

Bridging the Silos of Environment and Human Health for Microplastics

Photo credit:
Dana Haine

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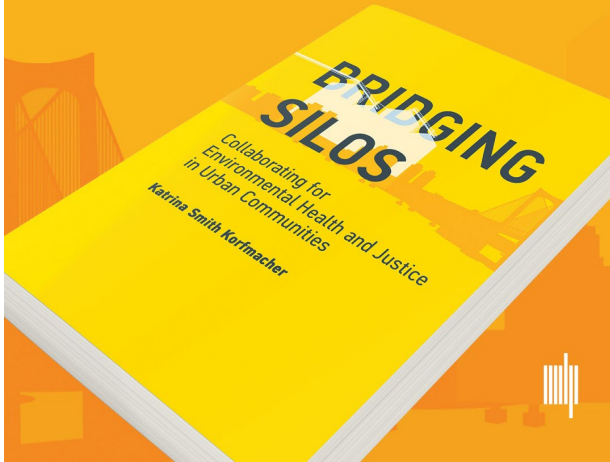
NASEM Microplastics Webinar #4
“Research Pathways and Priorities”
June 9, 2025



BRIDGING SILOS

Collaborating for
Environmental Health and Justice
in Urban Communities

By Katrina Smith Korfmacher



- Separate silos of environment and health block solutions to environmental health problems
- Local collaborations among community, government, public health and academic partners focused on health equity can help
- Need new structures & processes to support generation, transmission, and use of transdisciplinary & local knowledge

<https://direct.mit.edu/books/oa-monograph/4559/Bridging-SilosCollaborating-for-Environmental>

...takes merit careful consideration by future researchers and practitioners.

Integrating health equity goals into policies in multiple sectors requires new ways of engaging communities; forming partnerships between government, academia, and interest groups; harnessing multidisciplinary sources of knowledge; and developing funding streams that support these efforts.

....but how?



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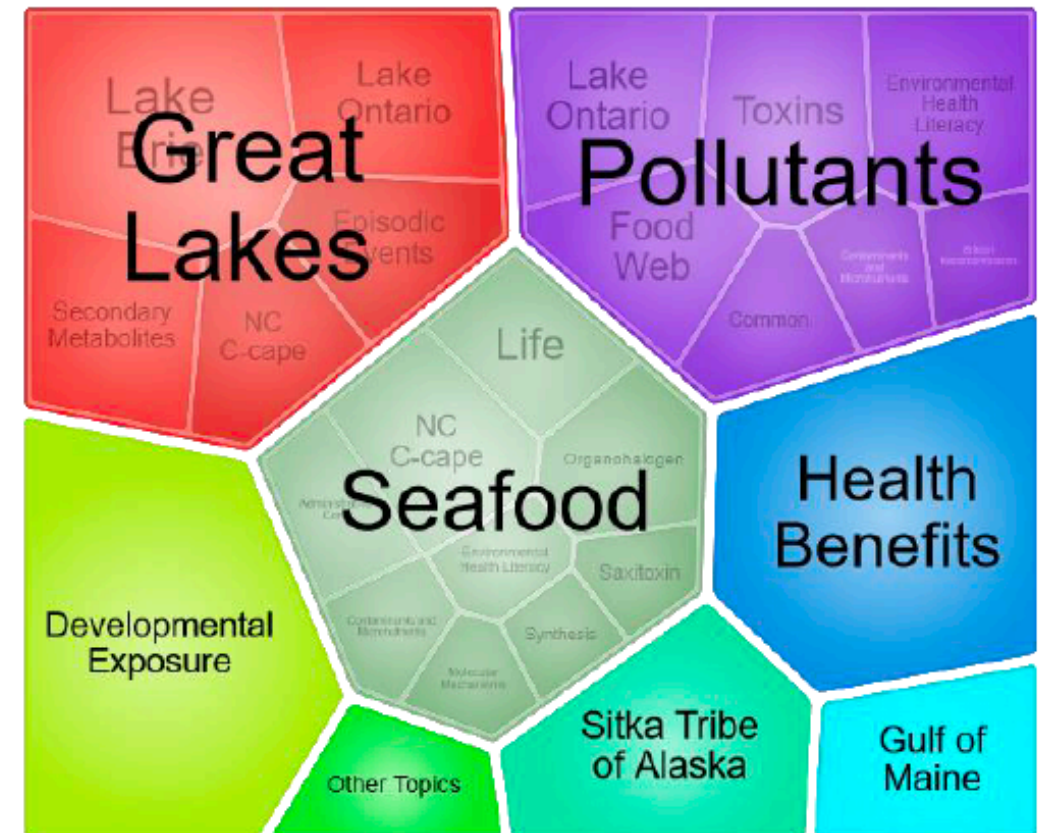
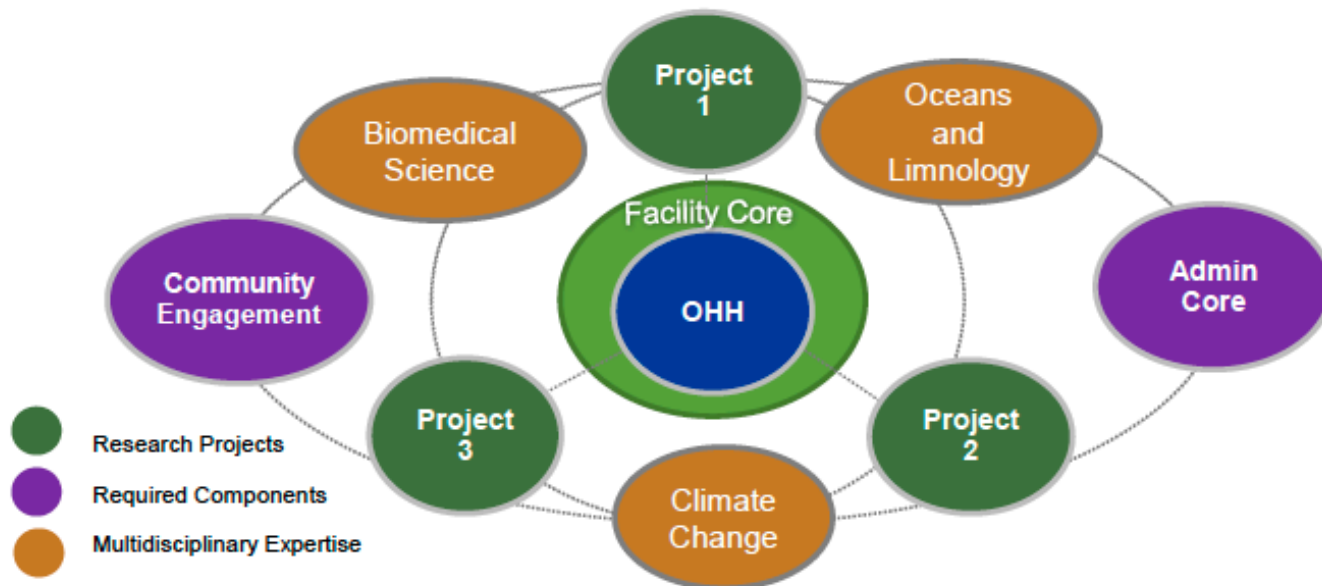
Lake Ontario MicroPlastics (LOMP) Center

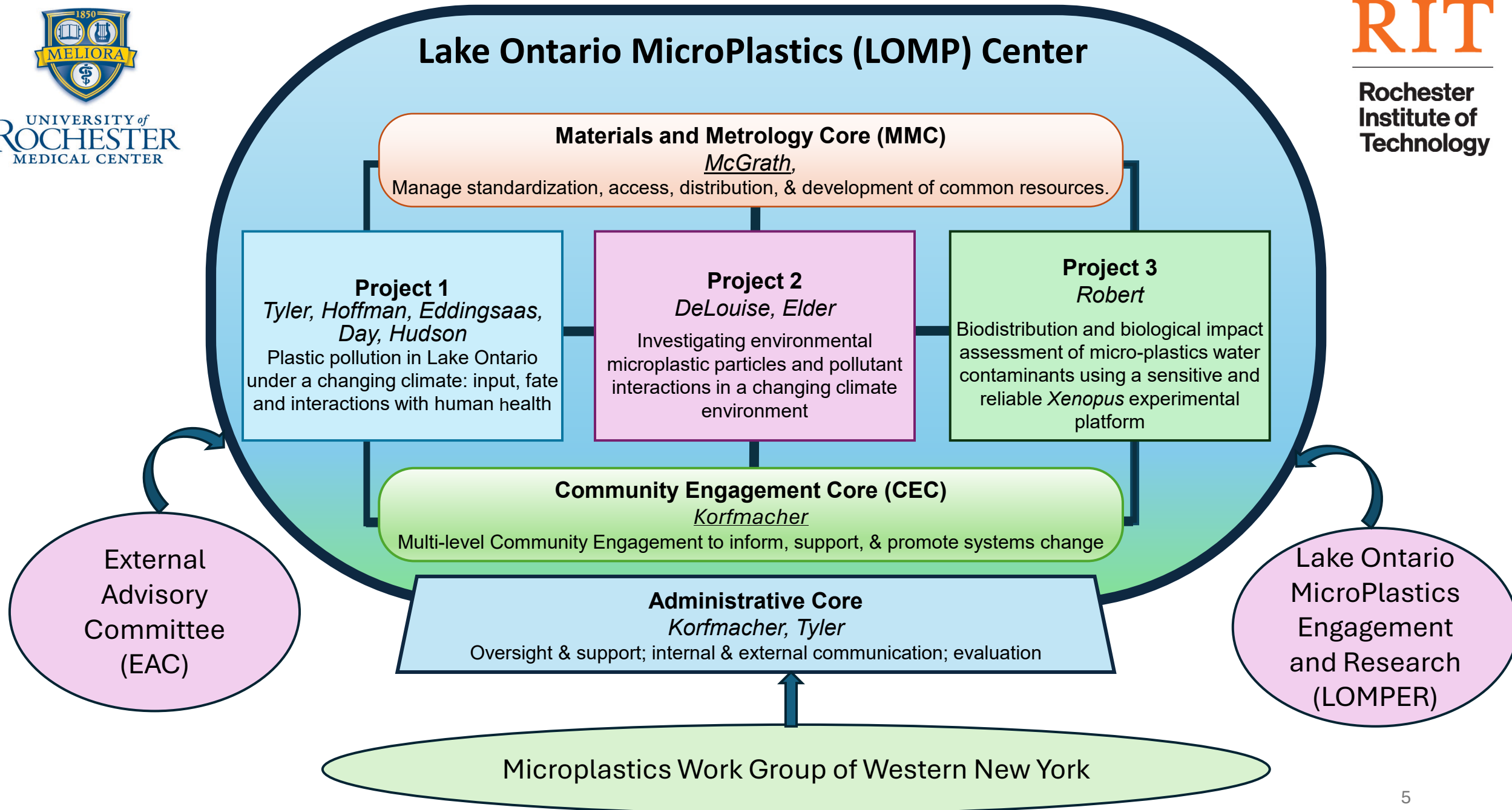
LOMP is a hub for research, translation, and engagement to inform strategies to prevent negative impacts of microplastics on human health in the Great Lakes region.

www.lomp.urmc.edu

NIEHS NSF Oceans & Human Health Initiative

- Promotion of interdisciplinary collaborations:
 - Improve knowledge of the impact of marine and lacustrine environments on human health
 - 3-4 hypothesis-driven research projects comprised of biological and physical sciences
 - Meaningful stakeholder engagement (CEC)





LOMP Materials & Metrology Core (MMC)

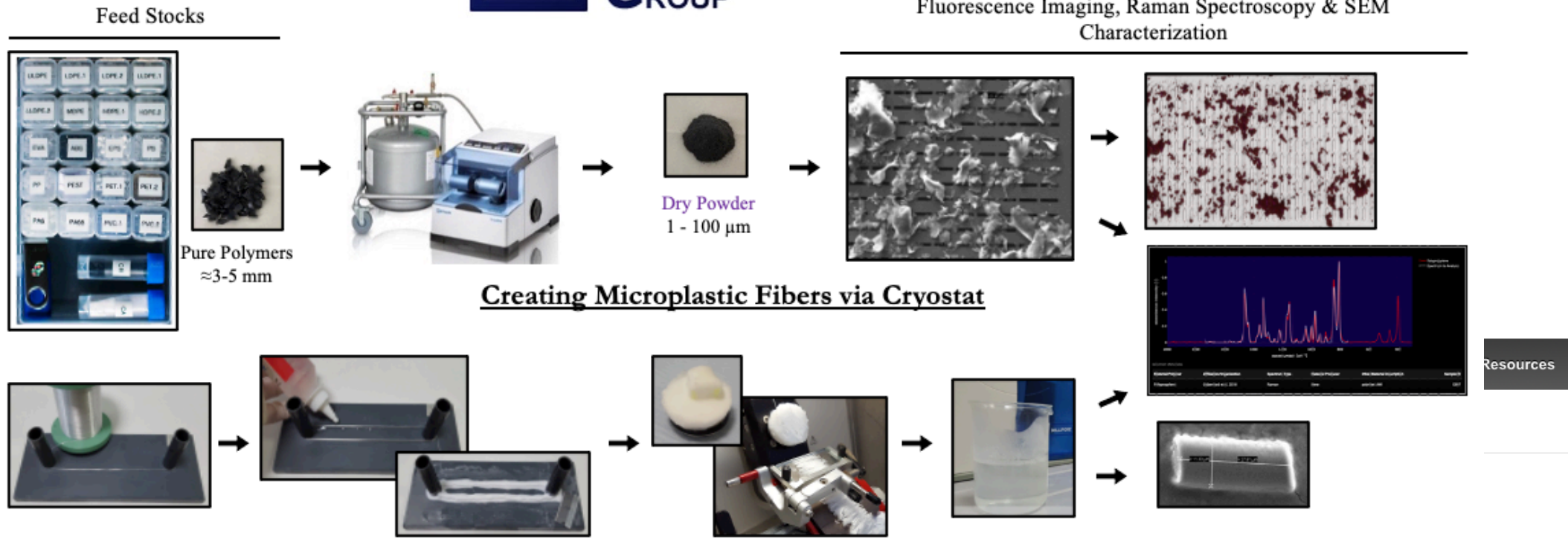
Aim 1: Provide essential materials to Center research projects

Aim 2: Develop and distribute consensus protocols

Aim 3: Access to instruments for MP analysis and production



<https://www.urmc.rochester.edu/labs/mcgrath>





7TH INTERNATIONAL
MARINE DEBRIS
CONFERENCE
September 2022, Busan, South Korea

Project 1

Plastic Pollution in Lake Ontario: Input, Fate, and Interactions with Human Health



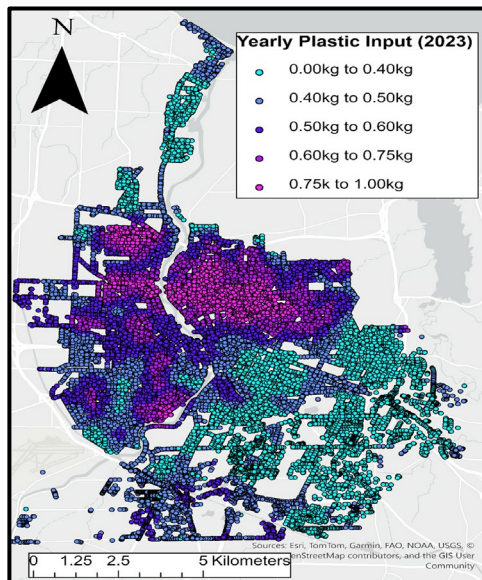
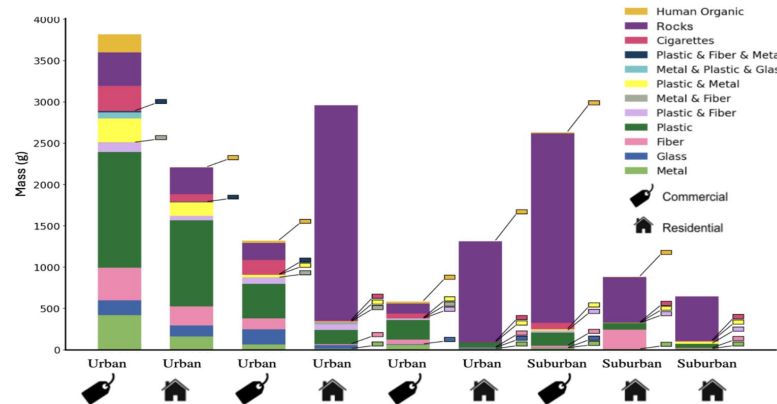
Christy Tyler, Matthew Hoffman, Steven Day, Nathan Eddingsaas, Andre Hudson

RIT | Rochester Institute
of Technology

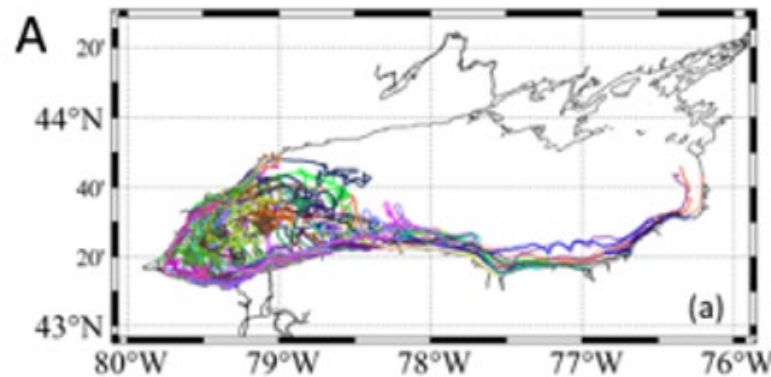
Collaborative for Plastic and the Environment

LOMP Project 1

Aim 1. Stormwater Input and Accumulation

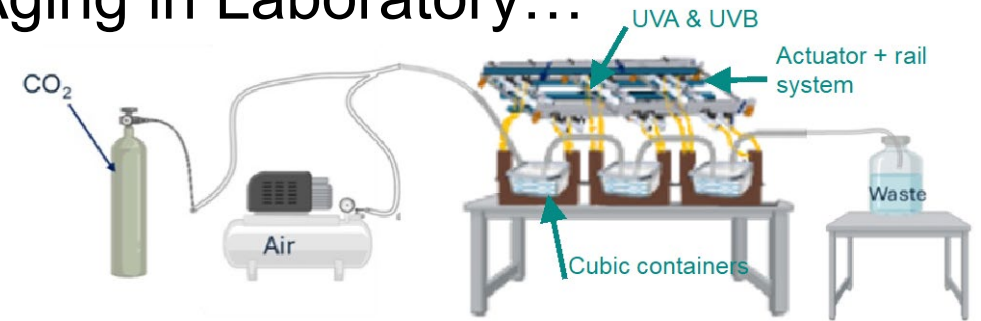


Aim 3. Model input to and fate of MP in Lake Ontario



Aim 2. Transformation of MP with under temp/pH conditions

Aging in Laboratory...



...& Field Incubation

...Provide aged materials to Projects 2 and 3

LOMP Project 2: Investigating environmental microplastic particles and pollutant interactions



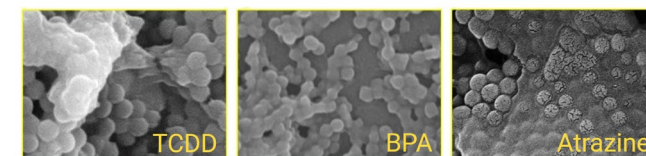
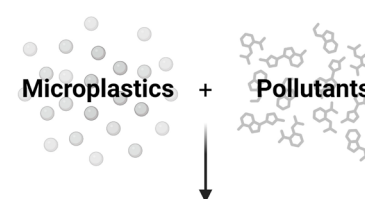
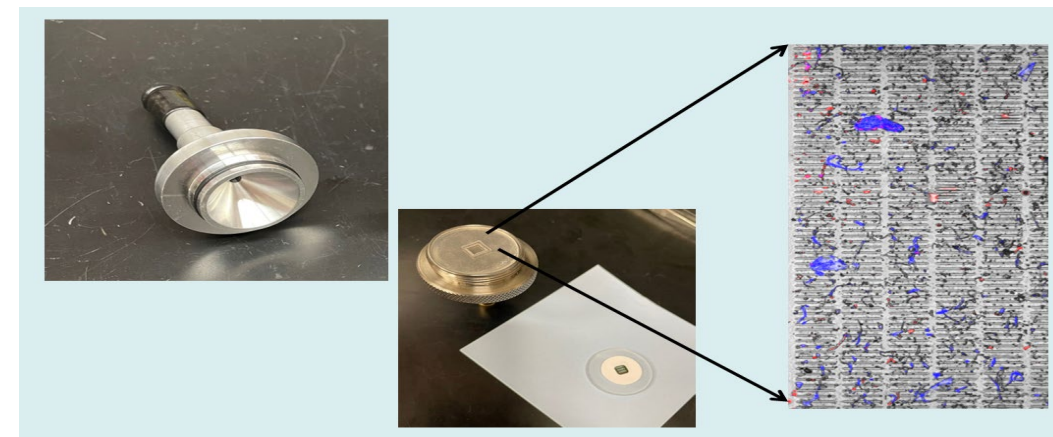
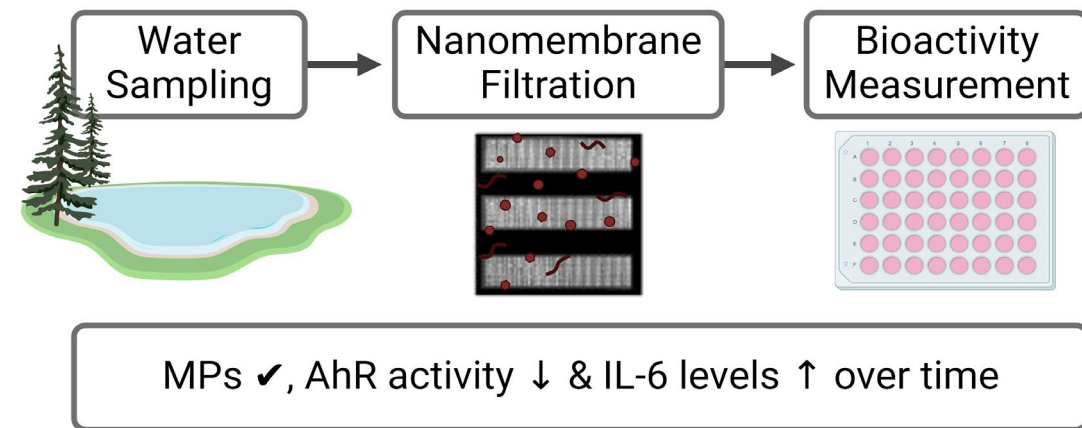
Lisa DeLouise &
Alison Elder



Aim 1: Sample and Characterize the Biological Activity of Filtered Retentate (MP + pollutants) from Lake Ontario Water

Aim 2: Sample, Characterize, and Assess Bioactivity of Airborne Microplastics in Outdoor Environments

Aim 3: Examine role of Microplastic Composition, Water Temperature and pH on Pollutant Association and Bioactivity

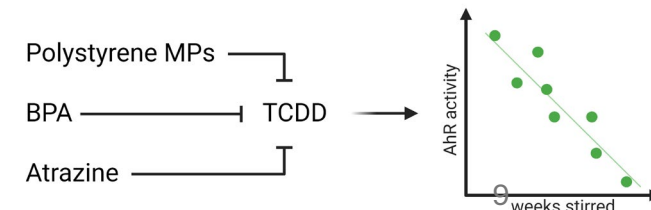


Stirring with Chemicals changes PS



Environmental Plastic Particle Mimetics

- more relevant than pristine MPs
- more reproducible than environmental MPs



LOMP Project 3: Biodistribution and biological impact assessment of micro-plastics water contaminants using a sensitive and reliable *Xenopus* experimental platform

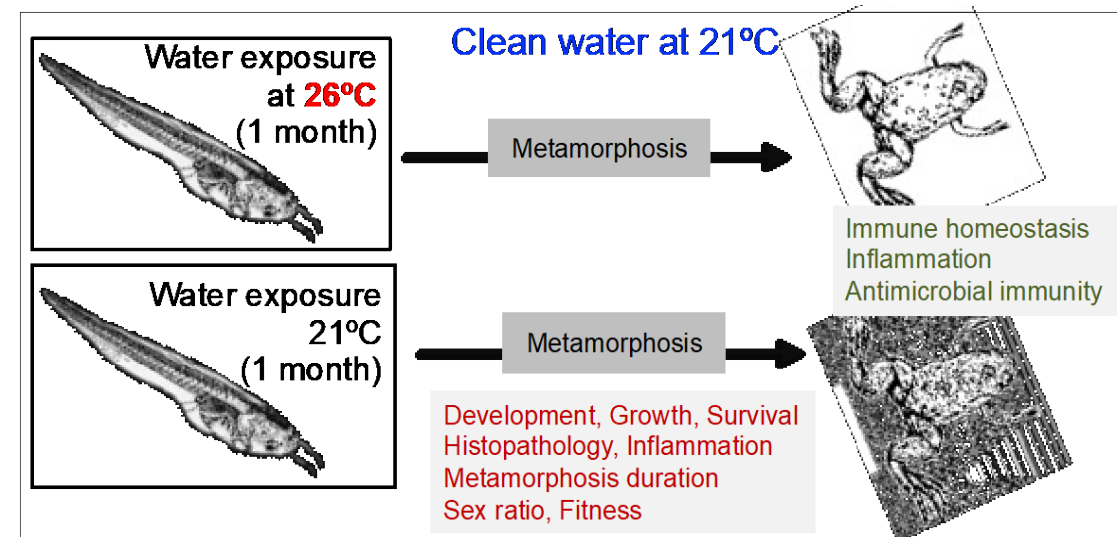
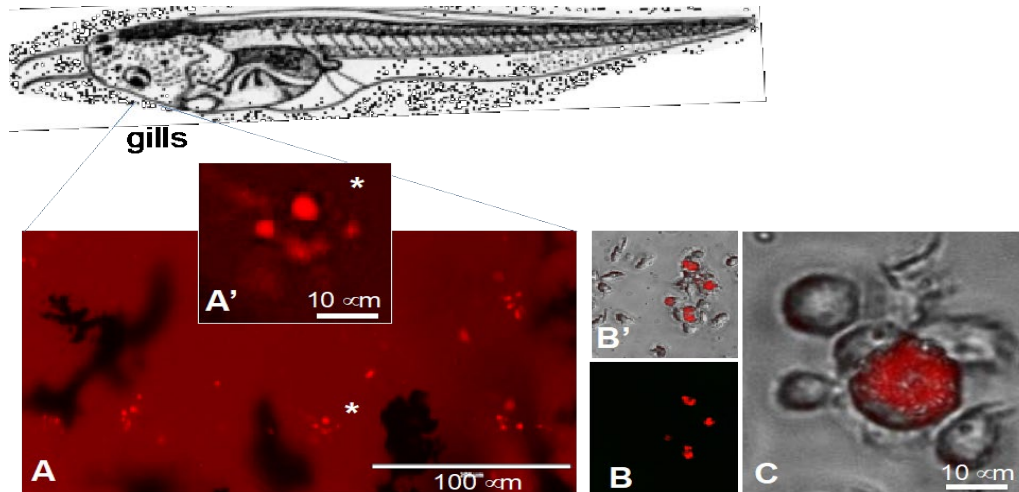
Aim 1: Biodistribution of environmentally-relevant new and experimentally aged MP in exposed tadpoles.

Aim 2: Effect of water temperature on MP biodistribution.

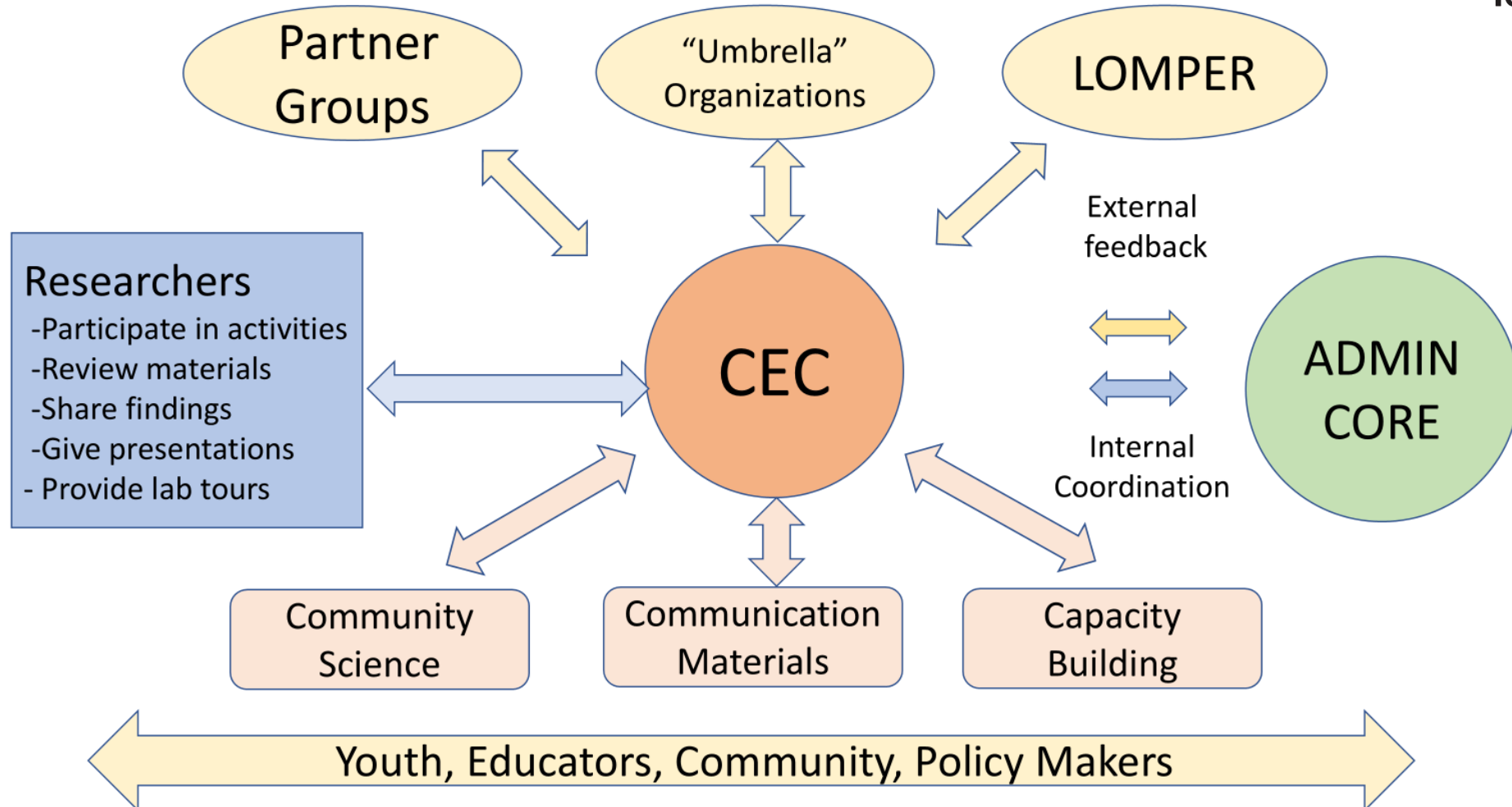
Aim 3: Impacts of new and aged MP on development, fitness immunity, and resistance to pathogens



Jacques Robert



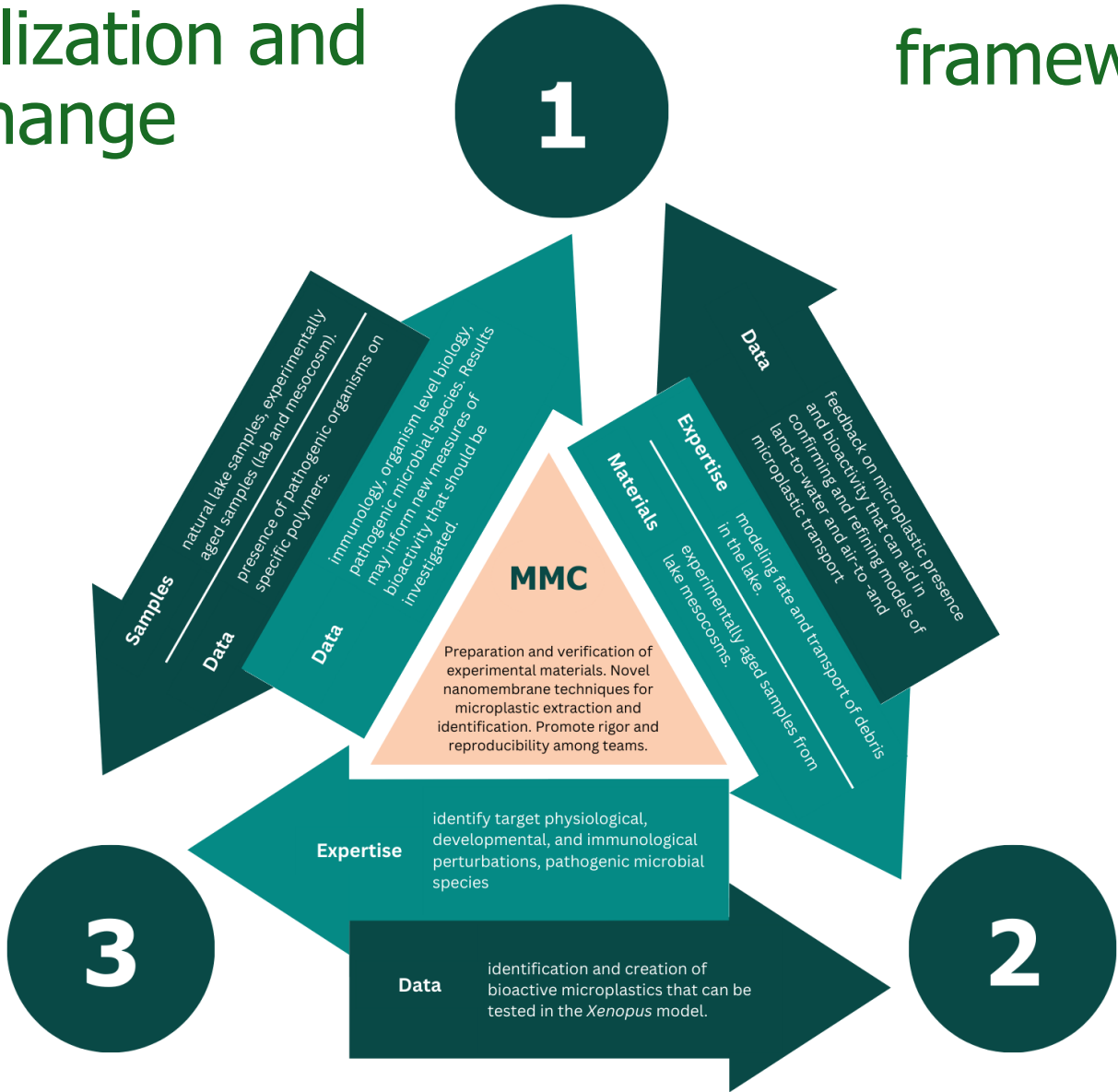
Community Engagement Core (CEC)



Partners participate in, inform, and translate LOMP research

Cross-project fertilization and exchange

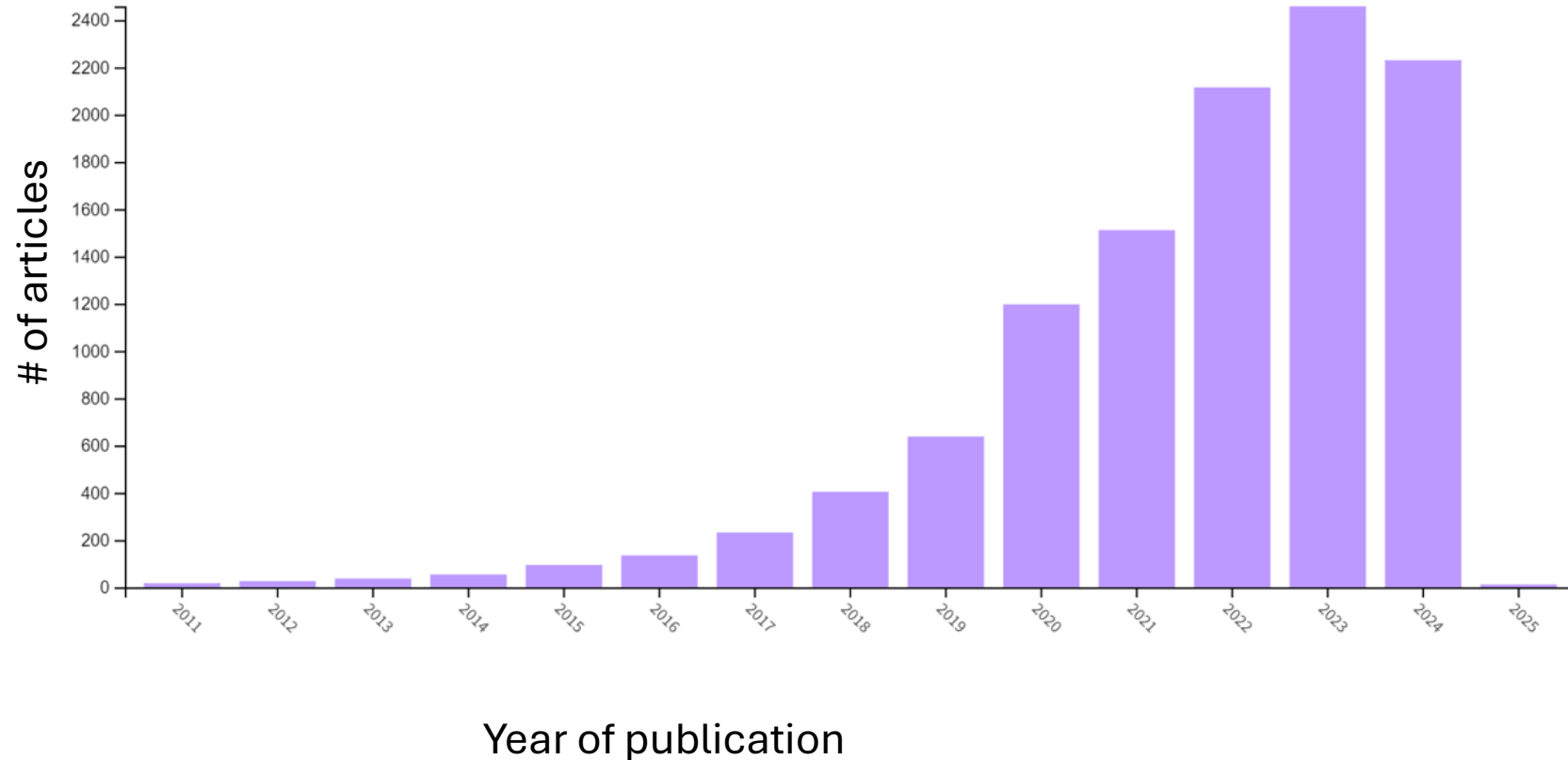
One Health framework



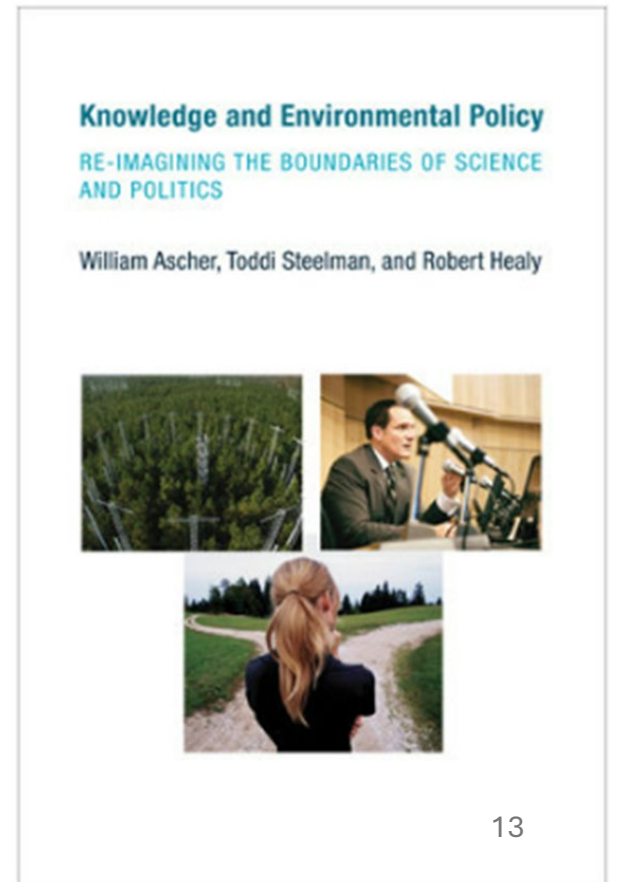
Focus on health equity

- Geographic
- Vulnerable populations
- Disadvantaged communities

Web of Science: # articles with word “microplastics”



“We challenge the assumption that more and better science alone will lead to improved environmental decision making.” (Ascher, Steelman, and Healy, 2010)



Problem orientation/use-informed knowledge

- Social science integrated with natural science
- Boundary spanning individuals and organizations
- Diverse stakeholders help set research agenda
- Partners engage in generation, transmission *and* use of research
- Promote and learn from adaptive management efforts
- Iteration, community building and collaboration

THANK YOU!

LOMP

Lake Ontario MicroPlastics Center

LOMP.urmc.edu

RIT | Rochester Institute of Technology



UNIVERSITY of
ROCHESTER

