

AVNI MALHOTRA

Earth Scientist | Pacific Northwest National Laboratory

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RESEARCH & PROFESSIONAL PROFILE

Earth scientist studying ecosystem nutrient and trace gas cycling, plant-soil interactions, northern ecosystems, peatlands and other terrestrial-aquatic interface ecosystems. Research spans plot- to continental/global scales and combines field experiments, data synthesis, databases, and modeling. Extensive experience in scientific community leadership, interdisciplinary coordination, mentoring, and professional-society service.

PROFESSIONAL APPOINTMENTS

2023–present Earth Scientist, Pacific Northwest National Laboratory

2021–2023 Senior Scientist, University of Zurich

2018–2021 Postdoctoral Researcher, Stanford University

2016–2018 Postdoctoral Researcher, Oak Ridge National Laboratory

2015 Course Instructor, McGill University

EDUCATION

2016 Ph.D., McGill University

2010 M.S. (Biology), Villanova University

2007 B.S. (Honors), York University

AGU LEADERSHIP & SERVICE

- Associate Editor, Journal of Geophysical Research: Biogeosciences (2024–present).
- Organizer and chair of multiple AGU oral, town hall, and poster sessions (2017–2026).
- AGU Fall Meeting Planning Committee Chair, Biogeosciences Section (2021); Planning Committee member (2018–2021).
- Invited speaker, AGU Biogeosciences career series (2024).

COMMUNITY LEADERSHIP

- Session organizer, European Geosciences Union: “Soils and Climate Change” (2022–2026) and northern peatlands (2024–2025).
- Session organizer, Department of Energy Environmental System Science PI annual meeting (2022–2025).
- Review Board member, Biogeochemistry (2018–present).
- Scientific advisory board member, ICON initiative (2022–present) and PNNL River Corridors Scientific Focus Area (2023–present).
- Coordinator, International Soil Carbon Network (ISCN) and soil database (2017–present).
- Organized and led workshops on distributed data generation, next-generation ecosystem experiments, big soil data, root traits and soil carbon, and soil warming experiments.
- Invited panelist/speaker for AmeriFlux, ESIL, EMERGE Biological Integration Institute, Commonland, etc.

SELECTED PUBLICATIONS

Malhotra A et al. (2026) Do we have globally representative data to understand soil processes? Biogeochemistry.

Määttä T, Desai A, Ueyama M et al., Malhotra A (2026) A cross-site comparison of ecosystem- and plot-scale methane fluxes from wetlands and uplands. Biogeosciences.

Malhotra A et al. (2025) Fine root and soil carbon stocks are positively related in grasslands but not in forests. Communications Earth & Environment.

Feron S, Malhotra A et al. (2024) Recent increases in annual, seasonal, and extreme methane fluxes driven by changes in climate and vegetation in boreal and temperate wetland ecosystems. Global Change Biology.

Määttä T and Malhotra A (2024) The hidden roots of wetland methane emissions. Global Change Biology.

Fluet-Chouinard E, Stocker BD, Zhang Z, Malhotra A et al. (2023) Extensive global wetland loss over the past three centuries. Nature.

McNicol G et al., Malhotra A et al. (2023) Upscaling wetland methane emissions from the FLUXNET-CH4 eddy covariance network (UpCH4 v1.0): Model development, network assessment, and budget comparison. AGU Advances.

Ofiti NOE, Schmidt MWI, Abiven S et al., Malhotra A (2023) Climate warming and elevated CO₂ alter peatland soil carbon sources and stability. Nature Communications.

Malhotra A et al. (2020) Peatland warming strongly increases fine-root growth. PNAS

Perryman CR, McCalley CK, Malhotra A et al. (2020) Thaw transitions and redox conditions drive methane oxidation in a permafrost peatland. Journal of Geophysical Research: Biogeosciences.

Malhotra A et al. (2019) The landscape of soil carbon data: emerging questions, synergies and databases. Progress in Physical Geography.

MENTORING, TEACHING & TRAINING

- Main supervisor, University of Zurich: 1 postdoc, 1 PhD, and 3 master's students working on root economics, peatland carbon cycling, methane, and root-derived carbon (2021–2026).
- Thesis examiner for PhD and master's candidates at the University of Tartu, University of Helsinki, University of Cambridge, ETH Zurich, and University of Zurich (2021-present).
- Mentored trainees who received awards including Swiss National Science Foundation Postdoc Mobility, Marie Skłodowska-Curie Actions, Swiss Polar Institute, and University of Zurich doc.Mobility grants.
- Instructor: Soil Science III; Basics of the Soil-Plant-Environment; Soil Science Practical Project; Isotopes in Ecosystem Sciences (University of Zurich); Quantitative Methods (McGill University).
- Cofounder, FEMPSS, a peer-mentoring and networking community for postdocs and senior scientists in Zurich (2022).
- Co-chair, Stanford University School of Earth Postdoc Advisory Council (2019–2021).

SELECTED GRANTS

- Early Career Award (2025-2030) from the Department of Energy Biological and Environmental Research
- Environmental Molecular Sciences Laboratory Exploratory Grants (2024, 2025) and Developer Grant (2025).
- Swiss National Science Foundation Project Funding (2021); Climate Change Science Institute Early Career Grant, Oak Ridge National Laboratory (2018).
- University of Zurich Peer Mentoring Grant and Foundation for Scientific Research grants (2022).