

# Unique Challenges of Managing and Restoring Urban Lakes - Getting More Done with “LES”

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# Thanks To:

- NYSFOLA for inviting me... and to all of you attending this session



- Don Brockel – Chairman of Deal Lake Commission
- Dr. Jack Szczepanski, Princeton Hydro, LLC
- Peter Avakian, P.E., LSA Engineering
- Deal Lake Commission, Wesley Lake Commission and Sunset Lake Commission

# Value of Urban Lakes

- Urban lakes are unique destinations and hubs... an “oasis within a concrete desert”.
- Although most are not “swimming lakes”, on per area and per user basis, often utilized more extensively than the larger “recreational” lakes that typically receive the majority of lake management funding and lake restoration research.

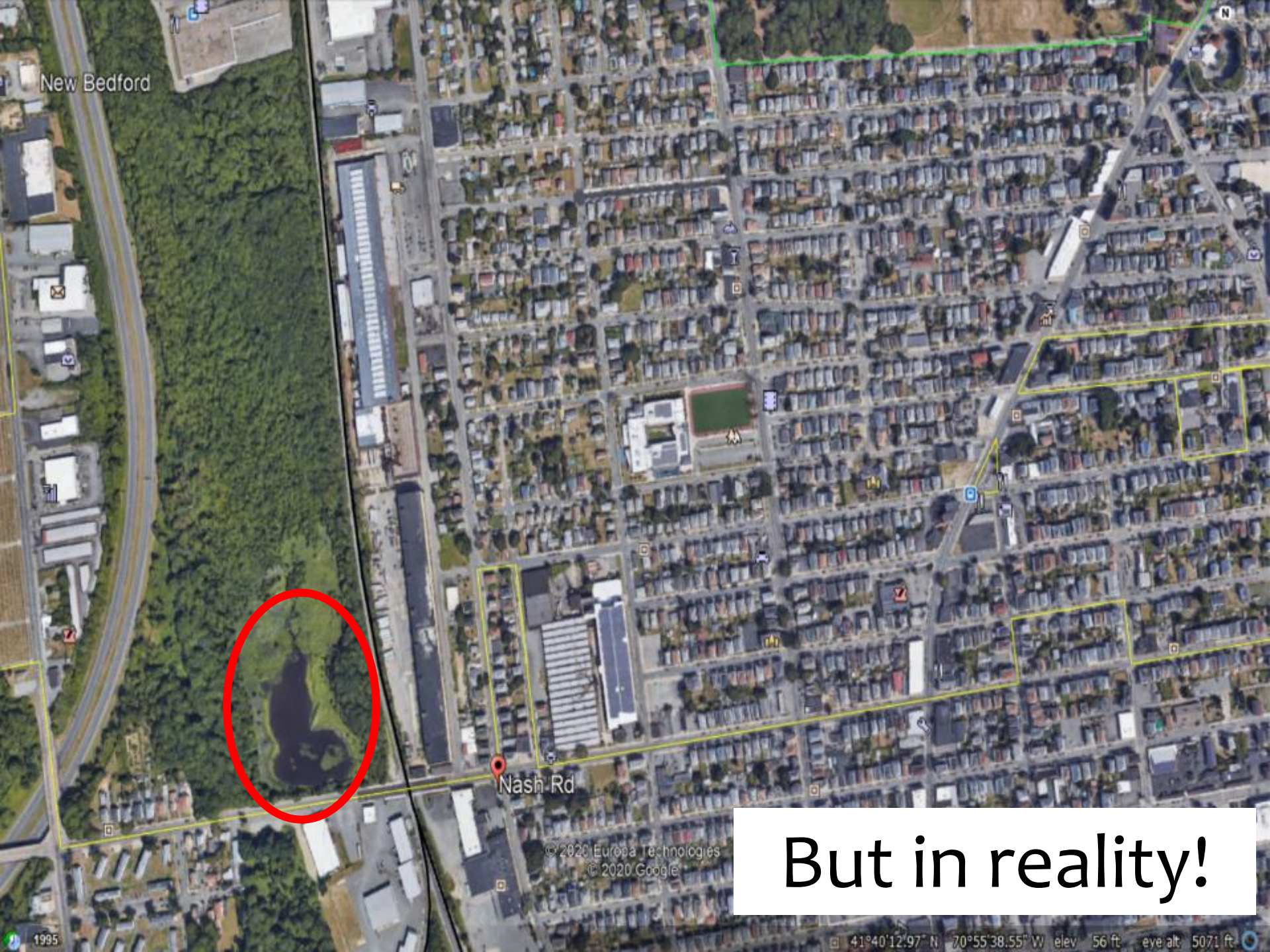
Nash Rd  
Pond  
New Bedford  
MA

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My little piece  
of boyhood  
heaven



New Bedford

Nash Rd

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**But in reality!**

# Multiple Management and Restoration Challenges

- Being shallow and fed mostly by stormwater runoff, the morphometry and hydrology of urban lakes makes them more susceptible to water quality impairments and hyper-eutrophication.
- Increases risk of experiencing harmful algae blooms (HABs).



# Failing to Meet Community Needs

- Urban lakes most often serve overburdened communities.
- Failure to manage these lakes leaves communities with waterbodies incapable of meeting their recreational needs.





# “LES”... Legacy, Environmental and Societal Issues

Urban lake managers faced with “LES”... impacts ability to properly restore and manage these lakes

- **Legacy** issues due to existing and historical pollution, history of insufficient representation, and lack of restoration funding.
- **Environmental** poor source water quality, intermittent inflow dominated by stormwater runoff and physiochemical features that promote water quality impacts and increase likelihood of HABs.
- **Societal** issues resulting from systemic discrimination and environmental justice issues... “throw away waterbodies”.

# Legacy Impacts...

## “Forgotten Resources”

- Urban lakes and ponds have long history of ecological abuse
  - Stormwater
  - Wastewater
  - Sediment in-filling
  - Phytoplankton and cyanobacteria blooms
  - Degraded fishery (dominated by non-native invasive species)
- As a result, these waterbodies often viewed as low value and maybe not worth managing or restoring... forgotten resource
- Communities often underrepresented, lack the “voice” to authorize and support change
- Without political support difficult to get the “ball rolling” and implement improvement

# Funding... Restoration Ain't Cheap

- Must be consistent, dedicated source of funding and recognize value of urban lakes to community
- Must be specifically targeted for management of urban lake and not open to large, recreational lakes
- Be based on a different metric than used to determine funding applicability used for large, recreational lakes... that is not based on swimmability, boating, etc.
- Should focus on correcting “root cause” of impairments but be flexible enough to allow funding to be used to address the symptoms of eutrophication (sediment in-filling, HAB and algae control, etc.)

# Community Engagement

- MUST target regulators, policy makers, and legislators... not just general public
- Educate and inform stakeholders and lake users... include local businesses
- Engage via clean ups, citizen science, fishing derbies and fun events... helps convey value
- Use urban lakes and ponds as living class rooms... develop curriculum and get kids wet!!



# “LES”... Legacy, Environmental and Societal Issues

Overcoming the lake management challenges arising from “LES” requires...

- Targeted funding for urban lakes
- Engagement of community leaders to take on a more proactive role
- Outreach and education
- Implementation of proven watershed management measures that address the causes of WQ... but balanced with basic lake maintenance that improves lake usability

# Deal Lake... an Urban Lake Doing More Even When Faced with “LES”

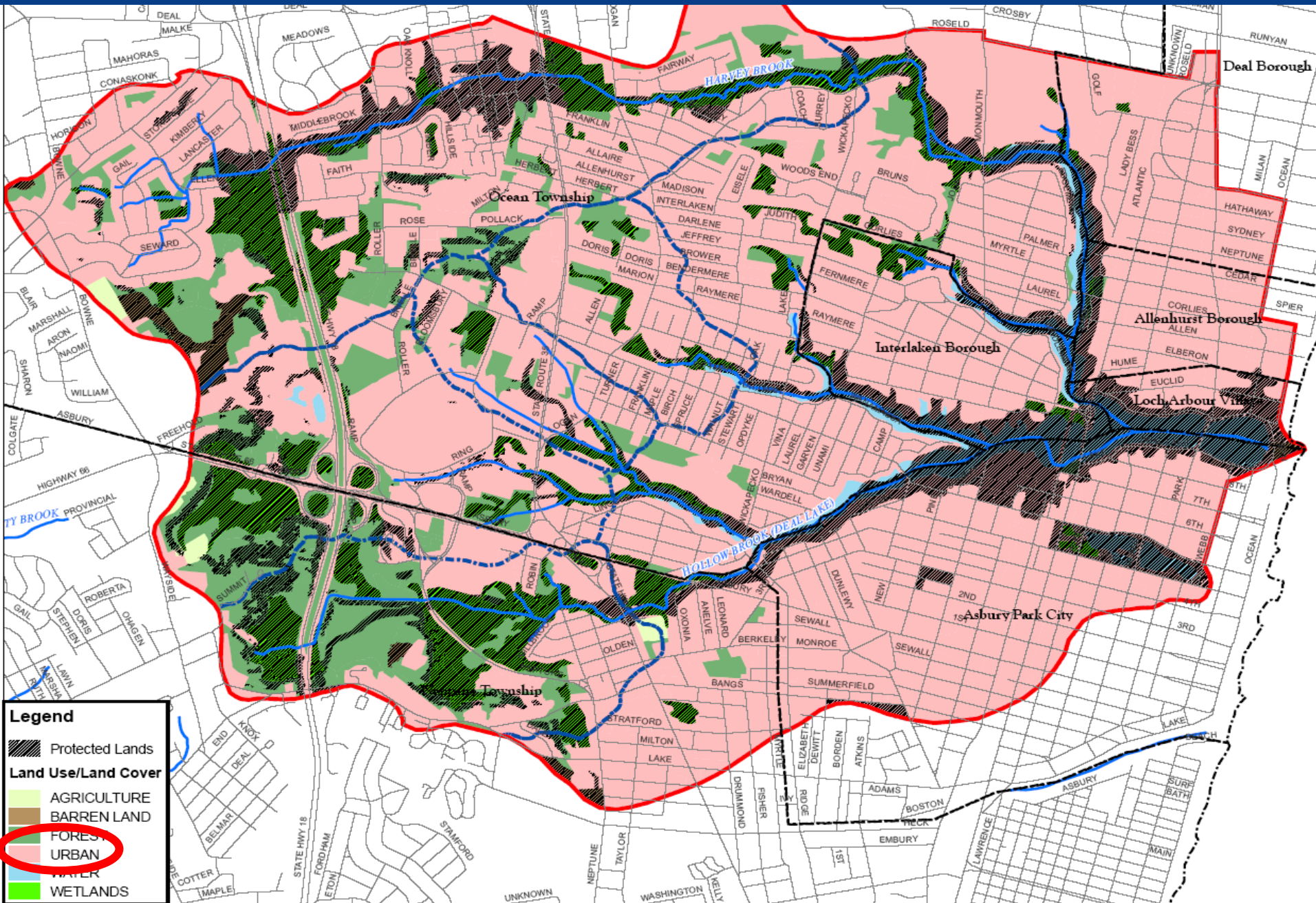
- Largest of NJ’s coastal lakes and 2<sup>nd</sup> largest lake in Monmouth County
- Managed by Deal Lake Commission, NJDEP appointed “Environmental Steward” of the lake... seven commissioners, one / each municipality abutting lake
- Long history of recreational use, serving mostly local community
- A long history of water quality impairments

# A Little About Deal Lake

## Deal Lake & Its Watershed

Surface Area	58 hectares (143 acres)
Mean Depth	1.6 meters (5.25 feet)
Maximum Depth	2.7 meters (8.85 feet)
Total Volume at Capacity	$9.28 \times 10^5 \text{ m}^3$ ( $245 \times 10^6 \text{ gal.}$ )
Watershed Area	1497 hectares ( $5.9 \text{ mi}^2$ )
Annualized Inflow	$10.0 \times 10^6 \text{ m}^3 \text{ yr}^{-1}$
Hydraulic Retention Time	0.84 yrs.
Population / Mean Density	$\sim 63,000 / 42/\text{ha}$ ( $10,700/\text{mi}^2$ )

# Land Use Within Deal Lake Watershed





# Yeah... The Lake Has Its Problems



# But It Is Highly Used



- WPP is the lake's “restoration and management blueprint”
- Focused on controlling and reducing stormwater inputs of nutrients, sediments, pathogens and floatables



**The Deal Lake  
Watershed Protection Plan  
Milestone 5 Report  
Grant #RP04-082**

Grantee  
and Lead Planning Agency:

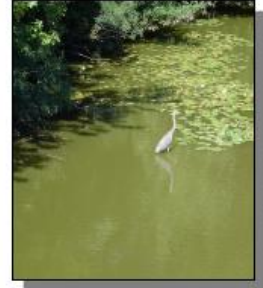
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January 2011



# DLC's Approach to Overcoming LES

- **Legacy** – Decrease stormwater-related pollutant and sediment loading... maintain contact with State, County and Local govt reps ... stay informed via State's Public Lake Action Network, only urban lake
- **Environmental** – Rely mostly on 319(h) grants and funding from USACOE... some funds generated locally through annual municipal appropriations... most of funds used to manage stormwater related pollutant loading... but a lot more needed
- **Societal** – Conduct education and outreach programs ..active community engagement ..involved in citizen-based science programs.. information sharing via website ... social networking and involvement in NALMS and NJCOLA.

# Stormwater Controls

## Manufactured Treatment Devices



Due to limited open space use both large and small subsurface MTDs to treat stormwater runoff... effective means of controlling floatables, sediment, particulate pollutants and nutrients... inspected quarterly and cleaned out

# Stormwater Controls Green Infrastructure



Where space available, GI SWM systems... FWIs, vegetated infiltration basins and rain gardens,

# Stormwater Management Shoreline Restoration



Use aquascaping and shoreline revegetation to restore eroded shorelines, a major source of sediment loading to lake... DLC promotes residential aquascaping

# Education and Outreach

- Participation in NALMS Lake Appreciation Month, Student Poster and Secchi Dip In
- Monmouth Univ CloNET volunteer lake sampling program
- Informational workshops w public
- Breakfast SW workshops w DPWs
- Fund goose control programs
- Extensive use of social media to get the message out and share info





# Community Engagement and Activism

- Floating wetland islands
- Student “living classroom”
- Eagle Scout projects
- Informational brochures
- Lake cleanups



## A Guide for Deal Lake Property Owners



# To Summarize

- Urban lakes are special
- Even though they serve a large community base, often overlooked and neglected
- Much of this has to do with LES... Legacy, Environmental and Societal barriers that make it difficult to restore and manage these waterbodies
- But... it can be done

# “LES... Legacy, Environmental and Societal Issues

- All lakes require management and maintenance
- “LES” adds to the challenges faced by urban lake managers and hinder the attainment of lake management goals
- Makes it difficult to achieve significant and sustainable water quality improvements



# Thank You... Questions

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