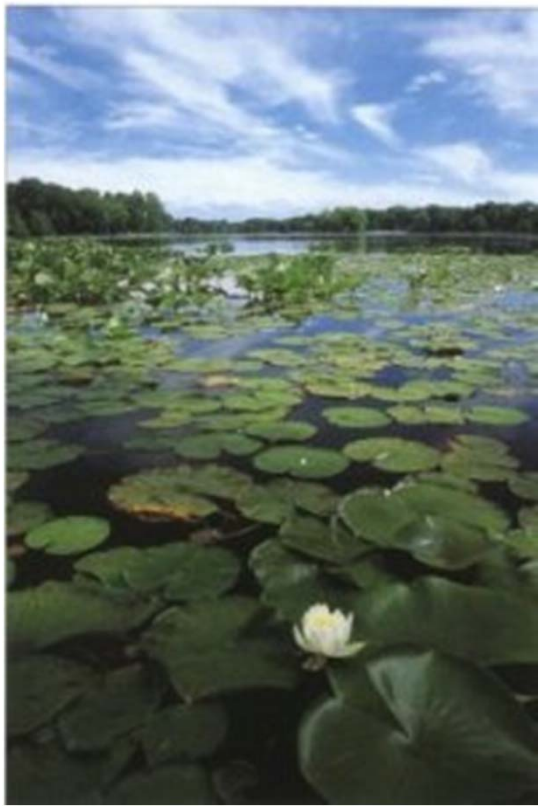

Silver Lake Water Quality

Town Hall meeting with Silver Lake Village Residents

June 18, 2014

Topics for Discussion

- Review WQ study findings and priority in-lake solutions
- Review aeration system proposal
- Status of watershed solutions efforts/next steps

Silver Lake Water Quality

- In 2012 **EnviroScience, Inc**. (ES) was contracted by the Silver Lake Estates Board of Trustees for lake diagnostic services to evaluate current in lake conditions and guide future management programs in Silver Lake. In addition to determining the current condition of the lake's water quality, the study evaluated:
  - operation of the existing hypolimnetic aeration system
  - The aquatic plant community
  - The lake's fishery
- Study design and interpretation was supported by researchers at Kent State University.

Study Findings & Conclusions

- Study found that the lake is **highly eutrophic** (nutrient rich), and sources of the nutrients are likely the riparian areas and the surrounding watershed
- SL supports a fairly diverse fishery, but stunted bluegill are a problem
- SL has a lack of native vegetation, and is dominated by several invasive species, including Eurasian watermilfoil
- **High levels of nutrients** entering from the watershed and cycling from the sediment is responsible for nuisance levels of algae seen in recent years
- The **existing aeration system** was only partially functional and is doing little to adequately aerate deeper water
- Several species of toxin-producing **algae** were found, algal toxin concentrations were approaching levels of concern

Study Findings & Conclusions

- A combination of **watershed controls** and **in-lake management** options should be investigated (there are no quick fixes!)
- Watershed options should include community involvement and may involve active stormwater controls and treatment
- In-lake options could include whole lake circulation/aeration, phosphorus inactivation, chemical treatment
- Monitoring for algal toxins on a periodic basis is highly recommended due to the potential threat toxins pose

SLE WQ Management History

- 1970 Study by Dennis Cooke, PhD, Kent State University
- 1981 installation of aeration system (currently undersized and only partially functional)
- 2012 study by EnviroScience (WQ and Fishery study)
- 2012 SLV Council support water quality education.
- 2012 SLV Ordinance proposed by the Mayor prohibiting the use of lawn fertilizers containing phosphorus. (ordinance did not pass)

SLE WQ Management History

- 2012 – current Silver Lake Estates provide periodic educational materials and programs addressing WQ
- 2013 fish management education and selective removal of invasive species
- 2014 Implement WQ action plan
- 2014 Joined Ohio Lake Management Society

7-step WQ Action Plan

1.	Study Silver Lake Water Quality	Complete
2.	Ongoing Monitoring of WQ	Weekly
3.	Educate and engage SLV residents	In-process
4.	Identify possible solutions to improve WQ	Completed
5.	Research/prioritize solutions (based on cost, impact, benefit and complexity)	In-process
6.	Decide on solutions and timing	Ongoing
7.	Implement solutions	Ongoing

In-Lake Solutions

1. Enhanced aeration and circulation
2. Phosphorus inactivation
   (inert chemical binding agents – e.g. Alum)
3. Chemical treatment (e.g. algaecides)

Source of possible solutions: Citation : Holdren, c., W. J o n e s , and J. Taggart. 200 I. Managing Lakes and Reservoirs. N. Am. Lake Manage. Soc. and Terrene Inst., in coop. with Off. Water Assess. Watershed Prot . Div. U.S. Environ. Prot. Agency, Madison, WI.

Aeration solution overview

- How does aeration improve water quality
- Comparison of aeration to other viable in-lake solutions
- Case studies
- Expected results short-term and long-term

AquaDoc
& Vertex Presentation

Aeration proposal

- Cost proposal review
  - System cost $110,000
  - Operating cost (electric and maintenance) $20,000/yr.
  - Electrical improvements TBD
- Installation timeline/start-up
- Pre/post study and ongoing testing by EnviroScience

Watershed Solutions Leadership

- Polly Bloom, Katie Clark and Stu Grant – Volunteers leading effort to create grassroots community participation and fundraising for watershed stormwater efforts to “stop the flow” to Silver Lake

- Overview of research
  - SSWCD
  - Ohio EPA
  - EnviroScience

Watershed Solutions Outline

- Conduct sampling of **stormwater flow** in SLV
- Identify and **educate** all key stakeholders in Community groups and Village government about watershed
- Conduct **public education** re: slowing the flow
- Research **best practices** of other cities implementing these programs
- Identify **grants** and funding available – submit for 2015
- Create **plan** for reducing storm water discharge in key problem areas
- Organize **neighbor meetings** to discuss lakescaping solutions, costs and implementation
- Organize **workshops** and encourage fall planting for rain gardens and disconnect projects

Total Community Concern

- Silver Lake Estates
  - Lake solutions
  - Lakeside landscaping

- Silver Lake Village
  - Slow the flow projects on streets, parkways and storm sewer
  - Ordinances and enforcement
  - Education and communications
  - Compliance with MS 4 EPA issued permit (Municipal Separate Storm Sewer) "*to enforce a storm management program designed to reduce the discharge of pollutants… to the maximum extent possible.*"

What can you DO today?

- Disconnect
  - Identify the ending flow point of your house gutters
  - Think about any other run-off points on your property (driveways, excessive irrigation habits…)
  - Learn if rain barrels or rain gardens would let you "stop your flow" and disconnect your run-off from entering the storm sewer or entering the lake
  - Stop and think if any actions you are taking on your property contribute to the run-off
  - Participate in Village workshops on "stopping the flow"
- Organics
  - Educate yourself about organic lawn solutions
  - Check the labels of all your pesticides for phosphorus

Next Steps

- **SLE Trustees** to take action on aeration proposal
- **Watershed team** to present sampling proposal to SLE and SLV Council for funding
- **Community volunteers** needed for communications , investigation of resources available (i.e. grants) and technical support

Thank You