

Punwath Prum

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EDUCATION

- Expected 2026** **Ph.D., Geology and Environmental Science**
University of Pittsburgh, Pittsburgh, PA
Focus: Aquatic remote sensing and hydrology
Committee: Anna Braswell, Josef Werne, Patrick Shirey, John Gardner
- 2021** **Professional M.S., Environmental Conservation**
University of Wisconsin–Madison
Major: Environmental Observation and Informatics
Capstone: Mapping agroforestry with hyperspectral imagery in Google Earth Engine
- 2016** **B.A., Education**
Royal University of Phnom Penh, Cambodia
- 2015** **B.S., Land Management and Land Administration**
Royal University of Agriculture, Cambodia

RESEARCH INTERESTS

Satellite remote sensing of inland and coastal water quality • Multi-sensor Landsat harmonization • Machine learning for environmental data • Suspended sediment and river–ocean continuum dynamics • Long-term hydrologic and water quality change • Cloud-based geospatial analysis (Google Earth Engine)

RESEARCH & PROFESSIONAL EXPERIENCE

- 2025–Present** **Future Investigator (FINESST Fellow)**, NASA Earth and Space Science and Technology
Project: Mapping suspended sediment trends across Earth's estuaries using satellites. Lead investigator on a NASA-funded dissertation project linking estuarine SSC dynamics to climate and anthropogenic drivers.
- 2021–2024** **Graduate Research Assistant**, Department of Geology and Environmental Science, University of Pittsburgh
NASA AIST Grant #AIST-21-0037: Hosted analytic collaborative framework for global river water quantity and quality from SWOT, Landsat, and Sentinel-2. Harmonized global suspended sediment concentration data across sensors.
NASA Early Career Investigator Grant #80NSSC21K0921: Built a global Landsat-based machine learning algorithm for SSC and produced a global riverine SSC database from 1985 to 2021.
- Fall 2023** **Graduate Teaching Assistant**, Surface Water Hydrology (GEOL 2150), University of Pittsburgh
- Spring 2022** **Graduate Teaching Assistant**, Ground Water Geology (GEOL 2051), University of Pittsburgh

2020–2021	Data and Map Update Specialist (Part-time) , Wisconsin Geological and Natural History Survey Converted legacy geologic map data into a standardized geodatabase, including topology checks and FGDC CSDGM metadata.
2020–2021	GIS and Open Data Officer , East-West Management Institute Collected and analyzed GIS data; produced maps, data visualizations, and infographics in support of project staff.
2015–2019	GIS and Data Research Coordinator (2018–2019); GIS and Data Research Officer (2016–2018); GIS and Mapping Officer (2015–2016) Open Development Cambodia, Phnom Penh, Cambodia Validated, analyzed, and mapped spatial data; maintained GIS databases and geo-visualizations; developed and delivered GIS training modules for partner organizations.

PUBLICATIONS

Peer-Reviewed (Published & In Press)

- (5) Prajapati, R., **Prum, P.**, & Gardner, J. (in press). Extent of sediment concentration trends associated with climate and human factors across Earth's major river basins. *Scientific Reports*.
- (4) Lucchese, L., Daroya, R., Simmons, T., **Prum, P.**, Pavelsky, T., Gardner, J., Gleason, C. J., & Maji, S. (2026). Operational near real-time global riverine sediment flux estimates from space. *Geophysical Research Letters*. <https://doi.org/10.1029/2025GL120407>
- (3) Daroya, R., Lucchese, L., Simmons, T., **Prum, P.**, Pavelsky, T., Gardner, J., Gleason, C. J., & Maji, S. (2025). Improving satellite imagery masking using multitask and transfer learning. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. <https://doi.org/10.1109/JSTARS.2025.3551620>
- (2) Barton, R., Dextro, R. B., Bloomer, C. C., Claar, D., Fernandes, T. d. F., Franklin, T. V., Huynh, T.-H., Possamai, B., **Prum, P.**, Turner, J. S., Werlang, C. C., & Latour, P. (2024). Just hit submit—Perspectives and advice from L&O Letters Early Career Publication Honor awardees. *Limnology and Oceanography Bulletin*, 33, 107–110. <https://doi.org/10.1002/lob.10658>
- (1) **Prum, P.**, Harris, L., & Gardner, J. (2024). Widespread warming of Earth's estuaries. *Limnology & Oceanography Letters*. <https://doi.org/10.1002/lol2.10389>

Manuscripts in Review

- (3) Devkota, P., Feng, D., Gupta, A., Gardner, J. R., Lucchese, L. V., & **Prum, P.** (submitted Apr 2026). Towards global estimation of riverine suspended sediment flux using deep learning.
- (2) **Prum, P.**, Sillen, S., Steele, B., Yang, X., & Gardner, J. (submitted Feb 2026). Harmonizing Landsat TM, ETM+, OLI, and OLI-2 surface reflectance data for long-term surface water quality monitoring.
- (1) **Prum, P.**, Lucchese, L., & Gardner, J. (submitted Dec 2025). Global model for riverine suspended sediment concentration from Landsat.

Manuscripts in Preparation

- (3) **Prum, P.**, Braswell, A., & Gardner, J. Trends in suspended sediment concentration in global estuaries from 1984 to 2024.
- (1) **Prum, P.** & Gardner, J. Integrating Harmonized Landsat–Sentinel-2 imagery and climate drivers for CONUS-scale detection of riverine cyanobacteria blooms
- (1) **Prum, P.** & Gardner, J. Random Cross-Validation Inflates Satellite-derived Suspended Sediment Retrieval Accuracy.

FELLOWSHIPS, GRANTS & AWARDS

Fellowships & Scholarships

2025–2027	NASA Future Investigators in NASA Earth and Space Science and Technology (FINESST). \$75,000
2024–2025	Hydroinformatics Innovation Fellowship, Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI). \$4,910
2024–2025	Andrew Mellon Predoctoral Fellowship, University of Pittsburgh. \$23,680 and 100% tuition coverage
2019–2020	Civil Society Leadership Award, Open Society Foundation. \$58,775 and 100% tuition coverage
2011–2015	Higher Education Scholarship for Outstanding Student, Ministry of Education, Cambodia. 100% tuition coverage

Awards & Honors

2024	A&S Graduate Student Organization Travel Grant, University of Pittsburgh. \$500
2024	Student Travel Award, Association for the Sciences of Limnology and Oceanography. \$1,200
2024	Christopher Hapke Memorial Planetary Award, University of Pittsburgh. \$1,500
2022	L&O Letters Early Career Publication Honor, Association for the Sciences of Limnology and Oceanography. \$3,360

CONFERENCE PRESENTATIONS

- (8) Lucchese, L., et al. (2025). Global river suspended sediment flux from space using highly scalable deep learning models. *AGU Fall Meeting*, USA.
- (7) **Prum, P.** (2025). Monitoring global changes in estuarine water quality with Landsat Collection 2 satellite data. *Geology Colloquium*, University of Pittsburgh.
- (6) **Prum, P.** (2024, 2025). Harmonizing Landsat-satellite surface reflectance for long-term understanding of water quality in rivers. *AGU Fall Meeting 2024 and Hack Limnology 2025*, USA.
- (5) **Prum, P.** (2024). Building a suspended sediment concentration database across Earth's rivers with Landsat. *ASLO Summer Meeting*, Madison, WI.
- (4) Gardner, J. & **Prum, P.** (2022). The color of Earth's large rivers. *AGU Fall Meeting*, USA.
- (3) Prajapati, R., et al. (2022). A global perspective on riverine suspended sediment trends and drivers. *AGU Fall Meeting*, USA.
- (2) **Prum, P.** (2022). Widespread decline in suspended sediment concentration in U.S. estuaries. *AGU Fall Meeting*, USA.
- (1) **Prum, P.** (2022). A robust application of Google Earth Engine for estimating surface suspended sediment concentration dynamics in the Mekong Delta. *THA 2022 International Conference on Moving Towards a Sustainable Water*, Thailand.

TECHNICAL SKILLS

Programming	Python (primary), R, JavaScript, SQL
Geospatial	Google Earth Engine, xarray, ArcGIS, QGIS, SNAP, SeaDAS, Git
Machine Learning	XGBoost and Random Forest

Remote Sensing Multi-generational Landsat archive (TM, ETM+, OLI, OLI-2), Harmonized Landsat–Sentinel (HLS), Sentinel-1/2, PlanetScope, SWOT, NASA PACE OCI hyperspectral

Languages Khmer (native), English (fluent), Thai (conversational)

SERVICE & PROFESSIONAL ACTIVITIES

Peer Review

Ad-hoc reviewer: *Journal of Hydrology*, *Scientific Reports*, *ISPRS Journal of Photogrammetry and Remote Sensing*, *Environmental Modelling & Software*, *Limnology and Oceanography*, and *Limnology and Oceanography: Method*

University Service

2024–Present Graduate Student Representative, Department of Geology and Environmental Science, University of Pittsburgh

2023–Present International Student Mentor Committee, University of Pittsburgh

Professional Memberships

American Geophysical Union (AGU); Association for the Sciences of Limnology and Oceanography (ASLO); Coastal and Estuarine Research Federation (CERF)

REFERENCES

Doctoral Advisor **Dr. John Gardner**, Assistant Professor
Department of Earth, Marine and Environmental Sciences
University of North Carolina at Chapel Hill
gardj@unc.edu

Collaborator **Dr. Luisa Lucchese**, Research Assistant Professor
Department of Geology and Environmental Science
University of Pittsburgh
luv14@pitt.edu

Collaborator **Mr. Sam Sillen**, Physical Sciences Scientist
Colorado Department of Public Health and Environment
samsillen0@gmail.com