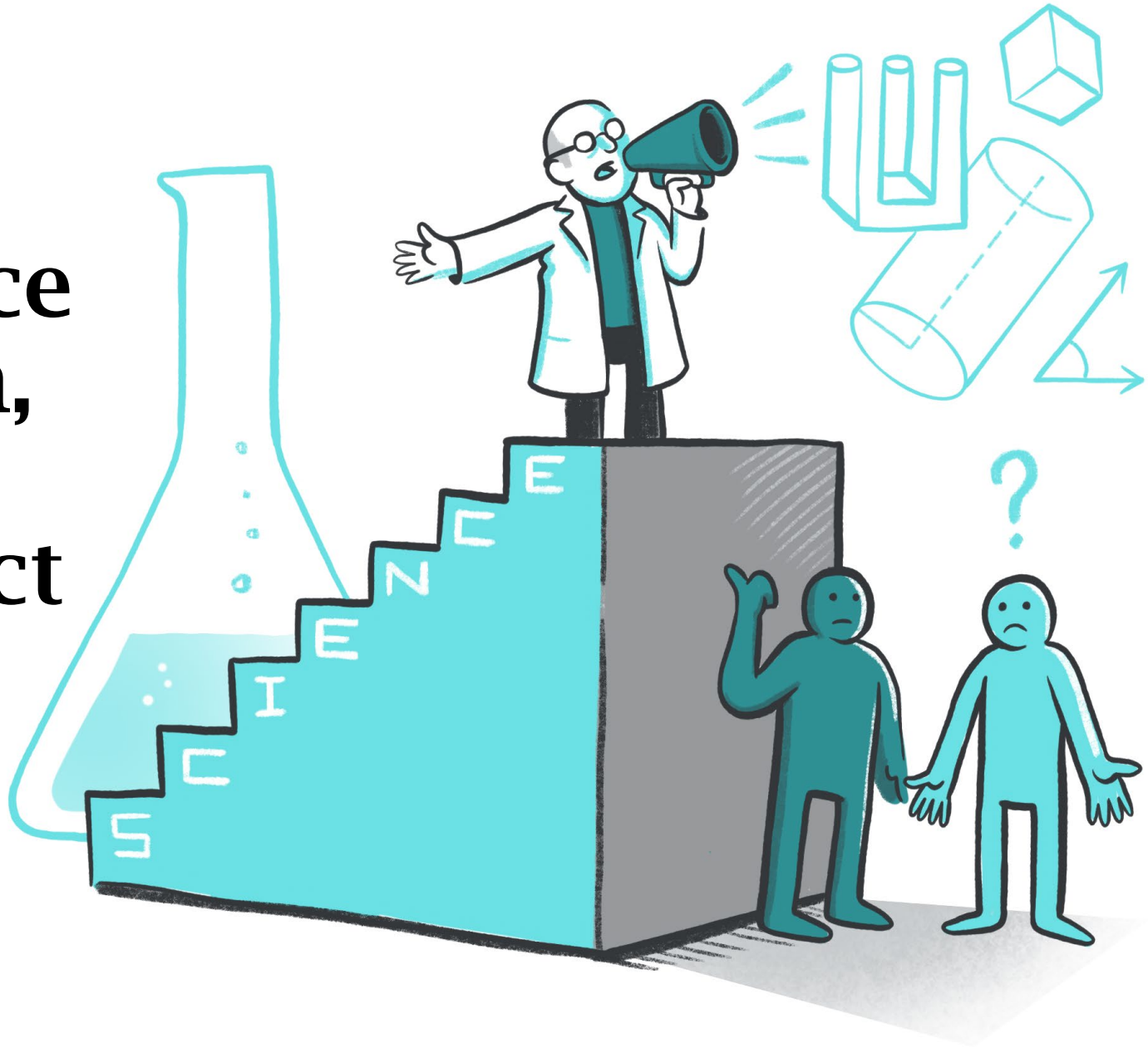
Bridging Ecology: Translating Science into Collaboration, Education, and Community Impact

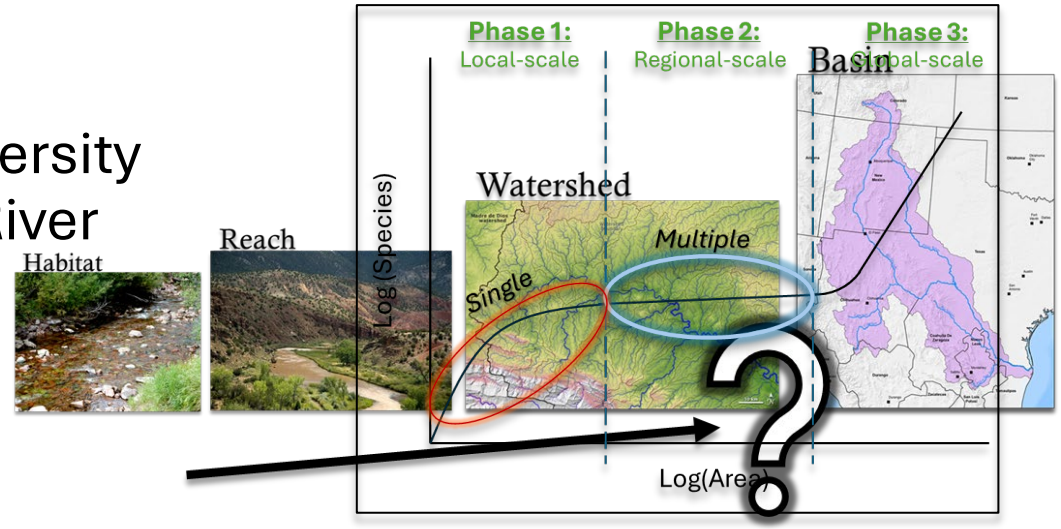
Miranda Sams

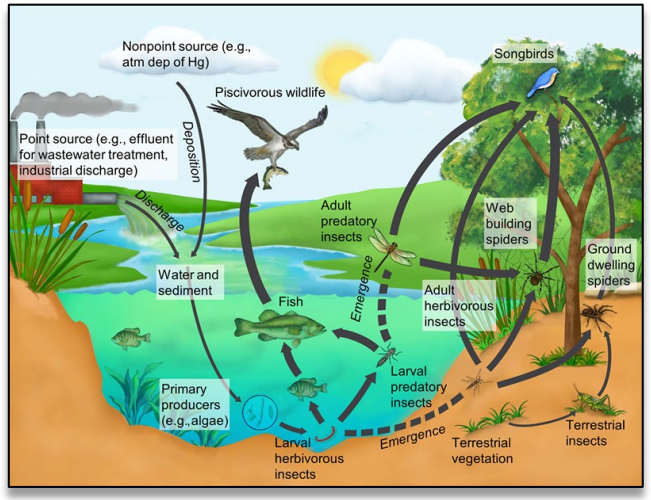


Graduate School

- MS Thesis:
  - Patterns of Benthic Macroinvertebrate Diversity and Composition in a Spatially Complex River Basin: *Taxonomic and Functional Trait Approaches*

- PhD Work:
  - Seasonal variation of Macroinvertebrate Diversity and Composition in a Spatially Complex River Basin: *Taxonomic and Functional Trait Approaches*
  - Spatial Scale Effects on Macroinvertebrate Diversity and Composition: *Taxonomic and Functional Trait-based Approaches*
  - Drivers of mercury between aquatic and terrestrial environments (macroinvertebrates & riparian spiders)
  - Spatial variation of mercury in Texas (East to West)





Chumchal et al., 2022

Where is all this leading?

The Vision: A Career with Purpose

Scientific Translator

- Ecology-based Research
- Collaborative Projects
- Science Education

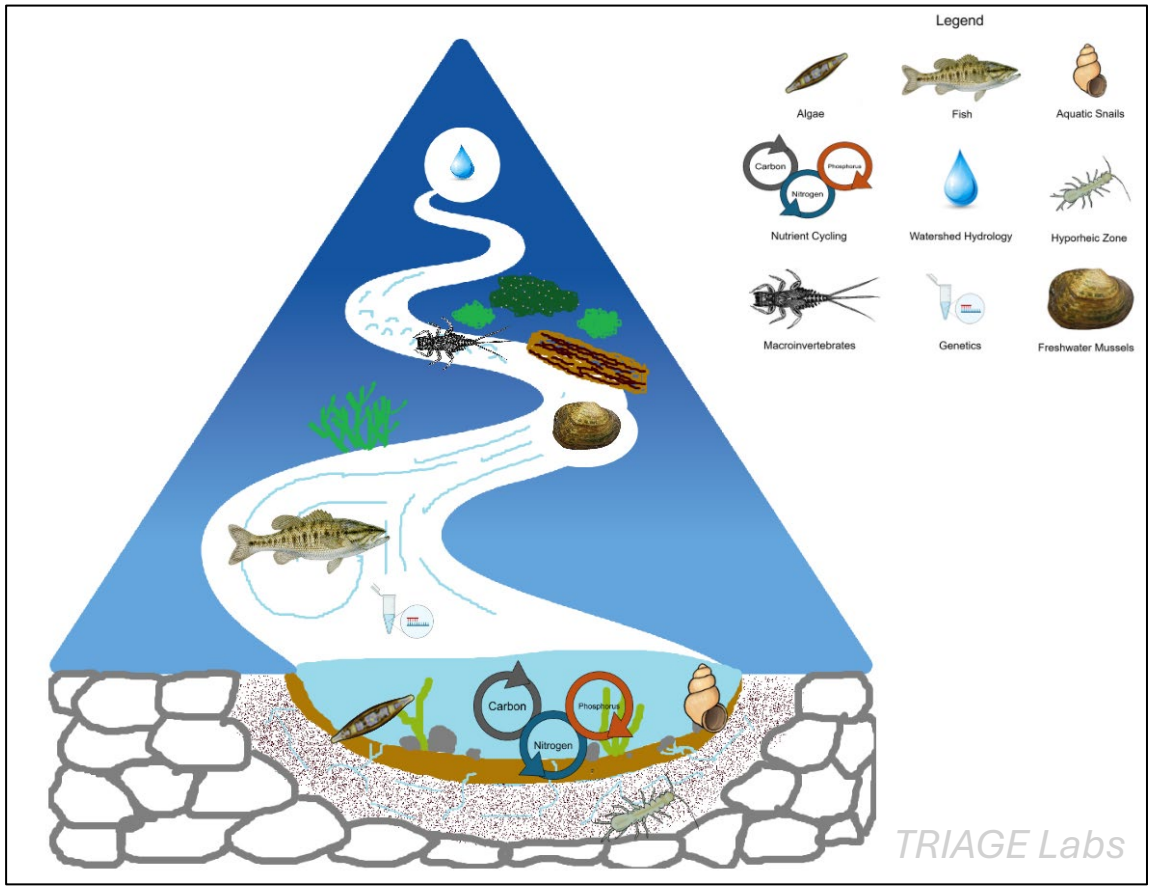
Potentially an NGO position?

The Key: Collaboration

- Spreads the workload
- Higher quality work
- Strengthens science overall

"If you want to go fast, go alone. If you want to go far, go together."

–African Proverb



Do not edit
How to change the design

What’s one thing you’ve experienced that makes collaboration challenging?

ⓘ The Slido app must be installed on every computer you’re presenting from

slido

The Problem: Communication Breakdown

- Jargon & Ego
- High complexity *(Multidisciplinary models)*

What is something that makes scientific communication bad?

Gatekeeping
Facts only
Distance
Deficit model
Complexity
Boring
Uncompassionate communicator
Jargon
Over Interpretation
Ego
Oversimplification
Complex graphs
Misunderstanding
Snobbism
Statistics
Bias
Narcissism

Benefits of a Scientific Translator

Bridges natural and social sciences, universities, NGOs, agencies, and local communities

Facilitates communication *and* coordination

Unlocks larger funding opportunities

The Scientific Translator in Action

Teach interdisciplinary courses to smaller groups

Lead interdisciplinary research to tackle real-world problems

Build cross-sector collaboration

NGOs, agencies, universities, policy makers, etc.

Engage communities to translate science into action

Unpacking the Black Box: Demystifying ecological models through interactive workshops and hands-on learning — Herman et al. 2019

A Model to Imitate

“The environmental science program provides broad preparation in the sciences, equipping you for careers in wildlife biology and conservation, environmental restoration, soil and water management, and environmental education, or for successful entry into graduate school.”

CEDARVILLE UNIVERSITY

A Model to Imitate

- *Hands-on training & field work*
- *Interdisciplinary coursework*
- *Smaller class sizes*

A Model to Imitate

"The Au Sable Undergraduate Research Program is designed to address pressing questions in ecology, conservation, and restoration; serve local environmental agencies and organizations with informed data, and prepare students as scientists by involving them in laboratory and field research. By partnering with local non-governmental organizations and government agencies, Au Sable advances scientific understanding using foundational and cutting-edge modes of inquiry and helps decision-makers make informed plans to advance environmental stewardship."

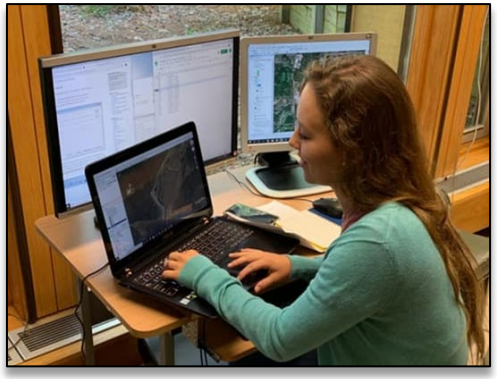
Serve. Protect. Restore.

AU SABLE INSTITUTE

ausable.org

A Model to Imitate

- *Hands-on training & field work*
- *Community outreach*



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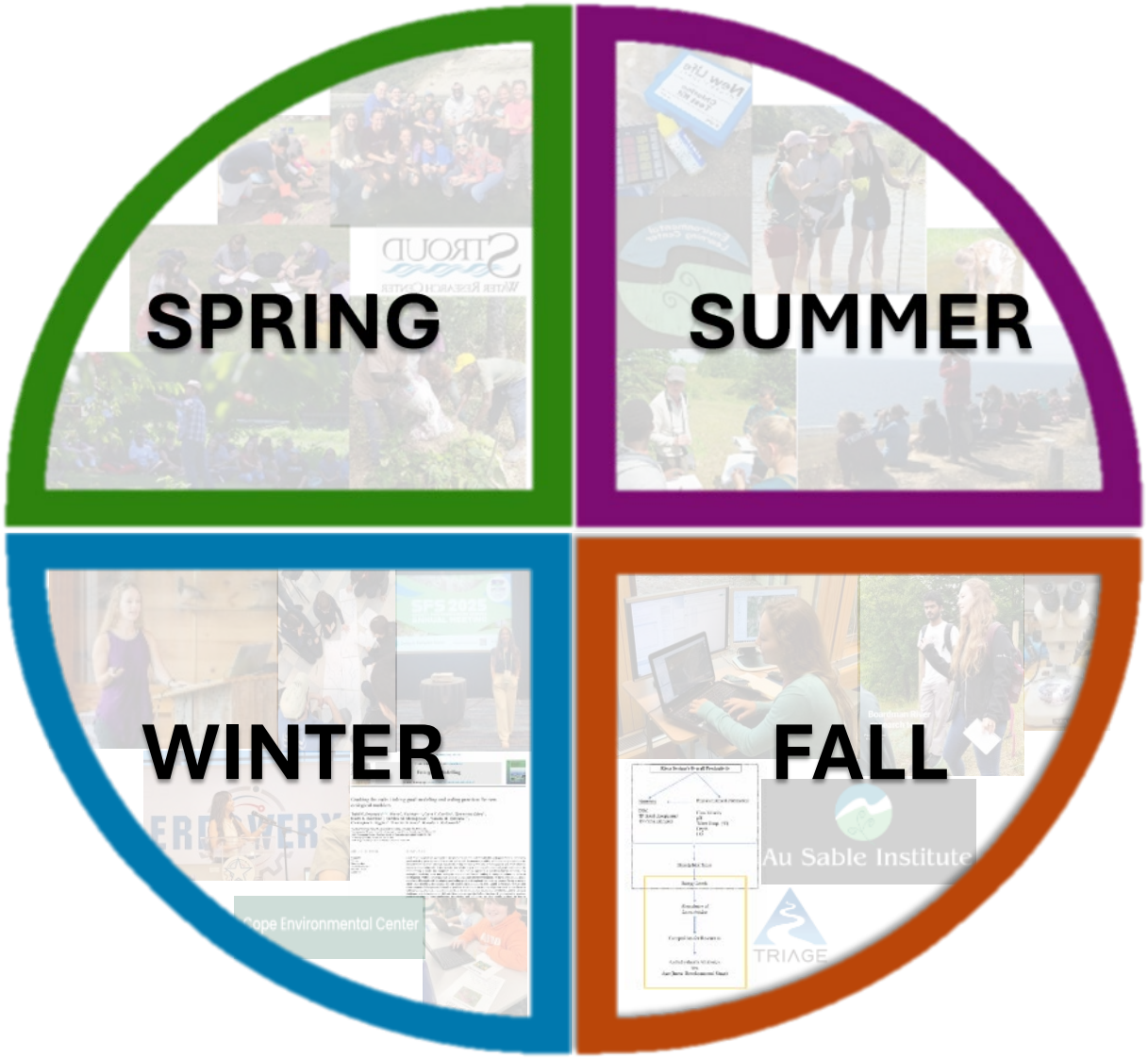
Recent Models and Examples

University of Wyoming's CURE Program	Hands-on research experience for undergraduates
Science Communication Workshops	Identifying good and bad communication Enhance community engagement
Watershed Institute in New Jersey	Certification programs and report cards to engage communities Environmental Youth Leadership Programs

A Year in the Life: *The Seasonal Model*



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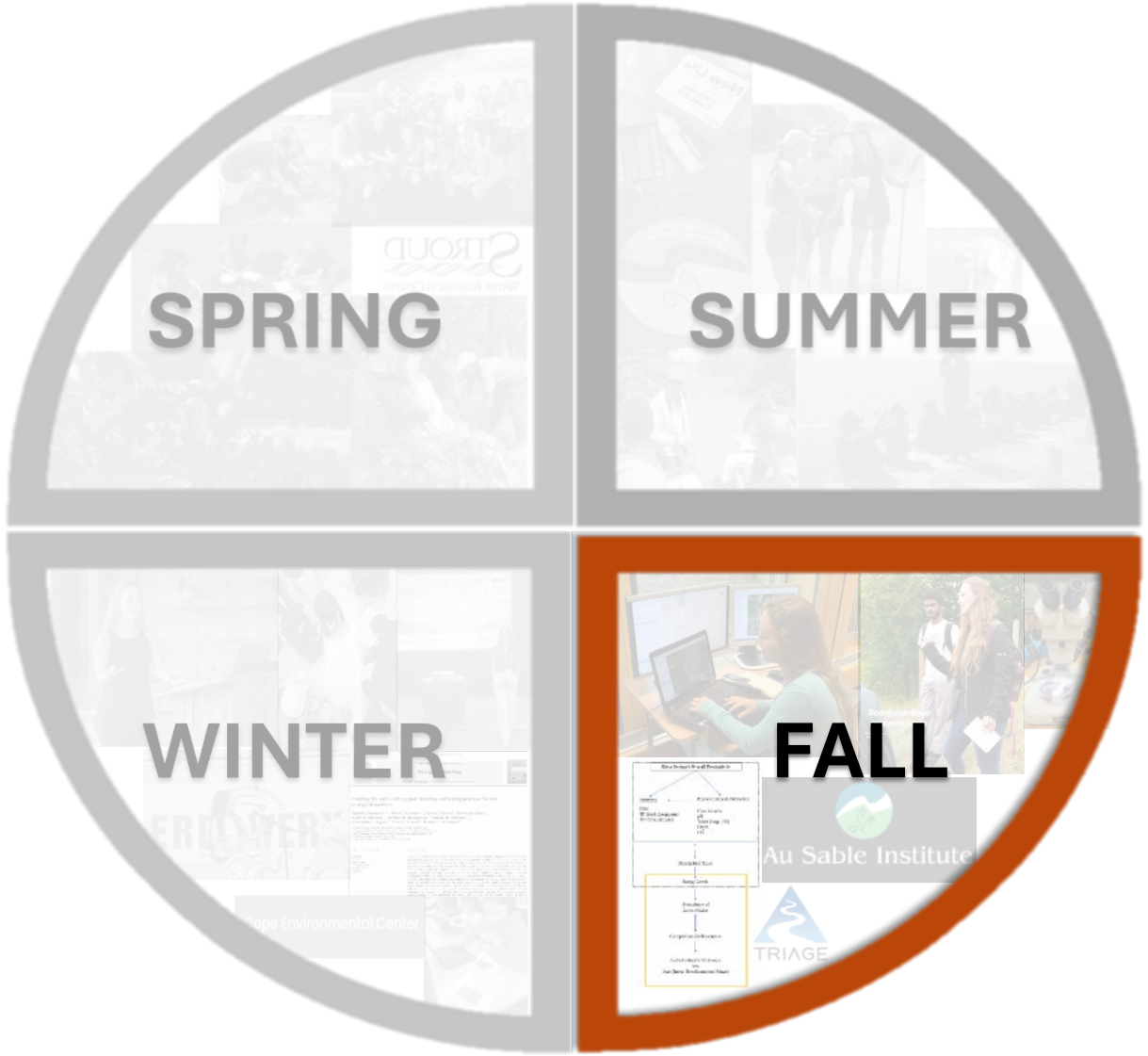
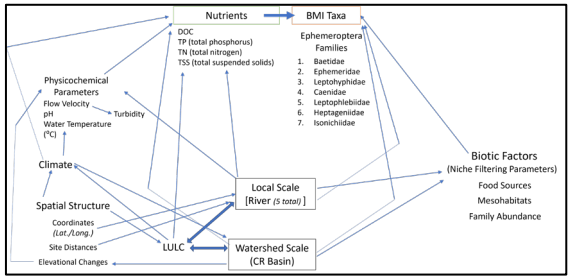


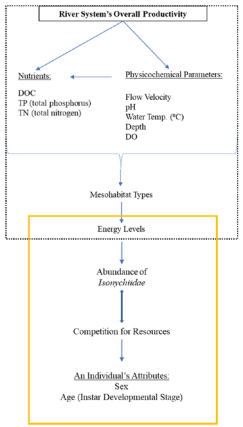
- Collaborative Research

TRIAGE

Au Sable Institute of Environmental Studies

- Stakeholder-mediated modeling engagements





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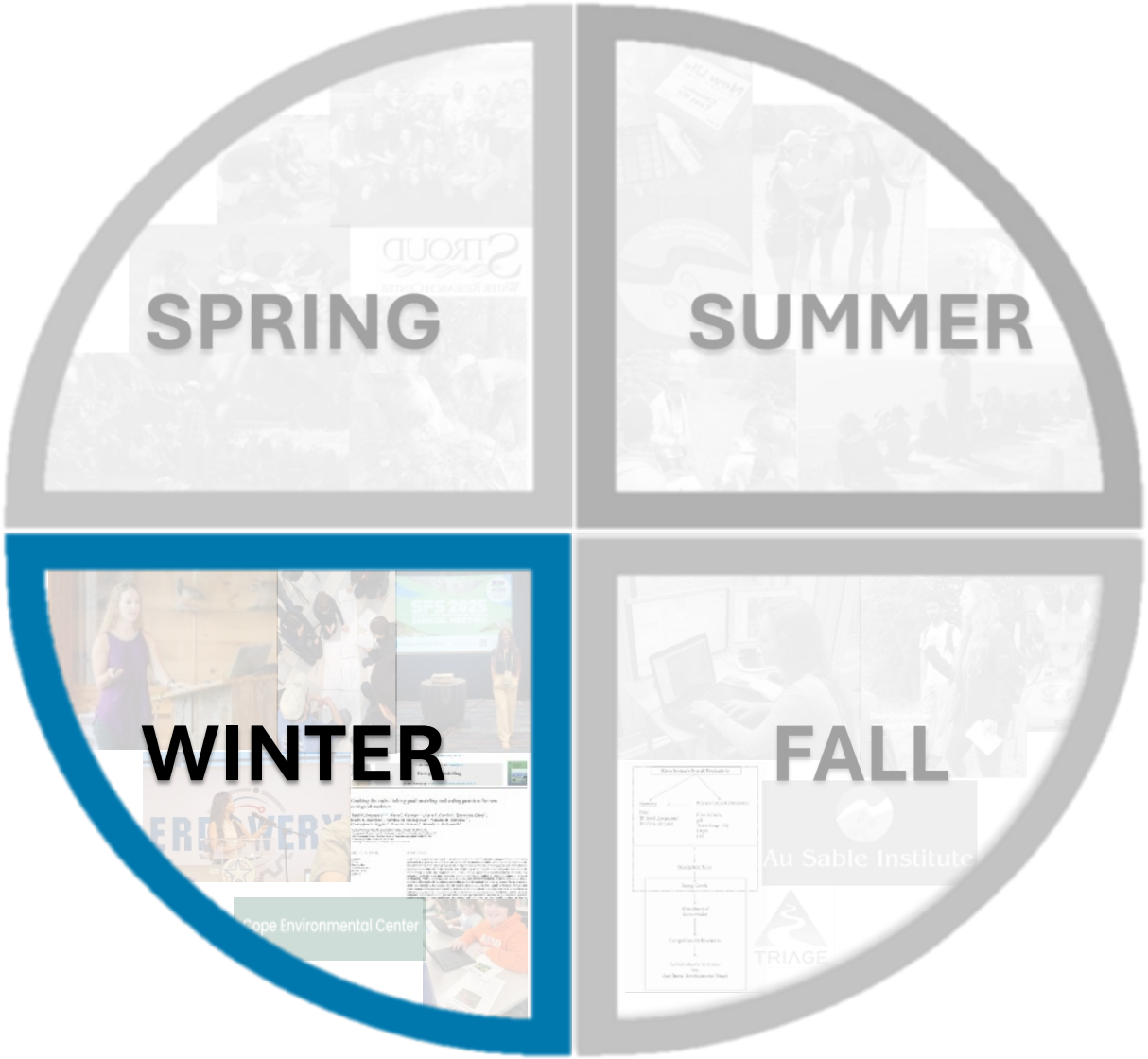
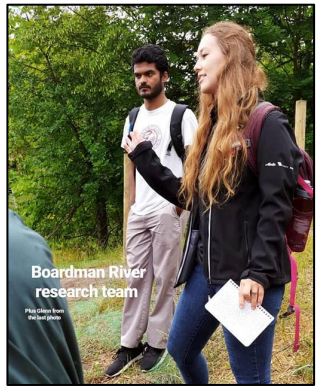


- Writing & Publishing

Ecological Modelling

Cracking the code: Linking good modeling and coding practices for new ecological modelers

- Local community outreach programs



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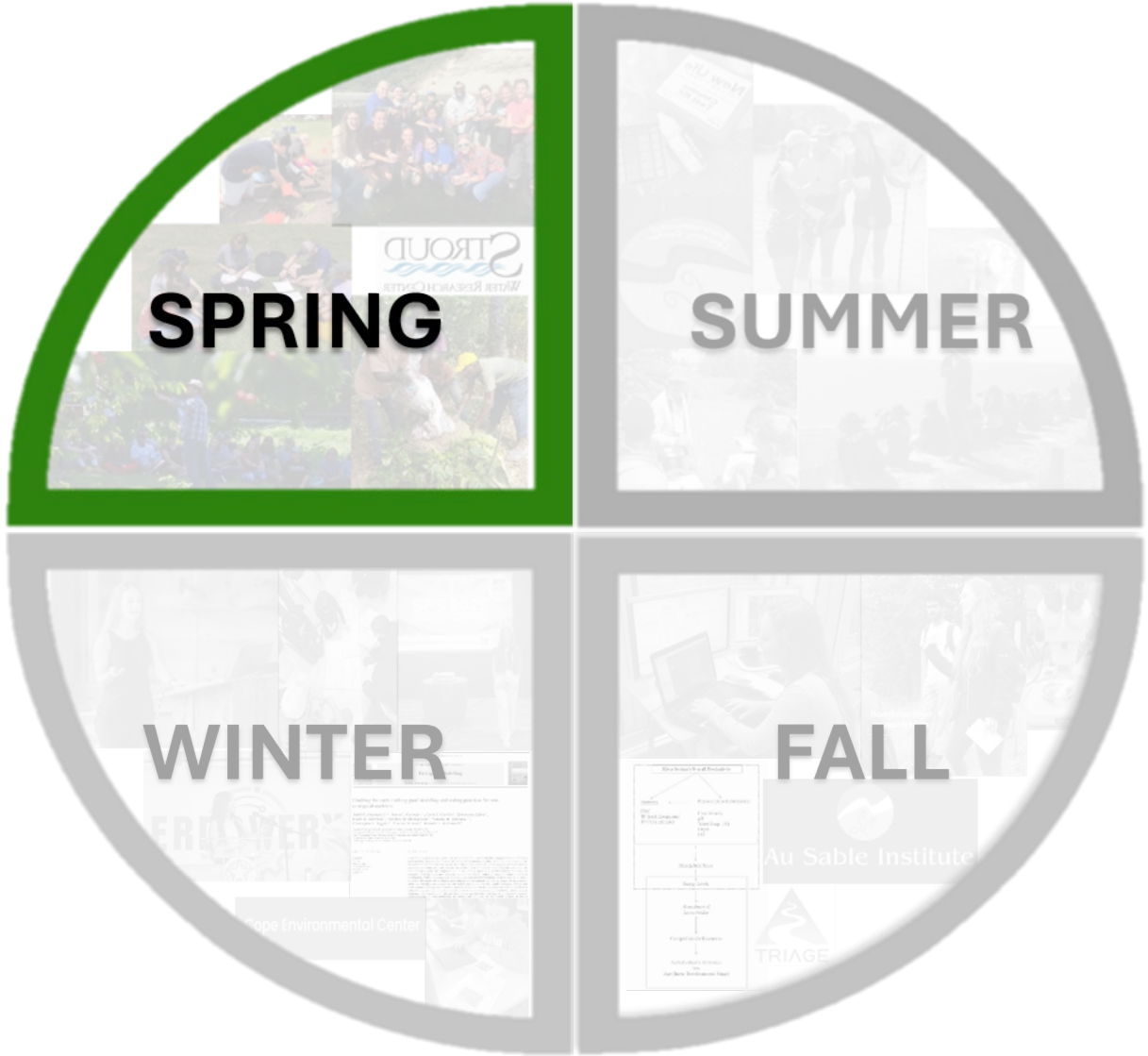


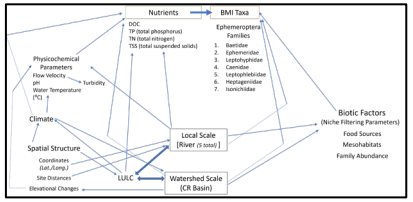
- Interdisciplinary workshops

- Community science programs

STROUD WATER RESEARCH CENTER

Conservation Resource Alliance

- Stakeholder-mediated modeling engagement



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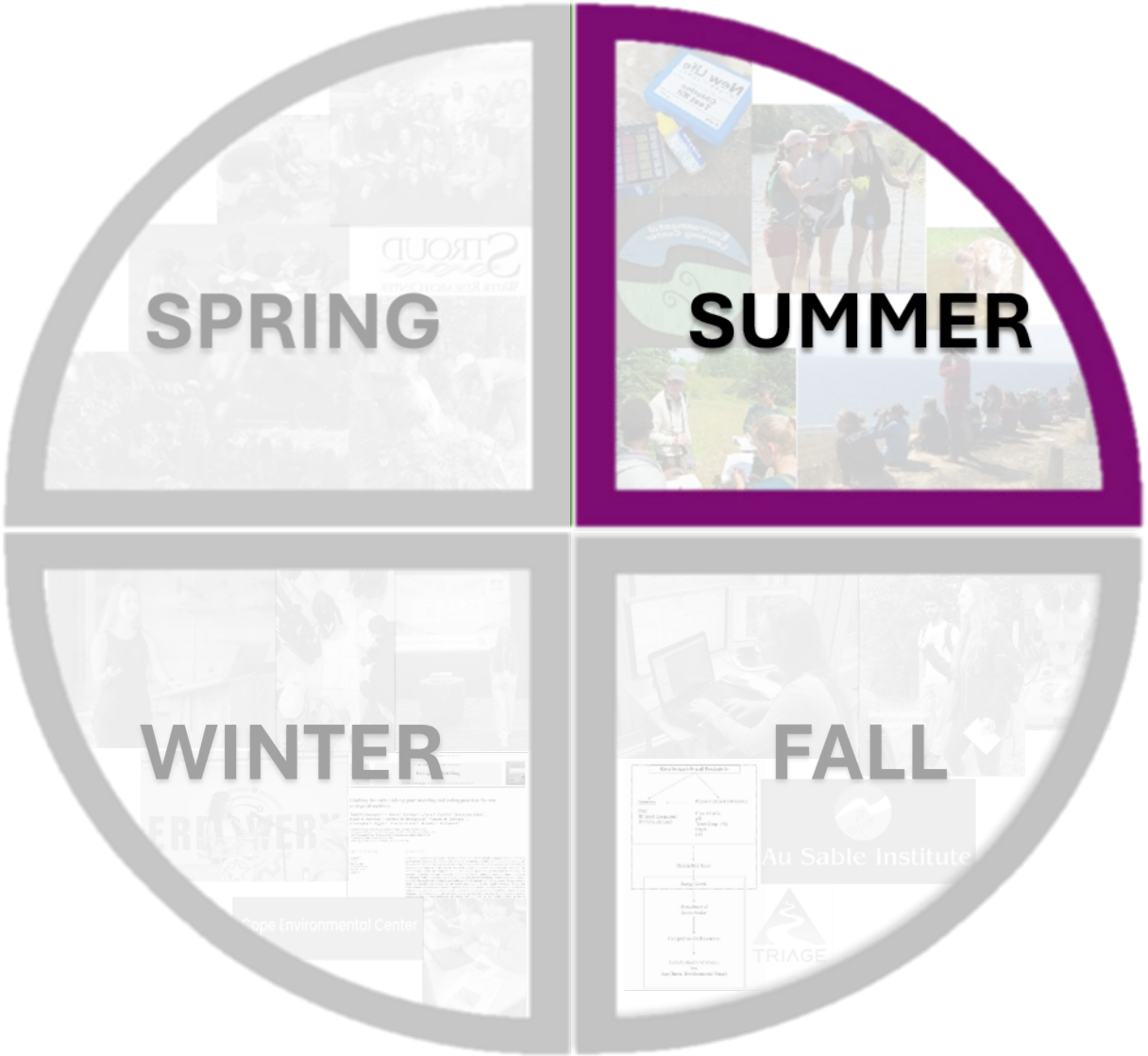

- Field Courses

- Undergraduate mentoring programs

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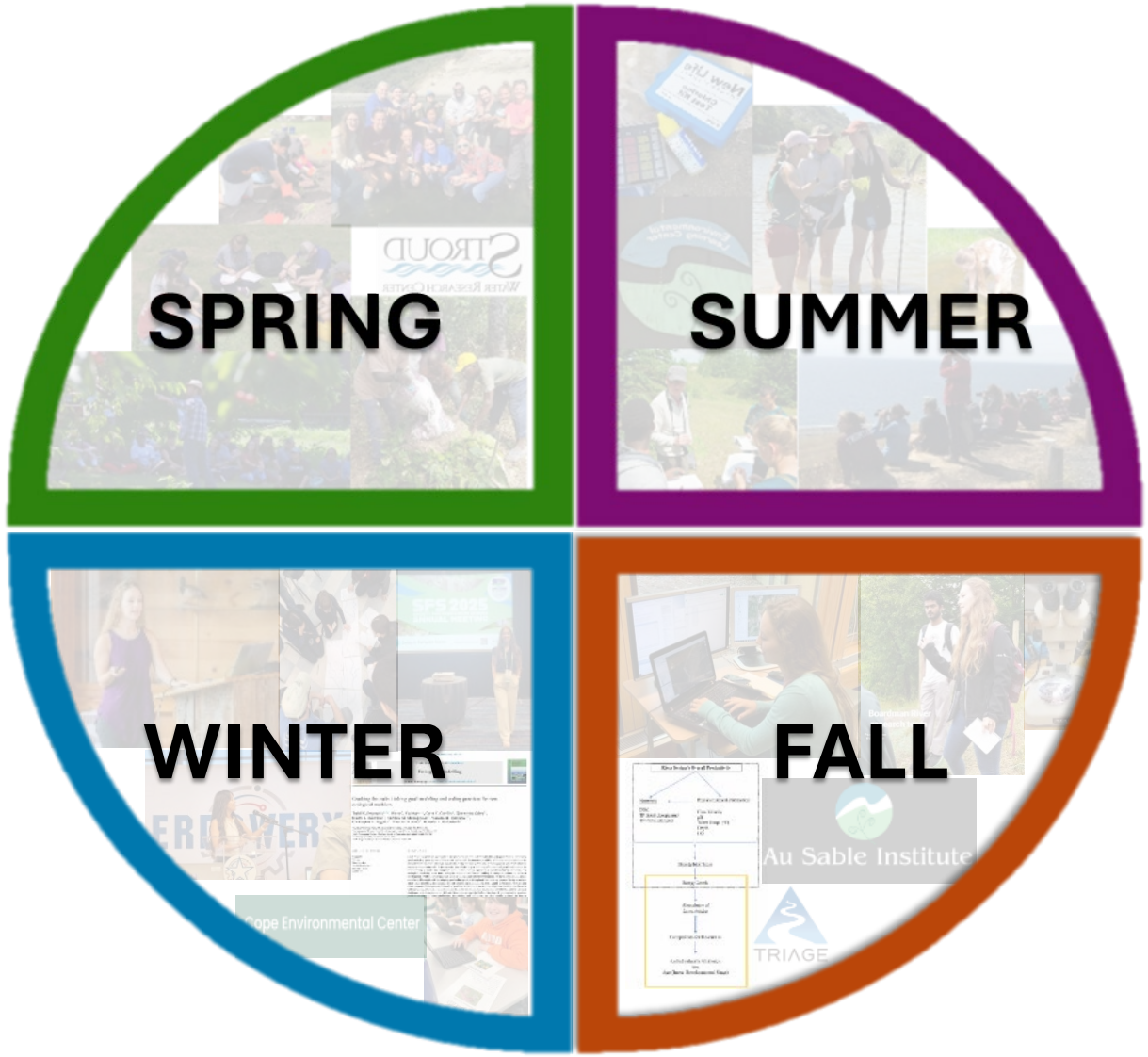

- Teaching interdisciplinary courses/workshops
- Leading multidisciplinary research projects
- Building collaboration
- Engaging communities

Steps Towards My Career Vision

Building Blocks

- Leadership
- Science communication
- Collaborative interdisciplinary networks
- Research & Analytical skills

Mentors & Models

- Academic Partners (Au Sable & Cedarville)
- NGOs
- USACE

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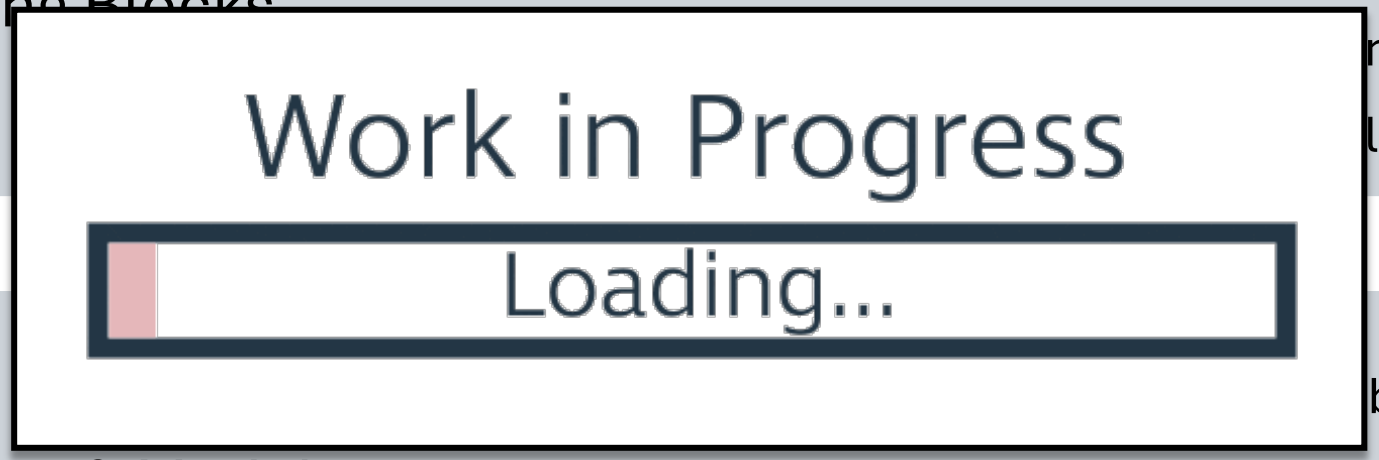

Any Thoughts or Advice?

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ERDC