



# Review of Lessons Learned and Best Management Practices for Dredging Inland Lakes

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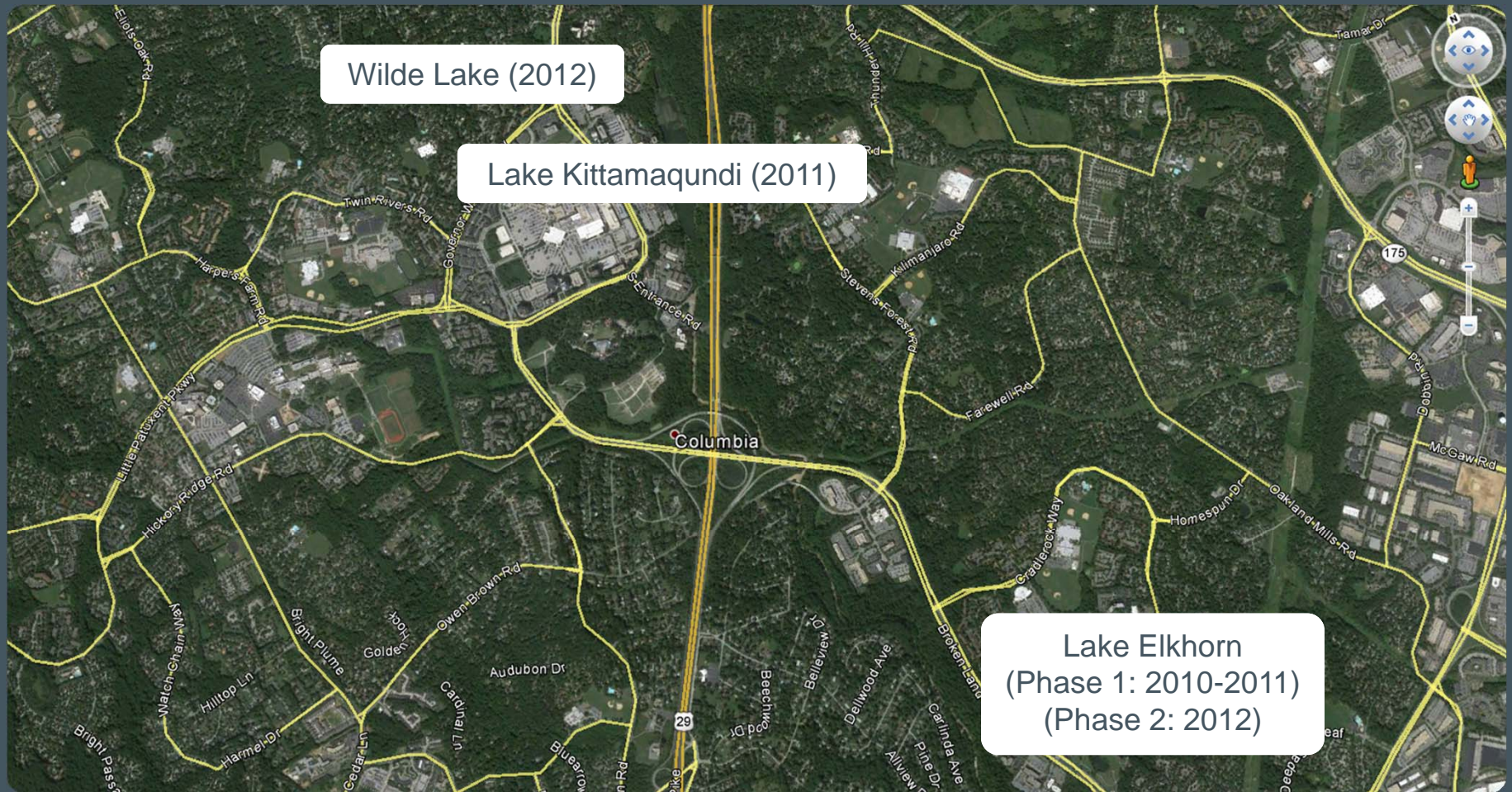
# Columbia Association (CA)

- Columbia, Maryland
- Howard County
- Private, non-profit association
- 3,500 acres of open space
- Lakes; parks; playgrounds; sports facilities; and pathways for walking, jogging, and biking





# Recent Dredging Work



# Recent Dredging Work (cont.)

Project	Dredge Type	Volume Removed (cy)	Year(s) Performed
Wilde Lake	DSC 8"	15,000	2012
Lake Elkhorn Phase 1	DSC 8"	17,000	2010-2011
Lake Elkhorn Phase 2	DSC 8"	28,000	2012
Lake Kittamaqundi	Ellicott 8" and 12"	47,000	2011



# Review of CA Lake Maintenance Program Goals

- Aesthetics
- Restore lake capacity
- Create catchment basin near inlet of lake
- Increase duration between required dredge events



# Wilde Lake Overview

- 22-acre, man-made lake
- Residential and open space





# Wilde Lake Sedimentation

- Island formation the result of lake sedimentation



View from the Northwestern corner of the lake (facing east)

# Wilde Lake Dam

- View of dam face (facing west)
- Originally constructed in 1967
- Approximately 15 feet tall, 288 feet long
- Significant (class 2) Hazard Dam



View of dam face (facing west)



# Lake Kittamaquondi Overview

- 27-acre, man-made lake
- Residential, commercial, and open space



# Lake Kittamaquondi Overview (cont.)





# Lake Elkhorn Overview

- 37-acre, man-made lake
- Residential and open space



# Cost Summary

Project	Volume Removed (cy)	Project Cost	Cost per Cubic Yard
Wilde Lake	15,000 cy	\$1,800,000	\$120
Lake Elkhorn Phase 1	17,000 cy	Information not available	N/A
Lake Elkhorn Phase 2	28,000 cy	\$3,200,000	\$114
Lake Kittamaqundi	47,000 cy	\$5,000,000	\$106



# Construction – What Went Right

- Utilizing the same contractor to complete two projects
  - Reduced costs
  - Incentive to optimize schedule
- Hydraulic dredging with mechanical dewatering
- Bathymetric surveying to track construction progress and determine pay volumes
- Disposal operations

# Construction – Inefficiencies

- Initial cost inefficiencies from individual contracts
- Variable physical properties of sediment
- Pre-design surveys conducted with survey rod method
- Disposal costs



# Contractor and Design Consultant Selection Process

- All lakes were contracted separately
- Open bid process
- Scope of services
- Low price bids with evaluation of qualifications
- Contractor evaluation based on
  - Cost
  - Qualifications
  - Methodology and approach
  - Cover letter
  - Possible BAFO and interview process

# Future Considerations for CA Dredging Program

- Increased monitoring of lakes
- Enhanced watershed management
- Regularly scheduled dredging events
  - Smaller volumes from focused removal areas
- Consolidation of dredging contracts, if possible
- Maintenance permits
- On-site disposal opportunities
- Retain single design consultant and/or contractor



# Watershed Improvement Projects



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# Sediment Management Plans



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# Dredge Event Scheduling

- Regularly scheduled bathymetric surveys to track lake sedimentation
- Focused dredging projects scheduled every 4 to 6 years
  - Approximately 5,000 to 12,000 cubic yard removal per lake
- Lake dredging to be strategically scheduled so that projects may be performed sequentially, if possible

# Disposal Options

- Sediment Management Plans include the evaluation of potential on-site disposal sites
- Off-site, CA-owned properties
- Privately owned property for lease or purchase



# Summary



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