



Twelve Years of Water Quality Monitoring in Little Lagoon at a Glance

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Collaborations



LLPS Water Quality Interest

- Our interest in Little Lagoon began with general scientific interest and a concern about “eutrophication”
- Eutrophication = Increase in nutrient supply to water bodies often resulting in a reduction of water quality.
- Defined by its effects
 - Hypoxia (loss of oxygen in the water)
 - Harmful algal blooms (HABs, red tides, pond scum, etc.)
 - Harmful bacteria (Fecal coliforms, *E. coli*)
 - Large changes in ecosystem



6-2007 Dr. Hugh MacIntyre reached out to us after a MBNEP CAC presentation by LLPS

Our WQ Group

- 9-12 trained volunteers have monitored WQ in LL since ~2008
- We monitor WT, DO, Sal, Ph, AT, clarity, phytoplankton, bacteria, weather, tides, some nutrient monitoring
- We are trained by DISL, PMN, AWW and mentoring
- 2 teams of at least 4 volunteers capture data every two weeks, several DB's are maintained and used



WQ Sites



WQ Parameters Measured

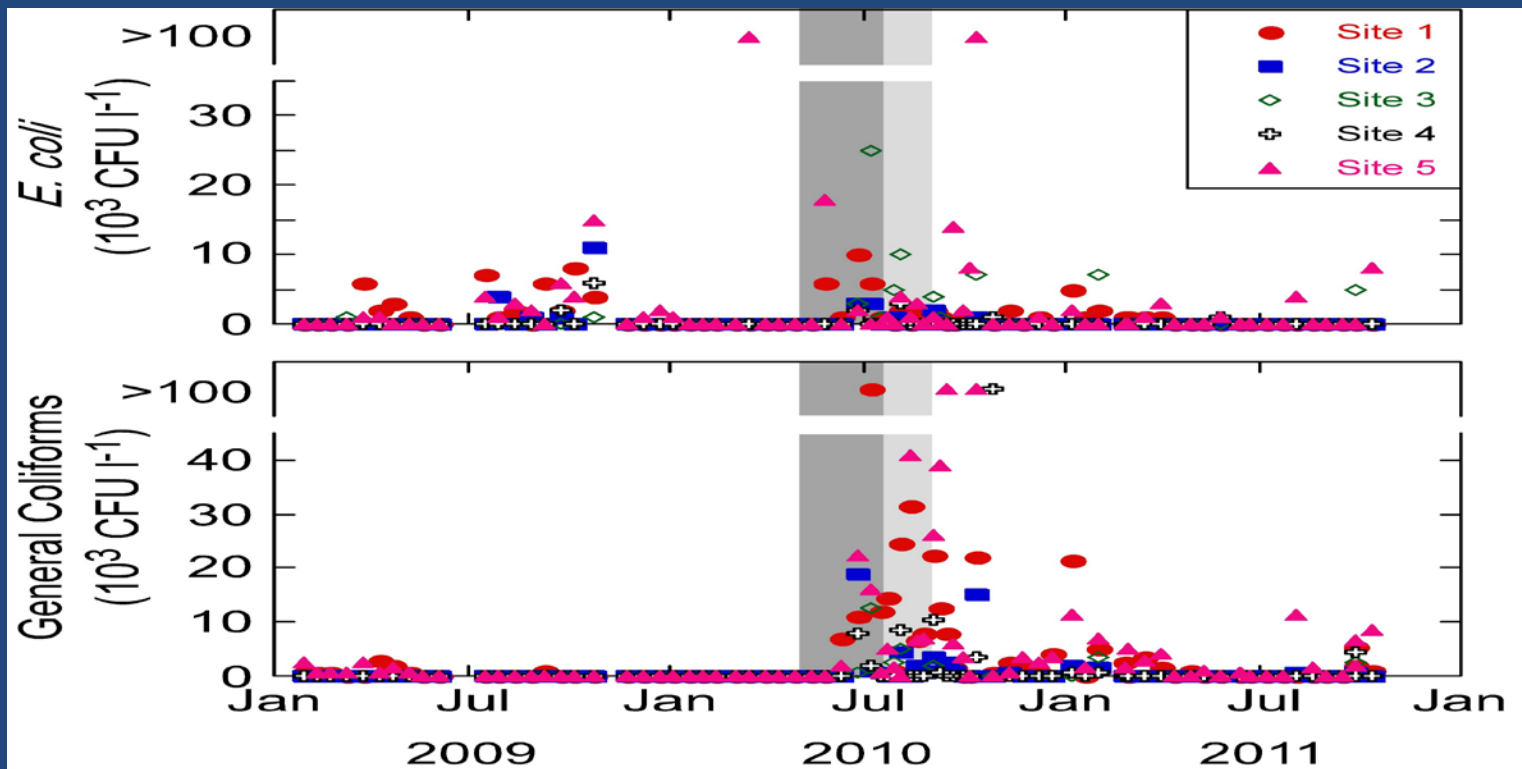
1. **DO**- measure of dissolved oxygen, like to see at least 5 MG/L, concerned when we measure <3MG/L, measured with a probe
2. **Salinity**- ppt, a measure of salt in Lagoon waters, measured with a probe
3. **Ph**- A measure of acidity or alkalinity in Lagoon waters, like to see 5-9 Ph, algal blooms buffer the water, measured with a probe
4. **WT**- A major factor in water's ability to hold O₂, measured with a probe
5. **Clarity**- Low values likely mean either stirred up phytoplankton bottom ooze or a phytoplankton bloom, measured with a secchi dish
6. **Bacteria**- measured in # of CFU/ltr of water. Lagoon waters classification for recreation and shellfish harvest have a "threshold" of ~ 100CFU/ltr of water. E-coli and other coliforms cultured and counted in agar/dish
7. **Phytoplankton**- microscopic plants and animals, base of food chain, produce O₂, contribute to water chemistry, can bloom and can be toxic. Sampled with a tow net, known volume of water filtered, ID and count with a research grade scope.
8. **Nutrients**- N and P. High N and P + sunshine = phytoplankton bloom, sometimes toxic. Water filtered and prepared samples provided to DISL for analytics in past. Currently not performing nutrient analysis.

Results-Public Available Data

- Water Rangers Curves
- <https://app.waterrangers.ca/locations/373>
- <https://app.waterrangers.ca/locations/371>
- <https://app.waterrangers.ca/locations/372>
- <https://app.waterrangers.ca/locations/374>
- <https://app.waterrangers.ca/locations/374>
- <https://app.waterrangers.ca/locations/1531>

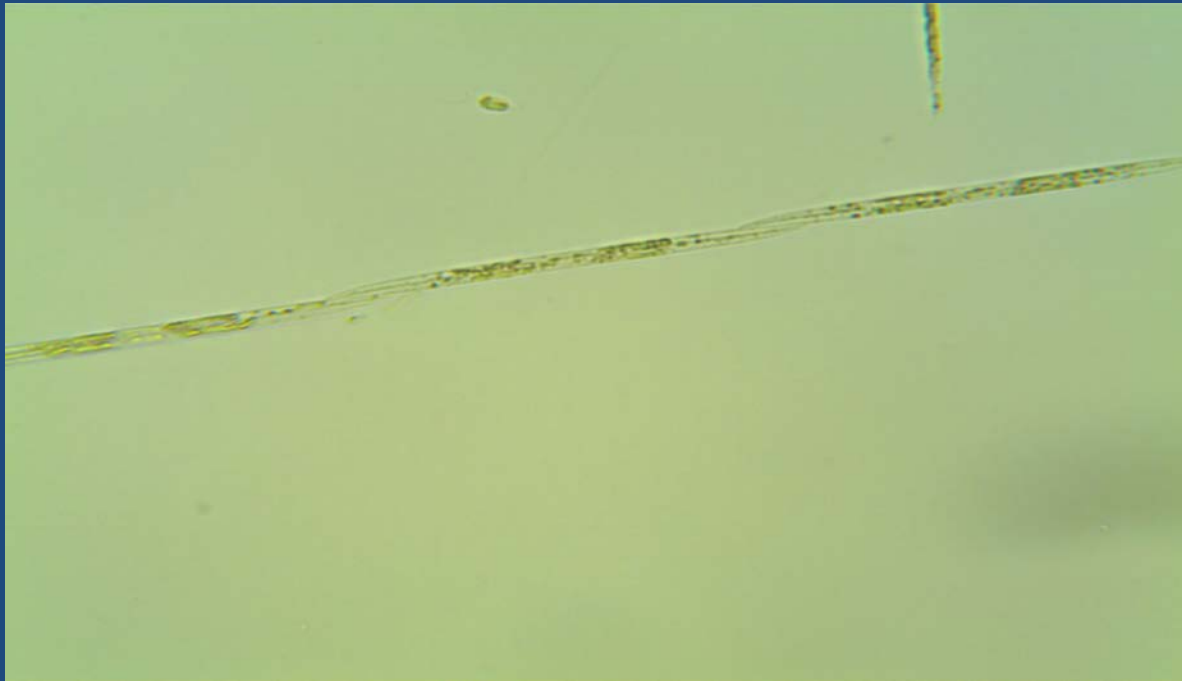
Results-Bacteria Monitoring

- Bacteria Monitoring-Impetus for research and DH Horizon Pass Closure



Results-Phytoplankton

- Algal Bloom detection
- Pseudo-nitzschia, toxic diatom, seasonal, notify ADPH



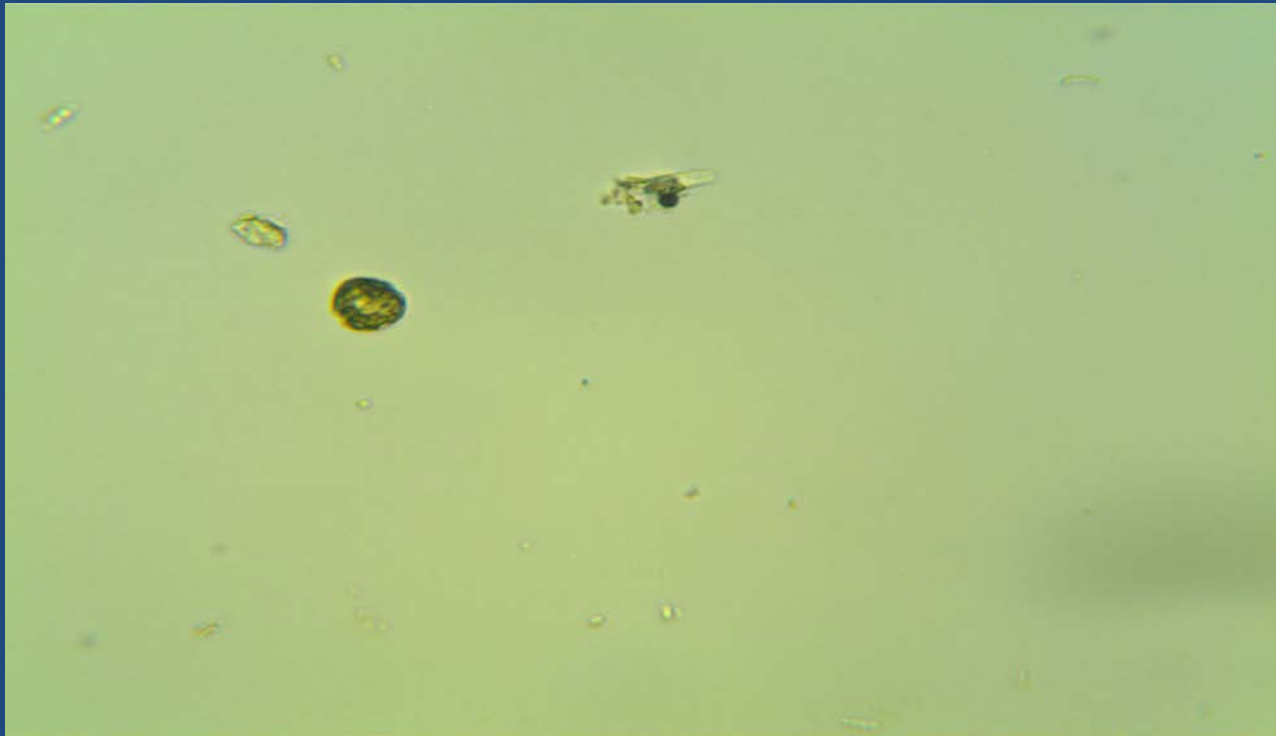
Results-Phytoplankton

- *Karenia brevis*- Red Tide, periodically comes to us from Fla., fish kills, respiratory distress, pass on counts to ADPH, notify COGS



Results-Phytoplankton

- Karlodinium- toxic dinoflagellate. 1 bloom noted in West Lagoon ~8 years ago



Results-Data Sharing

- Meetings with COGS Administrator, Environmental coordinator-impetus for current initiatives?
- Data sharing with USA for student analysis/outreach
- Data sharing with ADEM, ADCNR, ADPH-what should our level of concern be-impetus for current initiatives?
- Data sharing Geosyntec WMP, mostly interested in nutrients?
- University researchers, co-author phytoplankton paper w/Dr.'s Leifer and MacIntyre and grad. student

Future

- Keep building our DB
- Foster/conduct outreach
- Nutrient monitoring?
- Bottom water monitoring?