

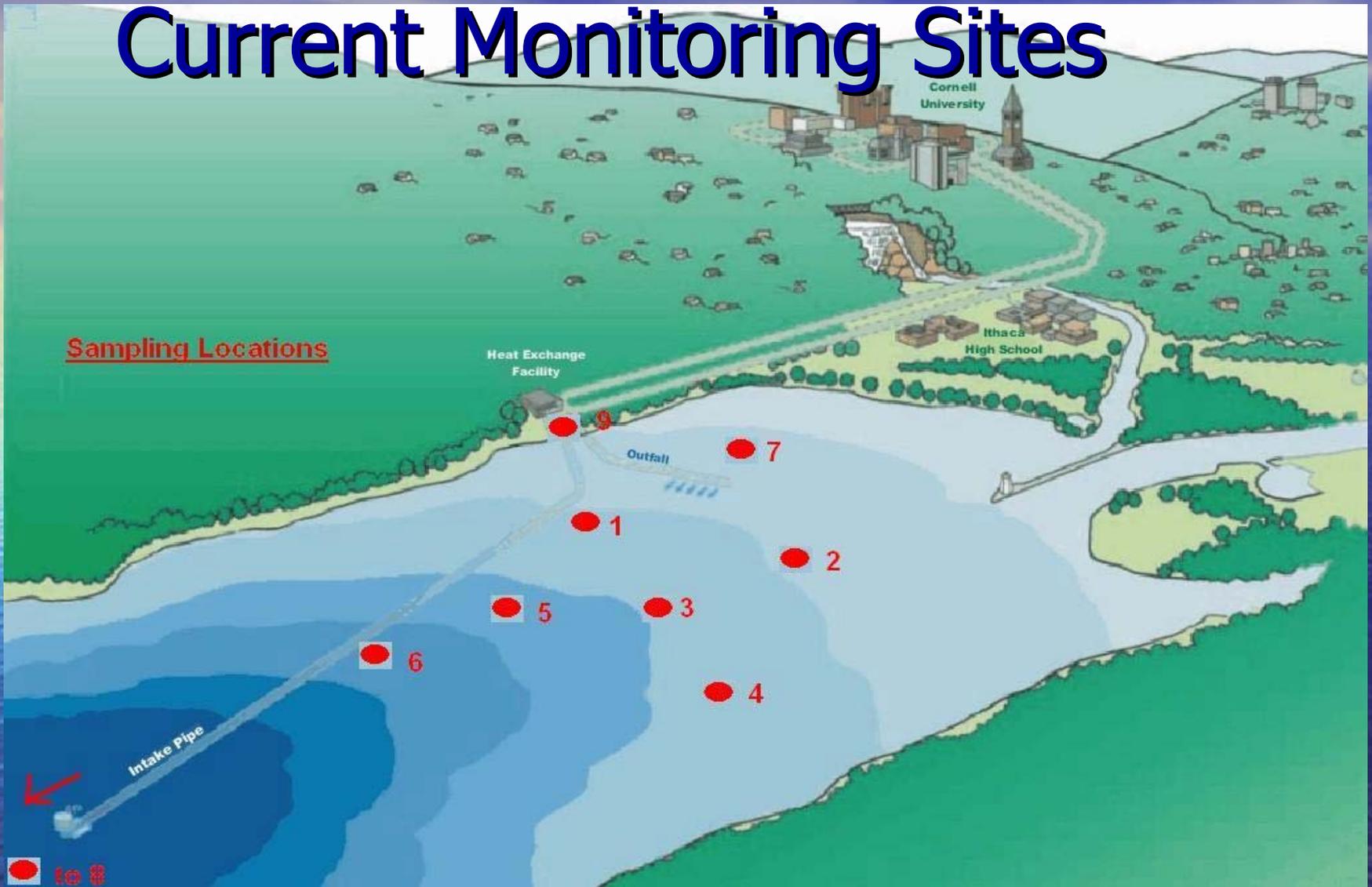
Lake Source Cooling

Should Monitoring be Reduced?

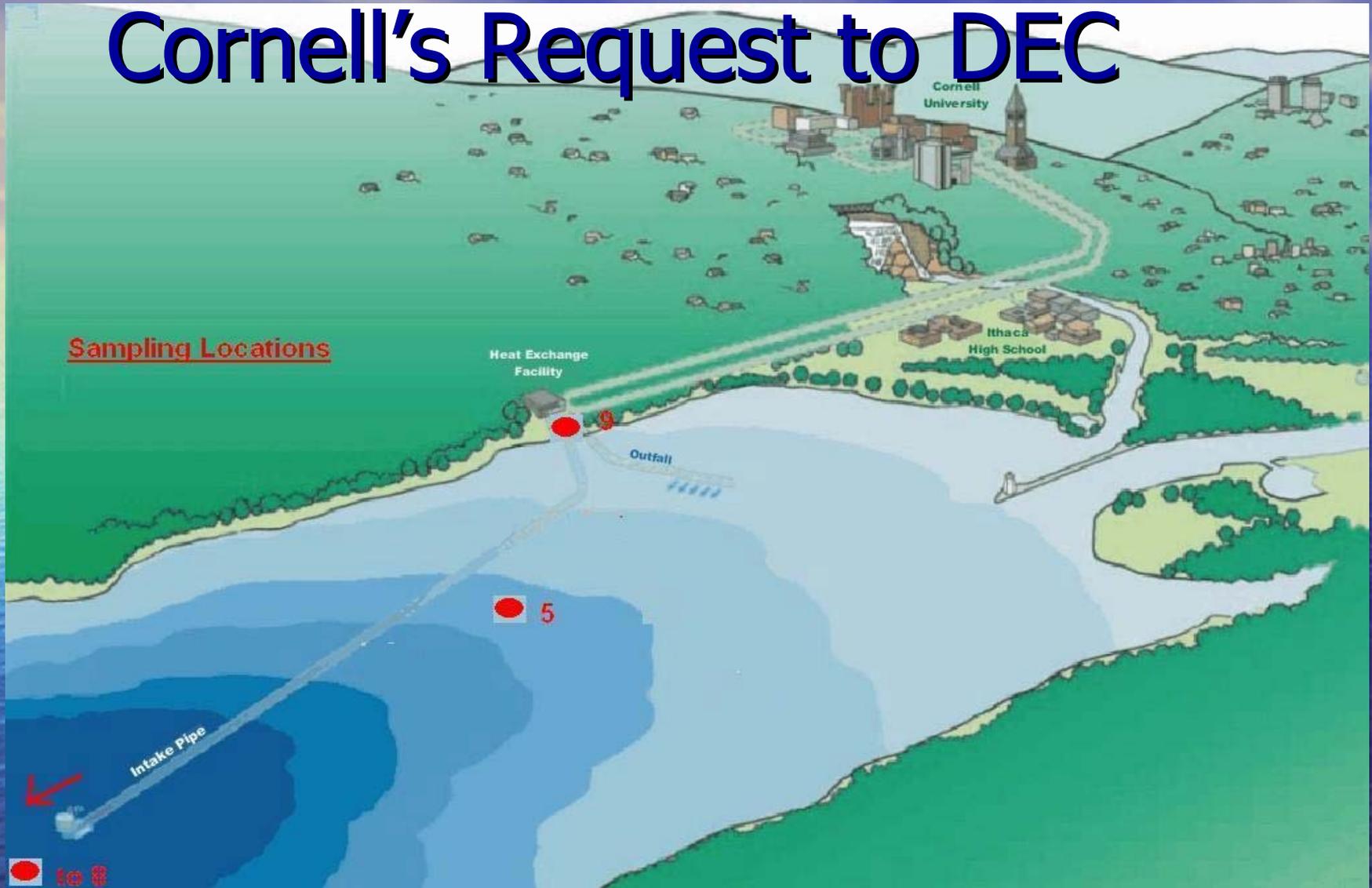
League of Women Voters of
Tompkins County
April 2005

Stephen Nicholson- Chair EMC
Steven Uzmann- Chair EMC ERC

Current Monitoring Sites



Cornell's Request to DEC



4/15/2005

Tompkins County Environmental
Management Council

Lake Source Cooling Project and the Environmental Management Council

- Environmental Benefits
- Brief History of Relationship
- Recent Request and Resolution
- Elected Officials respond
- Other EMC concerns
- Where do we go from here?

Environmental Benefits

- LSC has replaced over 40,000 tons of CFC refrigerants which are known to deplete the ozone layer
- LSC saves approximately 25,000,000 kilowatt-hours of electricity each year. This reduced Cornell's electricity demand by 10%
- LSC has reduced associated emissions of greenhouse gasses by up to 37 tons/year of SO₂, 16 tons/year of NO_x, and 11,000 tons/year of CO₂
- LSC is a model for sustainability and has become an invaluable community outreach and educational tool
- Data collected in association with LSC have been invaluable for regional and local watershed planning efforts

Emissions Reductions

Annual Emissions Reductions Due To LSC ¹

Year	kwh Saved	SO 2 (tons)	NO x (tons)	CO 2 (tons)
2001	18,200,000	26.4	11.6	7,850
2002	24,600,000	35.7	15.6	10,610
2003	25,500,000	37.0	16.2	10,998
2004	17,900,000	26.0	11.4	7,720
Total	86,200,000	99	43	29,458

Beginnings

1994

CU proposes LSC

1997

Environmental Impact Statement

EMC requests independent monitoring and public participation

1998

CU offers "Lake Source Data Sharing Group"

CU offers Town of Ithaca \$50,000 to hire independent consultant to review monitoring

Opponents to LSC in the News

- Cayuga Lake Defense Fund
- Ralph Nadar
- Natural Resources Defense Fund
- League of Women Voters of Tompkins County
- Environmental Protection Agency
- State Assemblyman Martin Luster
- US Representative Maurice Hinchey

March 1999 Construction Begins

“I want to thank the many Cornell staff members who worked on LSC over the past six-and-a-half years. With typical Cornell ingenuity, they devised a cutting-edge project, defended it from its critics, and demonstrated that once again Cornell is a university ahead of the curve”

President Hunter Rawlings, December 2000

Flash Forward to 2004

- Cornell requests DEC to modify In-Lake Water Monitoring (July 29)
- Proposes to collect only from sites 5 and 8

EMC Resolution 1-2005

- January 12, 2005 passed 15-1
- Requesting that the DEC continue the current requirements for the duration of the existing SPEDES permit (3/1/2008)
- Maintain Data collection at all 9 points

Other Similar Resolutions

- Ithaca Town Board
- Tompkins County Legislators
- City of Ithaca Common Council

Cornell's Rationale for Reduction

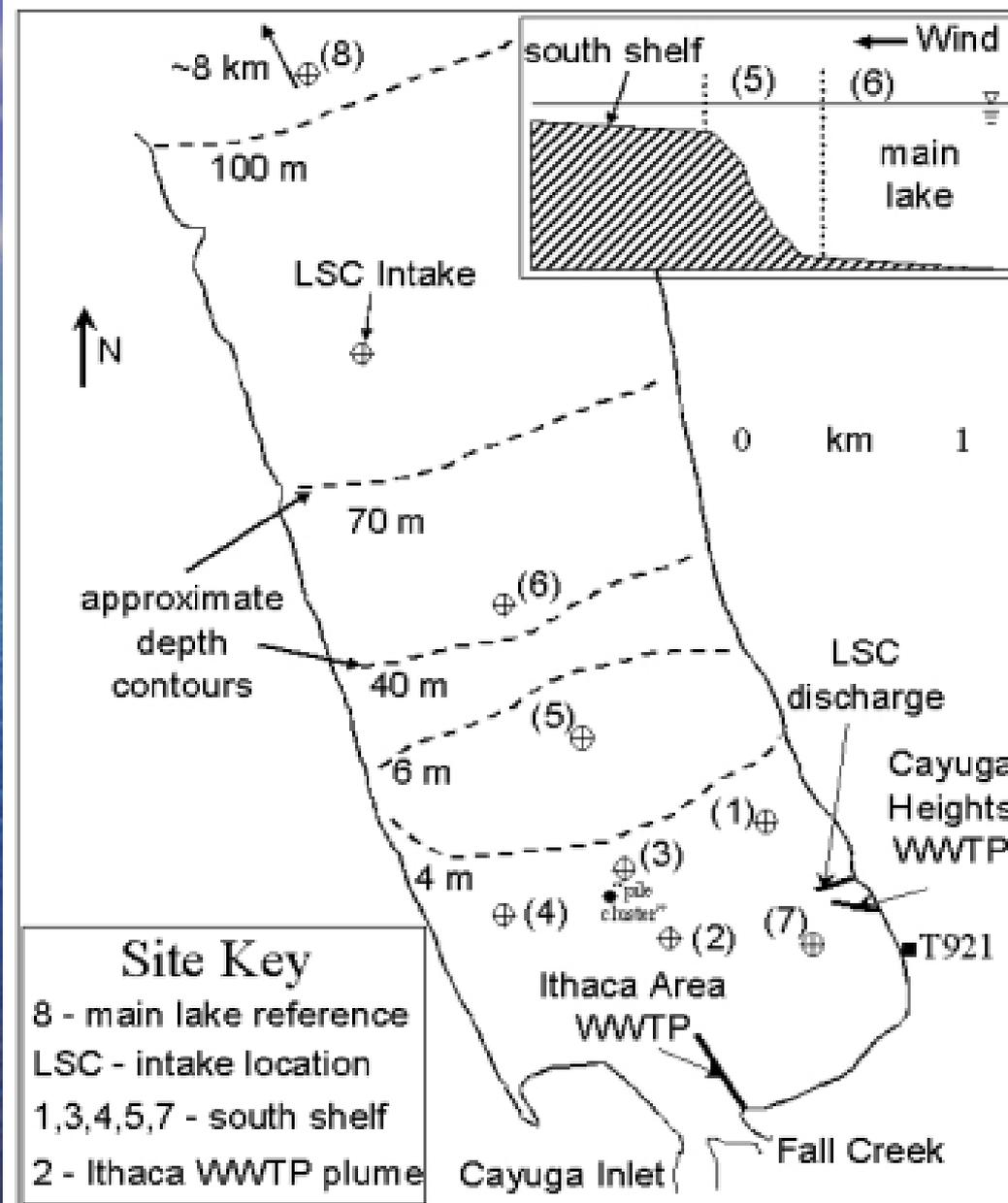
Letter to DEC July 29, 2004

- 7 of 9 sites were voluntary
- 3 years of LSC operation show no significant change in lake water quality
- LSC monitoring is unprecedented for a SPEDES permitted source
- Major sources of phosphorus are from the two wastewater treatment plants

Voluntary Monitoring Sites

- DEC required only two
- Cornell volunteered to have 9
- SPEDES permit includes 9

Map of Monitoring Sites



Data shows no significant changes

- Inconclusive vs insignificant
- Permit requires monitoring proximal to discharge
- Required to monitor impacts to lake from LSC project, not average conditions of southern shelf
- Weather Variations?

Ithaca Weather in August 2000-2005

Data from Northeast Regional Climate Center
Records from 1873

August	Dry Top 10 %	Normal	Wet Top 10%
Hot Top 10 %	2002		2001
Normal			2003
Cool Top 10 %	2000		2004

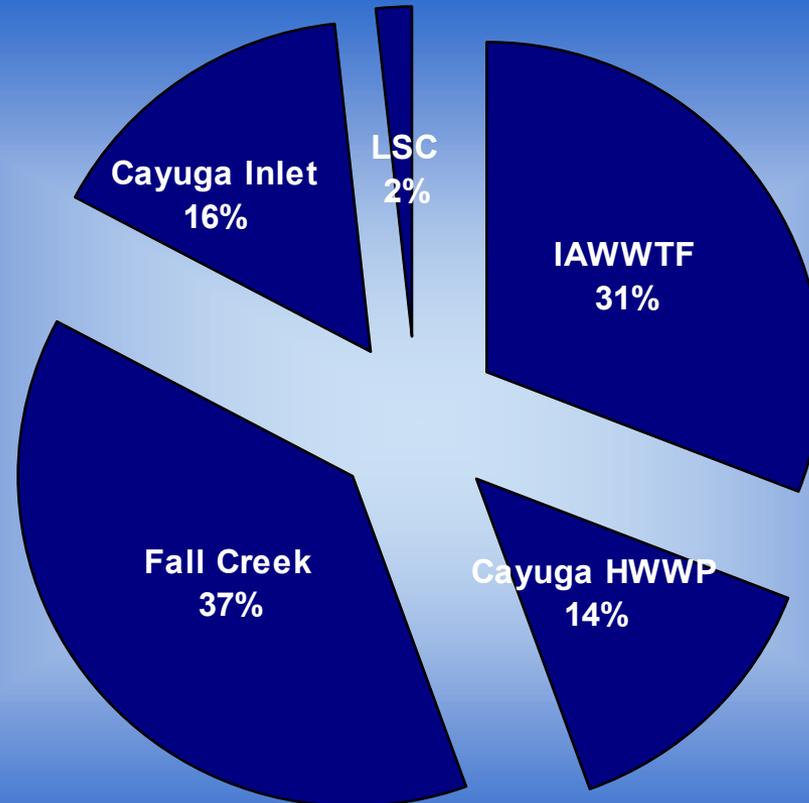
Monitoring Effort is unprecedented

- LSC is unprecedented

Most of Phosphorus comes from wastewater treatment plants

- Ithaca plant is installing reduction equipment
- Monitoring should be continued to document the changes in this output

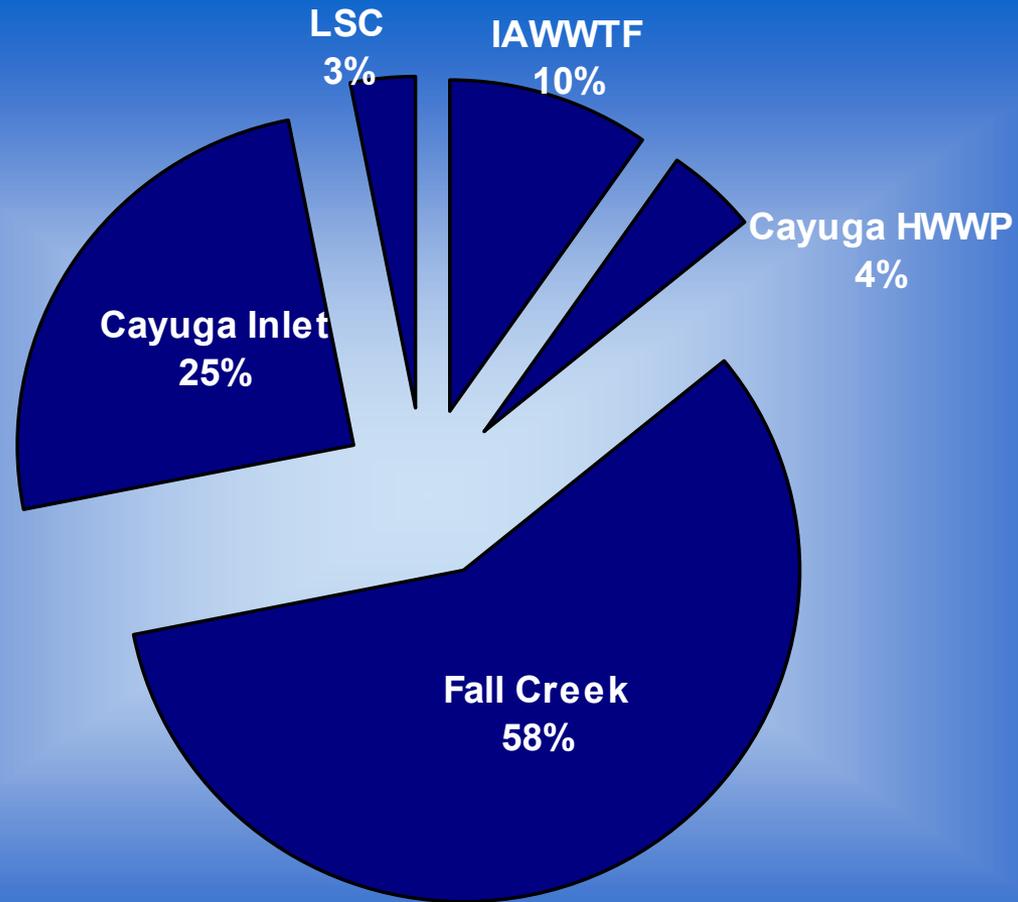
Estimated Phosphorus Budget



Tompkins County Environmental
Management Council

4/15/2005

Future Budget



Tompkins County Environmental
Management Council

4/15/2005

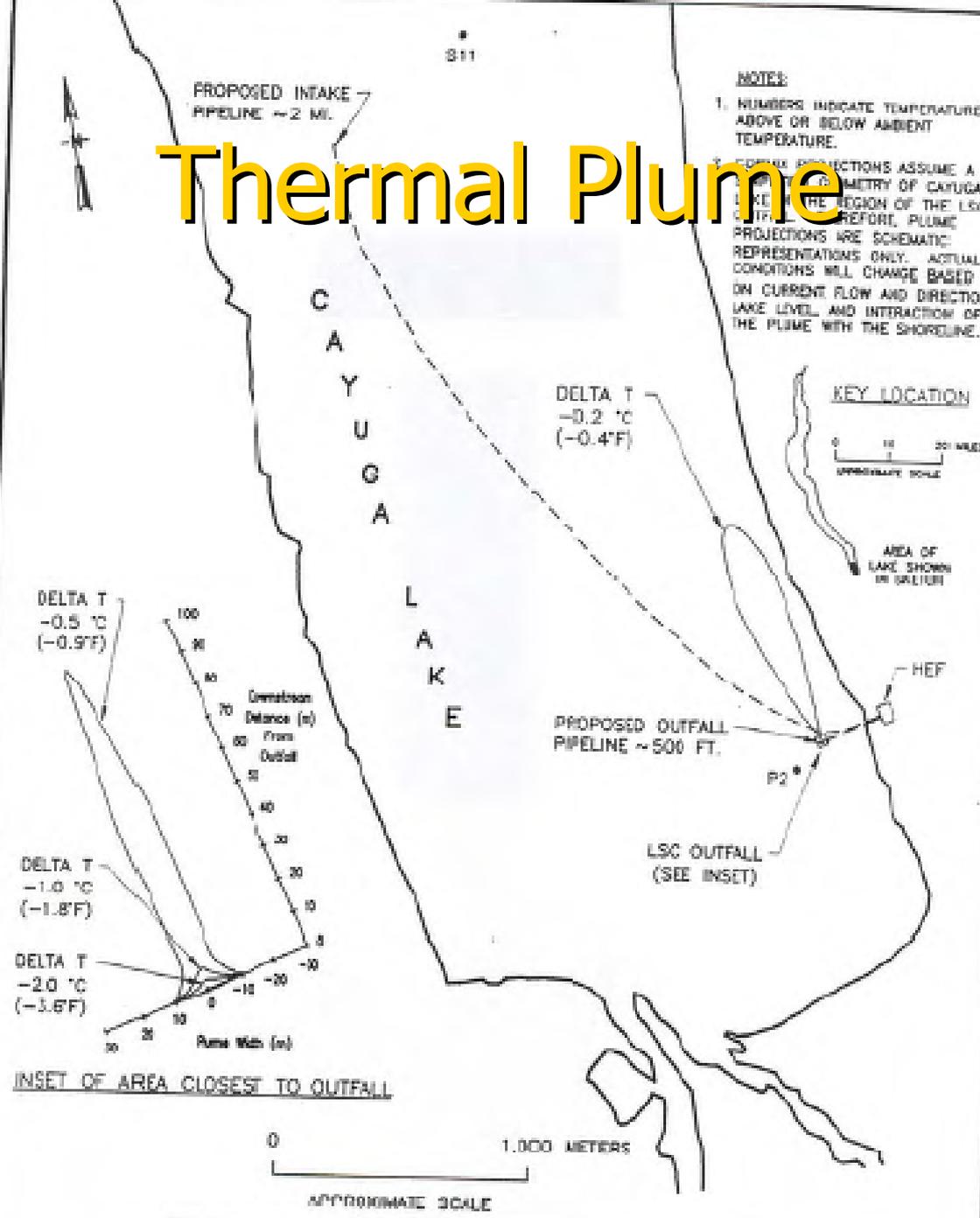
LSC contribution to Lake

- In dry times with low flow, over 60% of water into southern end attributed to LSC
- System now running at 40% capacity

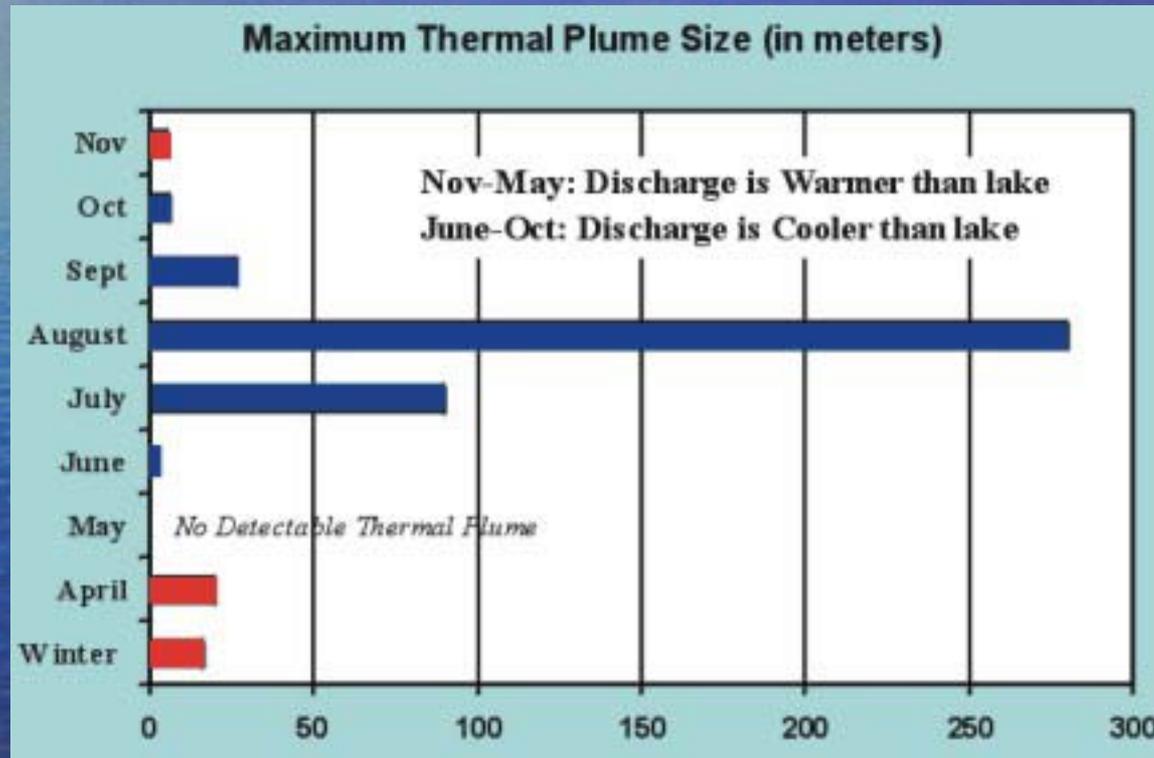
Other EMC Concerns

- World renown project only needs 3 years of comprehensive monitoring?
- CU agrees to pay for a private consultant to monitor monitoring, then ignores every recommendation?
- Thermal plume monitoring?
- Mysid shrimp population decline?
- CU promised to support pollution reduction strategies for Cayuga lake

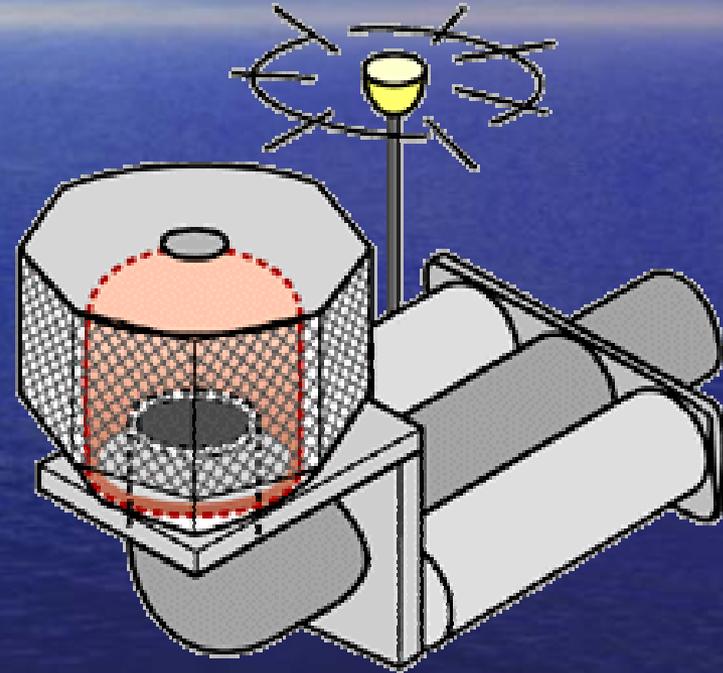
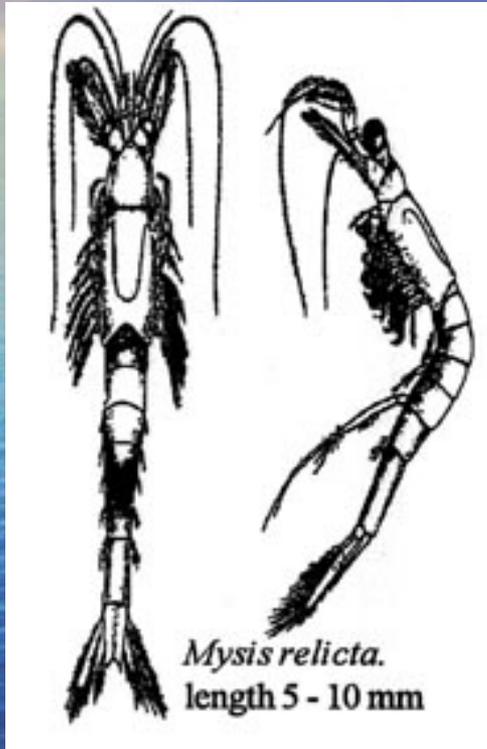
Thermal Plume



Thermal Plume



Mysid Shrimp Entrainment



Entrainment monitoring required

- Light ineffective as a deterrent, now it is broken
- 1-3 Mysid per 1,000 gallons (LSC max= 32,000 gal/minute)
- Entrainment declined significantly for first 2 years

Where do we go from here?

- Cornell has not adequately explained rationale for monitoring reduction
- Research and Educational Opportunities

Future Research Ideas?

- Effect of tributary nutrients and sediment on lake phosphorus loading
- Factors that influence invasive weeds
- Welfare of mysid shrimp populations
- Reproductive failure of top predator fish
- Trends in zebra mussel abundance and impacts on lake water quality