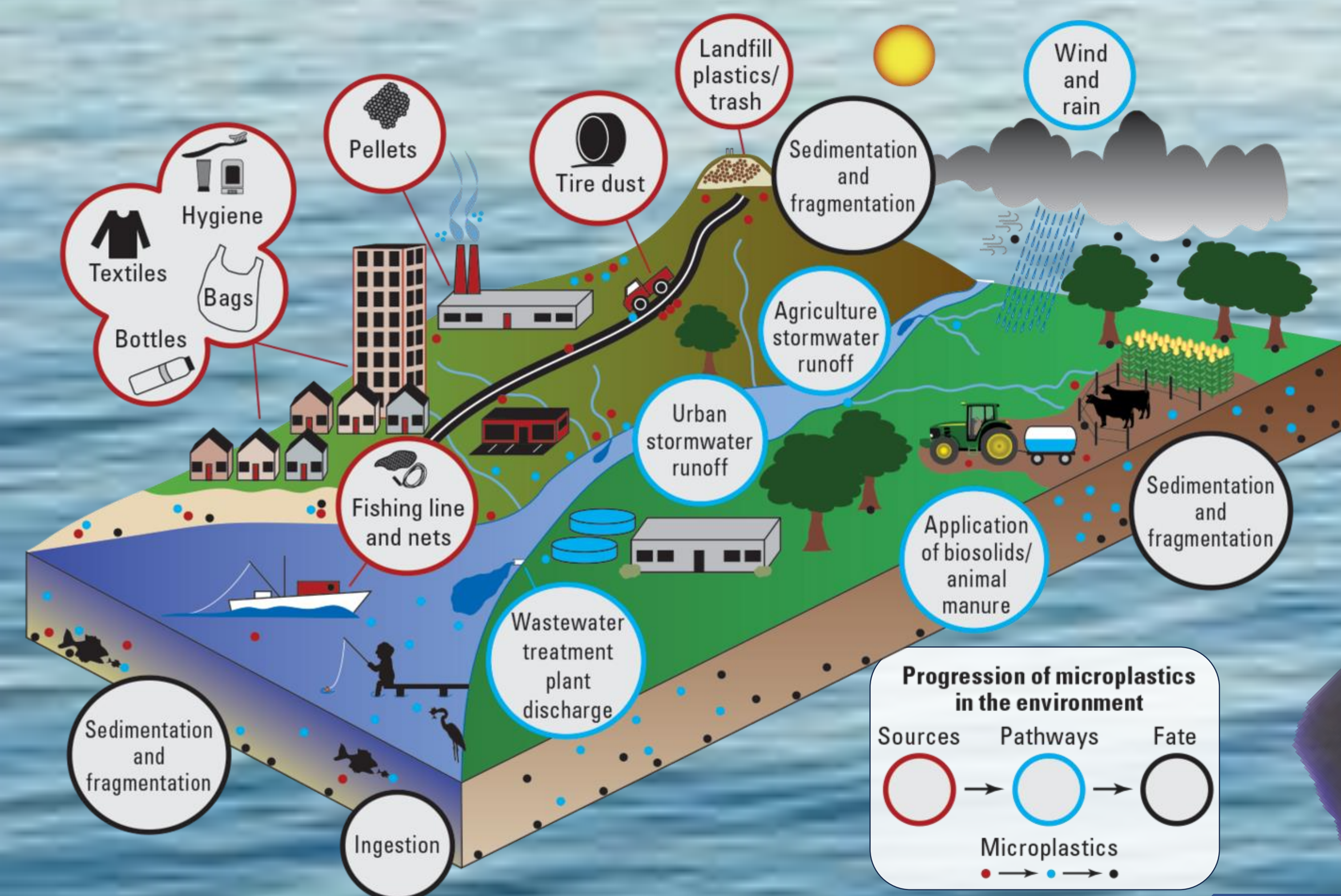


Microplastic Pollution

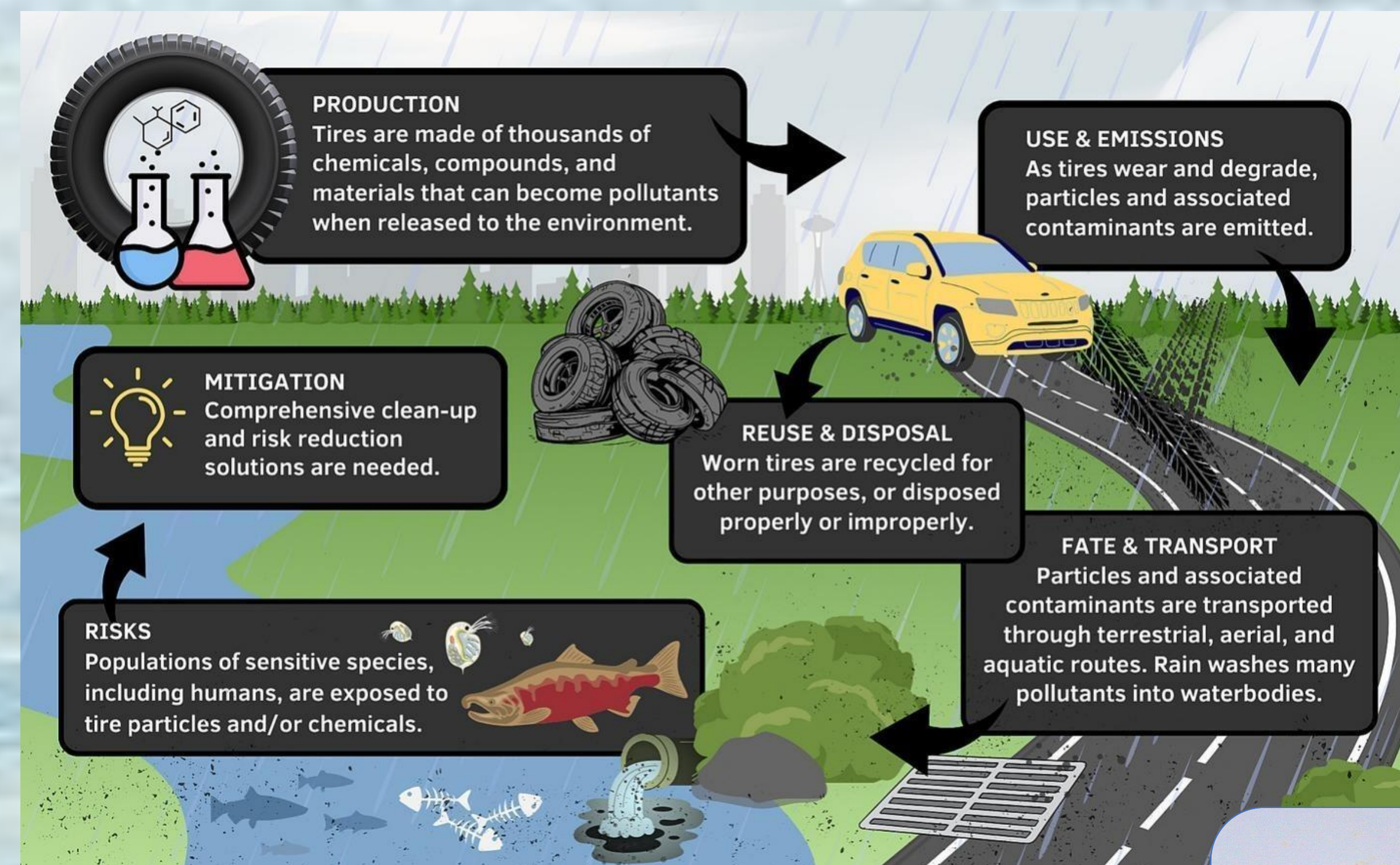
- Plastic particles < 5mm in size
- Most US freshwater microplastic studies are focused on Great Lakes ecosystems.
- Plastics biofoul, or break down over time, changing their density and shifting their location within the water column.



Micro-rubber

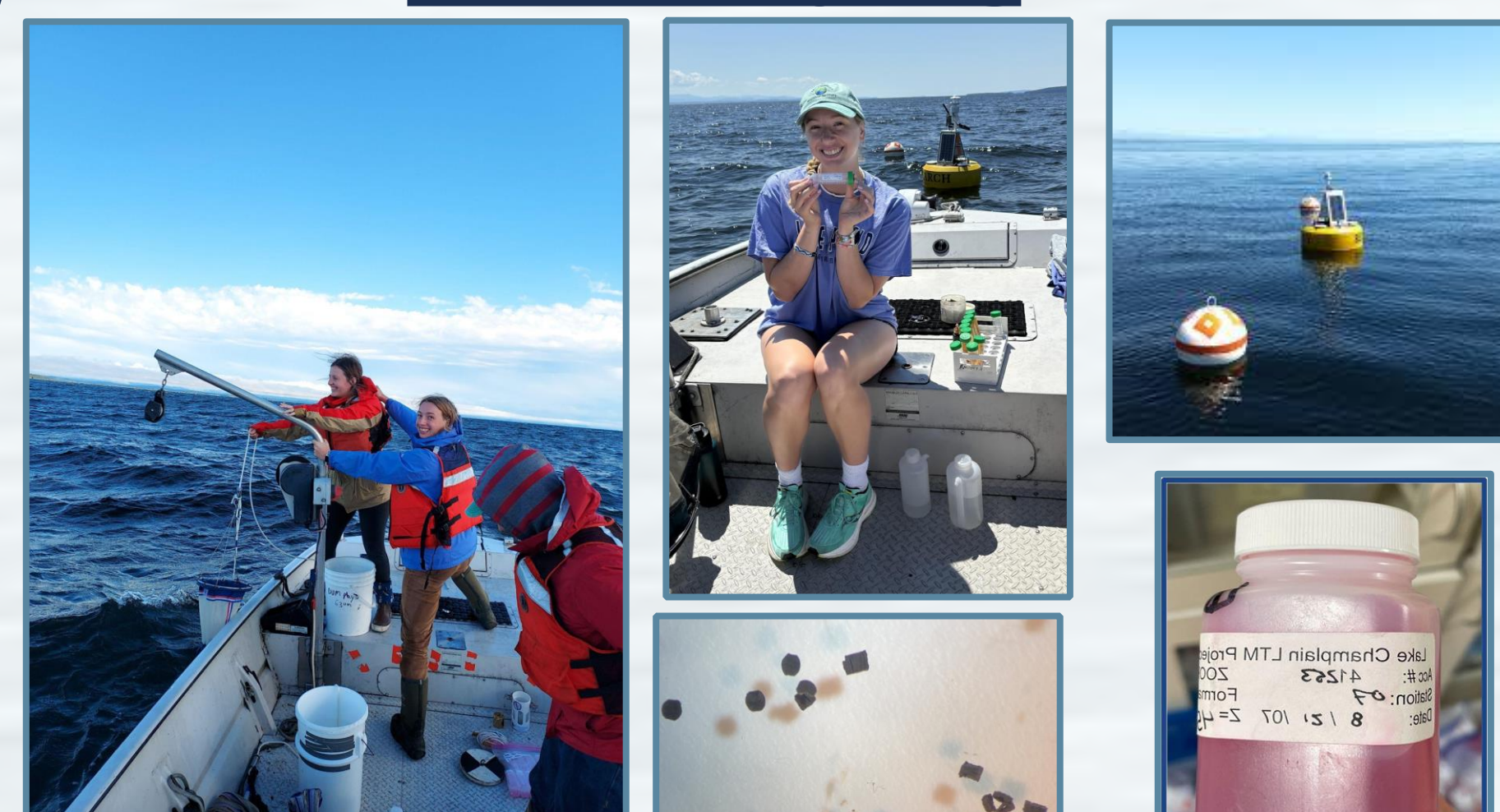
Micro-rubber is an elastomer particle ≤ 1 mm

- Crumb rubber is abraded or weathered rubber produced from tires or similar byproducts
- Rubber pellets range from polyisoprene rubber ribbon to adhesive compounds

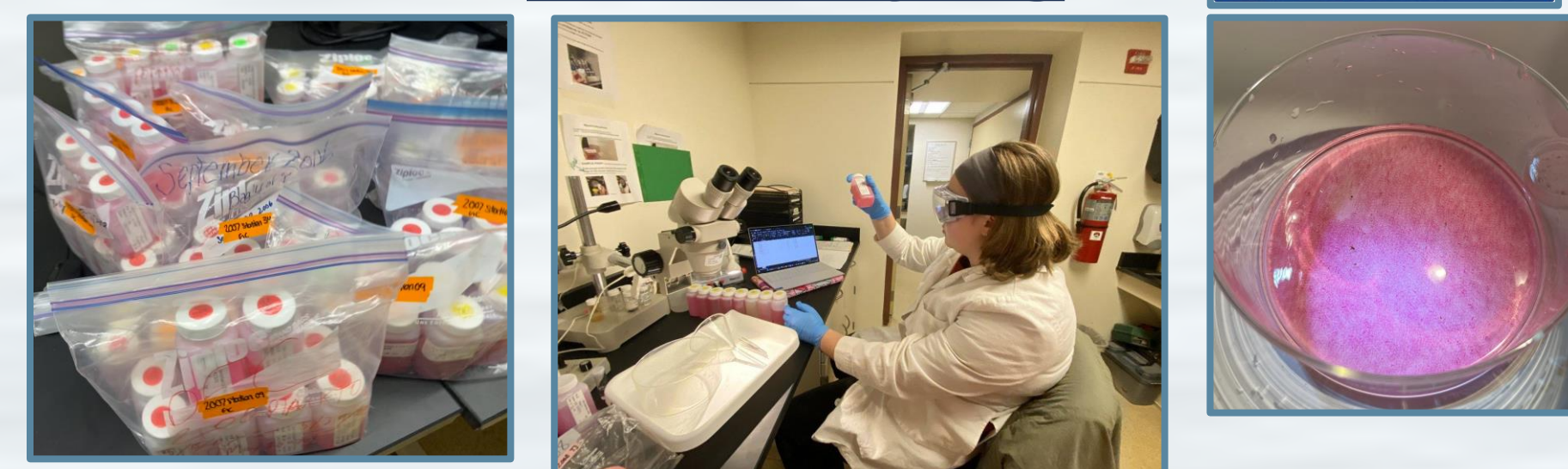


Methods

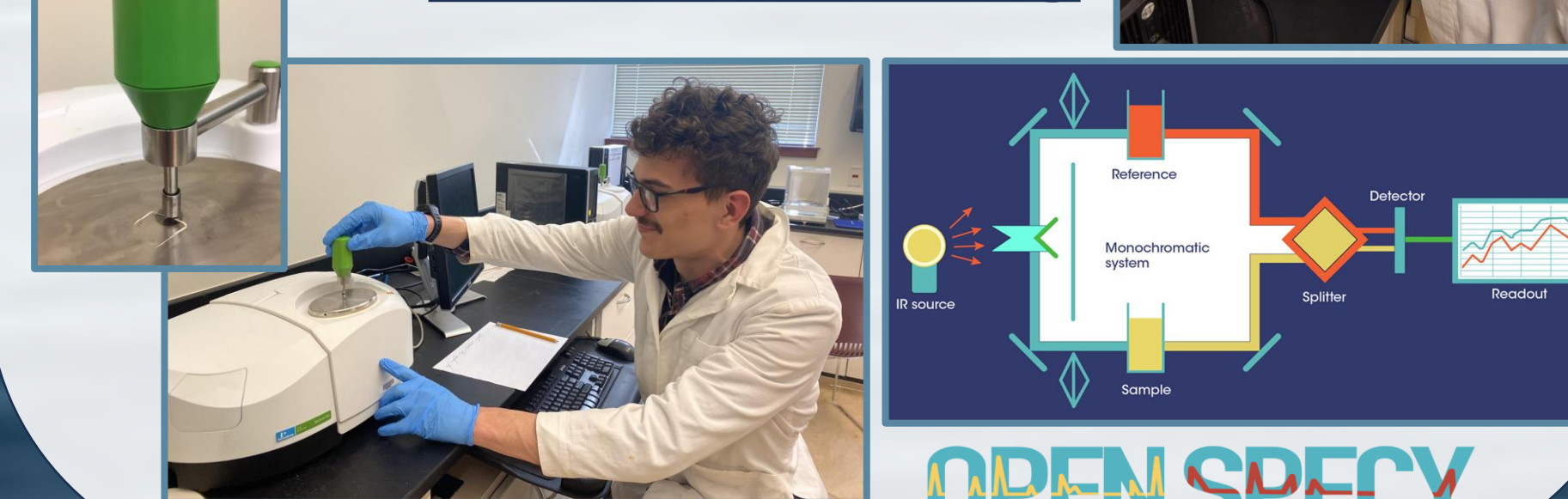
LTM Sampling



Quantifying

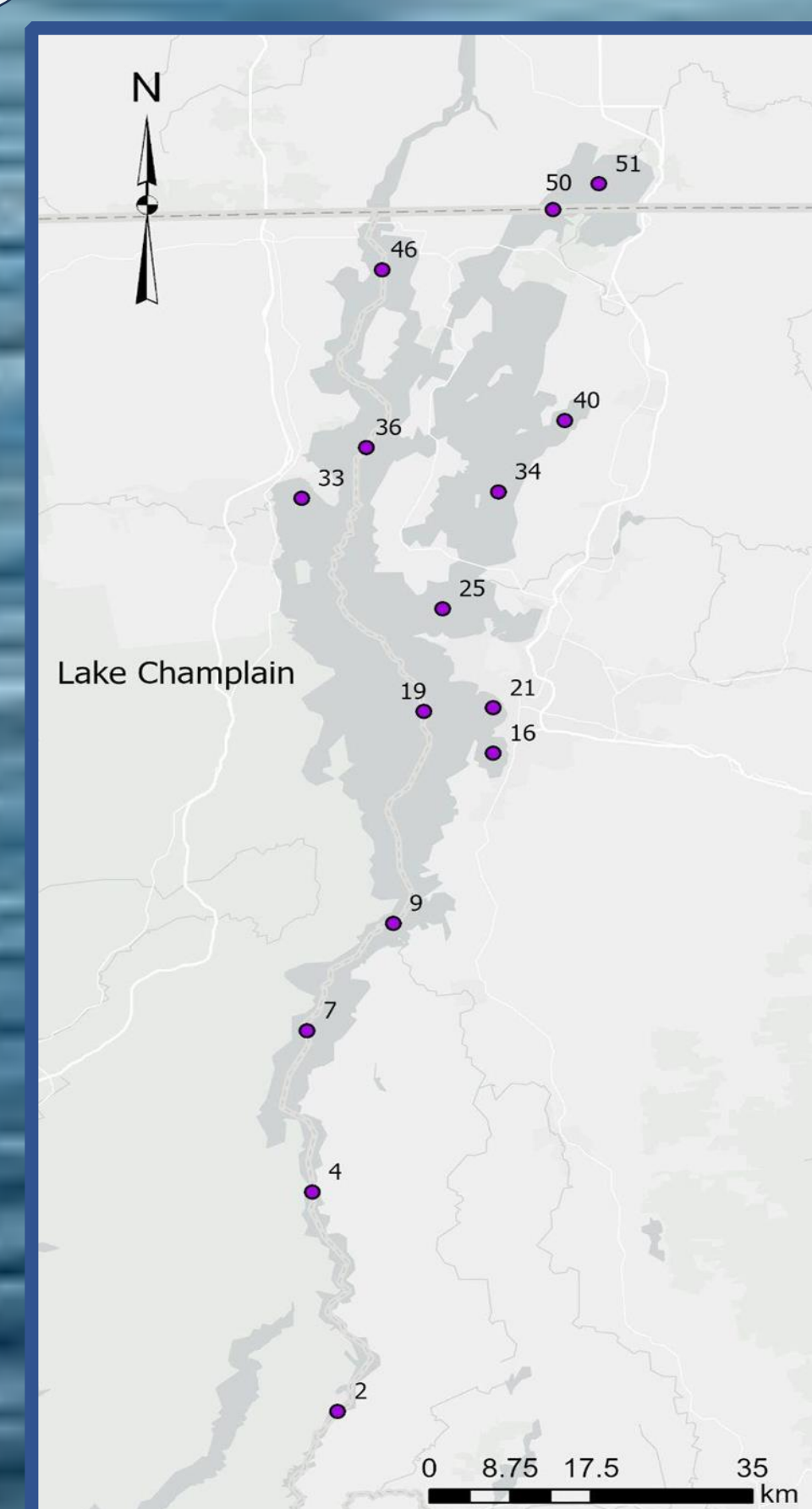


Characterizing



Long-term Monitoring (LTM)

- Joint Lake monitoring project with NYS DEC, Lake Champlain Research Institute/SUNY Plattsburgh
- 15 monitoring stations (1992-current)
- Standardized vertical net sampling
- Samples are intended for monitoring of phytoplankton, zooplankton, and invasive species

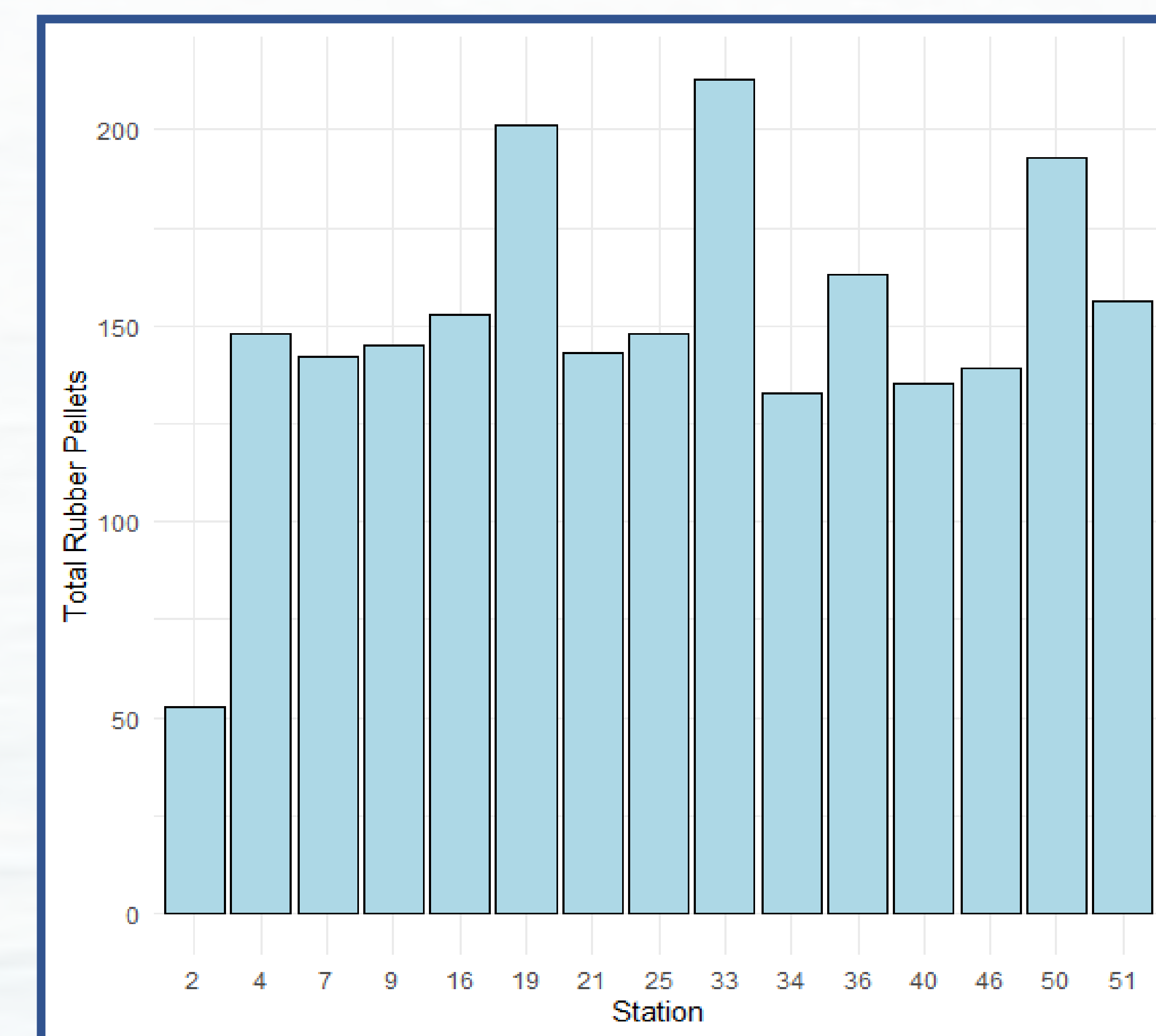


Goals, and Hypotheses

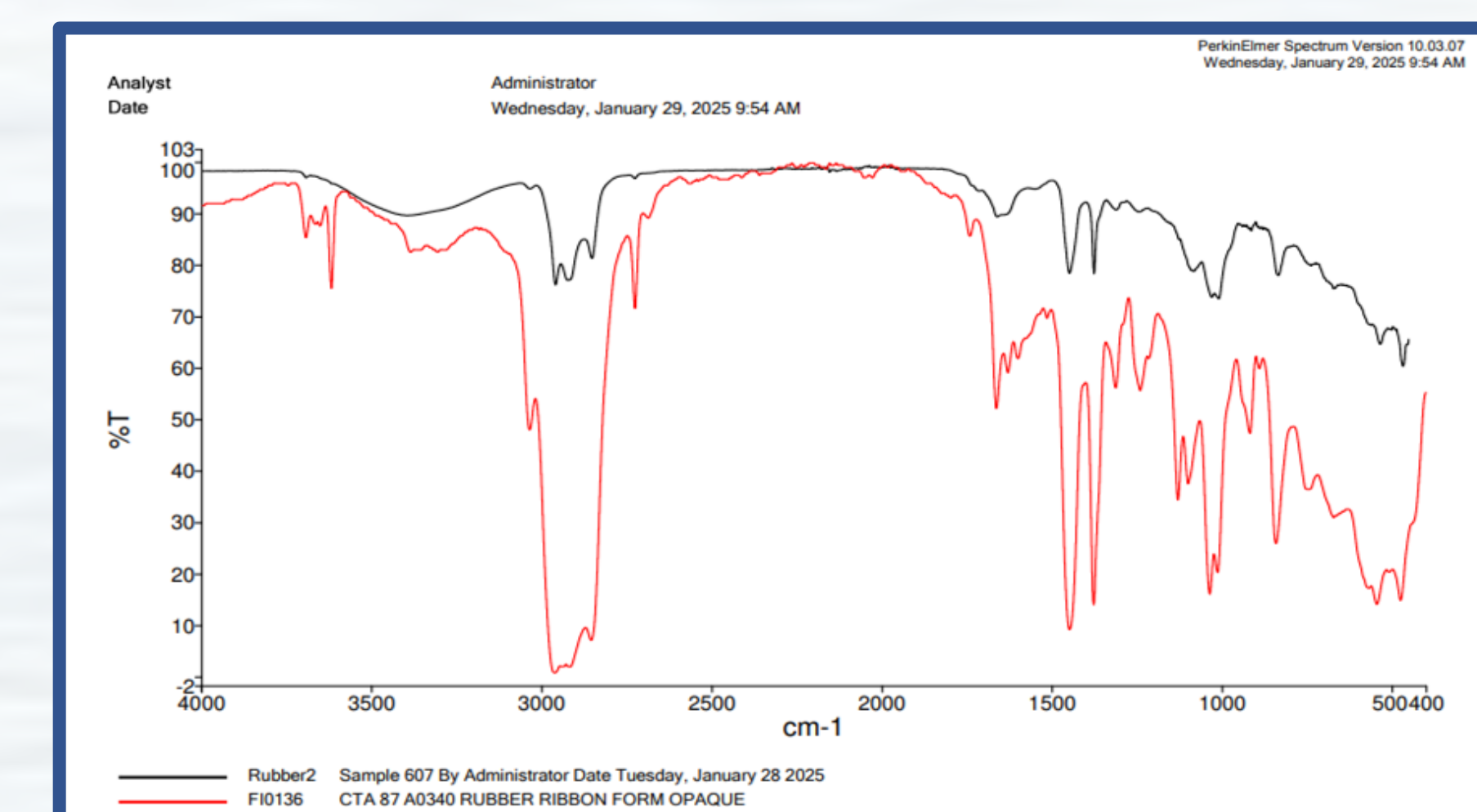
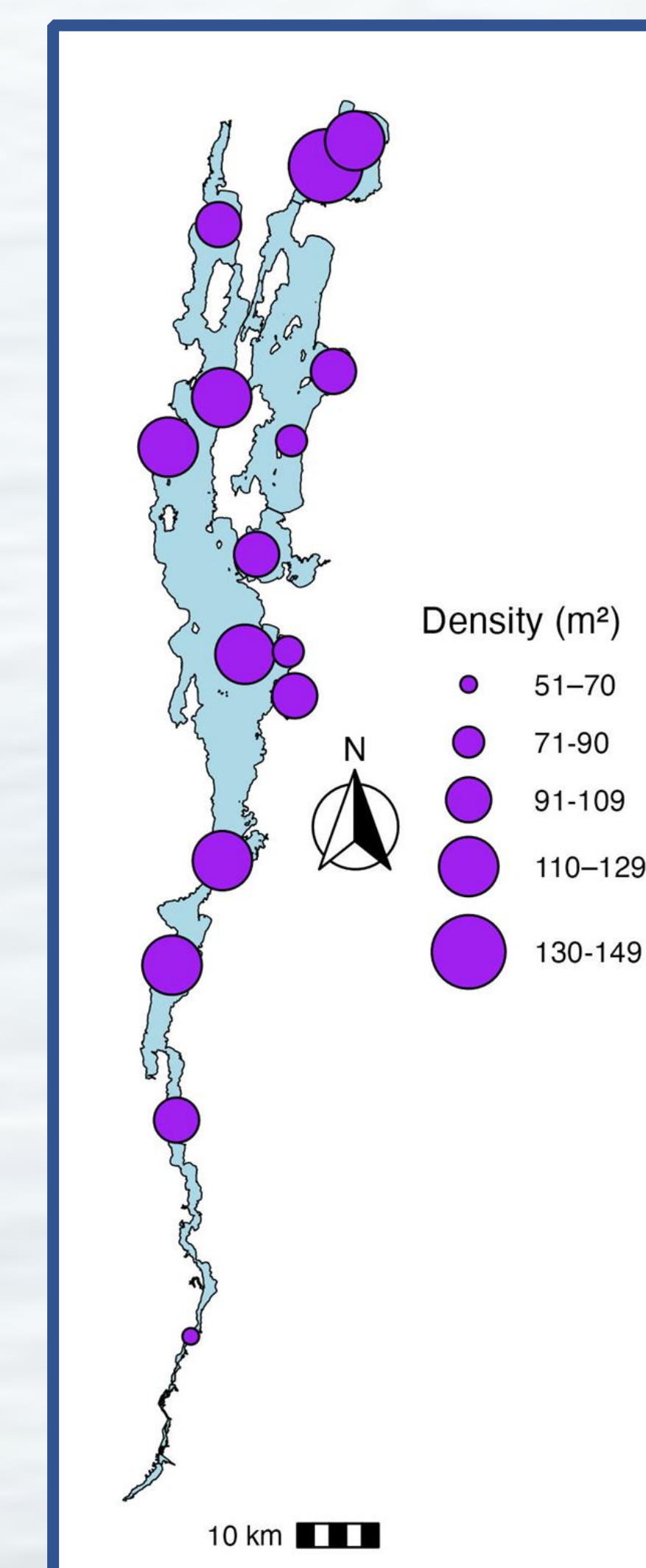
Expanding on prior work, we organized, quantified, and characterized micro-rubber in the LTM samples.

- Micro-rubber will be of greater abundance near sites close to urban centers.
- Micro-rubber will be more abundant from 2012 to present.

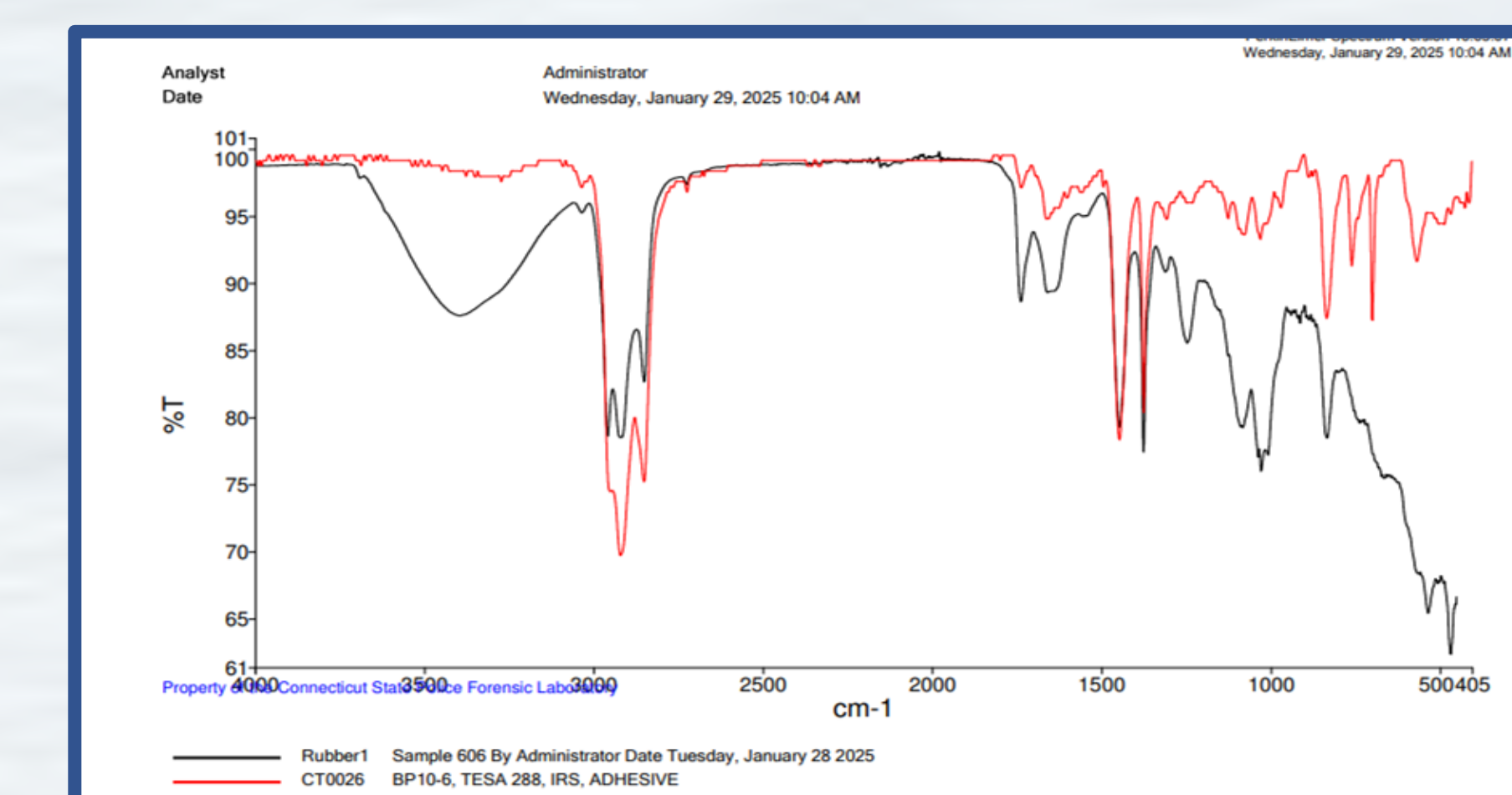
Findings



Total rubber pellet counts at all 15 stations (2012-2016)



Polyisoprene rubber ribbon sample (FTIR)



Adhesive sample (FTIR)

Future Directions

- Continue processing LTM samples to fill in data gaps in years
- Process tributary samples to determine if potential pathway (WWTP is not)
- Research possible sources associates with agricultural practices, road maintenance, or other regional industry (e.g., 3D printing, tires)

(a) Preparation method of the rapid-melting pellet



Acknowledgements

Special thanks to the Lake Champlain Basin Program for funding this research, as well as to UVM partners Nurjahan Begum, Andrea Stumpf, Arden Degener, and Dr. Anne Jefferson

Learn more

