



# Tower Lakes Lake Committee Report

Silt Removal Team 5-Year  
Summary Report



# Tower Lakes

## Our most important Asset

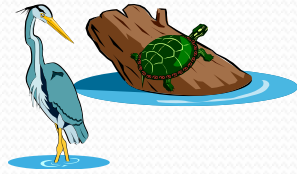
- 68 Acres including North Lake
- 4 miles of shoreline
- 2 major inlets to Main Lake
- 3 existing silt traps
- Vast majority of water enters from stormwater run-off
  - Across lawns
  - Stormwater drain pipes



# Lake Committee Goals & Impacts



Fishery &  
Nature Preserve



Invasive WEEDS



Sun



WATER QUALITY



Swimming &  
Water Sports

ALGAES



DEPTH SILT



Boating



Nutrients,  
Phosphates  
& Trash



Rain =  
Watershed &  
Road Run-off





# Lake Management Challenges

## Eutrophication

Eutrophication: The process by which a body of water becomes enriched with dissolved nutrients (such as phosphates) that stimulate the growth of aquatic plant life usually resulting in the depletion of dissolved oxygen. Lakes that cannot control this process will end up as “dead” lakes, and eventually bogs or swamps.

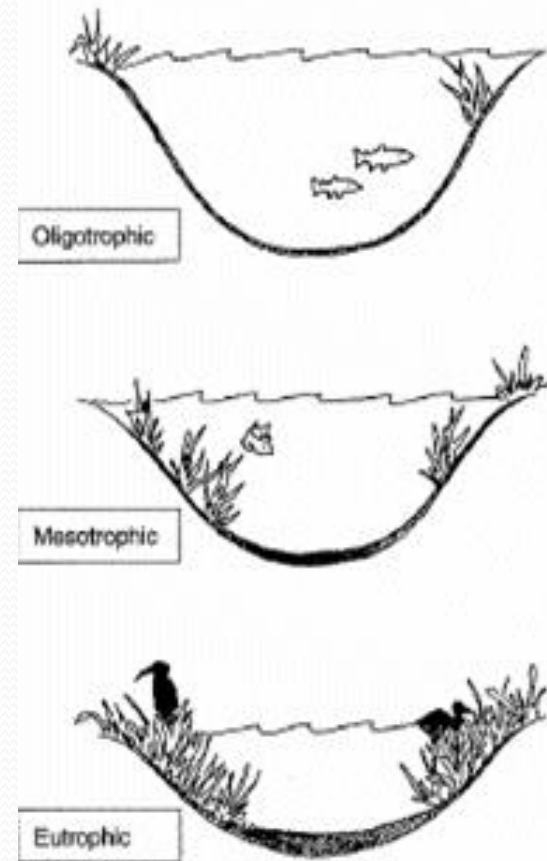


Figure 1. Lake classification.



# Lake Management Challenges

## Nutrients

- FOOD for plants
- Phosphates and Nitrogen naturally or added via runoff
- Existing Silt from lake creation
- Silt entering the lake from inlets and stormwater runoff
- Silt created by organic decomposition
  - Leaves
  - Sticks
  - Dead aquatic plants

## Aquatic Plants

- GOOD for fish
  - Provide Oxygen
  - Create habitat
- Fed by nutrients
- Difficult for swimming and boating
- We execute a plan to manage species and coverage
- Eliminate or Mitigate Nuisance Weeds



# We Have A History as CARETAKERS of this Lake! 1966-1968



DREDGE MAY 66



DREDGE MAY 66



JUNE 66



MAY 66



JUNE 66



# Silt Removal Project 2012-2016

## Why Remove The Silt?

- Large buildup of Nutrient-Rich Sediment over several decades.
- Engaged in Regular Cycle of:
  - (1) Observe Plant or Algae Growth
  - (2) Chemically Kill the Growth
  - (3) Observe Re-Growth of Plants & Algae
- **Wanted to Break the Cycle.**



# Silt Removal Project 2012-2016

## Options Considered

- Traditional Dredging (Scoop & Haul)
  - Expensive
  - Drain the Lake to do properly
  - Limited (if any) use of the Lake during the Traditional Dredging process
- Hydraulic Dredging (Slurry Vacuum Operation)
  - Less expensive
  - Least disruptive or visible to Homeowners
  - Considered “Barge” vs. “Diver” (Used Both)





# Silt Removal Project 2012-2016

## Hoped For Result

- Remove large volumes of muck
- Significantly reduce nutrient source that fuels undesirable plant and algae growth
- Create improved Lake conditions
  - Appearance
  - Biosystem (Health)
  - Enhanced Recreational Use
    - Boating
    - Fishing
    - Swimming
- **Done without “chemicalizing” the Lake.**



## Silt Removal Project 2012-2016

- TLIA members approved in 2011
- \$250 / year assessment for 5 years
- Silt removal and restoration only
- Projected three areas
- Original silt trap locations
  - Davlin's and Channel
  - Roberts Road
  - Southeast Main Lake
- 78% Membership Approval



# Silt Removal Project 2012-2016

## Necessary Pre-Work (#1)

- Silt Chemical Analysis (Confirm not Hazardous Material)
- Silt Growth Tests (Confirm Grass or Plant Growth Possible)
- Homeowners Association Marketing & Buy-In
- Development of a Comprehensive 5-Year Plan
- Independent Silt Surveys (Confirm Amount and Location of Silt)
- Research Silt Collection Bag Locations (Pros / Cons)
- Contracting with Environmental Consultant



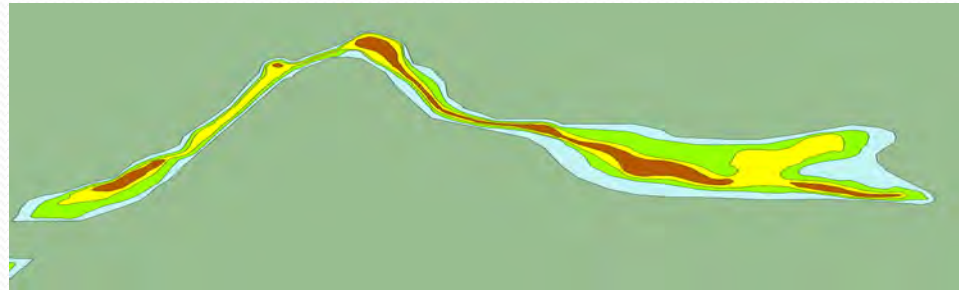
# Silt Removal Project 2012-2016

## Necessary Pre-Work (#2)

- Development of Hydraulic Dredging Contractor Options
  - Some Contractors “too big”; Some “too small”;
  - Only a few were “just right”
- Development of Request for Proposals
- Review of Contractor Bids
- Contractor Selection
- **Permits!** (US Army Corp of Engineers; IL EPA; LCSWM)



# Silt Project Phase I (July – October 2013) Davlin's Pond and Channel





# Silt Project Phase I (2013) – SUMMARY

- Removed 9,000 Cubic Yards of wet silt
- 900 Cubic Yards of dried silt
- Deepened some areas 2 feet to 4 feet deeper
- Re-established #1 Silt Trap

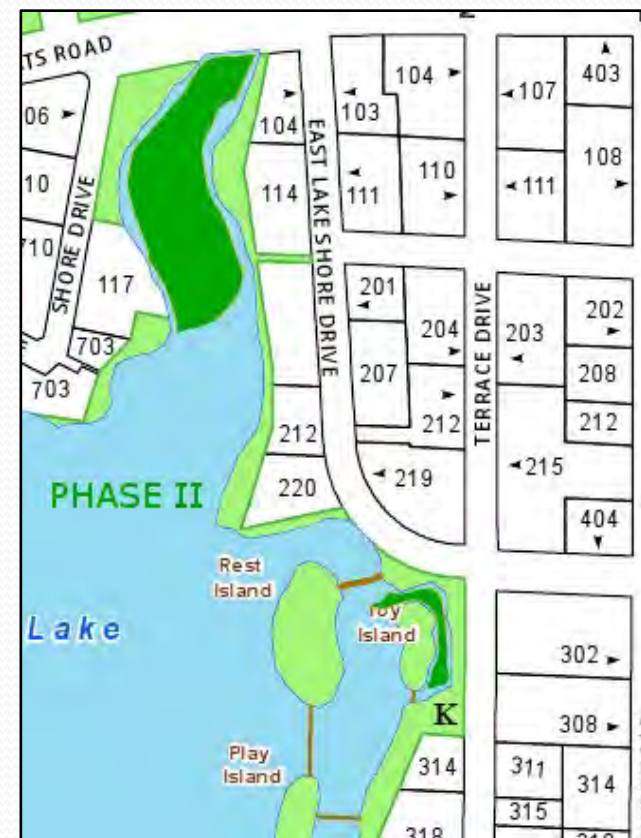




# Silt Project Phase II

## Robert's Road South (2014-15)

- Fall of 2014 and Summer 2015
- Removed 3,500 Cubic Yards of wet suspended silt
- 350 Cubic Yards of dried silt
- Utilized capacity at North Lake Entrance
- Re-established #3 Silt Trap (1994)





# Lathan's Landing – Wetland Restoration

- Collaboration w/ VOTL and Lake County Stormwater Mgt
- \$12,000 LC WMB grant (Dec 2014)
- \$21,750 VOTL match
- Remediated wetland “swamp”
- Fixed old catch basin & replaced drainage piping
- Silt at NL entrance moved and seeded
- Depression filled and re-landscaped







# Lathan's Landing – Wetland Restoration



Silt fill from Phase I and II



Larger catch basin



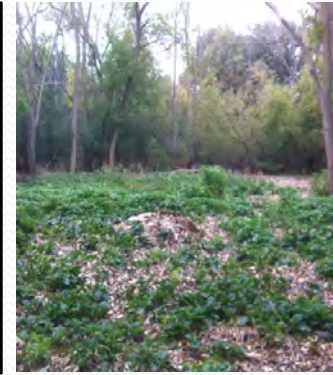
End result is an awesome boat launch





# Silt Project Phase III (July – October 2016) Kelsey Woods

- July to September 2016
- Removed 9,000 Cubic Yards of wet silt
- 900 Cubic Yards of dried silt
- Deepened some areas 2 feet to 6 feet deeper
- Re-established #2 Silt Trap
- Most efficient project to date
- Kelsey site has capacity and permitting for future projects





# RESULTS



# Silt Removal Summary

- Removed approximately:
  - 25,000 Wet Suspended cubic yards of silt
  - 2,500 Dry cubic yards of silt
- Deepened all three previous Silt traps
- Developed extensive learning via collaboration with local agencies and neighboring lakes
- Became more efficient over time
- Provided:
  - Example to other communities
  - Delivered multiple “how to” presentations as requested
- Successfully implemented first steps to “long term maintenance” of our lakes

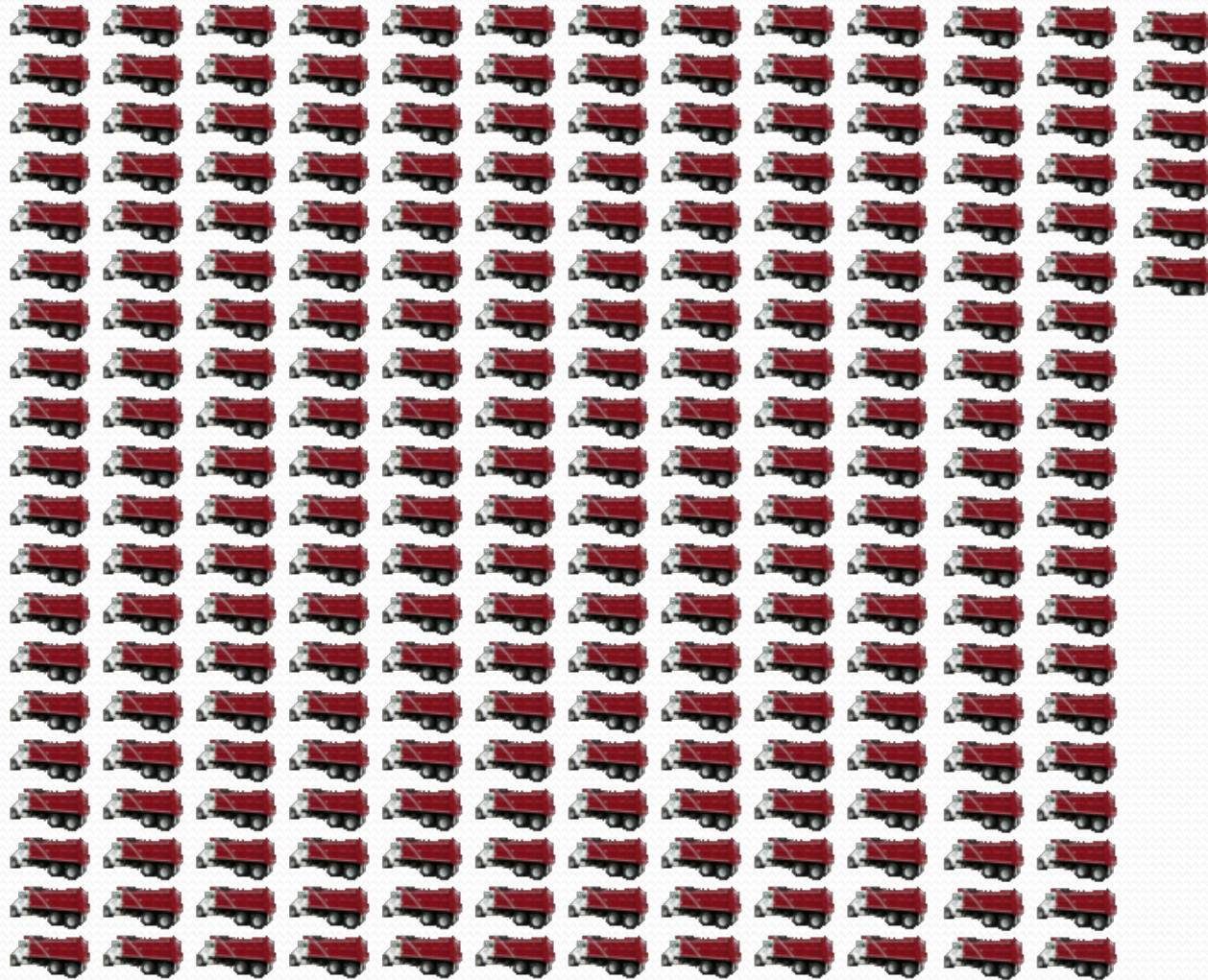


# 10 Cubic Yards Is a Truckload!





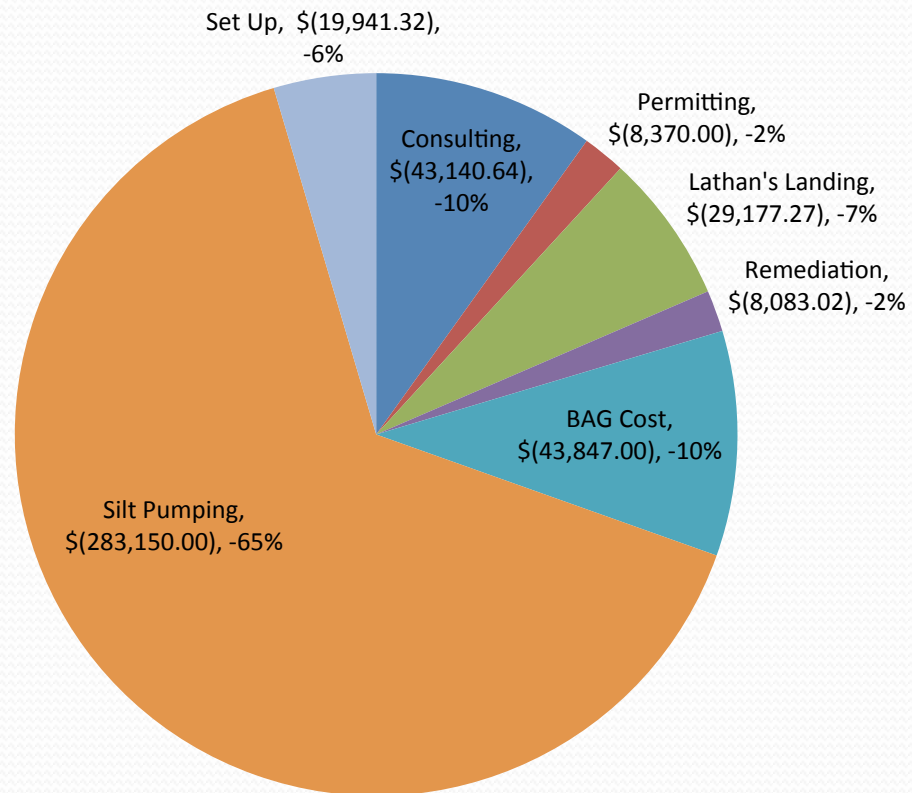
246 Dry Truckloads were remediated on site vs.  
cost of over \$60,000 to haul away.





# Financials

**Total Expenditures \$435,709.25**





# Financials

- Important Metrics: (approximations)
  - Actual Silt Removal (pumping) was ~65% of Project cost
  - Total Silt Removal (setup, bags, pumping ) was ~80% of cost
  - Therefore, Non-Silt Removal costs were ~20% of Total Project costs
    - Included costs of Consultant(s), Permits, Remediation
    - Smaller projects will have considerably higher “other” costs
    - The scale of our Project (3 Phases) drove down the Non-Silt Removal Costs from ~33% (Phase 1 only) to ~20 for Phases 1 – 3
    - Dried Silt relocation and/or disposal costs could be substantial
      - (The silt was used on-site, hence no disposal costs)
  - **VERY, VERY ROUGH ESTIMATES:** (Use at your own risk!)
    - Total cost was ~\$175 per dried, compressed cubic yard of silt removed
    - Total cost was ~\$17 per wet, dispersed cubic yard of lake sediment removed





# Silt Removal Challenges & Lessons Learned

- **Cost to Homeowner's Association**
- **Stakeholder Support** (Critical to have "Buy-In" from all relevant parties)  
Terrific support even though ~75% of TLIA Homeowners do not own shoreline property.
- **Permits (timing) are crucial to Project schedule**
- **Must have good rapport with Silt Removal Contractor**
  - However, must diligently monitor Contractor and keep on task throughout Project
- **Silt Drydown Time** - Long time to dryout; Unsightly!
- **Silt Disposal** -Unable to sell. Ultimately used all the silt within Tower Lakes. This is a critical (and possibly under-appreciated) issue. Disposal costs could be substantial.
- **Must minimize "extraneous" costs so far as practical**  
Difficult, but maximizing Silt Removal (Pump time) is critical.
- **Difficult to tell (with certainty) of the overall success of the process** - Underwater! Initially appears to have "worked".



# Future Lake Management



## Lake Maintenance Request – Best Management Practices (BMPs)

- Weed Harvesting
- Alum Treatments
- Aeration
- Water Elevators
- Water Movers
- Floating Islands



Need to research and evaluate these potential lake management solutions



# Lake Maintenance Request

- Still need to remove silt in critical remaining areas
- Funds for two more removal projects
- Kelsey Road site is available and permitted for more silt
- Also need to research and experiment with other lake management BMPs
- Asking for new Lake Special Assessment @ \$200/HH for 5 years





**Thank You for Your  
Confidence in our Team**



# 10 Cubic Yards Dry vs. Wet





The Wet Suspended Volume in the Lake was 10x the dry 246 Truckloads



So in Effect 2,460 Truckloads of Silt by Volume has been Removed!



20,000 cubic yards under 12 to 15 surface acres of the lake