

Lake Algal Control Techniques with Implications for Vancouver Lake

Vancouver Lake Watershed Partnership
December 16, 2009

Lake Algal Control Techniques

with Implications for Vancouver Lake

- Focus on the reduction of cyanobacteria in Vancouver Lake.
- To explore techniques that have been used around the world to help control nuisance algal blooms.
- Should be viewed as a primer for future decision-making after research studies have been completed.

Lake Algal Control Techniques

with Implications for Vancouver Lake

Techniques Explored:

Best Management Practices

Water Level Drawdown

Lake Sediment Removal

Recruit/Plant Rooted Plants

Modify Lake Footprint

Dilution and Flushing

Artificial Circulation

Biomanipulation

Phosphorus Inactivation

Algaecides & Algaestats

Mechanical Removal

Shading

Techniques *(continued)*

Best Management Practices

- Prevent/reduce human inputs of nutrients and sediment to the lake
- Addresses root causes of lake eutrophication for long-term
- Often need in-lake techniques to “jump start” restoration
- Examples: Spokane County: dishwasher soaps
Minnesota: phosphorus ban in fertilizers

Techniques *(continued)*

Water Level Drawdown

- Reduces re-suspension of sediments and nutrients when lake re-filled.
- Good time to implement other techniques.
- Examples: Big Muskego Lake, MN; Long Lake, WA.

Lake Sediment Removal

- Dredge the lake bottom to remove nutrient-rich sediments.
- Increase lake depth to increase circulation rates.
- Example: Lake Trummen, Sweden

Techniques (*continued*)

Recruit/Plant Rooted Plants

- Reduce wind/wave energy, reducing re-suspension of sediments/nutrients.
- Make fewer nutrients available for cyanobacteria.
- Example: Pend Oreille River, WA; Big Muskego Lake, MN

Modify Lake Footprint

- Develop emergent wetland areas (wind fetch spurs).
- Reduce lake footprint (greater inflow to area ratio).

Techniques (*continued*)

Dilution and Flushing

- Add low-nutrient water: reduce nutrient concentrations
- Add large volume of water: flush out cyanobacteria (Port?)
- Example: Moses Lake, Washington

Artificial Circulation

- Force vertical circulation of lake water
- Interferes with cyanobacteria buoyancy

Techniques (*continued*)

Biomanipulation

- **Introduce/Remove species to:**
 - reduce introduction/resuspension of nutrients
 - manipulate the food web
- Examples: Tiger muskie intro, common carp removal

Phosphorus Inactivation

- Add alum (Aluminum sulfate) or other to bind phosphorus in the sediment
- Example: Green Lake, Seattle

Techniques *(continued)*

Algaecides

- Use chemicals to kill existing algae

Algaestats

- Lesser amounts of algaecides impede algal growth
- Dried barley straw, dying/drying wetland plants
- Example: Upper Klamath Lake, Oregon

Techniques (*continued*)

Mechanical Removal

- Collect by barge
- Electronic “weeders”
- Example: Klamath Lake, Oregon

Shading

- Use dyes to shade water column
- Water clarity issue?



Questions?