

Victor Boyd

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SUMMARY

Early career environmental AI researcher completing a PhD in Computer Science in 2026, with more than three years of graduate research applying machine learning, **computational data science**, **spatial environmental modeling**, **dynamic systems modeling**, and **knowledge representation** to sustainability questions. Research covers water quality, ecosystem function, landscape ecology, and environmental decision support. Leads projects from research framing through reproducible analysis, model evaluation, uncertainty documentation, manuscript preparation, journal submission, and conference presentation. Works independently on defined questions while collaborating across computer science and environmental science teams. Additional research examines responsible AI, model alignment, AI safety, and transparent use of computational outputs in environmental decisions. Brings clear scientific writing, interdisciplinary communication, and a thoughtful approach to useful, interpretable research.

EDUCATION

PhD in Computer Science	2026
University of Colorado Boulder GPA: 0	Boulder, CO
<i>Coursework: Machine learning, spatial modeling, knowledge representation, responsible AI</i>	
Bachelor of Science in Computer Science	2021
Colorado State University GPA: 0	Fort Collins, CO
<i>Coursework: Artificial intelligence, data science, algorithms, environmental applications</i>	

TECHNICAL SKILLS

- **Programming Languages:** Python, SQL, R
- **Machine Learning:** Scikit learn, supervised learning, model evaluation
- **Spatial Analysis:** GeoPandas, QGIS, spatial feature engineering
- **Environmental Modeling:** Water quality modeling, ecosystem modeling, landscape ecology
- **Dynamic Modeling:** Dynamic systems modeling, simulation, sensitivity analysis
- **Knowledge Systems:** Knowledge models, knowledge representation, structured reasoning
- **Data Science:** Computational data science, data pipelines, exploratory analysis
- **Research Methods:** Cross validation, ablation testing, error analysis
- **Reproducible Research:** Version control, provenance tracking, documented workflows
- **Scientific Publishing:** Manuscript development, journal submission, peer review
- **Research Communication:** Conference presentations, research posters, scientific writing
- **Responsible AI:** AI safety, model alignment, interpretable AI

SKILLS

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|--------------------------------|----------------------|----------------------------|----------------------------|
| • Artificial intelligence | • Water quality | • Dynamic systems modeling | • Model alignment |
| • Computational data science | • Ecosystem function | • Knowledge representation | • Scientific communication |
| • Machine learning | • Landscape ecology | • Responsible AI | • Manuscript development |
| • Environmental sustainability | • Spatial modeling | • AI safety | |

EXPERIENCE

Doctoral Researcher, Environmental AI	August 2023 - Present
University Research Lab	Boulder, CO
Leads dissertation research applying AI, computational data science , and spatial modeling to watershed, landscape, and sustainability questions. Supports interdisciplinary research from study design through reproducible analysis, publication, and conference communication.	
• Framed watershed studies with scientists, documenting assumptions for reproducible environmental analysis. • Built Python geospatial pipelines linking monitoring, land cover, and hydrologic observations. • Compared predictive and dynamic models through cross validation and sensitivity analysis. • Led manuscript development from research framing through figures, review, and journal submission. • Presented uncertainty and model behavior at conferences and interdisciplinary departmental seminars. • Examined knowledge representation, model alignment, and AI safety for environmental decisions.	
Graduate Research Fellow, Spatial Sustainability Modeling	September 2022 - July 2023
Academic Research	Boulder, CO

Developed **landscape ecology** research connecting geospatial features, computational data science, and ecosystem indicators. Produced documented workflows, structured **knowledge models**, conference materials, and manuscript content through close faculty collaboration.

- Studied land use patterns and ecosystem indicators through spatial **sustainability** modeling.
- Implemented Python preprocessing, feature engineering, evaluation, and visualization workflows.
- Linked environmental entities, measurements, and actions within structured knowledge representations.
- Tested modeling choices against held out observations and literature supported expectations.
- Prepared a first author conference presentation explaining validation and environmental interpretation.
- Converted findings into reproducible figures, literature synthesis, and manuscript workflows.

AI Research Lead, Environmental Decision Support

January 2022 - August 2022

Capstone Project

Boulder, CO

Led a supervised graduate capstone exploring AI assisted decision support for environmental interventions under competing objectives and incomplete information. Coordinated interdisciplinary integration, testing, documentation, and presentation of an interpretable prototype.

- Designed decision support research for competing ecological objectives and incomplete information.
- Combined structured environmental knowledge with **machine learning** outputs for scenario comparison.
- Tested case scenarios using ablation checks and error analysis to identify failures.
- Documented provenance, assumptions, evaluation criteria, and responsible use constraints.
- Coordinated technical integration across an interdisciplinary student research team.
- Presented interpretability, environmental relevance, and **AI safety** findings to faculty reviewers.

PROJECTS

Watershed Decision Modeling Study 📅 2026

Applied machine learning and spatial environmental modeling to watershed data, comparing predictive behavior, uncertainty, and domain informed baselines for water quality research.

Landscape Ecology Knowledge Model 📅 2023

Connected land use, ecosystem indicators, measurements, and management actions through a structured knowledge model supporting interdisciplinary sustainability analysis.

Responsible Environmental AI Prototype 📅 2022

Created interpretable decision support using environmental knowledge and machine learning, documenting provenance, failure modes, evaluation criteria, and responsible use limits.

LEADERSHIP & AWARDS

- Graduate Research Fellowship, 2024
- Outstanding Graduate Research Presentation, 2025
- Doctoral Research Travel Award, 2026

CERTIFICATIONS

- Responsible AI Practices 📅 2025
- Geospatial Data Science 📅 2024

PROFESSIONAL AFFILIATIONS

- Graduate Environmental Computing Reading Group, Discussion Coordinator
- Interdisciplinary Sustainability Research Forum, Student Presenter
- Graduate Peer Research Mentoring Program, Peer Mentor

LANGUAGES

- English (Native)
- Spanish (Intermediate)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST