

Controls on microplastics accumulation in stormwater pond sediments: Preliminary results

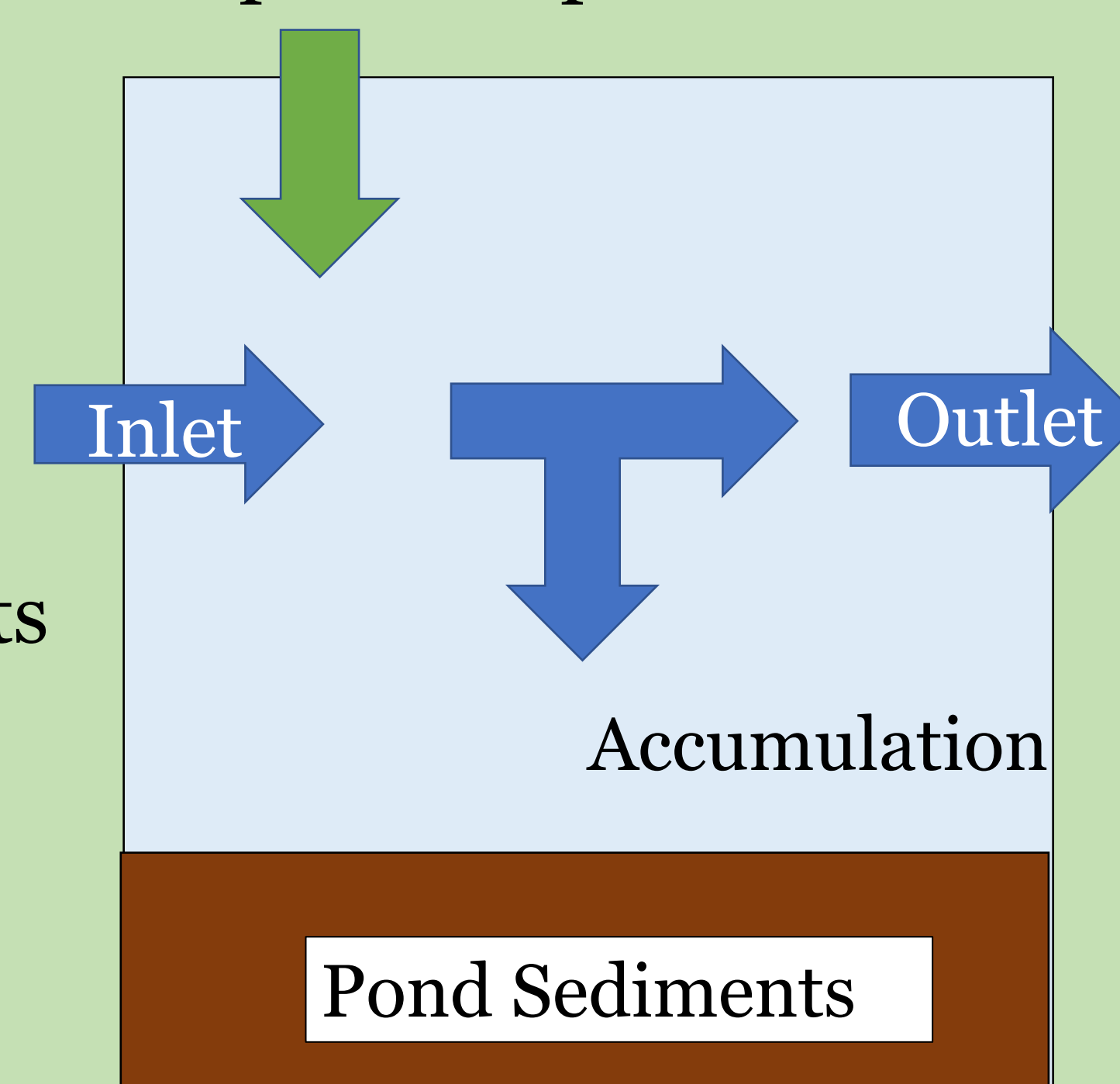
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Background

- Stormwater ponds (SWPs) are receivers of land-based microplastics (MPs) carried by stormwater runoff¹
- MPs accumulated in SWP sediments = archives of historic MPs delivery to SWPs²
- Factors controlling accumulation and spatial variability of MPs in sediments are understudied³

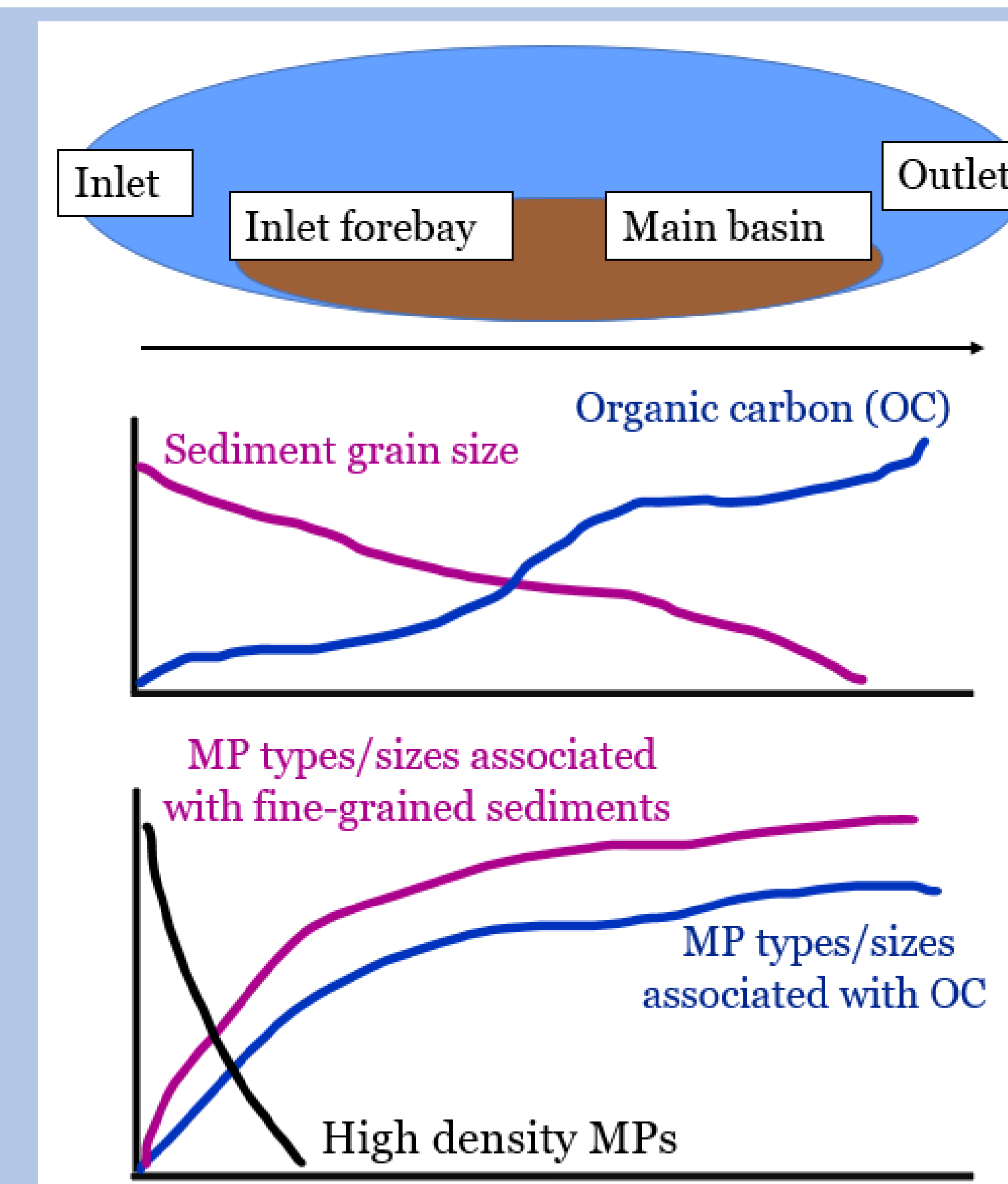
Atmospheric deposition



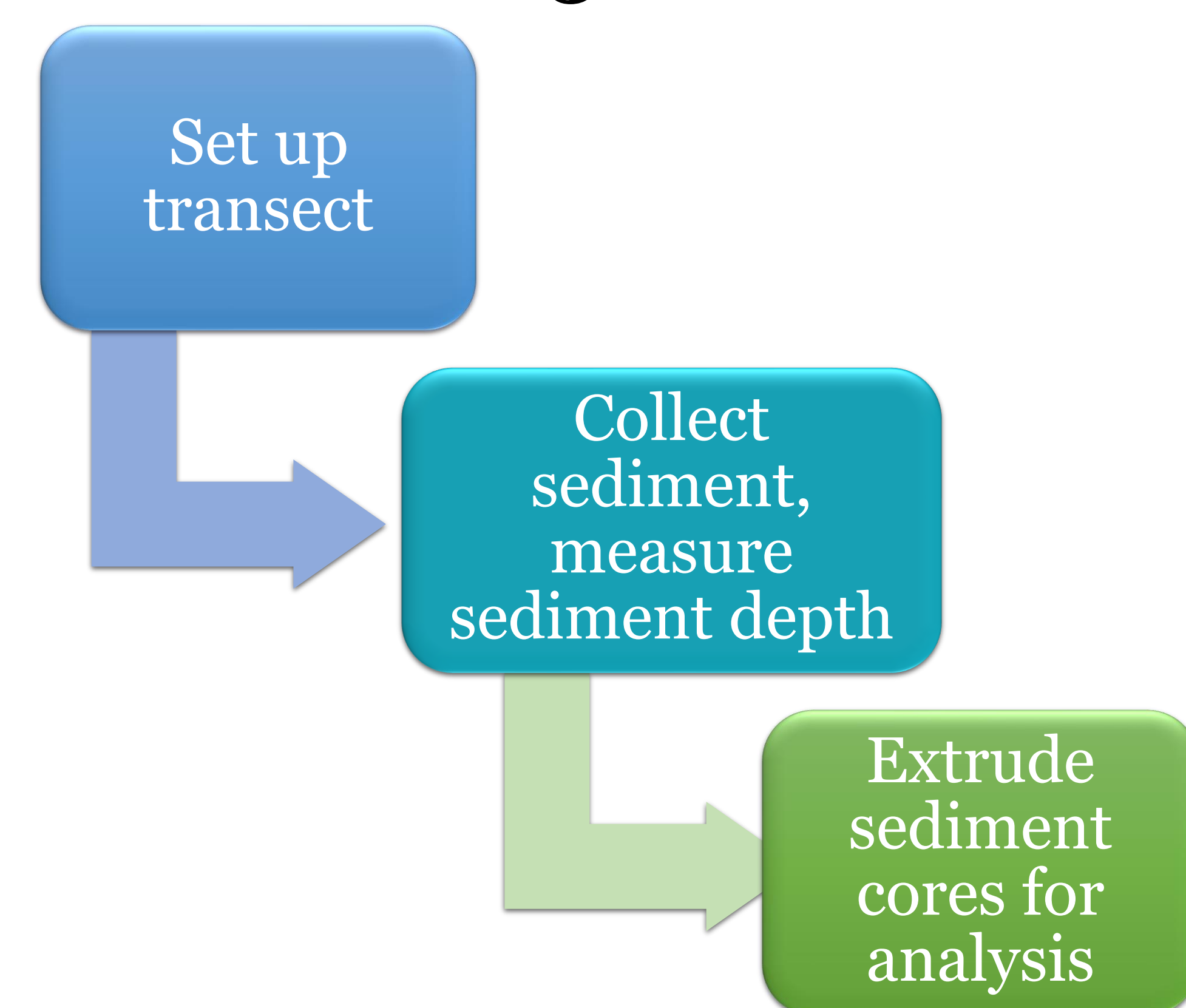
Conceptual sketch of MP particle (and mass) balance for a SWP

Objectives

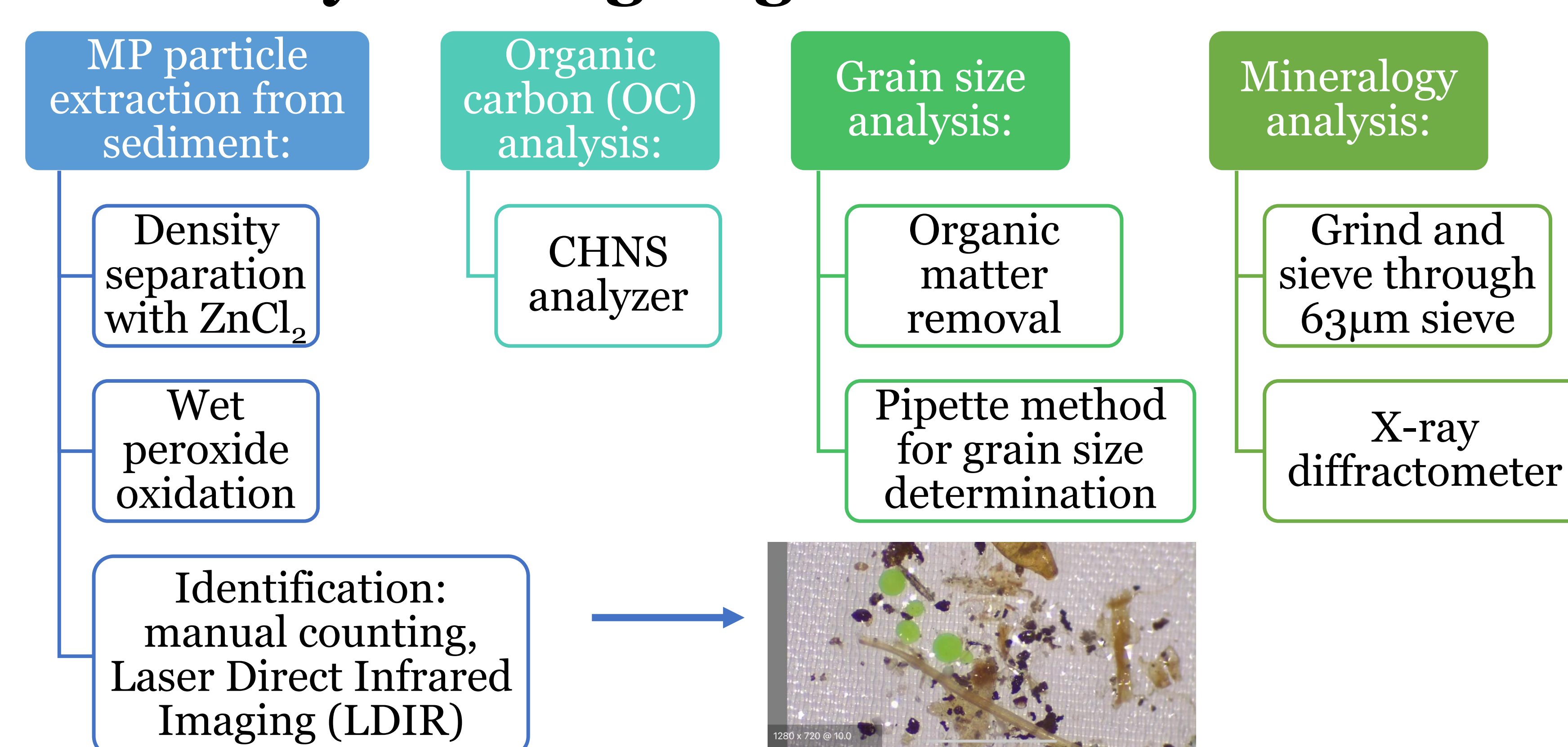
- Assess **the variability in MPs types, sizes, and abundances** in SWP sediments
- Determine **the influence of sediment properties** on MP accumulation
- Reconstruct stormwater runoff **MP loads** using sediment core accumulation rates, and relate them to **upstream land use**



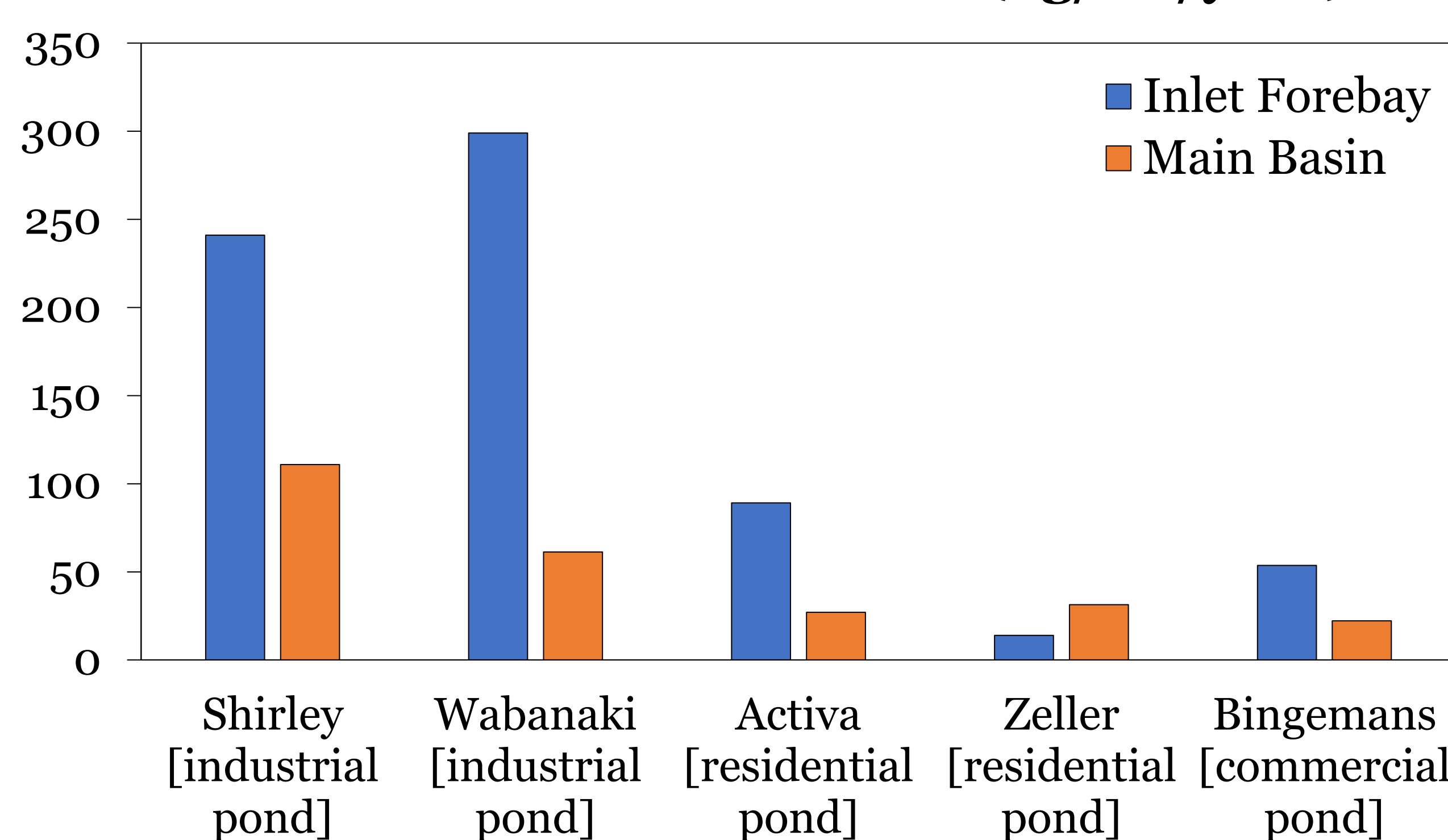
Field sites: 5 SWPs in the City of Kitchener



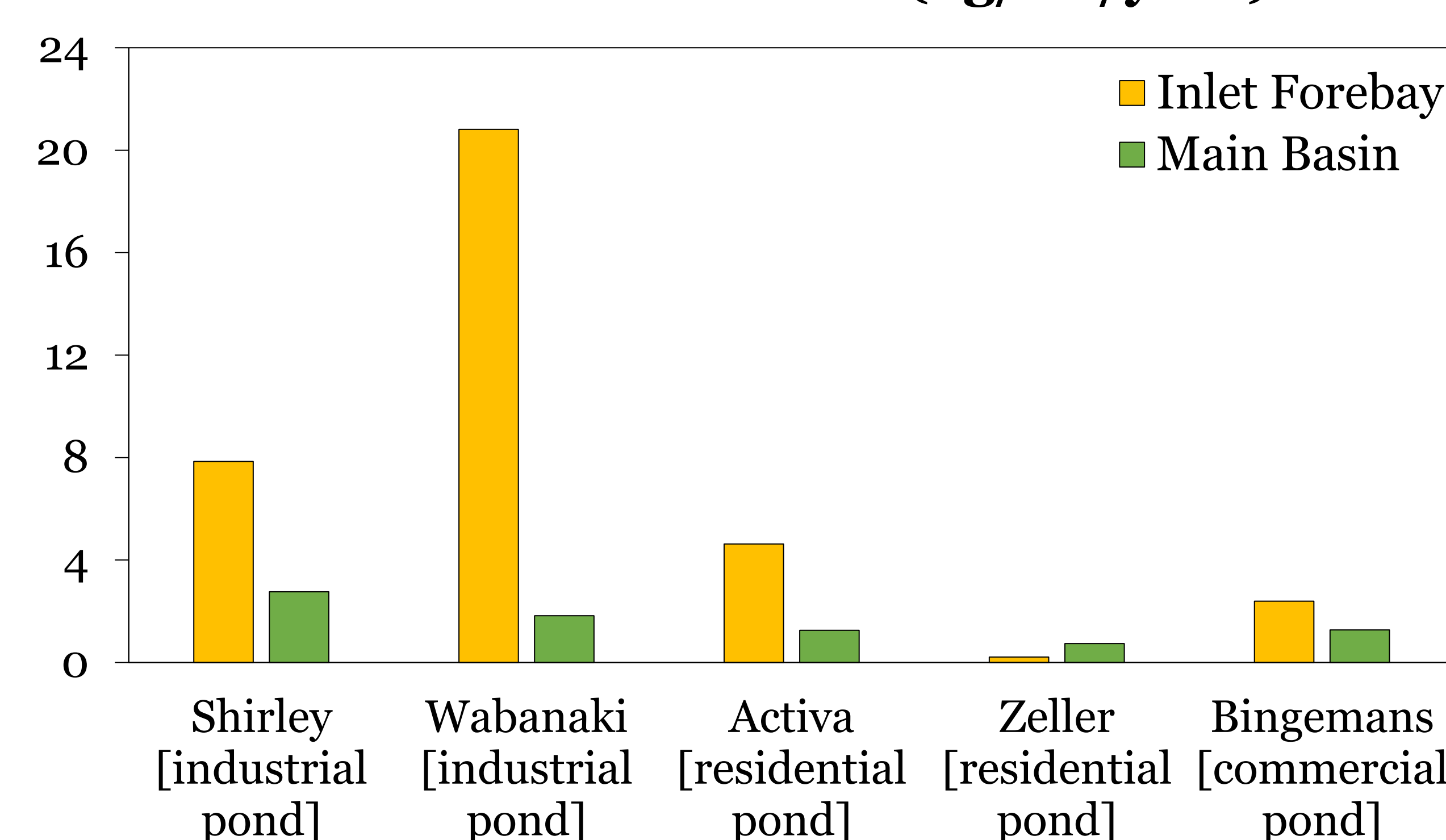
Lab Analyses: Ongoing



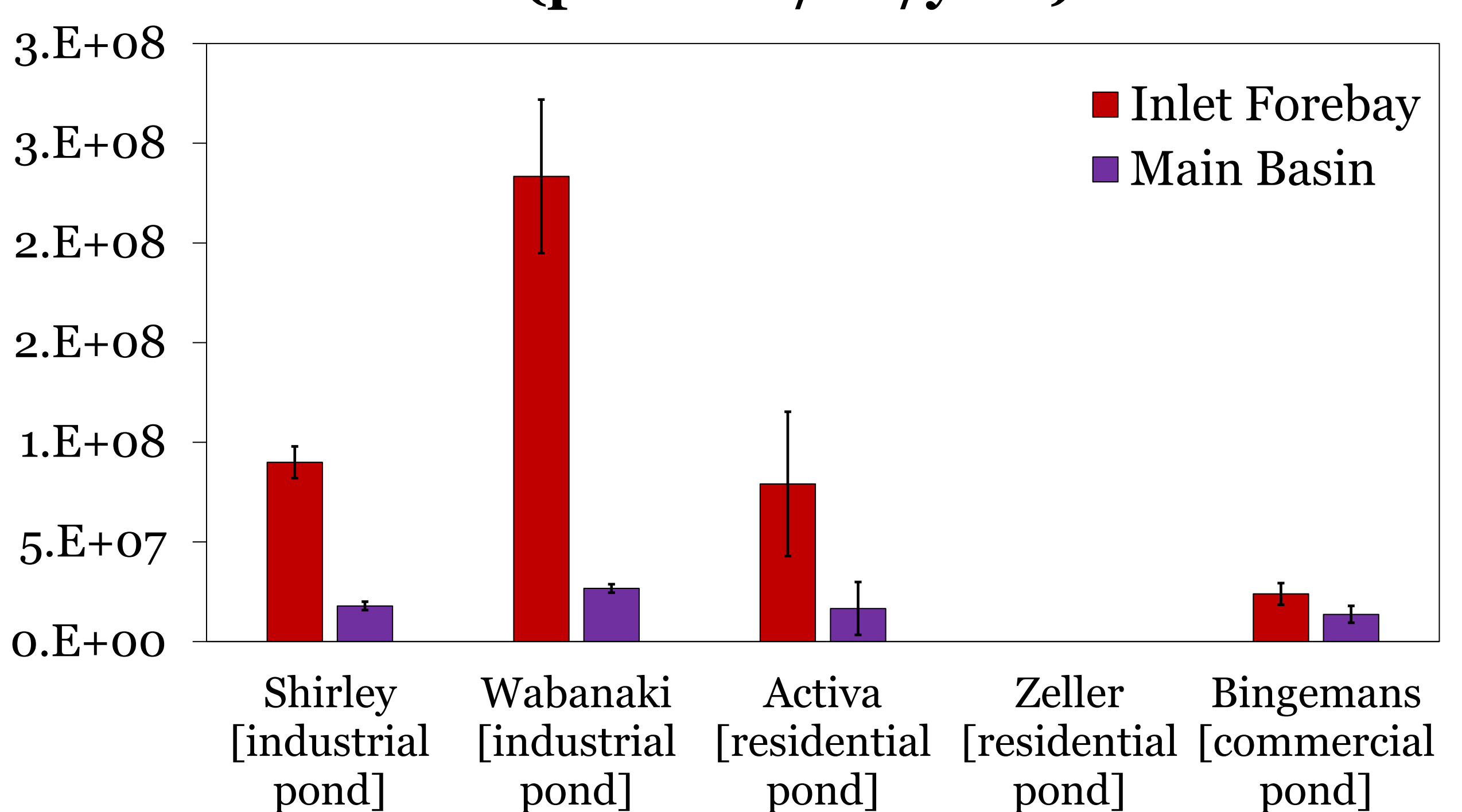
Sediment accumulation rates (kg/m²/year)



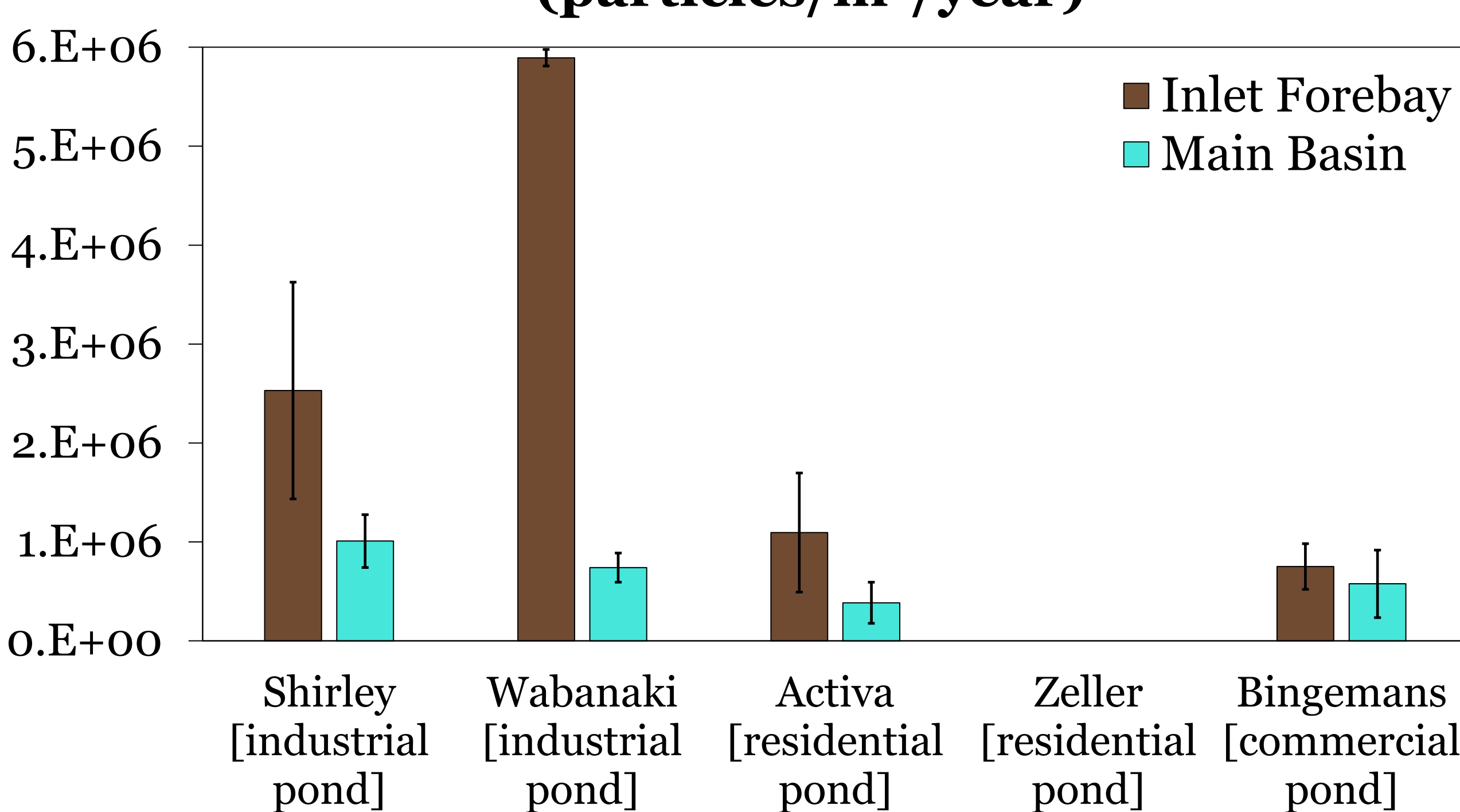
OC accumulation rates (kg/m²/year)



Fragment accumulation rates (particles/m²/year)



Fiber accumulation rates (particles/m²/year)



➤ Preliminary results show impact of catchment land use on sediment, OC, and MP accumulation rates:

- Industrial SWPs had highest accumulation rates, followed by residential and commercial SWPs
- Sediment, OC, and MP accumulation rates higher in inlet forebay than main basin for most SWPs
- Fragment accumulation rates were considerably higher than those of fibers

Acknowledgement

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Reference

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