

Charlie Bettigole

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Appointments and Experience

Director | GIS Center for Interdisciplinary Research | Skidmore College | 2019 - Present | Saratoga Springs, NY

Program Director | Quick Carbon | Yale School of Forestry & Environmental Studies | 2018-2019 | New Haven, CT

Program Director | Ucross High Plains Stewardship Initiative | Yale School of Forestry & Environmental Studies | 2013-2018 | New Haven, CT and Ucross, WY

Visiting Assistant in Science Instruction | Middlebury College | 2012-2013 | Middlebury, VT

GIS and Conservation Consulting | 2005-2012 | Vermont and Portland, OR

Education

University of Vermont (2009 – 2012) | *M.S. Wildlife Biology*

Master's Thesis: Normative Standards for Land Use in Vermont: The Effects of Social Norms on Wildlife Occupancy.

Middlebury College (2001- 2005) | *B.A. Environmental Studies: focus in Conservation Biology*

Grants and Awards

NASA DEVELOP (2023) | In-kind | *Remote Sensing*

Skidmore Faculty-Student Research Award (2020-2023) | **\$5,600 - \$16,800** per year | *Remote Sensing and GIS*

The Nature Conservancy (2021) | **\$13,291** | *3D Modeling*

Lake George Land Conservancy (2021) | **\$5,600** | *3D Modeling*

Noble Research Institute (2020) | **\$7,346** | *Stratified Soil Sampling*

Oak Spring Garden Foundation (2020) | **\$27,421** | *Stratifi*

Caney Fork Farm (2020) | **\$32,840** | *Stratified Soil Sampling*

TomKat Foundation (2018) | **\$162,500** | *Quick Carbon*

Plank Stewardship Initiative (2018) | **\$8,000** | *Quick Carbon*

Dillon Family Foundation (2018) | **\$50,000** | *Quick Carbon*

Noble Research Institute (2017) | **\$35,000** | *Quick Carbon*

Dillon Family Foundation (2017) | **\$15,000** | *Quick Carbon*

Raymond Plank, Gift (2015) | **\$2,000,000** | *Five year gift to support Ucross High Plains Stewardship Initiative*

Google Earth Engine Research Award (2015) | **\$60,000**
Change detection in rangelands using time series analysis

Google Earth Engine Research Award (2014) | **\$60,000**
Spectral unmixing of hyperspectral imagery for invasive species mapping in rangelands

Selected Publications

Bettigole, C.; Hanle, J.; Kane, D.A.; Pagliaro, Z.; Kolodney, S.; Szuhay, S.; Chandler, M.; Hersh, E.; Wood, S.A.; Basso, B.; et al. 2023. Optimizing Sampling Strategies for Near-Surface Soil Carbon Inventory: One Size Doesn't Fit All. *Soil Systems*, 7, 27

Goodwin DJ, Kane DA, Dhakal K, Covey KR, **Bettigole C**, Hanle J, Ortega-S. JA, Perotto-Baldivieso HL, Fox WE, Tolleson DR. 2022. Can Low-Cost, Handheld Spectroscopy Tools Coupled with Remote Sensing Accurately Estimate Soil Organic Carbon in Semi-Arid Grazing Lands? *Soil Systems*.; 6(2):38

Ganz, T. R., J. McMurray, K. Covey, **C. Bettigole**, G. Benoit. 2021 Chemical Effects of Snowmelt on an Alpine Lake in the

Wind River Range, WY *Water Air and Soil Pollution*

- Turnbull, R., Foster, M., Faires, C., Singer, J., Downey, M., **Bettigole, C.**, and K.R. Covey. 2019. Sudden decline disease in quaking aspen (*Populus tremuloides*), *Forest Ecology and Management*
- Espenshade, J., J. D. Murdoch, T. M. Donovan, R. E. Manning, and **C. Bettigole**. 2018. Public acceptability of development in the Northern Forest of Vermont, USA – the influence of wildlife information, recreation involvement, and demographic characteristics. *PLOS ONE*.
- Routh, D., Seegmiller, L., **Bettigole, C.**, Kuhn, C., Oliver, C.D., Glick, H.B. 2018. Improving the Reliability of Mixture Tuned Matched Filtering Remote Sensing Classification Results Using Supervised Learning Algorithms and Cross-Validation. *Remote Sensing*
- Keeler, B. L., R. Chaplin-Kramer, A. D. Guerry, P. F. E. Addison, **C. Bettigole**, I. C. Burke, B. Gentry, L. Chambliss, C. Young, A. J. Travis, C. T. Darimont, D. R. Gordon, J. Hellmann, P. Kareiva, S. Monfort, L. Olander, T. Profeta, H. P. Possingham, C. Slotterback, E. Sterling, T. Ticktin and B. Vira. 2017. "Society Is Ready for a New Kind of Science—Is Academia?" *BioScience*
- Kuhn, C., **Bettigole, C.**, Glick, H. B., Seegmiller, L., Oliver, C. D., & Raymond, P. 2017. Patterns in stream greenhouse gas dynamics from mountains to plains in northcentral Wyoming. *Journal of Geophysical Research: Biogeosciences*
- Glick, H. B., **C. Bettigole**, D. S. Maynard, K. R. Covey, J. R. Smith and T. W. Crowther. 2016. "Spatially-explicit models of global tree density." *Nature Scientific Data*
- Glick, HB, Routh, D, **Bettigole, C**, Oliver, CD, Seegmiller, L and Kuhn, C. 2016. Modeling the Effects of Horizontal Positional Error on Classification Accuracy Statistics. *Photogrammetric Engineering & Remote Sensing*
- Covey, K.R., Bueno de Mesquita C.P., Oberle, B., Maynard, D.S., **Bettigole, C.**, Crowther T.W., Duguid, M.C., Steven, B., Zanne, A.E., Lapin M., Ashton, M.S., Oliver, C.D., Xuhui, L., Willimas, C., Gu, H & Bradford, M.A. 2016. Greenhouse Trace Gases in Dead Wood. *Biogeochemistry*.
- Crowther, T. W., H. B. Glick, K. R. Covey, **C. Bettigole**, D. S. Maynard, S. M. Thomas, J. R. Smith et al. 2015. Mapping Tree Density at a Global Scale. *Nature*
- Glick, H.B., **Bettigole, C.**, Routh, D., Seegmiller, L., Kuhn, C., Khadka, A., Oliver, C.D. 2014. Wyoming's Aging Agricultural Community: Demographic Trends Among Farm and Ranch Operators, 1920-2007. *Rangelands*
- Bettigole, C.**, T. Donovan, R.E. Manning, and J. Austin. 2013. Normative Standards for Land Use in Vermont: Implications for Biodiversity. *Biological Conservation*.
- Bettigole, C.**, T. Donovan, R.E. Manning, J. Austin, and R. Long. 2013. Acceptability of Residential Development in a Regional Landscape: Potential Effects on Wildlife Occupancy Patterns. *Biological Conservation*.
- Beazley, K, C Reining, P Doran, **C Bettigole**. 2010. Integrating site-selection tools and expert judgment for conservation system design in the Greater Northern Appalachians of Canada and the United States. *Ecosystem based management: Beyond boundaries*
- Covey K.R., **Bettigole, C.**, Warren, R.J., Williams C.A., Gu, H., Aubrey, D.P., Megonigal, J.P., Asbjorsen, H., Bohn, K.K., Classen, A.T., Farrell, M., Crowther, T.W., Frey, B.R., Holzmueller E.J., Keaton, W.S., Knapp, B.O., King, J.R., Kuers, K., Lhokta J.M., Love, J.M., Maynard, D., Ruttenbeck, N.E., Sanders, N.J., Saunders, M.R., Stovall, J.P., Wright, J.P., Wurzburger, N., Oliver, C.D., Lee, X., and M.A. Bradford. *In review*. Methane in upland temperate forest trees, *Nature Geoscience*

Courses

Introduction to GIS (ID 210) | Fall/Spring 2019-2024 | Skidmore College

Advanced Spatial Analysis (ID 351D) | Spring 2020-2024 | Skidmore College

Landscape Analysis with UAV (ID 351B) | Fall 2021-2024 | Skidmore College

Fire Ecology and Management | Spring 2018 | Yale School of Forestry & Environmental Studies

Western Writing Workshop | Fall 2016, Fall 2017, Fall 2018 | Yale School of Forestry & Environmental Studies

Natural Science and the Environment | Fall 2013 | Middlebury College

Service

Board Vice Chair / Secretary – Plank Stewardship Initiative, Clearmont, WY (2014-present)

Caney Fork Farm Science Advisory Board -- Carthage, TN (2018-present)

Skidmore Tree Campus Committee – Saratoga Springs, NY (2022-present)

Recent Supervised Student Projects

- Evaluating Agricultural Conservation Easement Impact Using Earth Observations to Examine Avoided Soil Carbon Loss to Development: NASA DEVELOP [White paper](#) (manuscript in review)
- Geospatial drivers of oak mortality following spongy moth infestation: [Presentation](#) (manuscript under development)
- Daily vegetation response to regenerative grazing: [Storymap](#)
- Spatial analysis for holistic farm transition planning: [Storymap](#)
- Solar prioritization tool for Saratoga County: [Storymap](#)
- Forest carbon mapping on Skidmore's Newlands: [Storymap](#)
- Mapping 2022 spongy moth defoliation across New York State: [White paper](#)
- Assessing viability of solar development on abandoned mine sites in Pennsylvania: [Storymap](#)
- Mapping 3D forest structure on Dome Island, Lake George: [Storymap](#)
- Strategic Conservation Plan for Lake George Land Conservancy: [Storymap](#)
- Mapping Environmental Injustice in Geneva, NY with BluePrint Geneva: [Storymap](#)
- Identifying grazing lands across the USA with the Nature Conservancy: [Storymap](#) (manuscript in review)
- Spatially explicit recommendations on soil carbon sampling for Native Energy: [Storymap](#) (manuscript under development)
- Community mapping for change at Skidmore - New Visions Mapping Collaborative: [Website](#)
- Soil sampling optimization analysis with Caney Fork Farms and Oak Spring Gardens: [Storymap](#) | [Publication](#)
- Assessing future sites for Environmental Justice funding in New York State with NYS DEC: [Storymap](#)
- Designing an interactive food map for the Hudson Valley during the COVID-19 crisis with Stone Barns Center: [Web app](#)
- Mapping Hemlock Woolly Adelgid spread in the southern Adirondacks with LGLC: [Storymap](#)

Projects before 2020 available upon request