

Multi-Faceted Approaches to Waterbody Management



Emily Reed

ILM

Three Case Studies

McKinley Lagoon

- Large urban waterbody with persistent planktonic algae blooms



Brookside

- Retention pond in subdivision with nuisance algae and aquatic vegetation



Humboldt

- Public beach experiencing excessive algae and dangerous *E. coli* levels



Urban waterbodies experience different conditions than rural glacial lakes

- Retention ponds are designed to prevent nutrients, sediment, and pollutants from moving downstream
- More nutrients entering the water
- Eutrophication occurs more quickly in urban ponds than undeveloped areas
- Vegetation-free water is difficult to achieve in shallow water with high nutrients



How to help meet expectations?

Applying a variety of management strategies to develop a holistic approach to management

- Long-term strategies
 - Nutrient mitigation
 - Prevent further accumulation
 - Native buffers, education
 - Sediment removal
 - Products to bind nutrients
 - Introduce desirable plants
- Short-term strategies
 - Targeted herbicide applications
 - Manual removals



McKinley Case Study

Overview: Large Lagoon, urban environment

Problem: Planktonic algae blooms for years



McKinley Case Study

Management Plan:

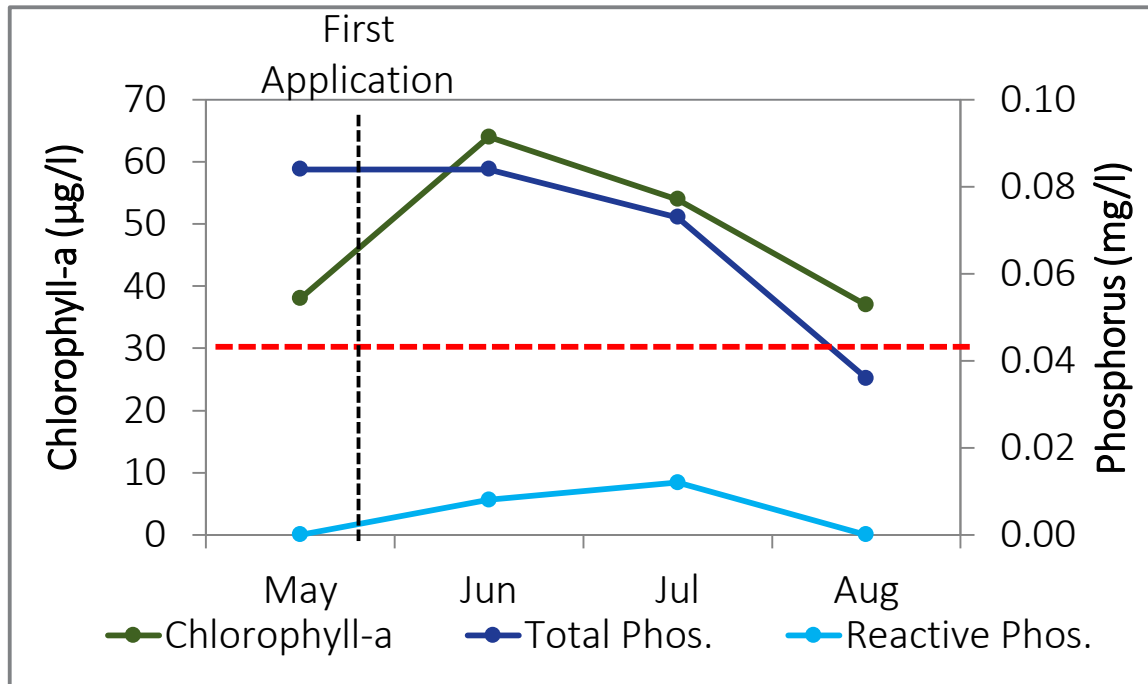
- Pre-emptive algaecide treatments with additive to remove nutrients (SeClear)

Results: No algae blooms in 2018



McKinley Case Study

Results: Quantified reduction of phosphorus in the water column



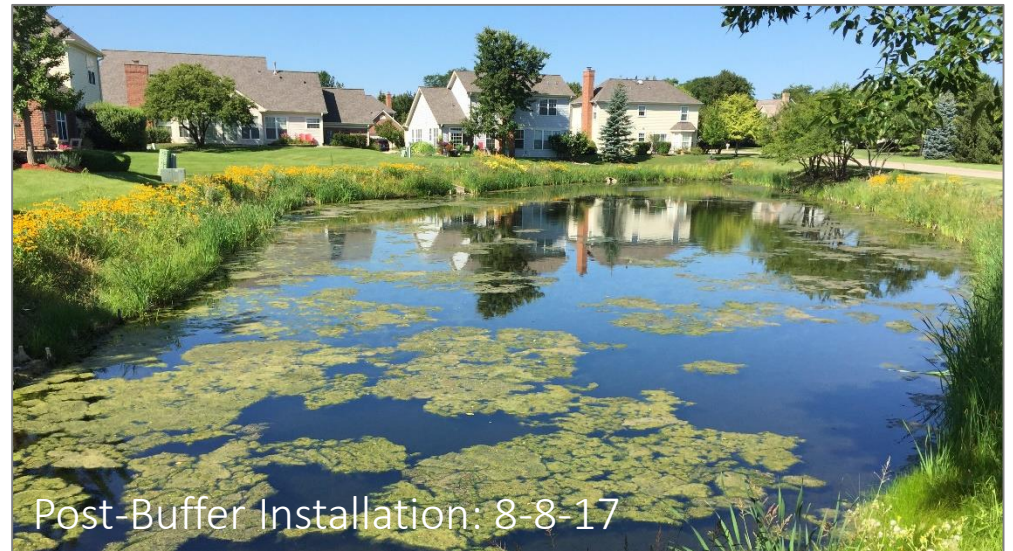
Algae blooms do not typically occur when P is below 0.04 mg/l.

Brookside Case Study

Overview: Subdivision retention pond
Problem: Recurrent nuisance vegetation and algae, despite restoration efforts



Pre-Restoration: 7-7-16



Post-Buffer Installation: 8-8-17

Management Strategy

- Case study
- Apply Phoslock at recommended rates to bind available phosphorus
- Continue to treat with algaecides as needed



Brookside Case Study

6/26/2017



6/20/2018



Brookside Case Study

7/10/2017



7/12/2018



Brookside Case Study

8/8/2017



8/14/2018



Brookside Case Study

9/19/2017

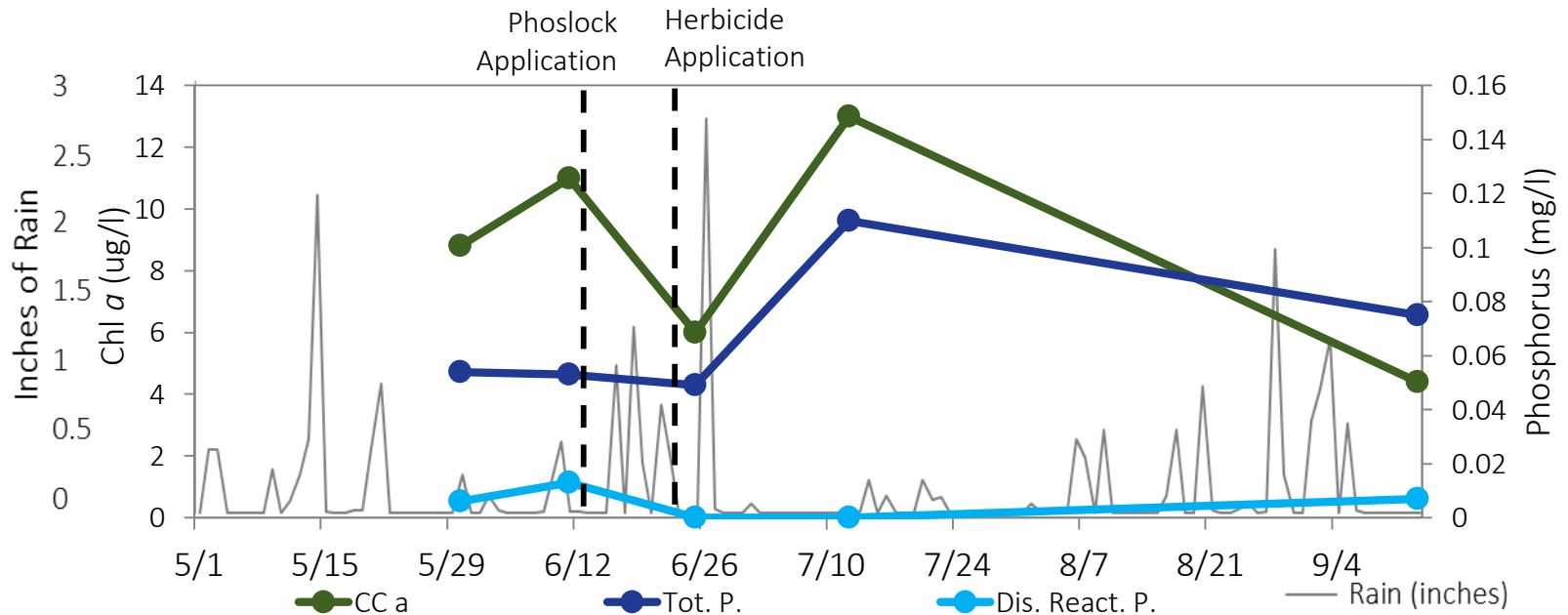


9/13/2018



Brookside Case Study

- Phosphorus decreased following application, but rebounded after storm event and herbicide application. Continued decreasing through rest of summer.
- Potential to mix long-acting products (Phoslock) with short-term (alum).
- Used 40% less copper in 2018 compared to 2017, overall cost of all products was about equal



Future management

- Earlier application of Phoslock
- External nutrient loading must be addressed before internal loading
- Small retention ponds have different stressors than larger waterbodies, more sensitive to change
- Other sources of nutrient mitigation
 - Planting emergent vegetation?
 - Organic sediment reduction?
 - Working with community to reduce nutrient runoff?

Humboldt Beach Case Study

Overview: Public beach, Filled with municipal water (high levels of phosphates)

Problem: Frequent algae blooms, Elevated *E. coli* levels



Management Strategy

- Plantings to deter geese and goose harassment strategy
- Manual algae removal in early spring
- Citizen education
- Floc Log installations to bind nutrients
- Periodic product applications
 - Cutrine Plus and Pondzilla Pro to control algae
 - MD Pellets to breakdown organic sediment and improve water clarity to aid in *E. coli* degradation



Results

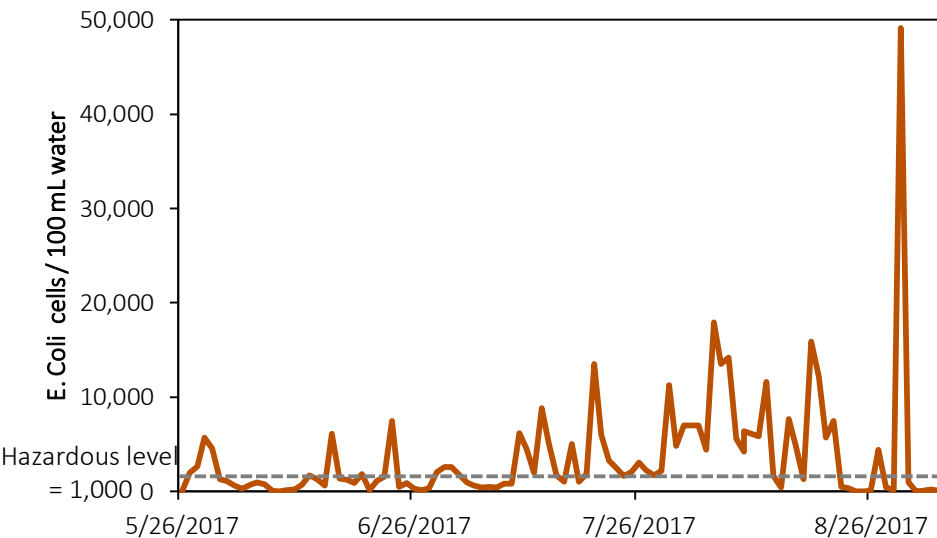


Reduction in algae growth

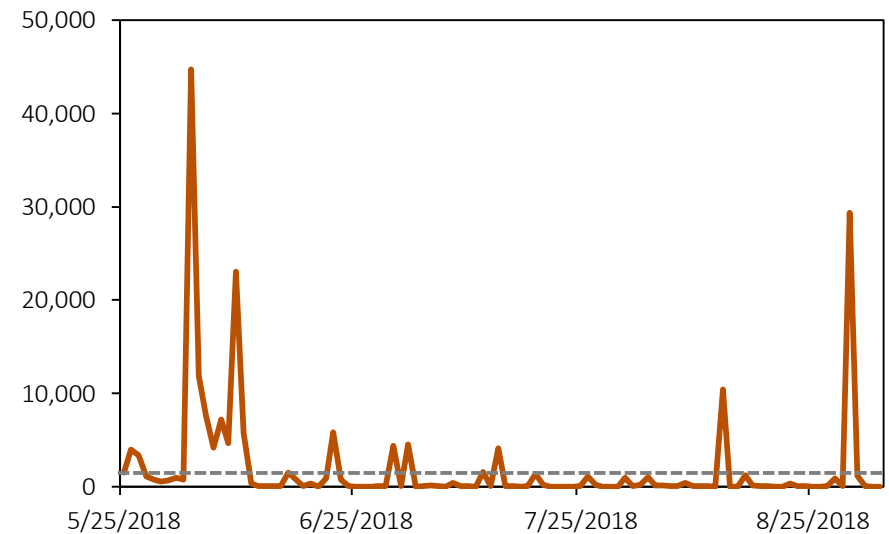


Reduction in hazardous E. coli levels

2017



2018



E. coli concentrations were at hazardous levels 70% of the summer in 2017

E. coli concentrations were at hazardous levels only 25% of the time in 2018*

* <https://blockclubchicago.org/2018/10/19/after-long-legacy-of-poor-water-quality-humboldt-park-beach-sees-major-improvement/>

The Future of Pond Management

- Pairing short-term and long-term management strategies to promote sustainability
- Importance of water quality monitoring to understand and interpret management outcomes
- Each situation is unique and requires a tailored management strategy to achieve the desired outcome

