

## Curriculum Vitae

(updated 3/20)

## Sigrid Chimner Resh

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Research Assistant Professor  
College of Forest Resources and Environmental Science  
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**Research Interests:** invasive species ecology and management, ecological sustainability and restoration

### **Educational Background:**

**Post-Doctoral Fellow** (1/00 to 5/01), CSIRO (Commonwealth Scientific and Industrial Research Organisation), Forestry and Forest Products Division, CRC, Hobart, Tasmania, AU. *Eucalyptus* biomass partitioning and carbon balance.

**Ph.D.** 1999, Forest Ecology (Department of Forest Sciences), Colorado State University, Fort Collins, Colorado. Dissertation title: "Nitrogen-fixing Tropical Trees Sequester Soil Carbon"

**M.S.** 1994, Resource Economics (Department of Forestry), Michigan State University, East Lansing, MI. Thesis title: "Assessing the Availability of Timberland for Harvest in the Lakes States"

### **Professional Experience:**

**Summer Undergraduate Research Fellowship (SURF) Coordinator** (1/19-present), Pavlis Honors College, Michigan Technological University. Responsibilities include: providing presentations to guide students on how to find a mentor and how to construct a proposal, obtaining faculty reviewers across all campus disciplines for 40+ proposals, ranking reviews and making decisions on student awardees, contacting awardees, and arranging/attending four professional development workshops for awardees in June.

**Keweenaw Invasive Species Management Area (KISMA) Coordinator** (9/15-present), School of Forest Resources and Environmental Science, Michigan Technological University. Invasive species control, outreach and education, information development and dissemination; collaboration with 21 partner organizations; budget development, reporting to funding agencies, and proposal development.

**Research Assistant Professor** (2/09-present), School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, MI 49931. Responsibilities include: Research idea development, collaboration, and implementation, and research proposal writing; grant management, reporting, and successful completion of granted projects; teaching; academic committee service, and graduate student advising.

**Consulting** (3/07-5/07), USDA Forest Service Northern Institute of Applied Carbon Science (NIACS). Developed information for, implemented, and launched webpage for NIACS--<http://nrs.fs.fed.us/niacs/>

**Consulting** (11/04 to 12/05), USDA Forest Service Rocky Mountain Research Station and Colorado State University. Responsible for organizing a workshop and writing a synthesis paper on chipping and mastication in Colorado Forests.

**Consulting** (3/03 to 10/04), USDA Forest Service Rocky Mountain Region 2. Responsible for data compilation, writing, and editing of parts of the Current Landscape Condition for the Bighorn, Grand Mesa, Uncompahgre, Gunnison, and San Juan National Forests as a component of the Species Conservation Project Terrestrial Ecosystem Assessments. Also helped develop the protocol for creating the assessments for current landscape condition.

### **Teaching Experience:**

**Co-Instructor for Capstone FW4811 and FW4830** (9/17 to present), advise student groups on projects involving invasive species.

**Co-Instructor for Senior Communication Class** (11/18 to 12/18), provided lectures and assignments related to applied proposal funding sources, writing, and budget preparation

**Guest Lecturer** (on-going) for Natural Resource Policy, Restoration Ecology, Isotopes in Ecology, Soil Biogeochemistry.

**Instructor of Forest Ecology** (9/07 to 12/07), School of Forest Resources and Environmental Science.

**Instructor for USDA Forest Service National Advanced Silviculture Program (5/07).** Prepared and presented information on forest ecosystem carbon and nutrient dynamics, productivity, and landscape ecology for a portion of this forest manager silviculture certification program

**Instructor of Forest Ecology (1/03 to 12/03),** Department of Forest Sciences, Colorado State University. Independently developed course curriculum for junior-level class with 60 students enrolled. Lecture topics related to forests included: climate, hydrology, carbon cycling and allocation, regeneration, structure and growth, genetics, soil, fire ecology, disturbance, productivity, nutrient biogeochemistry, spatial and temporal scales of forests, and restoration ecology.

**Instructor of General Ecology (8/99 to 12/99),** Department of Forest Sciences, Colorado State University. Lecture topics included biomes, energy budgets, population ecology, ecophysiology, community and ecosystem ecology, and global ecology for the same fundamentals of ecology class discussed below with enrollment of 100 students.

**Co-Instructor of General Ecology (1/99 to 5/99),** Department of Forest Sciences, Colorado State University. Independently developed course curriculum for half the lectures of a sophomore-level fundamentals of ecology course with 110 enrolled students. Lecture topics included biomes, hydrology, energy budgets, species diversity, ecosystem productivity, nutrient cycling, and foodwebs. Wrote exams; presented lectures using computer presentation software, slides, and overheads; managed class web page.

### ***Publications:***

Mosier, SL, ES Kane, D Richter, E Lilleskov, MF Jurgensen, AJ Burton, **SC Resh**. 2017. Interactive effects of climate change and fungal communities on wood-derived carbon in forest soils. **Soil Biology and Biochemistry** 117: 297-309.

Gollany, HT, BD Titus, DA Scott, H Asbjornsen, **SC Resh**, RA Chimner, DJ Kaczmarek, LFC Leite, ACC Ferreira, KA Rod, J Hilbert, MV Galdos, ME Cisz. 2015. Biogeochemical Research Priorities for Sustainable Biofuel and Bioenergy Feedstock Production in the Americas. **Environmental Management** 56(6):1330-1355.

Schrank, AJ, **SC Resh**, WJ Previat, and RA Chimner. 2015. Characterization and classification of vernal pool vegetation, soil, and amphibians of Pictured Rocks National Lakeshore. **The American Midland Naturalist** 174(1): 161-179.

Chimner, RA and **SC Resh**. 2014. Water Sources of Riparian Bur Oak Using Stable Water Isotopes in Homestead National Monument, Nebraska. **Natural Areas Journal** 34(1):56-64.

**Resh, SC**, AJ Schrank, WJ Previat, and RA Chimner. 2013. Vernal pool assessment in Pictured Rocks National Lakeshore in a dry year. **Natural Resource Technical Report NPS/PIRO/NRTR—2013/766**. National Park Service, Fort Collins, Colorado.

**Resh, SC**, L Joyce, MG Ryan. 2008. Fuel Treatments by Mulching—A Synthesis of the Ecological Impacts. **USDA-Forest Service, Rocky Mountain Research Station report**.

**Resh, SC**, M Battaglia, D Worledge, and S Ladiges. 2003. Coarse root biomass for eucalypt plantations in Tasmania, Australia: sources of variation and methods for assessment. **Trees: Structure and Function** 17:389-399.

Rothe, A, Cromack, K Jr, **Resh, S**, Makineci, E, and Son, Y. 2002. Soil carbon and nitrogen changes under Douglas-fir with and without red alder. **Soil Science Society of America Journal** 66:1988-1995.

**Resh, SC**, D Binkley, and JA Parrotta. 2002. Greater soil carbon sequestration under nitrogen-fixing tree species compared with *Eucalyptus* species. **Ecosystems** 5:217-231.

Kaye, J, **SC Resh**, MW Kaye, and RA Chimner. 2000. Nutrient and carbon dynamics in a replacement series of *Eucalyptus* and *Albizia* trees. **Ecology** 81:3267-3273.

Smith, FW and **SC Resh**. 1999. Age-related changes in production and below-ground carbon allocation in *Pinus contorta* forests. **Forest Science** 45:1-9.

Binkley, D and **SC Resh**. 1999. Rapid changes in soils following *Eucalyptus* afforestation in Hawaii. **Soil Science Society of America Journal** 63:222-225.

### ***Pending Research Grants:***

Burton, AJ, M Cavaleri, Fengjing Liu, **SC Resh**, JD Wolfe, Senior Personnel: K. Brzeski, AM Marcarelli, RA Chimner. MRI: Acquisition of an Isotope Ratio Mass Spectrometer for using stable isotopes to study complex ecological systems. **NSF-MRI**. \$344,244. 8/1/20 – 7/31/22.

Chimner, RA, G Bowser, KR Young, C Turin, R Boone, **Senior Personnel:** MH Polk, L Bourgeau-Chavez, **SC Resh**, JA Naupari. CNH2-L: Ecosystem services and pastoralism in changing Andean landscapes. **NSF-CNH2**. \$1,576,354. 7/1/2020 – 6/30/2025.

### ***Awarded Research Grants:***

**Resh, SC**. Continuing Treatments for Priority Invasive Plant Species within the KISMA Tri-County Area. 4/1/20 – 3/31/22. **USFS/GLRI/CWMA**. \$48,000 (\$51,765 with match).

**Resh, SC (PI)**. 4/1/20-3/31/21. Growing KISMA community engagement with outreach, education, and treatment continuation. **MISGP**. \$60,000 (\$74,660 with match).

Chimner, RA and **SC Resh (Co-PI)**. 1/1/20-12/31/21. Replanting the Pilgrim River wetlands to enhance ecosystem function. **USFS/GLRI**. \$100,264 (\$125,330 with match).

**Resh, SC (PI)**, L Dolinski, RA Chimner, C Edson. 2019-2021. Purple Loosestrife Control in the Keweenaw Invasive Species Management Area (KISMA). **USDA-FS GLRI CWMA**. \$40,000 (\$50,002 with match).

**Resh, SC (PI)**, T Ball, RA Chimner, J Schmierer, A Storer, CR Webster. 2018-2020. Tree Planting for EAB mitigation on community trails. **USFS/GLRI**. \$100,000 (\$127,154 with match).

**Resh, SC (PI)**, CR Webster. 2017-2020. Targeted control of invasive plants on recreational trail system: demonstration, education, and implementation. **USFS-GLRI-CWMA**. \$47,000. Additional funds added in 2018 (\$7,492 (\$11,992 with match)). **Additional funds added in 2019 (\$4,000 (\$6304 with match))**.

**Resh, SC (PI)**, E McDonald, J Chadde. Reinvigorating KISMA: Improved collaborative planning and control of invasive species. **DNR: Michigan Invasive Species Grant Program**. \$261,021 (\$354,109 with partner match). 2017-2020. Submitted through Keweenaw Land Trust with ~\$230,000 subawarded to Michigan Tech over 3 years.

Bowser, G, RB Boone, RA Chimner, AB Taber, KR Young with **SC Resh (Co-PI)**. CNH-RCN: Andes Bofedales and Cattle: The Impacts of Changing Hydrology and Glacial Retreat on Community Livelihoods in Peru's Cordillera Blanca. **NSF**. \$499,992 (\$65,921 subawarded to Michigan Tech). 2016-2021.

**Resh, SC (PI)**, E Kane, MF Jurgensen. Wood it matter: Tracing isotopically labeled wood into the soil. **REF seed grant through Michigan Tech**. \$24,000. 2015-2017.

**Resh, SC (PI)**, E Kane, E Lilleskov, D Richter and MF Jurgensen. Interactive Effects of Climate Change and Decomposer Communities on the Stabilization of Wood-Derived Carbon Pools: Catalyst for a New Study. **U.S. Department of Energy**. \$149,397. 2011-2014.

Chimner, RA, **SC Resh (Co-PI)**. Assessing vernal pools of Pictured Rocks National Lakeshore by determining distribution, abundance, and ecological significance. **National Park Service**. \$18,615. 2009-2011.

Bolli JM, RA Chimner, G Eckart, **SC Resh (co-PI)**. Analyzing water isotopes to determine impacts of burning in a mesic burr oak forest. **National Park Service**. \$21,000. 2007-2009.

Ryan, MG, CC Rhoades, M Rocca, **SC Resh (co-PI)**. A regional assessment of the ecological effects of chipping and mastication fuels reduction and forest restoration treatments. **Joint Fire Science**. \$350K. 2006-2009

### ***Participant on Funded Research Grants:***

Halvorsen, K, PI, Co-Pis: H Asbjornsen, R Chimner, C Moseley, D Shonnard. **Collaborator: SC Resh**. OISE-PIRE: Sustainability, Ecosystem Services, and Bioenergy Development across the Americas. **NSF PIRE**, \$4,841,735. 2012-2017.

Shonnard, DR, PI, Co-PIs: RP Donovan, KE Halvorsen, BD Solomon, and SR Sweitz. **Collaborator: SC Resh**. RCN-SEES: A Research Coordination Network on Pan American Biofuels Bioenergy Sustainability. **NSF-RCN**. \$749,996. 2011-2015.

## ***Declined Research Grants***

- Grout, T, **SC Resh (Co-PI)**, Grimm, A. 2019. Central UP Knotweed Risk Analysis and Treatment Prioritization and Comparison. MISGP. \$300,000.
- Bowser and others including **SC Resh (senior personnel)**. 2019. COLLABORATIVE AccelNet: People, Pollinators and Place (P3) A global network of networks coupling livelihoods, culture, pollinators and place across a changing world. NSF-ACCELNET. \$750,000. 10/1/19 - 09/30/22.
- Schelly, CL, NR Urban, DF Flaspohler, **SC Resh (Co-PI)**, RM Handler, Lockyer, J. 2019. CNH2-L: Assessing linkages among socio-technological provisioning systems and integrated socio-ecological systems to enhance community resilience. NSF. \$1,274,060.
- Chimner, RA, **SC Resh (Co-PI)**, C Edson. 2018. Replanting the Pilgrim River wetlands to enhance ecosystem function. USDA-FS and GLRI. \$100,000
- Grimm, A, C Brooks, **SC Resh (Co-PI)**, RA Chimner. 2018. Advancing physiochemical control and surveillance of invasive knotweeds in Michigan. MDNR, MDEQ, and MDARD: Michigan Invasive Species Grant Program. \$232,380 (\$258,200) with partner match).
- Schelly, CL, NR Urban, DF Flaspohler, **SC Resh (Co-PI)**, RM Handler. 2018. CNH-L: Coupled Natural-Human Systems for Sustainable and Sustained Rural Communities: Quantification and Comparison of Linked Infrastructure-Ecosystem-Governance Systems. NSF. \$1,234,471.
- Kelly, M, **SC Resh (Co-PI)**, JM Schmierer. 2017. Establishing an ORV/ATV Invasive Species Decontamination Station in the Western U.P. MDNR, MDEQ, and MDARD: Michigan Invasive Species Grant Program.
- Grimm, A, L Bourgeau-Chavez, **SC Resh (Co-PI)**, RA Chimner. 2017. Innovative EDRR Methods for Invasive Knotweeds in the KISMA. MDNR, MDEQ, and MDARD: Michigan Invasive Species Grant Program.
- Resh, SC**, RA Chimner, and CR Webster. 2015. Developing targeted non-chemical control strategies for an emerging invasive species in the Keweenaw, giant and Japanese knotweed. MI DEQ Coastal Zone Management. \$110,250.
- Resh, SC** and CR Webster. 2015. Unraveling knotweed in the Keweenaw. MIDNR—Michigan Invasive Species Grants Program. \$141,817.
- Resh, SC**, E Lilleskov, E Kane, AJ Burton, M Jurgensen, and D Richter. 2014 Interactive effects of climate change and decomposer communities on the stabilization of wood-derived carbon in soils: a continuation. DOE Environmental System Science. \$499,998.
- Bowser, G, E Sagas, A Taber, RA Chimner, K Young. (Co-PIs), **SC Resh**, R Boone, D Swift, and J Klein (Collaborators/Senior Personnel). 2014. NSF CNH-L: Andes, Bofedales and Cattle: Coupled Human and Natural Systems under Glacial Retreat in the High Andes. \$1,779,152.
- Resh, SC**, E Kane, E Lilleskov, D Richter, MF Jurgensen, and W Parton. Interactive Effects of Climate Change and Decomposer Communities on the Stabilization of Wood-Derived Carbon Pools: A continuation. NASA-ROSES (2013).
- Resh, SC** and J Hribljan. Using Soil Carbon Fractions to Determine Land Use Sustainability. REF seed grant (2014) through Michigan Tech.

## ***Conference Presentations:***

- oral presentation entitled “Soil sustainability of bioenergy feedstocks across the Americas” and participation at NSF-PIRE workshop May, 2017, Eugene, Oregon, USA.
- oral presentation entitled “Soil Sustainability with Bioenergy Production” and participation at NSF-PIRE workshop July 18-21, 2014, Belem, Brazil.
- poster presentation entitled “Stabilization of Wood-Derived Carbon in Soils: Catalyst for a new study” (authors of poster: **SC Resh**, E Kane, D Richter, and S. Mosier) and participation at DOE TES/SBR joint investigators meeting May 6-7, 2014, Potomac, MD.
- poster presentation entitled “Stabilization of Wood-Derived Carbon in Soils: Catalyst for a new study” (authors of poster: **SC Resh**, E Kane, D Richter, and S Mosier) and participation at North American Forest Soils Conference, June 17-21, 2013, Whitefish, MT.

poster presentation entitled “Stabilization of Wood-Derived Carbon in Soils: Catalyst for a new study” (authors of poster: **SC Resh**, E Kane, and D Richter) and participation at DOE TES/SBR joint investigators meeting May 13-15, 2013, Potomac, MD.

oral presentation entitled “Belowground Carbon Dynamics” and participation at NSF-RCN workshop May 29-31, 2012, Merida, Mexico.

poster presentation entitled “Vernal pool assessment in Pictured Rocks National Lakeshore in a Dry year” (authors of poster: **AJ Schrank**, **SC Resh**, WJ Previant, and RA Chimner) at Western Great Lakes Resource Management Conference, April 17-18, 2012., Ashland, Wisconsin.

### ***Invited Speaker Presentations:***

June 20, 2019, Lake Superior Stewardship Initiative teacher training workshop, Copper Country ISD CTE Center. Presentation title: “Invasive Species: Agents of Ecosystem Change” for a 1-day workshop where I led both in-class and field tour components.

May 14, 2019, Hilary Sproule Master Gardener Project, Carnegie Museum. Presentation title: “Common Buckthorn and Other Backyard Woody Invasives” for 30-minute presentation time slot.

March 17, 2018, Native Plant Symposium, Carnegie Museum. Presentation title: “Plants to Avoid in Landscaping and Gardening” for 40-minute presentation time slot.

June 22, 2017, Keweenaw Historical Society, Eagle Harbor Township Hall. Presentation title: “Invasive Species Yoga: Relax We Can Do It” for a 1.5-hour time slot.

June, 2016, Lake Superior Stewardship Initiative teacher training workshop, Michigan Tech Campus. Presentation titles: “Invasive Species the Big Picture” and “The Good, the Bad, and the Ugly” for a 2-hour timeslot followed by 2-hour field tour.

### ***Graduate Students:***

Ph.D. student—Michelle Cisz (Co-advised with Rod Chimner, 2013-present)

Masters students

Lindsey Dolinski (expected graduation fall 2021)

Samantha Mosier (graduated May 2015)

Committees--Chad Jacobson, Master of Forestry Plan C, graduated December 2008

### ***Service:***

#### **Professional**

- Reviewer of SURF proposals (2010-2018)
- Judged campus-wide Three Minute Thesis (3MT) competition held on Oct. 12, 2016
- Judged posters for the Graduate Research Colloquium (2013), ESC Research Symposium (2015 and 2018), and Western UP Science Fair (2016)
- Charter Revision Committee (Dec. 2013-April 2014)
- SFRES Council Representative for the Non-Tenure-Track Faculty (2013-2014)
- SFRES Council Alternative Rep. for the Non-Tenure-Track Faculty (2012-2013)
- Reviewed manuscripts for: *Plant and Soil*, *Global Change Biology*, and *Forest Ecology and Management* (2013, 2014, 2015), *Ecosystems* (2013), *Annals of Forest Science* (2017)

#### **Community**

- Led a day-long invasive species pulling and native seeding fieldtrip for ~ 100 Houghton-Portage Township 7<sup>th</sup> graders (September 2013, 2015, 2016, 2017, 2018)
- Volunteer in local middle school to assist with various science related activities to advance understanding and broaden students’ perspectives (2006 – present)

### ***Awards:***

- Hammer’s Endowed Field Equipment Fund (\$875)

### ***Professional Memberships:***

- Ecological Society of America
- Phi Beta Kappa, National Honors Society
- Natural Areas Association