HY, *Rhodes A, St. Clair SB (2014) Fire severity alters plant regeneration patterns and defense against herbivores in mixed forests. Oikos 123: 1479-1488.

*Wan HY, #Olson A, #Muncey K, St. Clair SB (2014) Legacy effects of fire severity and size on forest regeneration, recruitment and wildlife activity in aspen forests. Forest Ecology and Management 329: 59-68.

*Buck J, St. Clair SB (2014) Stand composition, proximity to overstory trees and gradients of soil moisture influence patterns of subalpine fir seedling emergence and survival. Plant and Soil 381: 61-70.

St. Clair SB, Cavard X, Bergeron Y (2013) The role of facilitation and competition in the development and resilience of aspen forests. Forest Ecology and Management 299: 91-99.

Seager T, Eisenberg C, St. Clair SB (2013) Patterns and consequences of ungulate herbivory in aspen forests of North America. Forest Ecology and Management 299: 81-90.

Lindroth R, St. Clair SB (2013) Adaptation of quaking aspen (*Populus tremuloides*) for defense against herbivores. Forest Ecology and Management 299:14-21.

Rogers PC, Eisenberg C, St. Clair SB. (2013) Resilience in quaking aspen: recent advances and future needs. Forest Ecology and Management 299:1-5.

*Buck J, St. Clair SB (2012) Aspen increases soil moisture, nutrients, organic matter and respiration in Rocky Mountain forest communities. PLoS ONE 7(12) e52369.

- Sudderth E, St.Clair SB et al. (2012) Sensitivity of resource pools and fluxes to dry periods under low and high rain treatments. *Ecosphere* 3 (8): 70.
- *Calder WJ, St.Clair SB. (2012) Facilitation drives mortality patterns on succession gradients of aspen-conifer forests. *Ecosphere* 3 (6): 57.
- *Horn K, McMillan B & St.Clair SB (2012) Expansive fire in Mojave Desert reduces small mammal abundance & diversity. *Journal of Arid Environments* 77: 54-58.
- Salve R, Sudderth E, St. Clair SB and Torn M (2011) Effect of grassland vegetation type on the response of hydrological processes to seasonal precipitation patterns. *Journal of Hydrology* 410: 51-61.
- *Calder W, *Horn K and St. Clair SB (2011) Conifer expansion compromises the competitive ability and herbivore defense of aspen by modifying light environment and soil chemistry. *Tree Physiology* 31: 582-591.
- *Smith E, #Collette S, #Boynton T, #Lillrose T, Stevens M, Bekker M, Eggett D, St. Clair SB (2011). Developmental contributions to phenotypic variation in functional leaf traits within quaking aspen clones. *Tree Physiology* 31: 68-77.
- #Clark A, and St. Clair SB (2011) Mycorrhizas and secondary succession in aspen-conifer forests: light limitation differentially affects a dominant early and late successional species. *Forest Ecology and Management* 262:203-207.
- * Smith E, #O'loughlin D, #Buck J, St.Clair SB (2011) The influences of conifer succession, physiographic conditions and herbivory on quaking aspen regeneration after fire. *Forest Ecology and Management* 262: 325-330.
- Swarbreck S, Sudderth E, St. Clair SB, Salve R, Castanha C, Torn M, Ackerly D, Anderson G (2011) Linking leaf transcripts levels to whole plant analysis provides mechanistic insights to the impact of warming and altered water availability in an annual grass. *Global Change Biology* 17: 1577-1594.
- St.Clair SB and Lynch JP (2010). The opening of Pandora's Box: climate change impacts on soil fertility and crop nutrition in developing countries. *Plant and Soil* 335: 101-115. Invited paper.
- *Calder W, #Lifferth G, Moritz M and St.Clair SB (2010) Physiological effects of smoke exposure on deciduous and evergreen tree species. *International Journal of Forest Research* 438930: 1-7.
- St. Clair SB, Mock K, Lamalfa E, Campbell R and Ryel R (2010) Genetic contributions to phenotypic variation in physiology, growth and vigor of aspen (*Populus tremuloides*) clones. *Forest Science* 56: 222-230.
- Currit N and St.Clair SB (2010) Assessing the impact of extreme climatic events on aspen defoliation using MODIS imagery. *Geocarto International* 25: 133-147.
- St.Clair SB, Guyon J and Donaldson J (2010) Quaking aspen's current and future status in western North America: the role of succession, climate, biotic agents and its clonal nature. *Progress in Botany* 71: 371-400. Commissioned review.
- St.Clair SB, #Monson S, #Smith E, # Cahill D and *Calder W (2009) Altered leaf morphology, leaf resource dilution and defense chemistry induction in frost-defoliated aspen (*Populus tremuloides*). *Tree Physiology* 29: 1259-1268.
- St.Clair SB, Sudderth E, Fischer M, Torn M, Stuart S, Salve R, Eggett D and

- Ackerly D (2009) Soil drying and nitrogen availability modulate carbon and water exchange over a range of annual precipitation totals and grassland community types. *Global Change Biology* 15: 3018-3030.
- St.Clair SB, Sudderth E, Castanha C, Torn M and Ackerly D (2009) Plant response to variation in precipitation and nitrogen is consistent across the diversity of a California annual grassland. *Journal of Vegetation Science* 20: 860-870.
- Thayer SS, St.Clair SB, Somerville S and Field CB (2008) Accentuation of phosphorus limitation by nitrogen deposition in *Geranium dissectum*: an ecological genomics study. *Global Change Biology* 14: 1877-1890.
- St.Clair SB, Sharpe WE and Lynch JP (2008) Key interactions between nutrient limitation and climatic factors in temperate forests: a synthesis of the sugar maple literature. *Canadian Journal of Forest Research* 38: 401-414.
- Wullschlegel SD, Leakey A and St. Clair SB (2007) Functional genomics and ecology: a tale of two scales. *New Phytologist* 176: 735-739.
- St.Clair LL, Johansen JR, St.Clair SB and Knight KB (2007) The influence of grazing and abiotic factors on vascular plant and lichen community structure along an alpine tundra ridge in the Uinta Mountains, Utah, USA. *Arctic, Antarctic and Alpine Research* 39: 603-613.
- St.Clair SB and Lynch JP (2007) The differential success of sugar maple and red maple seedlings on acid soils is influenced by nutrient dynamics and light environment. In Adjustment of photosynthetic processes of plants and cells to light environment, ed. Tom Sharkey. *Plant, Cell and Environment* 30 virtual issue.
- St.Clair SB, Carlson JE and Lynch JP. (2005) Evidence for oxidative stress in sugar maple stands on acidic, nutrient imbalanced forest soils. *Oecologia* 145: 258-269.
- St.Clair SB and Lynch JP (2005) The differential success of sugar maple and red maple seedlings on acid soils is influenced by nutrient dynamics and light environment. *Plant, Cell and Environment* 28: 874-885.
- St.Clair SB and Lynch JP (2005) Base cation stimulation of mycorrhization and photosynthesis of sugar maple on acid soils are coupled by foliar nutrient dynamics. *New Phytologist* 165: 581-590.
- St.Clair SB and Lynch JP (2005) Element accumulation patterns of deciduous and evergreen tree seedlings on acid soils and its implications for sensitivity to manganese toxicity. *Tree Physiology* 25: 85-92.
- St.Clair SB and Lynch JP (2004) Photosynthetic and antioxidant enzyme responses of sugar maple and red maple to excess manganese in contrasting light environments. *Functional Plant Biology* 31: 1005-1014.

- Lynch JP and St.Clair SB (2004) Mineral stress: the missing link in understanding how global climate change will affect plants in real world soils. *Field Crops Research* 90: 101-115.
- St.Clair SB, Sharpe WE and Lynch JP (2003) Excess manganese reduces chlorophyll in sugar maple leaves. *Maple Syrup Digest* 15: 28-31.
- St.Clair SB, St.Clair LL, Mangelson NF and Weber DJ (2002) Influence of growth form on the accumulation of airborne copper by lichens. *Atmospheric Environment* 36: 5637-5644.
- St.Clair SB, St.Clair LL, Mangelson NF, Weber DJ and Eggett DL (2002) Element accumulation patterns in foliose and fruticose lichens from rock and bark substrates in Arizona. *Bryologist* 105: 415-421.
- St.Clair SB, Cooper LS, Stewart LJ, Newberry CC and St.Clair LL (1998). The lichen flora of Stony Pass, an alpine tundra site in southwestern Colorado. *In* Lichenographia Thomsoniana: North American Lichenology eds. Glenn M, Cole M, Dirig R, Harris R, pp. 315-322. Ithaca NY.

INVITED SEMINARS (60)

- St. Clair SB. Aspen in urban ecosystems. Green Conference. Sandy, UT Jan. 2018.
- St. Clair SB. Aspen Ecology. Green Conference. Sandy, UT Jan. 2018.
- St. Clair SB. Fire frequency in forest systems. Fire in Ecosystem Management, National Advanced Fire Institute; Tucson, AZ., Jan. 2017.
- St. Clair SB. Fire and plant invasions. Advanced Fire Effects, National Advanced Fire Institute; Tucson, AZ., Jan. 2017.
- St. Clair SB. The role of fire in mediating herbivory impacts in forests. Flagstaff, AZ Sept 2017
- St. Clair SB. Aspen forest ecology. Six county field tour with Governor Herbert and politicians. Richfield, Ut July 2017.
- St. Clair SB. Aspen in the Intermountain West. Center for Change. Orem, Utah, June 2017.
- St. Clair SB. Managing aspen in the western US. Utah BLM Research Group. Price, Utah May 2017.
- St. Clair SB. Management of ungulate herbivory in aspen forests. Watershed Restoration Initiative Conference. Richfield, Utah, May 2017.
- St. Clair SB. The role of herbivory and fire in the ecology of earth's ecosystems. Utah Valley University. Department of Biology. Orem, Utah. February 2017.
- St. Clair SB. Indirect effects of climate on regeneration of aspen forests mediated through ungulate herbivory and wildfire. Restoring the West Conference. Utah State University, Logan UT October 2016
- St. Clair SB. *Keynote Speaker*: The role of consumers in plant community stability.

Forage and Range Research Conference. Salt Lake City, UT. September 2016

St. Clair SB. Constraints to successful aspen regeneration in Utah Forests. Utah Division Forestry, Fire and State Lands. Richfield UT. July 2016

St. Clair SB. *Keynote Speaker*: Aspen ecology in Utah's urban and montane forests. Utah Association of Urban Forestry. Provo UT. April 2016.

St. Clair SB. Fire ecology in aspen-conifer forests. Advanced Fire Effects, National Advanced Fire Institute; Tucson, AZ., Jan. 2016.

St. Clair SB. Climate-driven invasive grass regimes in deserts: role of precipitation and rodents. Great Basin Climate Forum. Elko Nevada, December 2015.

Rhodes A, St. Clair SB. Seasonal Timing of Aspen Herbivory on aspen forests. Utah Forest Restoration Group, Salt Lake City Utah. Nov. 2015.

Rhodes A, St. Clair SB. Monitoring regeneration of aspen on Monroe Mountain, UT. Monroe Mountain Working Group. Richfield Utah. Oct. 2015

St. Clair SB. Patterns and consequences of ungulate herbivory in aspen forests. Society of Range Management, Moab Utah, November 2015.

Rhodes A, St. Clair SB. Differential and Additive effects of Mule Deer, Elk, and Cattle on aspen regeneration after fire. Utah Society for Range Management. Logan, Utah April 2015.

St. Clair SB. Small mammal and fire effects on plant invasions. Umea University. Umea Sweden, April. 2015.

St. Clair SB. Herbivory in aspen forests. Swedish National University. Umea Sweden, April. 2015.

St. Clair SB. Herbivory in aspen forests. Wolf Creek Ranch Home Owners Association, Heber City, Utah, July 2015.

St. Clair SB. Herbivory in forests. Webinar for the Western Aspen Alliance. Mar. 2014.

St. Clair SB. Ungulate herbivory patterns in aspen-conifer forests. Orem Public Library Lecture. Orem, Utah, May 2014.

Rhodes A, St. Clair SB. Fire Regimes in forests. Santiago, Chile, December 2014

St. Clair SB. Functional Ecology in aspen-conifer forests. Western International Forest Disease Work Conference. Cedar City, Utah, Sept. 2014.

Wan HY, St. Clair SB. Fire modifies herbivory patterns in forests of North America. Western International Forest Disease Conference. Cedar City, Utah, Sept. 2014.

Rhodes A, St. Clair SB. Ungulate herbivory patterns in aspen-conifer forests. Western International Forest Disease Work Conference. Cedar City, Utah, Sept. 2014.

St. Clair SB. Fire ecology in aspen-conifer forests. Advanced Fire Effects, National Advanced Fire Institute; Tucson, AZ., Jan. 2014.

St. Clair SB. Interactions of fire and herbivory in aspen forests. Utah Forest Restoration Working Group. Salt Lake City, Ut. Dec. 2013.

Rhodes A, St. Clair SB. Investigating the impact of ungulate herbivory in intact aspen stands. Utah Department of Natural Resources. Salt Lake City, Utah Dec. 2013.

St. Clair SB. Wildlife herbivory in post-fire landscapes. Utah Division of Wildlife Resources Seminar Series. Salt Lake City, Ut. Dec. 2013.

St. Clair SB. Fire ecology in Utah's forests. Department of Chemical Engineering,

- Brigham Young University. Nov. 2013.
- St. Clair SB. Integrating science research into the curriculum. Alpine School District, Highland Ut. October 2013.
- St. Clair SB. Fire ecology in North American Deserts. US Department of Agriculture NIFA, Rangeland Program. Oklahoma City, Ok. Feb. 2013
- St. Clair SB. Effects of plant invasion and fire in the Great Basin Desert. Bureau of Land Management. Salt Lake City, Ut. April 2013.
- St. Clair SB. Pollination biology in the changing Mojave Desert. Desert Ecology Workshop. Washington Co. Ut. April 2013.
- St. Clair SB. The effects of invasive grass fires on pollination success in deserts. College of Life Sciences, Brigham Young University, Provo, Ut. Nov. 2012
- St. Clair SB. Facilitation and competition in aspen forests. Symposium: Resilience in aspen forests. Debeque, CO. June 2012.
- Lindroth, R and St. Clair SB. Herbivore defense strategies in aspen. Symposium: Resilience in aspen forests. Debeque, CO. June 2012.
- St. Clair SB. Quaking aspen defense strategies against herbivores and pathogens. Society of Ecological Restoration Meeting. Ephraim UT. June 2012
- St. Clair SB. Responses of aspen forests to fire regimes and herbivory. Utah Bureau of Land Management Fire and Fuels Workshop. Torrey UT, May 2012.
- St. Clair SB. Wildlife impacts on aspen forests. Utah Division of Wildlife Resources Research Conference, Midway UT, April 2012
- St. Clair SB. Resilience of Utah's forest and desert communities to altered fire cycles. Wildland Resources Department, Utah State University, February 2012.
- St. Clair SB. Aspen resilience to large mammal browsing and its ecological implications for aspen forests. Monroe Mountain Working Group. Richfield UT, February 2012
- St. Clair SB. The role of facilitation and competition in driving successional changes in aspen forests. Regional meeting of the Fishlake, Dixie and Manti-Lasal National Forest. Richfield, Utah, January 2012
- St. Clair SB. The opening of Pandora's Box: climate change impacts on soil fertility and crop nutrition in developing countries. International Symposium: Improving nutrient management for food production and reduced environmental impacts. Bhubaneswar, India, November 2009
- St. Clair SB. Drivers of change in western aspen. Intermountain Native Plant Summit, Boise Idaho, March 2009.
- Horn K, and St. Clair SB. Consequences of an emerging plant invasion-fire cycle in the Mojave Desert. Intermountain Native Plant Summit, Boise Idaho, March 2009.
- St. Clair SB. The physiological ecology of aspen-conifer interactions in the Intermountain West. Restoring the West Conference, Logan UT, September 2008
- St. Clair SB. Nutrient limitation: the missing link in understanding plant response to climate change. Brigham Young University, Plant and Animal Sciences, Oct. 2006.
- St. Clair SB. Nutrient limitation: unraveling plant responses to climate change. Texas Tech University, Department of Biology, November 2006.
- St. Clair SB. Nutrient limitation: unraveling plant responses to climate change. Kansas State University, Division of Biology, October 2006.

St.Clair SB. Mineral stress: the missing link in understanding how plants respond to environmental change. UC Berkeley, Integrative Biology Department, May 2005.
St.Clair SB. The differential success of maples on acid soils. University of Vermont, School of Forest Resources. March 2005
St.Clair SB. Evidence for oxidative stress as a mechanism underlying sugar maple sensitivity to edaphic stress. Stanford University, Carnegie Institution of Washington, Department of Plant Biology, August 2004.

St.Clair SB. The role of nutrient-climate interactions in understanding compositional shifts

in maple species in the eastern deciduous forest. University of Illinois Urbana-Champaign, Department of Plant Biology, August 2004.

St.Clair SB. Key interactions between nutrient limitation and climatic factors in forests. Brigham Young University, Integrative Biology Department, April 2004.

St.Clair SB. Base cation stimulation of mycorrhization and photosynthesis of maples are coupled by foliar nutrient status. Penn State University, Intercollegiate Ecology Seminar, October 2003.

MEETING PRESENTATIONS (71 since 2007) (*grad, # undergrad in St.Clair lab)

*Stanton R and St. Clair SB. Drivers of desert communities: post fire seedling folivory preference of rodents. Ecological Society of America Annual Meeting. New Orleans, LA August 2018

*Terry T and St. Clair SB. Climate change in the sagebrush steppe region: a seed perspective. Ecological Society of America Annual Meeting. New Orleans, LA August 2018

#Nusink B, Bishop T, #Lee R and St. Clair SB. Competition between invasive and native desert plants. Ecological Society of America Annual Meeting. New Orleans, LA August 2018

#Lee R, *Bishop T, St. Clair SB. Effects of fire and consumers on plants invasions in the Mojave Desert. Ecological Society of America Annual Meeting. New Orleans, LA August 2018

*Bishop T, Munson S, Gill R, Belnap J and St. Clair SB. Spatiotemporal patterns of cheatgrass invasion in the Colorado Plateau National Parks. Ecological Society of America Annual Meeting. New Orleans, LA August 2018

*Maxwell J and St. Clair SB. Topography alters wildfire impacts on snowpack characteristics in montane forests Ecological Society of America Annual Meeting. New Orleans, LA August 2018

*Rhodes A and St.Clair SB. Ungulate herbivory alters leaf functional traits and recruitment of regenerating aspen Ecological Society of America Annual Meeting. Portland OR, August 2017

- *Rhodes A and St. Clair SB. Ungulate herbivory alters leaf functional traits and recruitment and growth of aspen. Society of Range Management Annual Meeting St. George, Utah. December 2017.
- *Rhodes A and St. Clair SB. Herbivory impacts of elk, deer and cattle in aspen forests. 10th International Rangeland Congress. Saskatoon Canada August 2016.
- St. Clair SB and T Bishop. The role of consumers in plants invasions. Ecological Society of America Annual Meeting. Portland OR, August 2017
- *Call AC, St. Clair SB. *Populus Tremuloides* and *Drepanopeziza*: Patterns, phytochemistry, and phenology. 14th Biennial Conference of Science and Management, Flagstaff, AZ, August 2017.
- *Call AC, St. Clair SB. Aspen and *Drepanopeziza*: Patterns, phytochemistry, and phenology. ESA Annual Meeting, August 2017. Contributed Oral Session 144: "Species Interactions III." Abstract #66296
- *Maxwell J.D. and St. Clair, Samuel B. Forest Fires alter Snow-Water Resources. NSF EPSCOR 2017 meeting. Poster Presentation to be delivered in Missoula Montana, November 2017.
- *Maxwell J.D., Rhodes, Aaron, and St. Clair, Samuel B. Impacts of Herbivory, Forest Composition, Aspect, and Climate on Stable Aspen Forest Regeneration. Ecological Society of America Conference. Oral Presentation presented in Portland Oregon August, 2017.
- *Maxwell J.D., Rhodes, Aaron, and St. Clair, Samuel B.. Impacts of Herbivory, Forest Composition, Aspect, and Climate on Stable Aspen Forest Regeneration. Brigham Young University Graduate Conclave. Oral Presentation presented in Provo Utah November, 2016.
- *Maxwell J.D. and St. Clair, Samuel B. Fire disturbance and Snow-Water Resources in the Twitchell Canyon. Restoring the West Conference. Poster Presentation presented in Logan Utah September, 2016
- *Maxwell J.D., Rhodes, Aaron, and St. Clair, Samuel B.. Characterizing Aspen Regeneration by Presence of Ungulates, Topography, and Tree Species Composition. Ecological Society of America Conference. Oral Presentation Presented in Baltimore Maryland August, 2015.
- *Maxwell J.D. and St. Clair, Samuel B. Changing Snowpack across Gradients of Disturbance. All Hands iUTAH EPSCOR Meeting. Oral Presentation presented in Midway Utah, March, 2015.
- *Day, Tara B B Bishop, Samuel B St. Clair. Effects of fire and rodent presence on a semi-arid cold-desert ant community Ecological Society of America Annual Conference, Portland, OR, August 8, 2017
- Heroy, K, Burrit B, St. Clair SB, Villalba (2016). Nutrients and secondary compounds influence trembling aspen (*Populus tremuloides*) intake by sheep. Society of Range Management. Corpus Christi TX.
- *Bishop T and St. Clair SB. Using Hotspot Analysis and Detection of Early Season Invasives (DESI) to analyze the temporal and spatial dynamics of invasive

cheatgrass (*Bromus tectorum*). Ogden Utah 2017.

*Bishop T and St. Clair SB. Detection of Early Season Invasives (DESI) shows that climate and landscape sensitivity controls annual grass density in Utah's National Parks and Monuments. Graduate Research Conclave, BYU Provo, UT 2017.

*Bishop T and St. Clair SB. Changing precipitation patterns and the effect on invasive red brome (*Bromus rubens*) in arid environments. Ecological Society of America 101st Annual Meeting Ft. Lauderdale, FL

*Bishop T and St. Clair SB. Detection of Early Season Invasives (DESI) shows that climate and landscape sensitivity controls annual grass density in Utah's National Parks and Monuments. Ecological Society of America 100th Annual Meeting Baltimore, MD. August 2015.

St. Clair SB, *O'Connor R (2015) Loss of trophic regulation by rodent and disturbance shifts a native plant community to an invaded annual plant community. Ecological Society of America Meeting. Baltimore, Maryland.

*Rhodes A, St. Clair SB (2015) Differential and Additive effects of ungulates on aspen regeneration after fire. Ecological Soc. of America Meeting. Baltimore, Maryland

*Rhodes A, St. Clair SB (2014) Additive effects of Mule Deer, Elk, and Cattle on aspen regeneration after fire. Ecological Society America Meeting. Sacramento, CA.

*Rhodes A, St. Clair SB (2014) Characterizing Aspen Regeneration By Presence of Ungulates, Topography, and Tree Species. IUFRO World Congress, Salt Lake City, Utah

St. Clair SB, *Lybbert A (2013) Disturbance differentially affects plant reproductive success depending on pollination strategy. International Ecology Congress, London England.

*Rhodes A, St. Clair SB (2013) Herbivory by mule deer and cattle suppress aspen basal shoot height and aspen stand resilience Ecological Society of America Meeting. Minneapolis, MN.

St. Clair SB, *Horn K, McMillan B (2012) Fire alters top-down effects of small mammals on Mojave Desert plant communities Ecological Society of America Meeting. Portland, OR.

#Lybbert A, St. Clair SB (2012) Reproductive consequences of fire disturbance on native plant communities in the Mojave Desert. Ecological Society of America Meeting. Portland, OR.

- #Nettles R, *Horn K, St.Clair SB (2012) The effects of temperature and water potential on the germination of *Bromus rubens*. Ecological Society of America Meeting. Portland, OR.
- *Wan HY, St.Clair SB (2012) The effects of fire severity on tolerance and resistance of aspen against ungulate herbivores. Ecological Society of America Meeting. Portland, OR.
- *Horn K, St.Clair SB, Jensen R (2012) Exotic grass invasions in western US desert alters landscape scale response to precipitation and temperature through fire. Ecological Society of America Meeting. Portland, OR.
- *Rhodes A, *Buck JR, St.Clair SB (2012) Aspen facilitates subalpine fir regeneration by increasing germination success. Ecological Society of America. Portland, OR.
- Bahr J, Aanderud Z, St.Clair (2012). Effects of fire and precipitation regime on microbial activity of desert soil crusts. Ecological Society of America Meeting. Portland, OR.
- Aanderud, Z, St.Clair SB, McMillan B, Gill R (2012) Climate driven invasive grass-fire cycles: understanding ecosystem response for effective pre-and post-fire management of Great Basin and Mojave rangelands. Society of Range Management Meetings. Spokane, WA
- Kitchen S, Petersen S, St.Clair SB. Mixed Aspen-Conifer Post-Fire Succession: the Twitchell Canyon Fire as a Long-term, Variable-Severity Case Study (2011) Restoring the West Conference. Logan, UT.
- *Horn K, #Wilkinson J, #White S, St.Clair SB (2011) Fire results in increased physiological vigor for surviving Joshua trees (*Yucca brevifolia*) and creosote bushes (*Larrea tridentata*) in the Mojave Desert. Ecological Society of America Annual Meeting. Austin, TX
- *Buck J, St.Clair SB (2011) Altered disturbance patterns promote facilitated competition in aspen-conifer forest. Ecological Society of American Meeting. Austin, TX.
- #Clark A, St.Clair SB (2011) Mycorrhizas and secondary succession in aspen-conifer forests Ecological Society of American Annual Meeting. Austin, TX.
- Sudderth E, Byrne K, Gherardi L, Placella S, Herman D, St.Clair SB (2011) How do linked plant-soil processes affect ecosystem responses to climate change? Ecological Society of American Annual Meeting. Austin, TX.
- *Horn K, McMillan B, St.Clair SB (2010) Plant invasions and altered fire regimes in the Mojave Desert. American Society of Mammologists, Laramie, WY
- *Horn K, McMillan B, St.Clair SB (2010) Small mammal responses to fire in the Mojave Desert Ecological Society of American Annual Meeting. Pittsburgh, PA.
- *Buck J, St.Clair SB (2010) Impact of aspen on subalpine fir establishment and succession. Ecological Society of American Annual Meeting. Pittsburgh, PA.
- St.Clair SB, *Smith EA 2010. Pre-fire successional status strongly impacts aspen regeneration success following fire. Ecological Society of American Annual Meeting. Pittsburgh, PA.
- St.Clair SB, #Wilkinson J, #White S, *Horn K (2010) Potential for native plant community recovery following fire in the Mojave Desert (poster). Mojave Desert Restoration Workshop. Las Vegas, NV

- St.Clair SB. (2010) Unraveling the aspen paradox. Department of Plant and Wildlife Sciences, Brigham Young University, Utah.
- St.Clair SB (2009) Synthesis talk. Penn State University, Plant Biology Symposium, State College, PA.
- #Carlisle B, Wooley S and St.Clair SB (2009) Impact of aphid feeding galls on cottonwood leaf physiology (poster). UCUR Conference. Salt Lake City, UT
- #Smith, E and St.Clair S (2009) Age related shifts in defense strategies of quaking aspen. UCUR Conference. Salt Lake City, UT
- #Lillrose T, #Smith E, # Ko A, Bekker M and St.Clair SB (2009) Reductions in water uptake and photosynthesis in aging Utah aspen stands. UCUR Conference. Salt Lake City, UT
- #Collette S, #Boynton T, Stevens M and St.Clair SB (2009) Clonal vs. sexual regeneration patterns in Utah aspen. UCUR Conference. Salt Lake City, UT
- #O'loughlin D, #Smith E, *Calder W, Webb B and St.Clair SB (2009) Conifer invasion of aspen modifies soil nitrogen and organic content (poster). UCUR Conference. Salt Lake City, UT
- #Monson S, *Calder W and St.Clair SB (2009) Light availability and soil chemistry influence aspen's defense chemistry. UCUR Conference, Salt Lake City, UT
- Wooley S, #Carlisle B and St.Clair SB (2009) Physiological responses to leaf galling in cottonwood. Cottonwood Symposium, Flagstaff, AZ.
- St.Clair SB, #Monson SD, #Smith EA, #Cahill DG and *Calder WJ (2009) Altered leaf morphology, leaf resource dilution and defense chemistry induction in frost defoliated aspen (poster). PSU Plant Biology Symposium, State College, PA.
- Salve R, Sudderth E, St. Clair SB and Torn M (2009) The impact of precipitation and grassland vegetation on soil moisture dynamics (poster). American Geophysical Union meeting, San Francisco, CA.
- St.Clair SB, Bernard SM, Lunch C and Field CB (2008) Elevated CO₂ and N deposition modulate P acquisition and Rubisco activity in a California annual grassland. American Society of Plant Biologist, Western Section Meeting. Orem, UT.
- Currit, N. and St.Clair SB (2008) Land-cover change due to a late spring frost: A MODIS analysis of the Wasatch Front. Association of American Geographers Annual Meeting, Boston, MA.
- St.Clair SB, #Monson S, #Cahill D, #Smith E, *Calder J and Zou J (2008) Altered leaf morphology and defense chemistry induction in frost damaged trembling aspen. Ecological Society of American Annual Meeting. Milwaukee, WI.
- Sudderth EA, Bernard SM, Placella SA, St. Clair SB, et al. (2008) The effects of changing precipitation on ecosystem function in *Avena barbata* grasslands: linking microbial and plant responses in contrasting soil types. Ecological Society of American Annual Meeting. Milwaukee, WI.
- Bernard SM, St. Clair SB, Sudderth EA, Torn MS, Ackerly DD and Andersen GL (2008) The long-term effects of drought and high temperature on N metabolism in a C₃ grass. American Society of Plant Biologists Annual Meeting. Merida, Mexico.

- Bernard SM, St. Clair SB, Placella S, Firestone M, Salve R, Ackerly DD and Andersen G (2007) A molecular analysis of plant response to global climate change in an annual grassland. Ecological Society of America Annual Meeting. San Jose, CA.
- Bernard SM, St. Clair SB, Placella S, Salve R, Brodie E, Firestone M, Torn MS, AckerlyDD, and Andersen G. (2007). A molecular analysis of plant response to long-term changes in water availability in an annual grassland. Plant Biology and Botany Joint Congress. Chicago, IL.
- Firestone MK, Placella SA, Bernard SM, Herman DJ, Brodie EL, Andersen GL, St.Clair SB, and Ackerly DD. (2007). Connecting soil microbial N-transformations to plant N-processing. Ecological Society of America Annual Meeting. San Jose, CA.
- Thayer S, St.Clair SB, Field, CB and Somerville S (2007) Accentuation of P limitation by N deposition: an ecological genomics study. Ecological Society of America Annual Meeting. San Jose, CA.
- St. Clair SB, Castanha C, Sudderth E, Torn MS, Firestone MK and Ackerly DD (2007) The influence of cumulative and temporal variation in soil moisture on California grassland plant processes Ecological Society of America Meeting. San Jose, CA.
- Torn MS, St. Clair SB, Ackerly DD, Andersen GL, Bernard SM, Brody EL, Castanha C, Firestone MK, Fischer ML, Hopkins FM, Placella SA, and Salve R (2007) Annual grassland response to altered precipitation and temperature: genes, species, and ecosystem. Ecological Society of America Annual Meeting. San Jose, CA (Invited).

RESEARCH FUNDING SUPPORT

External Grant Funding (Total: \$3,213,993)

Joint Fire Sciences

Post-fire recovery of Great Basin sagebrush habitat using seed coating technology and herbicides to overcome abiotic and biotic limitations to native plant establishment

Funding period: 2017-2020

Funding amount: \$315,000

PI: Sam St. Clair, Co PIs Matt Madsen, Rick Gill, Dean Pearson

National Science Foundation

iUTAH – *innovative* **U**rban **T**ransition and **A**ridregion **H**ydro-sustainability

Funding period: 2012-2017

Funding amount: \$20 M (Total), 1.4 M to BYU

PI: Todd Crowl Co-PIs (BYU): Zach Aanderud, Sam St. Clair, Rick Gill

United States Forest Service

Ecological responses of aspen forest to landscape scale Rx and Mx treatments

Funding period: 2018-2024

Funding amount: \$183,000

PI: Sam St. Clair

Utah Division of Natural Resources

Role of ungulate herbivores on aspen forest regeneration

Funding period: 2018-2019

Total project funding: \$30,000

PI: Sam St. Clair

National Science Foundation

The role of biotic resistance in invasive grass fire cycles (2014)

Invited for full proposal (top 20% of proposals, but not funded)

PI: Sam St. Clair

National Science Foundation

Trophic controls on plant invasions in a changing world (2015)

Invited for full proposal (top 20% of proposals, but not funded)

PI: Sam St. Clair

United States Department of Agriculture, AFRI competitive grants program

Climate driven invasive grass-fire cycles: ecosystem responses

Funding period: 2010-2013

Funding amount: \$420,000

PI: Sam St. Clair Co-PIs: Zach Aanderud, Brock McMillan, Rick Gill, Mark Brunson, Steve Petersen

Utah Division of Natural Resources

The role of fire and ecological conditions on wildlife impacts on aspen regeneration

Funding period: 2011-2017

Total project funding: \$480,655

PI: Sam St. Clair Co-PI: Randy Larsen

United States Forest Service

Influence of ecological conditions on herbivory in aspen forests

Funding period: 2012-2017

Funding amount: \$125,000

PI: Sam St. Clair

United States Department of Interior

Invasive grass driven fire cycles in the Mojave Desert

Funding period: 2010-2013

Funding amount: \$104,000

PI: Sam St. Clair Co-PIs: Brock McMillan, Zach Aanderud

United States Department of Energy

An annual grassland mesocosm exploration: scaling from genomes to ecosystem function

Funding period: 2008-2010
Funding amount: \$28,338 (\$28,338 to St.Clair)
Co-PI: Sam St. Clair

United States Department of Agriculture (AFRI)
Support for Symposium entitled: 'Regulatory roles of soil resources in plant and ecosystem responses to global change'
Funding period: 2009
Funding amount: \$10,000
PI: Jonathan Lynch, Co-PIs: Sam St.Clair, Teh-Hui Kao

United States Department of Agriculture-National Research Initiative (NRI)
The role of Mn toxicity in sugar maple decline on acidic forest soils
Funding period: 2002-2004
Funding amount: \$125,000 (Funded St. Clair's Ph.D dissertation)
PI: Jonathan Lynch, Co-PIs: Sam St. Clair, John Carlson

Student Mentoring Grants & Awards (Total: \$405,000)

Sant Environmental Science Grant
Plant invasions in Utah deserts
Funding period: 2019-2020.
Funding amount: \$15,000
PI: Sam St. Clair

Mini Mentoring Environment Grant (College of Life Sciences)
A mentoring environment to understand the impacts of drought on plant invasions in Utah deserts
Funding period: 2017-2018.
Funding amount: \$10,000
PI: Sam St. Clair

J. Rueben Clark Research Grant
Engaging students and the public in research of human-ecosystem relationships to increase sustainability and stewardship of the earth's resources
Funding period: 2017-2018
Funding amount: \$25,000
PI: Sam St. Clair

Sant Environmental Science Grant
The role of native biota and repeat fires on plant invasions in Utah deserts
Funding period: 2017-2019.

Funding amount: \$10,000
PI: Sam St. Clair

BYU High Impact Dissertation Research Fellowship
Impacts of wildfire and changing climate on plant invasions in desert ecosystems
Funding period: 2016-2019
Funding amount: \$90,000
PI: Sam St. Clair; Ph.D. student: Rebekah Stanton

Brigham Young University, Mentoring Environment Grant
Consumer impacts on competition between invasive and native species
Funding period: 2016-2017.
Funding amount: \$20,000
PI: Sam St. Clair

Brigham Young University, Mentoring Environment Grant
Consumer impacts on plant invasions
Funding period: 2015-2016.
Funding amount: \$20,000
PI: Sam St. Clair

Brigham Young University, Graduate Mentoring Grant
Herbivory patterns in aspen forests
Funding period: 2015-2016.
Funding amount: \$15,000
PI: Sam St. Clair and Aaron Rhodes

Brigham Young University Endowed Young Scholar Award
Funding period: 2014-2017.
Award amount: \$25,000

J. Rueben Clark Research Grant
Invasive grass-fire cycles, dust generation and its urban consequences
Funding period: 2014-2015
Funding amount: \$25,000
PI: Sam St. Clair

Sant Environmental Science Grant
Effects of an invasive plant/fire cycle on Mojave Desert ecosystem function: Funding
period: 2014-2015.
Funding amount: \$10,000
PI: Sam St. Clair

Redd Foundation for Western Studies

Influence of ants in restructuring plant communities following desert fire
Funding period: 2014-2015
Funding amount: \$10,000
PI: Sam St. Clair

Karl and Mollie Butler Endowed Young Scholar Award
Funding period: 2013-2015.
Award amount: \$25,000

BYU High Impact Dissertation Research Fellowship
Impacts of fire suppression and wildlife browsing on the future sustainability of forests
Funding period: 2012-2015
Funding amount: \$90,000 (funded but student was not able to come)
Brigham Young University, Mentoring Environment Grant 2012-2013
Consequences of fire on plant-pollinator relationships in Utah deserts
Funding amount: \$20,000
PI: Sam St. Clair

Brigham Young University, Mentoring Environment Grant
Mechanisms and consequences of conifer expansion in aspen forests
Funding period: 2010-2012.
Funding amount: \$20,000
PI: Sam St. Clair

Brigham Young University, Mentoring Environment Grant
Effects of invasive plants, small mammals, fire, and climate on the Mojave Desert
Funding period: 2010-2012.
Funding amount: \$20,000
PI: Brock McMillan, Co-PIs: Sam St. Clair, Zach Aanderud

Brigham Young University, Mentoring Environment Grant
Mechanisms and consequences of Aspen decline in the Rocky Mountains.
Funding period: 2008-2010.
Funding amount: \$20,000
PI: Sam St. Clair

Brigham Young University, Mentoring Environment Grant
Comparative function genomics of salt tolerance Chenopodium and Brassicas
Funding period: 2008-2010.
Funding amount: \$20,000; PI: Josh Udall

Sant Environmental Science Grant
Effects of an invasive plant/fire cycle on Mojave Desert ecosystem function: Funding

period: 2008-2010.

Funding amount: \$20,000

PI: Sam St. Clair, Co-PIs: Steve Petersen, Tom Smith, Val Anderson, Perry Hardin

Redd Foundation for Western Studies

Drought as a contributing factor to aspen decline in the Rocky Mountain region.

Funding period: 2008-2010.

Funding amount: \$12,000

PI: Sam St. Clair

Redd Foundation for Western Studies

Mechanisms and Consequences of Conifer Expansion in Aspen Forests of Utah

Funding period: 2009-2012.

Funding amount: \$9,000

PI: Sam St. Clair

BYU Graduate Mentoring Grant

Funding period: BYU, 2008-2010.

Funding amount: \$9,000

PI: Sam St. Clair

MENTORING AND ADVISEMENT

Graduate Students Advised (18 total, 11 graduated, 7 current)

John Calder (M.S. Graduated December 2009)

Ecophysiology of conifer expansion in aspen forest

Publications: 3 first author, 1 co-author

Eric Smith (M.S. Graduated August 2010)

Developmental influences on quaking aspen fitness under altered disturbances regimes

Publications: 2 first author, 1 co-author

Josh Buck (M.S. Graduated August 2012)

Facilitative and competitive interactions in subalpine forests

Publications: 2 first author, 1 co-author

Kevin Horn (Ph.D. Graduated August 2013)

Ecosystem responses to emergence of invasive/plant fire cycles in deserts

Publications: 6 first author, 1 co-author

Ho Yi Wan (M.S. Graduated April 2014)

Influence of fire size and severity on wildlife herbivory in forests

Publications: 2 first author, 1 co-author

Andrew Lybbert (M.S. Graduated December 2014)

The effects of invasive plant-fire cycles on desert pollination

Publications: 2 first author

Rory O'Connor (M.S. Graduated December 2014) co-advised with Rick Gill

Top-down regulation of plant invasions

Publications: 2 co-author

Tiffany Sharp Bowman (M.S. Graduated April 2015) co-advised with Brock McMillan

Consumer impact on invasions

Publications: 3 first author

Aaron Rhodes (Ph.D. Graduated December 2017)

Influences of ungulate herbivory on forest development

Publications: 7 first author, 2 co-author

Anson Call (M.S. Graduated August 2017)

Pathogen and herbivore impacts on forest function

Publications: 2 first author

Josh Day (M.S. Graduated April 2018)

Invertebrate community response to plant invasions

Publications: 1 first author, 1 in review

Jordan Maxwell (Ph.D. 2014-present)

Effects of disturbance and climate change on forest hydrology

Publications: 1 first author, 1 co-author, 1 in review

Tara Bishop (Ph.D. 2014-present)

Plant community ecology and invasions

Publications: 3 co-author, 1 in review

Rebekah Stanton (Ph.D. 2016-present)

Consumer impacts on invasive grass fire cycles in deserts

Justin Taylor (M.S. 2017-present)

Overcoming biotic limitations to desert plant community assembly

Publications: 1 co-author

Chelsea Lamb Keefer (M.S. 2017-present)

Seed coating to overcome limitations to desert plant community assembly

Tyson Terry (M.S. 2017-present)
Overcoming abiotic limitations to desert plant community assembly

Rebecca Lee (M.S. 2018-present)
Remote sensing to track drought impacts on the plant invasions

Thesis/Dissertation Committee Member (18)

Patrice McNulty (M.S. 2008-2010) Aspen herbivory
Gajendra Shrestha (M.S. 2008-2010) Lichen biogeography
Monica Proulx (M.S. 2008-present) Lichen ecology
Craig Johnson (M.S. 2009-2010) False Hellebore physiology
Katie Temus (M.S. 2009-2011) Cheatgrass ecology
Nathan Cline (Ph.D. 2008-2014) Great Basin plant-water relations
Lafe Connor (Ph.D. 2009-2014) Dust impacts on alpine plant water relations
Sabrina Saurey (M.S. 2010-2013) Antarctic soil microbiology
Josh Raney: (M.S. 2010-2012) Genetic characterization of drought tolerance in Quinoa
Jason Bahr: (M.S. 2011-2013) Soil crust ecology
Steve Bergsten (M.S. 2012-2013) Ecophysiology of Agave
Michael Bunnell (M.S. 2013-2015) Tree water relations
Kristen Heroy (Ph.D. at USU 2013-2017) Ungulate forage selection in aspen forests
Hannah Yokum (M.S. 2014-2017) water relations of Ephedra
Na Yin (Ph.D. 2015-present) mechanisms of decomposition
Ryan Call (M.S. 2016-present) seed coating to mitigate sagebrush establishment failure
Travis Sowards (Ph.D. 2017-present) Seed coating technologies to improve rangelands
Josh Gilman (M.S. 2017-present) climate change impacts on plant invasions

Mentored Undergraduate Researchers (68) **Bold** = student co-author on publication,
Underlined = student co-author on paper in review or in prep

Eric Smith (2007-2009) aspen, functional traits
Steve Monson (2007-2009) aspen, defense chemistry
David Cahill (2007-2008) aspen, elemental analysis
Dan O'Loughlin (2008-2009) aspen-conifer, soil analysis
Tiffany Lillrose (2008-2009) aspen, dendrochronology
Sean Collette (2008-2009) aspen, genetics
Tom Boynton (2008-2009) aspen, molecular biology
Greg Lifferth (2009) aspen, stress physiology
Josh Buck (2009-2010) forest hydrology
Joe Wilkinson (2009-2011) Mojave Desert, stress physiology
Steve White (2009-2011) Mojave Desert, biochemistry
Amy Clark (2010-present) secondary succession, mycorrhizas
Rachel Nettles (2011-2013) plant invasions and fire ecology
Nate Duncan (2012-2014) forest ecology

Adam Olson (2012-2014t) defense chemistry
Kyle Muncey (2012-2014) forest ecology
Justin Taylor (2013-present) aspen ecology
Alysa DeFranco (2012-present) desert ecology
Trevor Barney (2010-2012) aspen defense chemistry
Joey Schmutz (2008) native trees, stress physiology
Dan Zvirzdin (2008) aspen, remote sensing/landscape analysis
Allison Ko (2008) aspen biochemistry
Brandon Carlisle (2008-2009) cottonwood, gall physiology
Jonathan Vandermark (2009) aspen, genetics
Ryan Shannon (2010-2011) aspen physiology
Jared Johns (2010-2011) aspen genetics
Richard Curzon (2010-2011) biochemistry of carnivorous plants
Anson Call (2010-present) aspen root biology
Andrew Hollingshead (2010) plant-pathogen interactions
Logan Beebe (2010) aspen genetics
Braden Boyer (2010-2011) aspen genetics
Ben St. Clair (2011-present) dendrochronology
Roshni Khadji (2011) desert ecology
Ryan Williams (2011) aspen physiology
Andrew Lybbert (2011-2012) desert ecology
Ho Yi Wan (2011) aspen ecology
Jessica Flory (2011-2012) aspen genetics and biogeography
Jason Bartholomew (2011-present) dendrochronology
Kerri Russell (2012) forest ecology
Ariel Hong (2012) desert herbivory
Brian Graham (2012-2013) biochemistry
Annie Xie (2012) seed ecology
Christian Boekweg (2012-2013) ungulate herbivory
Jacob Engel (2012-2014) aspen ecology
Holly Waddel (2012-2013) environmental biochemistry
Miriam Carr (2013-2014)
Hannah Payne (2013-2014)
Ivy Chatwin (2013-2014) plant hydraulics
Kevin Ricks (2013-2014) plant responses to desert fire
Tysen Nickle (2013-2014) forest ecology
Josh Day (2014-2015) plant-animal interactions
Ashlee Farnsworth (2015-present) desert ecology
Cecily Fitch (2015-2016) dendrochronology
Amanda Huebner (2015-present) desert research
Branden Jeromchek (2015-present) desert ecology
Baylie Nusink (2015-present) desert ecology
Emma Petersen (2015-present) Mojave desert ecology
Rachel Wight (2015-present) Desert ecology

Rebecca Lee (2016-present) Forest ecology.
Carrie Evans (2017) Seed Germination
Eliza Jones (2016-2017) Desert Ecology
Heather Perrazo (2017) Aspen forest ecology
Quinn Sutton (2016-2017) Desert seed ecology
Rachel Watts (2016-2018) Desert and forest ecology
Brianna Newberry (2017-2018) Desert ecology
Vashti Musig (2017) Aspen research
Hannah Scow (2017) seed ecology
David Armond (2018) desert ecology
Emily C

TEACHING ACTIVITIES

Courses taught

PWS 100 Living with Plants (3 credit course)
PWS 150 Environmental Biology (3 credit course)
PWS 440 Plant Physiology (3 credit course)
PWS 494 Mentored Research for Undergraduates
PWS 540 Plant Response to the Environment (3 credit graduate course)

Teaching evaluations

MEETINGS ORGANIZED

Fire Ecology Workshop. Lytle Preserve, Utah, April 2013.
Resilience in Quaking Aspen: linking ecological processes with management of aspen forests. Western Aspen Alliance Symposium, Debeque Colorado, June 2012.
Regulatory role of soil resources in plant and ecosystem response to climate change.

Plant Biology Symposium, Penn State University, May 2009

Scaling from genes to ecosystems. Ecological Society of America Meeting, San Jose, CA, August 2007

REVIEWS

Grant proposal and review panels

United States Dept. of Agriculture NIFA, Panel Member, Washington D.C., March 2012

United States Dept. of Agriculture NIFA, Panel Member, Washington D.C., April 2011

United States Dept. of Agriculture ARS Proposal, Panel Chair, June 2015

National Science Foundation, Ecological Biology Panel, external review, 2010

Netherlands Organization for Scientific Research, external review, 2010

National Geographic, competitive grants, external review, 2010

External reviewer for faculty tenure packet, 2012

Peer reviews for nearly 40 scientific journals (multiple reviews in parentheses)

Ecology (3), Ecological Monographs, Journal of Ecology (2), Plant Physiology, New Phytologist (2), Global Change Biology, Plant, Cell and Environment, Oecologia, Journal of Biogeography (2), Tree Physiology (4), Journal of Vegetation Science (2), American Journal of Botany, Annals of Botany (3), Ecosphere, Functional Plant Biology (3), Forest Ecology and Management (17), Plant and Soil (3), Biodiversity and Conservation, Restoration Ecology, Journal of Chemical Ecology (3), PLoS ONE (7), Rangeland Ecology and Management (5), Journal of Arid Environments, Journal of Plant Ecology, New Forests, Journal of Environmental Management, Canadian Journal of Forest Research (3), Forest Science, International Journal of Forestry Research, Photosynthetica, Symbiosis, Plant Breeding, Canadian Journal of Botany, Environmental Science and Technology, Bryologist, Western North American Naturalist, IEEE Transactions on Instrumentation and Measurements, Annals of Applied Biology, Annales Botanici Fennici, Entomologia Experimentalis et Applicata, Nature Education: The Knowledge Project