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## William Wallace (Wally) Macfarlane Curriculum Vitae

Utah State University • Department of Watershed Sciences  
5210 Old Main Hill • Logan, UT 84322-5210  
Phone: (435) 512-1839 • Email: [Wally.Macfarlane@usu.edu](mailto:Wally.Macfarlane@usu.edu)

Updated February 2, 2024

### Research Interests

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I am a geospatial scientist who is captivated by rivers, riparian areas and the landscapes they dissect. My research interests include developing innovative GIS, photogrammetry and remote sensing techniques to assess riverscape health, recovery potential and process-based restoration.

Topics I have explored include:

- Effectiveness monitoring of low-tech process-based stream restoration
- Modeling and mapping of landforms associated with riverscapes
- Beaver dam capacity modeling
- Large woody debris capacity modeling
- Watershed-scale geomorphic condition
- Riparian condition and recovery potential
- Climate change induced disturbance
- Watershed conservation and restoration planning

I have packaged much of my research into tools and frameworks useful to both practitioners and researchers. These tools include LAS (Landscape Assessment System), VBET ([Valley Bottom Extraction Tool](#)), BRAT ([Beaver Restoration Assessment Tool](#)) and RCAT ([Riparian Condition Assessment Toolbox](#)) and GMWest System -- A GIS-based Risk Assessment System for Gypsy Moth. LAS has been widely used to document the decline of the threatened whitebark pine. VBET, BRAT and RCAT have been widely used across the US, Canada and Europe for beaver, stream and riparian restoration projects.

### Education

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**Bard College**, Graduate School of Environmental Sciences,  
Annandale-on-Hudson, New York, USA  
M.S. Degree in Environmental Science

*Received June, 1999*

**Utah State University**, Department of Geography and Earth Resources,  
Logan, Utah, USA  
B.S. Degree in Environmental Studies, *Cum Laude*

*Received June, 1996*

## Work Experience

### Professional Academic Experience

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#### **Research Assistant Professor**, September, 2023 to present

Utah State University, Department of Watershed Sciences, Logan, Utah, USA

Supervisor: Patrick Belmont, Department Head, Watershed Sciences

Primary responsibilities:

- Manage geospatial research projects
- Complete and oversee analyses on research projects
- Publish findings in peer-reviewed outlets and prepare project reports
- Grant writing to cover my salary and my staff's wages
- Manage grants
- Manage staff
- Manage Ecogeomorphology & Topographic Analysis Lab
- Lead field-based data collection efforts

Related USU Affiliations:

- Co-Director of Ecogeomorphology & Topographic Analysis Lab
- Co-Director of Fluvial Habitats Center
- Principle Investigator

#### **Senior Research Associate/Co-Lab Director**, April, 2020 to September, 2023

Utah State University, Department of Watershed Sciences, Logan, Utah, USA

Supervisor: Patrick Belmont, Department Head, Watershed Sciences

Primary responsibilities:

- Manage geospatial research projects
- Complete and oversee analyses on research projects
- Publish findings in peer-reviewed outlets and prepare project reports
- Grant writing to cover my salary and my staff's wages
- Manage grants
- Manage staff
- Manage Ecogeomorphology & Topographic Analysis Lab
- Lead field-based data collection efforts

Related USU Affiliations:

- Co-Director of Ecogeomorphology & Topographic Analysis Lab
- Co-Director of Fluvial Habitats Center
- Principle Investigator

#### **Research Scientist/Associate Lab Director**, September, 2017 to March, 2020

Utah State University, Department of Watershed Sciences, Logan, Utah, USA

Supervisor: Joseph Wheaton, Associate Professor

Primary responsibilities:

- Manage geospatial research projects

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- Complete and oversee analyses on research projects
- Publish findings in peer-reviewed outlets and prepare project reports
- Grant writing to cover salary
- Co-manage grants
- Manage staff
- Lead field-based data collection

Related USU Affiliations:

- Associate Director of Ecogeomorphology & Topographic Analysis Lab
- Associate Director Fluvial Habitats Center
- Co-Principle Investigator

**Research Associate (Researcher III)**, June, 2012 to August, 2017

Utah State University, Department of Watershed Sciences, Logan, Utah, USA

Supervisor: Joseph Wheaton, Associate Professor

Primary responsibilities:

- Manage geospatial research projects
- Complete and oversee analyses on research projects
- Publish findings in peer-reviewed outlets and prepare project reports
- Participate in grant writing
- Provide occasional training of students and other researchers and document protocols
- Periodic field work

**Research Associate (Researcher II)**, February, 2012 to May, 2012

Utah State University, Department of Watershed Sciences, Logan, Utah, USA

Supervisor: Joseph Wheaton, Assistant Professor

Primary responsibilities:

- Provide GIS, photogrammetry, and remote sensing support for the Ecogeomorphology & Topographic Analysis Lab, Fish Ecology Lab and Adler Lab.
- Provide technical trainings and short courses on geospatial techniques and solutions.

**MS Student 1997-1999**

Graduate School of Environmental Sciences, Bard College, Annandale-on-Hudson, New York, USA

- Supervisor: Kathleen C. Weathers

**Fluvial Geomorphology Field Technician**, fall term 1995, fall term 1996

Utah State University, Department of Geography and Earth Resources, Logan, Utah, USA

Primary responsibilities:

- Conducted topographic and bathymetric surveys on the Colorado, Green and Snake rivers, Utah and Idaho.

**Other Professional Experience**

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**GIS/Photogrammetry Specialist**, July, 1999- December, 2011

GEO/Graphics, Inc., Logan, Utah, USA

Supervisor: Jerry Hughes, Owner

Primary responsibilities:

- Implemented and managed over 40 environmental and land-use related GIS, photogrammetry and remote sensing projects for governmental agencies, private businesses and NGOs worldwide.

Employment highlight:

- **International Development Enterprise: Rural Prosperity Initiative**, January, 2006-December, 2010. Worked on a project aimed at increasing the income of poor farmers in Nepal, Zambia and Ethiopia, through the delivery of low-cost irrigation technologies and developing supply chains. Developed spatial analyses to determine the best location for technology interventions. Provided environmental monitoring and impact mapping. Monitored and evaluated income growth/distribution through a time series GIS analysis. Provided in-country data collection and training of local staff in GIS, GPS, and data collection. The project was funded by the Bill and Melinda Gates Foundation.

## Research

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### Scholarly Contributions

See also:

- ResearchGate Profile: [https://www.researchgate.net/profile/William\\_Macfarlane](https://www.researchgate.net/profile/William_Macfarlane)
- Researcher ID Profile: <https://orcid.org/0000-0002-1876-5453>

### Peer Reviewed Papers

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1. 2024. Glassic, H. C., McGwire, K. C., **Macfarlane, W. W.**, Rasmussen, C., Bouwes, N., Wheaton, J. M., & Al-Chokhachy, R. (2024). From pixels to riverscapes: How remote sensing and geospatial tools can prioritize riverscape restoration at multiple scales. *WIREs Water*, e1716. <https://doi.org/10.1002/wat2.1716>
2. 2023. **Macfarlane, W.W.**; Howell, B.; Logan, J.A.; Smith, A.L.; Rasmussen, C.C.; Spangler, R.E. Climate Change-Driven Cumulative Mountain Pine Beetle-Caused Whitebark Pine Mortality in the Greater Yellowstone Ecosystem. *Forests* **2023**, *14*, 2361. <https://doi.org/10.3390/f14122361>
3. 2023. Remiszewski, T. T., Budy, P., & **Macfarlane, W. W.** (2023). Expansive, positive changes to fish habitat diversity following the formation of a valley plug in a degraded desert river. *River Research and Applications*, 40(1), 116–128. <https://doi.org/10.1002/rra.4213>
4. 2023. Fairfax, E., Zhu, E., Clinton, N., Maiman, S., Shaikh, A., **Macfarlane, W. W.**, et al. (2023). EEAGER: A neural network model for finding beaver complexes in satellite and aerial imagery. *Journal of Geophysical Research: Biogeosciences*, 128, e2022JG007196. <https://doi.org/10.1029/2022JG007196>

5. 2022. Pennock, CA, Bruckerhoff, LA, Gido, KB, Barkalow, AL, Breen, MJ, Budy, P, **Macfarlane, WW**, Propst, DL. Failure to achieve recommended environmental flows coincides with declining fish populations: Long-term trends in regulated and unregulated rivers. *Freshwater Biology*. 00, 1– 13. DOI: [10.1111/FWB.13966](https://doi.org/10.1111/FWB.13966)
6. 2022. Pennock, CA, Budy, P, **Macfarlane WW**. Effective Conservation of Desert Riverscapes Requires Protection and Rehabilitation of In-Stream Flows with Rehabilitation Approaches Tailored to Water Availability. *Frontiers in Environmental Science* 10:870488. DOI: [10.3389/fenvs.2022.870488](https://doi.org/10.3389/fenvs.2022.870488)
7. 2021. Pennock, CA, Budy, P, **Macfarlane WW**, Breen MJ, Jimenez, J, Schmidt, JC. Native fish need a natural flow regime. *Fisheries*. 47: 118-123. DOI: [10.1002/fsh.10703](https://doi.org/10.1002/fsh.10703)
8. 2020. Graham H, Puttock A, **Macfarlane WW**, Wheaton JM, Gilbert JT, Campbell-Palmer R, Elliott M; Anderson K, and Brazier RE. Modelling Eurasian beaver foraging habitat and dam suitability, for predicting the location and number of dams throughout catchments in Great Britain. *European Journal of Wildlife Research* (2020) 66: 42 DOI: [10.1007/s10344-020-01379-w](https://doi.org/10.1007/s10344-020-01379-w)
9. 2019. O'Brien, G.R., J.M. Wheaton, K. Fryirs, **W.W. Macfarlane**, G. Brierley, K. Whitehead, J. Gilbert, and C. Volk. Mapping valley bottom confinement at the network scale. *Earth Surface Processes and Landforms*. DOI: [10.1002/esp.4615](https://doi.org/10.1002/esp.4615)
10. 2018. **Macfarlane, W.W.**, J.T. Gilbert, M.L., N. Hough-Snee, C. Saunders, C.W. Hafen, and J.M. Wheaton. What are the conditions of riparian ecosystems? Identifying impaired floodplain ecosystems across the western U.S. Using the riparian condition assessment (RCA) tool. *Environmental Management*. 62:548-570. DOI: [10.1007/s00267-018-1061-2](https://doi.org/10.1007/s00267-018-1061-2)
11. 2018. Laub, B.G., G.P. Thiede, **W.W. Macfarlane** and P. Budy. Evaluating the conservation potential of tributaries for native fish in the Upper Colorado River Basin. *Fisheries*. 43:194-206. DOI: [10.1002/fsh.10054](https://doi.org/10.1002/fsh.10054)
12. 2017. **Macfarlane, W.W.**, J.M. Wheaton, N. Bouwes, M. L. Jensen, J. T. Gilbert, N. Hough-Snee, and J. A. Shivik. Modeling the capacity of riverscapes to support dam-building beaver. *Geomorphology*. DOI: [10.1016/j.geomorph.2015.11.019](https://doi.org/10.1016/j.geomorph.2015.11.019).
13. 2017. **Macfarlane, W.W.**, C.M. McGinty, B.G. Laub and S.J. Gifford. High resolution riparian vegetation mapping to prioritize conservation and restoration in an impaired desert river. *Restoration Ecology*. 25:333-341. DOI: [10.1111/rec.12425](https://doi.org/10.1111/rec.12425)
14. 2016. **Macfarlane, W.W.**, J.T. Gilbert, M.L. Jensen, J. D. Gilbert, N. Hough-Snee, P.A. McHugh, J.M. Wheaton, and S.N. Bennett. Riparian vegetation as an indicator of riparian condition: detecting departures from historic condition across the North American West. *Journal of Environmental Management*. 202:447-460. DOI: [10.1016/j.jenvman.2016.10.054](https://doi.org/10.1016/j.jenvman.2016.10.054)

15. 2016. Gilbert, J.T, **W.W. Macfarlane**, and J.M. Wheaton. V-BET: A GIS tool for delineating valley bottoms across entire drainage networks. *Computers and Geosciences*. 97:1014. DOI: [10.1016/j.cageo.2016.07.014](https://doi.org/10.1016/j.cageo.2016.07.014).
16. 2015. Budy, P., M.M. Conner, N.L. Salant and **W.W. Macfarlane**. Occupancy-based assessment of regional vulnerability of endemic desert fishes: A template for conservation actions. *Conservation Biology* 29 (4) 1142-1152. DOI: [10.1111/cobi.12513](https://doi.org/10.1111/cobi.12513)
17. 2013. **Macfarlane, W.W.**, J.A., Logan and W.R. Kern. An innovative aerial assessment of Greater Yellowstone Ecosystem mountain pine beetle-caused whitebark pine mortality. *Ecological Applications*. 23: 421-437. DOI: [10.1890/11-1982.1](https://doi.org/10.1890/11-1982.1)
18. 2010. Logan, J. A., **W.W. Macfarlane**, and L. Willcox. Whitebark pine vulnerability to climate-driven mountain pine beetle disturbance in the Greater Yellowstone Ecosystem. *Ecological Applications*. 20:895—902. DOI: [10.1890/09-0655.1](https://doi.org/10.1890/09-0655.1)
19. 2009. Logan, J. A., **W.W. Macfarlane**, and L. Willcox. Effective monitoring as a basis for adaptive management: A case history of mountain pine beetle in Greater Yellowstone Ecosystem whitebark pine. 2009 *iForest - Biogeosciences and Forestry* 2(1). DOI: [10.3832/ifer0477-002](https://doi.org/10.3832/ifer0477-002)

#### Peer Reviewed Book and Book Chapters

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1. 2019. Bennett, S., Wheaton, J., Bouwes, N., Shahverdian, S., **Macfarlane, W.W.** and Portugal, E. Chapter 3 - Planning for Low-Tech Process-Based Restoration. In: *Low-Tech Process-Based Restoration of Riverscapes: Design Manual - Version 1.0*. Wheaton JM, Bennett S, Shahverdian S, and Maestas JD, (Editors). Utah State University Wheaton Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 57 pp. DOI: [10.13140/RG.2.2.15815.75680](https://doi.org/10.13140/RG.2.2.15815.75680).
2. 2019. Bennett, S.N., Wheaton, J.M., Bouwes, N., Camp, R., Jordan, C.E., **Macfarlane, W.W.**, Maestas, J.D., Shahverdian, S. and Weber, N. Chapter 6 - Low-Tech Restoration Project Implementation. In: J.M. Wheaton, S.N. Bennett, N. Bouwes, J.D. Maestas and S.M. Shahverdian (Editors), *Low-Tech Process-Based Restoration of Riverscapes: Design Manual*. Utah State University Wheaton Restoration Consortium, Logan, Utah. 38 pp. DOI: [10.13140/RG.2.2.25043.22567](https://doi.org/10.13140/RG.2.2.25043.22567).
3. 2009. Bentz, B. J. (Editor), J.A. Logan; J. MacMahon; C.D. Allen; M. Ayres, E. Berg; A. Carroll; M. Hansen; J. Hicke; L. Joyce; **W.W. Macfarlane**; S. Munson; J. Negron; T. Paine; J. Powell; K. Raffa; J. Regniere; M. Reid; B. Romme; S.J. Seybold; D. Six; D. Tomback; J. Vandygriff; T. Veblen; M. White; J. Witcosky; D. Wood. *Bark beetle outbreaks in Western North America: causes and consequences*. Bark Beetle Symposium; Snowbird, Utah; November, 2005. Salt Lake City, Utah: University of Utah Press. 42 p. <https://www.fs.usda.gov/treearch/pubs/43479>

**Peer Reviewed Research Publications In Press, Revision, Review, Prep**

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1. In Review. K. Bartelt, P. Belmont, N. Bouwes, E. Hammill, **W. Macfarlane**, W. Saunders, S. Shahverdian, J.M. Wolf, and J. Wheaton. Mapping valley bottom inundation patterns from beaver dam activity: A potential proxy for hydrologic inefficiency. Submitted to: Earth Surface Processes and Landforms.

**Selected Oral Presentations**

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1. 2022 *Invited Talk*. **Macfarlane, W.W.** An Introduction to Low-Tech Process-based Stream Restoration. Sustainable Southwest Beef Project On-Ranch Demonstration 2022, Canyonlands Research Center, Dugout Ranch UT.
2. 2022. *Talk*. **Macfarlane, W.W.**, K.M Urbanczyk, and S. Burch. Riparian Land Cover Classification to Guide Conservation and Restoration of the Lower White River, Utah. RiversEdge West 20<sup>th</sup> Anniversary Conference. Grand Junction, CO.
3. 2020. *Invited Webinar*. **Macfarlane, W.W.** and J. Jimenez. Beaver Restoration Webinar Series: Webinar #4: Addressing Common Barriers and Objections to Beaver Restoration Work. The Association of State Wetland Managers and the Bureau of Land Management.
4. 2017. *Invited Talk*. **Macfarlane, W.W.**, J.M. Wheaton, and J. Jimenez. What condition are lotic riparian ecosystems in? Workshop: Interagency riparian and wetland assessment -Best practices, innovative approaches, and opportunities for collaboration, Fort Collins, CO.
5. 2016. *Invited Poster*. **Macfarlane, W.W.**, and J.M. Wheaton. Modeling the capacity of riverscapes to support beaver dams. Binghamton Geomorphology Symposium, Colorado State University, Fort Collins, CO.
6. 2016. *Poster*: **Macfarlane, W.W.**, J.T. Gilbert, J.D. Gilbert, N. Hough-Snee, P.A. McHugh, J. M. Wheaton, S.N. Bennett. Riparian vegetation as an indicator of riparian condition: detecting departures from historic condition across the North American West, Restoring the West Annual Symposium. Logan, UT.
7. 2014. *Invited Plenary Talk*. **Macfarlane, W.W.**, J.M. Wheaton and M.L. Jensen. Modeling the capacity of riverscapes to support dam-building beaver: Utah statewide implementation, Restoring the West Annual Symposium. Logan, UT.

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8. 2014. *Poster*: Jensen M.L., **W. W., Macfarlane** and J.M. Wheaton. Filling an important data gap: valley bottom mapping, riparian condition assessment and geomorphic river classification for the Colorado Plateau Ecoregion, Restoring the West Annual Symposium. Logan, UT.
9. 2014. *Presentation*: **Macfarlane, W.W.**, P. Budy, G. Thiede and B. Laub. Looking beyond the mainstem: conservation and restoration of endangered and sensitive Colorado River fishes. American Fisheries Society, Western Division Annual Meeting. Mazatlán, Mexico.
10. 2013. Plenary Speaker: **Macfarlane, W.W.** and J.M. Wheaton. Modeling the Capacity of Riverscapes to Support Dam-Building Beaver, River Restoration Northwest Symposium. Stevenson, WA.
11. 2013. *Presentation*: **Macfarlane, W.W.**, J.M. Wheaton and S. Bangen. Fish habitat assessment and monitoring: Imagery and topographic techniques Utah Chapter AFS Annual Meeting Wahweap, UT.
12. 2013. *Presentation*: **Macfarlane, W.W.**, M.L. Scott, D.W. Perkins, and J.M. Wheaton, Hypothesis driven, multi-scalar monitoring protocol development: big, canyon-bound rivers, Tamarisk Coalition River Crossings: Linking River Communities Research Conference and Workshop Grand Junction, CO.
13. 2012. *Poster*: **Macfarlane, W.W.**, J.M. Wheaton, M. O'Brien, and J. Christensen, Modeling the capacity of riverscapes to support dam-building beaver, AGU Fall Meeting 2012. American Geophysical Union, San Francisco, CA.
14. 2011. *Invited Talk*: **Macfarlane, W.W.** An assessment of mountain pine beetle caused mortality of whitebark pine forests of mountain areas of the greater Yellowstone Ecosystem. Graduate Degree Program in Forest Ecology. University of Montana. Missoula, MT.
15. 2011. *Invited Talk*: **Macfarlane, W.W.** An assessment of mountain pine beetle caused mortality of whitebark pine forests of mountain areas of the Greater Yellowstone Ecosystem. Whitebark Pine Ecosystem Foundation workshop. Cody, WY.
16. 2010. *Poster*: Logan, J. A., **W.W. Macfarlane**, and L. Willcox. Whitebark pine vulnerability to climate driven mountain pine beetle disturbance in the Greater Yellowstone Ecosystem. 10th Biennial Scientific Conference on the Greater Yellowstone Ecosystem: Questioning Greater Yellowstone's Future: Climate, Land Use, and Invasive Species. West Yellowstone, WY.
17. 2010. *Presentation*: **Macfarlane, W. W.**, J. A. Logan, and W. R. Kern. Using the Landscape Assessment System (LAS) to map mountain pine beetle-caused mortality in whitebark pine,

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Greater Yellowstone Ecosystem. "High-Five" Symposium, the Future of High-Elevation Five-Needle White Pines in Western North America. Missoula, MT.

18. 2010. *Presentation: Macfarlane, W. W., J. A. Logan, and W. R. Kern.* Using the Landscape Assessment System (LAS): an aerial survey method for mapping the extent and intensity of Mountain Pine Beetle-caused tree mortality. Western Forest Insect Work Conference, Flagstaff, AZ.
19. 2009. *Presentation: Macfarlane, W. W., J. A. Logan, and W. R. Kern.* An assessment of mountain pine beetle caused mortality of whitebark pine forests of mountain areas of the Greater Yellowstone Ecosystem. Global Change and the World's Mountains, Perth, Scotland.
20. 2009. *Presentation: Macfarlane, W. W., J. A. Logan, and W. R. Kern.* Status of Whitebark Pine Decline in the Greater Yellowstone Using GIS and Remote Sensing Union of International Forest Researchers (IUFRO): Forest Insects and Environmental Change Conference, Jackson, WY.
21. 2008. *Presentation: Macfarlane, W. W., and J. A. Logan.* Remote sensing and GIS landscape assessment of Whitebark Pine mortality. 7th North American Forest Ecology Workshop, Logan, UT.

### Thesis

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- 1999 **Macfarlane, W.W.** Using historic research, remote sensing and GIS to investigate vegetation change related to land use in a rangeland ecosystem. *M.S. Thesis*. Bard Graduate Center, Bard College, Environmental Science: Annandale-on-Hudson, New York, 161 pp.

### Non-Reviewed Publications

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1. 2021. Pennock, C.A., **W.W. Macfarlane**, P. Budy, J. Jimenez, and J. Goodell. Conservation, Restoration, and Monitoring Plan for the Lower White River, Utah. TCFWRU 2022(1):1-78. DOI: [10.13140/RG.2.2.30133.96489](https://doi.org/10.13140/RG.2.2.30133.96489)
2. 2021. **Macfarlane, W.W.**, Nielsen, T. A. and Garlick, C. Surface Water & Riparian Resource Inventory & Assessment: Emery County: Dingell Act Land Conveyances & Exchanges. Prepared for Bureau of Land Management, Price Field Office. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 44 Pages. DOI: [10.13140/RG.2.2.16712.19207](https://doi.org/10.13140/RG.2.2.16712.19207)
3. 2021. **Macfarlane W.W., Adams, J. and Shahverdian, S.** Riverscape Conservation, Restoration and Monitoring Plan: Dugout Ranch, Utah. Prepared for The Nature Conservancy.

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Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 83 pages.  
DOI: [10.13140/RG.2.2.33486.95044](https://doi.org/10.13140/RG.2.2.33486.95044)

4. 2020. Laub, B. G., **W. W. Macfarlane**, T.E. Walsworth, J. Goodell, J. Jimenez, P. Kauss, D. Keller, G. P. Thiede, D. Truman, and P. Budy. 2020. Restoration and monitoring plan for the lower Price River, Utah. UTCFWRU 2020(3):1-44. DOI: [10.13140/RG.2.2.27446.32323](https://doi.org/10.13140/RG.2.2.27446.32323)
5. 2020. **Macfarlane W.W.**, Bangen S., Hallerud, M.A., Anderson, B., Hafen C., Albonico M.T., Garlick C., Gibby T., Hatch T., Rasmussen C., Portugal, E.W. and Wheaton J.M. California Beaver Restoration Assessment Tool Building Realistic Expectations for Partnering with Beaver in Conservation and Restoration. Prepared for the Nature Conservancy. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 45 pages. DOI: [10.13140/RG.2.2.20316.00644](https://doi.org/10.13140/RG.2.2.20316.00644)
6. 2020. Urbanczyk K.M., Burch, S. and **Macfarlane W.W.** 2018 Riparian Land Cover Classification of the Lower White River, Utah. Prepared for Bureau of Land Management, Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. DOI: [10.13140/RG.2.2.16832.25603](https://doi.org/10.13140/RG.2.2.16832.25603)
7. 2019. **Macfarlane W.W.**, Bangen S., Hallerud, M.A., Anderson B., Hafen C., Albonico M.T., Garlick C., Gibby T., Hatch T., Rasmussen C., Portugal E., and Wheaton J.M. California Beaver Restoration Assessment Tool: Building Realistic Expectations for Partnering with Beaver in Conservation and Restoration. Prepared for The Nature Conservancy. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 45 pages. DOI: [10.13140/RG.2.2.20316.00644](https://doi.org/10.13140/RG.2.2.20316.00644)
4. 2019. Wheaton J.M., Wheaton A., Maestas J.D., Bennett S.N., Bouwes N., Shahveridan S., Camp R., Jordan C., **Macfarlane W.M.**, Portugal E.W., and Weber N. Low-Tech Process-Based Restoration of Riverscapes: Pocket Field Guide. Utah State University Restoration Consortium. DOI: [10.13140/RG.2.2.28222.13123/1](https://doi.org/10.13140/RG.2.2.28222.13123/1)
5. 2019. **Macfarlane W.W.**, Hallerud, M.A., Bangen S., Hafen C., Albonico M.T., Garlick C., Gibby T., Hatch T., Rasmussen C., and Wheaton J.M. 2019. Idaho Beaver Restoration Assessment Tool: Building Realistic Expectations for Partnering with Beaver in Conservation and Restoration. Prepared Idaho Fish and Game. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 55 pages. DOI: [10.13140/RG.2.2.12641.25447](https://doi.org/10.13140/RG.2.2.12641.25447)
6. 2019. O'Brien G., Stevens G., **Macfarlane W.W.**, and Wheaton J.M. Geomorphic Assessment of the Lower White River: Valley Landform Delineation, Reach Typing, and Geomorphic Condition Assessment. Fluvial Habitats Center, Utah State University, Prepared for Bureau of Land Management, Logan, UT, 99 pp. DOI: [10.13140/RG.2.2.28838.57924/1](https://doi.org/10.13140/RG.2.2.28838.57924/1)
7. 2019. **Macfarlane W.W.**, M.A. Hallerud., C. Hafen, M.T. Albonico, and J.M. Wheaton. Panther Creek Beaver Restoration Assessment Tool: Building realistic expectations for partnering with beaver in restoration and conservation. Prepared for the Shoshone-Bannock Tribes Fish & Wildlife Department. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 42 pages. DOI: [10.13140/RG.2.2.28413.41445](https://doi.org/10.13140/RG.2.2.28413.41445)

8. 2019. **Macfarlane W.W.**, M.D. Meier, C. Hafen, M.T. Albonico, M.A. Hallerud, and J.M. Wheaton. John Day Basin Beaver Restoration Assessment Tool: Building realistic expectations for partnering with beaver in restoration and conservation. Prepared for the North Fork John Day Watershed Council. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 85 pages. DOI: [10.13140/RG.2.2.29252.27520](https://doi.org/10.13140/RG.2.2.29252.27520)
9. 2019. **Macfarlane W.W.**, M.D. Meier, C. Hafen, M.T. Albonico, and J.M. Wheaton. North Fork Brunt River Beaver Restoration Assessment Tool: Building realistic expectations for partnering with beaver in restoration and conservation. Prepared for the Powder Basin Watershed Council. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 80 pages. DOI: [10.13140/RG.2.2.25057.97128](https://doi.org/10.13140/RG.2.2.25057.97128)
10. 2019. **Macfarlane W.W.**, Hallerud, M.A., Bangen S., Hafen C., Albonico M.T., Garlick C., Gibby T., Hatch T., Rasmussen C., and Wheaton J.M. Greater Yellowstone Area Beaver Restoration Assessment Tool: Building Realistic Expectations for Partnering with Beaver in Conservation and Restoration. Prepared for Greater Yellowstone Coordinating Committee. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 45 pages. DOI: [10.13140/RG.2.2.23671.44964](https://doi.org/10.13140/RG.2.2.23671.44964)
11. 2018. Jordan C., N. Bouwes, and **W.W. Macfarlane**. Integrated status and effectiveness monitoring program (BPA Project 2003-017-00) and Columbia habitat monitoring program (BPA Project 2011-006-00) Final Technical Report for Bonneville Power Administration. DOI: [10.13140/RG.2.2.27808.23042](https://doi.org/10.13140/RG.2.2.27808.23042)
12. 2018. **Macfarlane W.W.**, J.D. Gilbert, M.D. Meier, C. Hafen, S.M. Shahverdian, M.T. Albonico, and J.M. Wheaton. Yakama Nation Beaver Restoration Assessment Tool: Building realistic expectations for partnering with beaver in restoration and conservation. Prepared for the Yakama Nation. Utah State University Ecogeomorphology & Topographic Analysis Lab. Logan, UT. 68 pages. DOI: [10.13140/RG.2.2.25896.83203](https://doi.org/10.13140/RG.2.2.25896.83203)
13. 2018. Shahverdian S., **W.W. Macfarlane**. G.R. O'Brien, and J.M. Wheaton. Birch creek restoration: Improving instream habitat and riparian areas to benefit Bonneville cutthroat trout and sage grouse. Ecogeomorphology and Topographic Analysis Lab, Utah State University, Prepared for Utah Division of Wildlife Resources and Bureau of Land Management, Logan, UT, 28 pp. DOI: [10.13140/RG.2.2.27580.28806](https://doi.org/10.13140/RG.2.2.27580.28806)
14. 2017. Shahverdian S., **W.W. Macfarlane**, G. Stevens, M. Meier, and J.M. Wheaton. Geomorphic response to pilot river restoration on the San Rafael River, Utah: a pilot installation of beaver dam analogues. Prepared for Utah Division of Wildlife Resources and Bureau of Land Management, Utah State University Ecogeomorphology & Topographic Analysis Lab Logan, UT, 35 pp. DOI: [10.13140/RG.2.2.18963.37928](https://doi.org/10.13140/RG.2.2.18963.37928)
15. 2017. Shahverdian S., E. Portugal, R. Camp, **W.W. Macfarlane**, K. Sorenson, and J.M. Wheaton. Grouse Creek watershed restoration plan: using beaver dam analogues to initiate process-based stream recovery. Ecogeomorphology and Topographic Analysis Lab, Utah State University. Prepared for Utah Division of Wildlife Resources, Logan, UT, 35 pp. DOI: [10.13140/RG.2.2.29281.76641](https://doi.org/10.13140/RG.2.2.29281.76641)

16. 2016. Shahverdian S., **W.W. Macfarlane** and J.M. Wheaton. Memo: Westerly Creek beaver dam capacity assessment: developing realistic expectations for beaver dam activity. Prepared for Muller Engineering Company. Anabranch Solutions, Logan, UT, 24 pp. DOI: [10.13140/RG.2.2.34120.93446](https://doi.org/10.13140/RG.2.2.34120.93446)
17. 2016. Hafen K. and **W.W. Macfarlane**. Can beaver dams mitigate water scarcity caused by climate change and population growth? USFS Stream Notes. (2016): November: 1-5.
18. 2014. Wheaton J.M. and **W.W. Macfarlane**. The Utah beaver restoration assessment tool: a decision support & planning tool – Manager Brief, Ecogeomorphology and Topographic Analysis Lab, Utah State University. Prepared for Utah Division of Wildlife Resources, Logan, UT, 16 pp. DOI: [10.13140/RG.2.2.19477.14562](https://doi.org/10.13140/RG.2.2.19477.14562)
19. 2014. **Macfarlane W.W.**, J.M. Wheaton, and M.L. Jensen. 2014. The beaver restoration assessment tool: a decision support & planning tool for Utah. Ecogeomorphology and Topographic Analysis Lab, Utah State University. Prepared for Utah Division of Wildlife Resources, Logan, Utah, 142 pp. DOI: [10.13140/2.1.3190.0167](https://doi.org/10.13140/2.1.3190.0167)
20. 2013. **Macfarlane W.W.** and C.M. McGinty. Fine scale riparian vegetation mapping: lower San Rafael River, Utah. Fish Ecology Lab and RS/GIS Laboratory, Utah State University. Prepared for Department of the Interior, Bureau of Land Management, Logan, Utah, 52 pp. DOI: [10.13140/RG.2.1.1464.3603](https://doi.org/10.13140/RG.2.1.1464.3603)
21. 2013. **Macfarlane W.W.** and J.M. Wheaton. Modeling the Capacity of Riverscapes to Support Dam-Building Beaver - Case Study: Escalante River Watershed. Prepared for Grand Canyon Trust and the Walton Family Foundation, Logan, UT, 79 pp. DOI: [10.13140/RG.2.2.18638.28488](https://doi.org/10.13140/RG.2.2.18638.28488)
22. 2013. **Macfarlane W.W.**, W.R. Kern, D.J. Mattson and J.A. Logan. Pilot Study: Gauging the impact of whitebark pine mortality on occurrence of Clark’s nutcracker, red squirrel, black bear and grizzly bear. Ecogeomorphology and Topographic Analysis Laboratory, Utah State University. Prepared for Natural Resources Defense Council, Logan, Utah, 23 pp. DOI: [10.13140/RG.2.2.33318.34885](https://doi.org/10.13140/RG.2.2.33318.34885)
23. 2010. **Macfarlane, W.W.**, J. A. Logan, and W.R. Kern. Using the Landscape Assessment System (LAS) to Assess Mountain Pine Beetle-Caused Mortality of Whitebark Pine, Greater Yellowstone Ecosystem, 2009: Project Report. DOI: [10.13140/RG.2.2.31640.62725](https://doi.org/10.13140/RG.2.2.31640.62725)
24. 2010. Logan, J. A., and **W.W. Macfarlane**. Beetle Devastates Yellowstone Whitebark Pine Forests. ActionBioscience.org. [https://www.researchgate.net/publication/307858492\\_Beetle\\_devastates\\_Yellowstone\\_white\\_bark\\_pine\\_forests](https://www.researchgate.net/publication/307858492_Beetle_devastates_Yellowstone_white_bark_pine_forests)
25. 2003. Pederson, J.L., Petersen, P.A., **Macfarlane, W.W.**, Gonzales, M.F. and Kohl, K., 2003. Mitigation, monitoring and geomorphology related to gully erosion of cultural sites in Grand Canyon. Report to the U.S. Geological Survey, Grand Canyon Monitoring and Research Center, 241 pp.

**Research Grants Awarded (since appointment as co-lab director)**

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1. **US Army Corps of Engineers**, 2022-2023. “Improving the Computation of Large Wood and Other Geomorphic Parameters in Rivers.” \$125,000 (PI)
2. **NASA/ Boise State University**, 2021-2025, “Integrating remote sensing and ecological forecasting into decision support for beaver rewilding.” \$149,784 (Co-PI)
3. **Luckiamute Watershed Council**, 2021-2024, Mid-Willamette Beaver Restoration Assessment Tool (BRAT) Oregon, \$43,052 (PI)
4. **Utah Division of Wildlife Resources**, 2022-2023, “White River Enhancement Project.” Awarded \$47,963 (PI)
5. **Utah Division of Wildlife Resources**, 2021-2023, “Lower San Rafael & Price River Riparian Corridor Habitat Improvement, Phase 2.” \$30,125 (PI)
6. **Utah Division of Wildlife Resources**, 2021-2022, “Eastern La Sal Watershed Restoration Project Phase II.” \$5,700 (PI)
7. **Utah Division of Wildlife Resources**, 2021-2023. “Ranch Canyon, Bear Creek Riparian Enhancement.” \$47,963 (PI)
8. **Anabranch Solutions**, 2020, Task orders 1-9. Awarded \$80,000. (PI)
9. **Eco Logical Research**, 2020-2024, “Riverscape Context for LCT Conservation and Restoration Planning”. Awarded \$195,028 (PI)
10. **US Bureau of Land Management**, 2020-2025, “Montana/Dakotas Fisheries and Aquatic Resource Management”. 5-year co-op agreement: \$610,000 (Co-PI)
11. **US Bureau of Land Management**, 2017-2022, “Making Regional Assessment of Rivercapes Useful.” 5-year co-op agreement: \$312,609 (PI)
12. **US Bureau of Reclamation**, 2019-2021, “Cottonwood Wash Geomorphic Change Detection.” Awarded \$20,000 (PI)
13. **US Fish and Wildlife Service**, 2020 -2025, “Planning & Prioritizing Low-Tech Process Based Restoration in the Upper Klamath & Sprague River Watersheds.” 5-year co-op agreement: 1<sup>st</sup> year awarded \$89,028 (Co-PI)
14. **US Forest Service**, 2019-2024, “Riverscapes Network Analysis & Comparison with Reach-Scale Monitoring.” 5-year co-op agreement: \$288,981 (PI)
15. **US Forest Service**, 2017-2022, “Whitebark Pine Cumulative Mortality Study”, 5-year co-op agreement, \$110,397 (PI)
16. **National Park Service**, 2021-2024, “Restoring Habitat and Fluvial Processes in Great Basin National Park with Low-Tech Restoration.” \$41,073 (PI)
17. **Utah Department of Environmental Quality**, 2019-2020, “Otter Creek Riparian and Water Quality Restoration Project.” Awarded \$65,000 (PI).
18. **Utah Department of Environmental Quality**. 2020-2023, “Otter Creek Riparian and Water Quality Restoration Project: Phase 1a.” Awarded \$20,000 (PI).
19. **Utah Division of Wildlife Resources**, 2020 “Grouse Creek Watershed Stream Restoration Phase II.” Awarded \$18,492 (PI).
20. **Utah Division of Wildlife Resources**, 2020, “White River Enhancement Project Phase 6.” Awarded \$10,000 (PI)

## Teaching

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### Invited/solicited workshops organized

Instructor\*; Instructor & Co-Organizer \*\*

1. **Mid-Willamette Beaver Project.** July, 2022, Beaver Restoration Assessment Tool Workshop. Corvallis, OR. \*\*
2. **Utah State University Restoration Consortium.** April 2019, Beaver Translocation Workshop, Logan UT\*
3. **North Fork John Day Watershed Council.** October 2019, John Day Beaver Restoration Assessment Tool. John Day, OR. \*\*
4. **Greater Yellowstone Area Working Group.** June 2019, Greater Yellowstone Beaver Restoration Assessment Tool. Alpine, WY. \*\*
5. **Greater Yellowstone Area Working Group.** May 2019, Greater Yellowstone Beaver Restoration Assessment Tool. Bozeman, MT.\*\*
6. **Idaho Department of Fish & Game.** February 2018, Idaho Beaver Restoration Assessment Tool. Boise, ID.\*
7. **Powder Basin Watershed Council.** October 2018, Burnt River Beaver Restoration Assessment Tool. Baker City, OR. \*\*
8. **Pheasants Forever & NRCS Sage Grouse Initiative,** September 2018, Partnering with Beaver in Restoration Design. Logan, UT.\*
9. **Sage Grouse Initiative, Pheasants Forever & NRS,** September 2016, ‘Partnering with Beaver in Restoration Design’, Logan, UT. \*
10. **Partnering with Beaver in Restoration,** Utah State University. 2015. Intermountain Center for River Rehabilitation and Restoration. \*
11. **Partnering with Beaver in Restoration Workshop,** Utah State University. 2012. Intermountain Center for River Rehabilitation and Restoration. \*
12. **US Army Corps of Engineers,** May 2012. – ‘Geomorphic Change Detection Workshop’, Kansas City, MO.\*
13. **International Development Enterprise: Rural Prosperity Initiative,** 2008. Provided week long GIS and GPS hands-on training. Kathmandu, Nepal. \*\*
14. **International Development Enterprise: Rural Prosperity Initiative,** 2008 Provided week long GIS and GPS hands-on training. Addis Ababa, Ethiopia. \*\*
15. **International Development Enterprise: Rural Prosperity Initiative,** 2007. Provided week long GIS and GPS hands-on training course. Lusaka, Zambia. \*\*
16. **Western Wildlands Environmental Threats Assessment Center.** Provided 2-day Training Workshop: GMWest System -- A GIS-based Risk Assessment System for Gypsy Moth Introductions. Portland, Oregon. \*\*

## Supervisions

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### Postgraduate Researchers Supervised at USU

1. Mary Buford Turnage, 2022 – Present, GIS Technician
2. Tansy Remiszewski , Master’s Graduate Committee Member 2020 – 2022

## WILLIAM W. MACFARLANE VITA

3. Matt Holland, Masters of Natural Resources Committee Member, 2022-present
4. Ally Smith, 2022 – Present, GIS Technician
5. Cashe Rasmussen, 2019 – present, GIS Analyst/Drone Pilot
6. Lauren Herbine, 2020 – present, GIS Technician
7. Shelby Sawyer, 2020 – present, GIS Technician
8. Karen Bartelt, 2018-2020, GIS Technician
9. Matt Meier, 2016 to 2019, Research Technician, Surveyor and Geospatial Analyst
10. Geoff Stevens, 2016 to 2018, Research Technician, Surveyor and Geospatial Analyst
11. Gary O'Brien, 2012 to 2018, Research Associate, Fluvial Geomorphologist
12. Elijah Portugal 2016 to 2017, Research Associate
13. Scott Shahverdian 2017 to present, Research Associate, Fluvial Geomorphologist
14. Sara Bangen, 2013 to 2019, Research Associate, Habitat Analyst
15. Chalese Hafen, 2015-2020, Senior Cartographer
16. Martha Jensen, 2013 – 2016, Senior Cartographer
17. Micael Albonico, 2016-2019, GIS Analyst
18. Josh Gilbert, 2015-2018, GIS Analyst/Surveyor
19. Jordan Gilbert, 2015-2018, Computer Programmer
20. Tyler Hatch, 2019 – present, Computer Programmer

### **Undergraduate Researchers Supervised at USU**

1. Jordan Burningham, 2012 - 2014, GIS Technician
2. Chris Smith, 2013 - 2014, GIS Technician
3. Taylor Dudunake, 2015-2017, GIS Technician
4. Christopher Brown, 2016, GIS Technician
5. Adan Banda, 2016-2018, GIS Technician
6. Landon Haycock 2017-2018, GIS Technician
7. Michael Hilmes 2017, GIS Technician
8. Braden Anderson, 2017-2019, Computer Programmer
9. Brittany Graham, 2018 -2019, Computer Programmer
10. Maggie Hallurud, 2018-2020, Computer Programmer
11. Chad Garlick, 2018 – 2021, GIS Technician/Drone Pilot
12. Gabe Henry, 2018-2020, GIS Technician
13. Tyler Gibby, 2019-2020, GIS Technician
14. Tyler Hatch, 2019 – 2021, GIS Technician
15. Brian Ferrerra, 2020, GIS Technician
16. Dylan Baum, 2020, GIS Technician
17. Tanner Nielson, 2021-2022, GIS Technician
18. Paige Sargeant, 2022-Present