

# Shared Costs of Implementation by the Power of Redevelopment Zoning

STORMWATER FINANCE FORUM

WATER AS A RESOURCE: FINANCING OPPORTUNITIES AND  
CHALLENGES FOR MUNICIPAL STORMWATER MANAGEMENT



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## Water Integration for Squamscott-Exeter (WISE)



Geosyntec  
consultants



ROCKINGHAM  
PLANNING  
COMMISSION



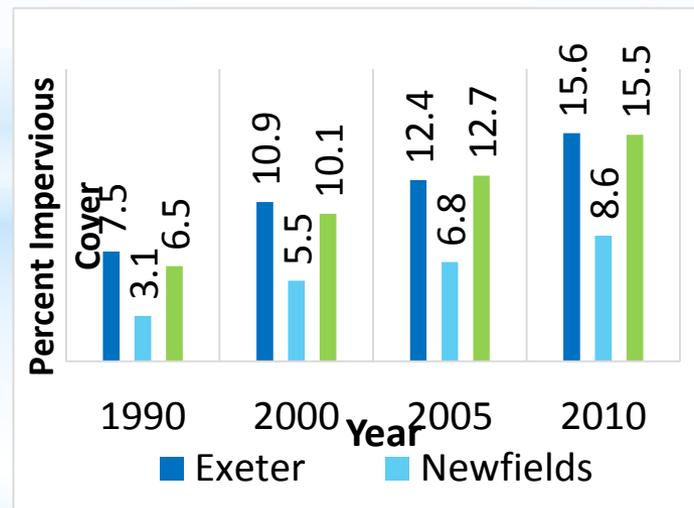
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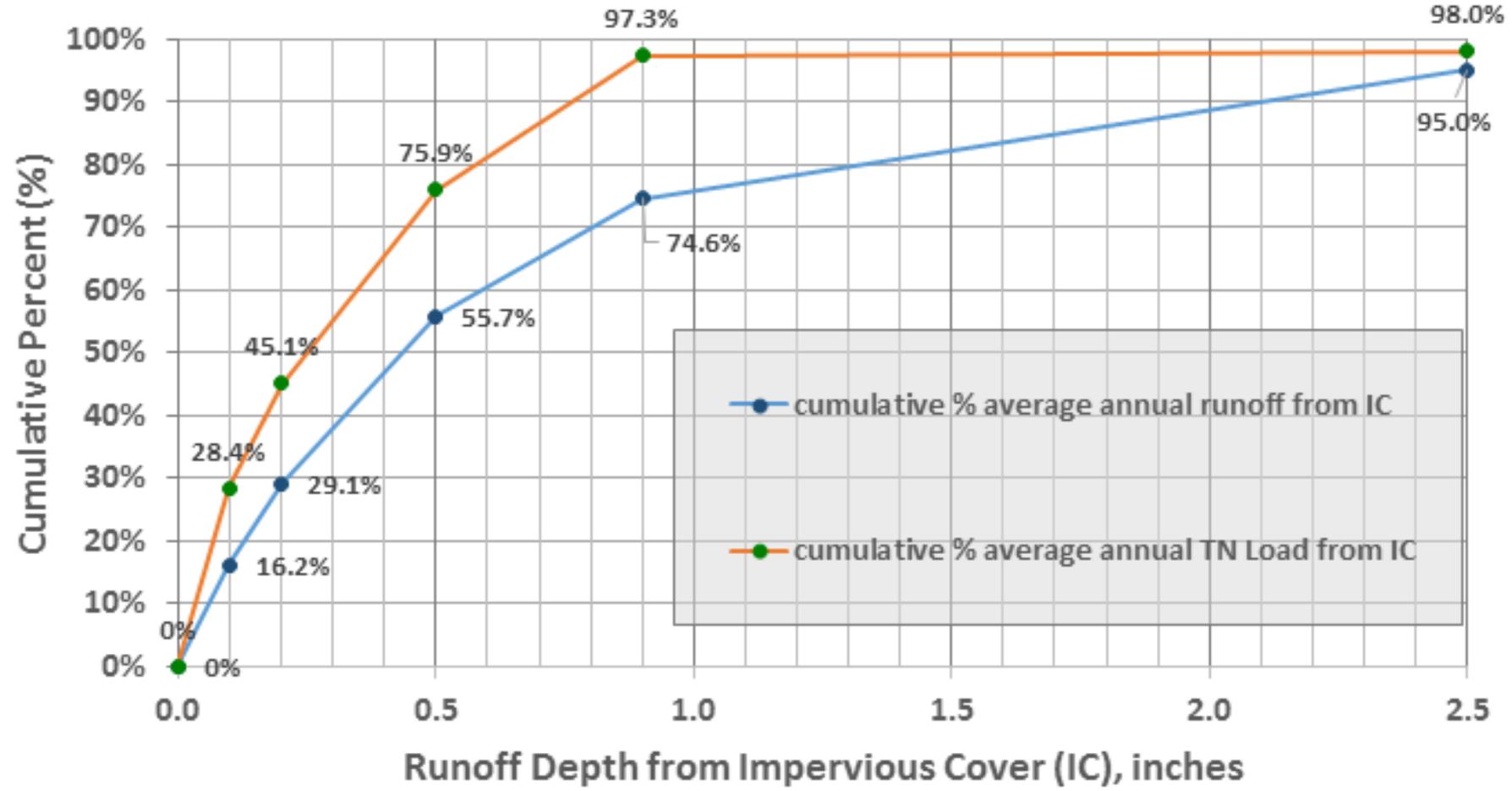
# POWER OF REDEVELOPMENT

1. The process of optimizing and prioritizing stormwater management retrofit opportunities to achieve the lowest cost solution, and
2. Harnessing the power of redevelopment through LID zoning to capture the private sector redevelopment cycle to gradually build resiliency and improve water quality through the upgrade of stormwater management and land development practices.



# Estimated Cumulative Percent (%) Runoff Volume and Total Nitrogen Load Delivery from Impervious Cover (IC)

Based on Hourly Precipitation Data - Boston, MA (1992-2014) and Median TN EMC data for Commercial/Industrial sites from NSQD - Rainfall Regions 1 &



Runoff volumes calculated by assuming initial abstraction of 0.1 inch of rainfall depth per event

# BMP OPTIMIZATION



**DRAINAGE AREA**



**BIO-RETENTION**



**POLLUTANT LOAD REDUCTION**



**COST**



Removes 12.7 lbs N/ac/yr

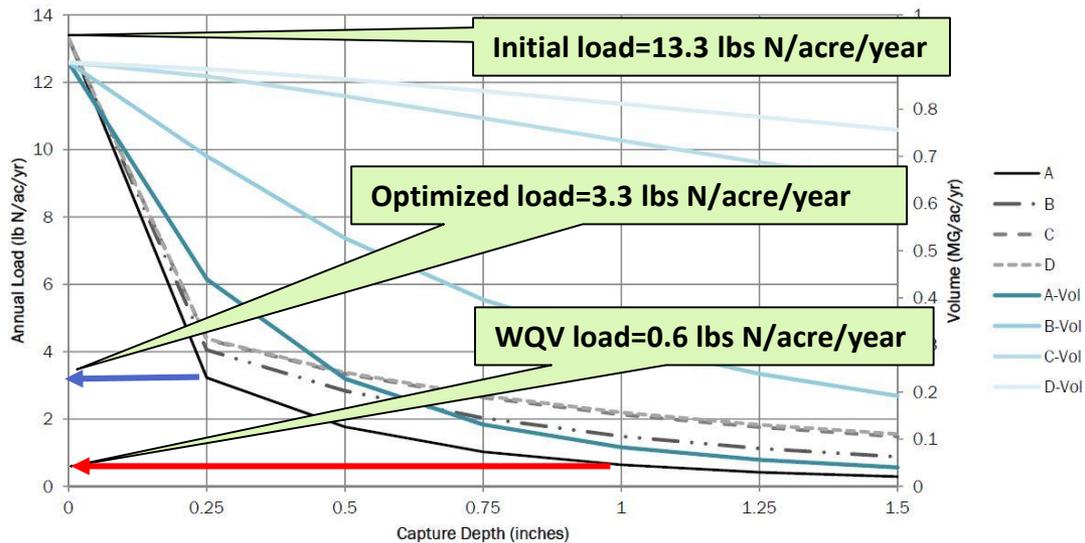


Each removes 10 lbs N/ac/yr for a total of 40 lbs

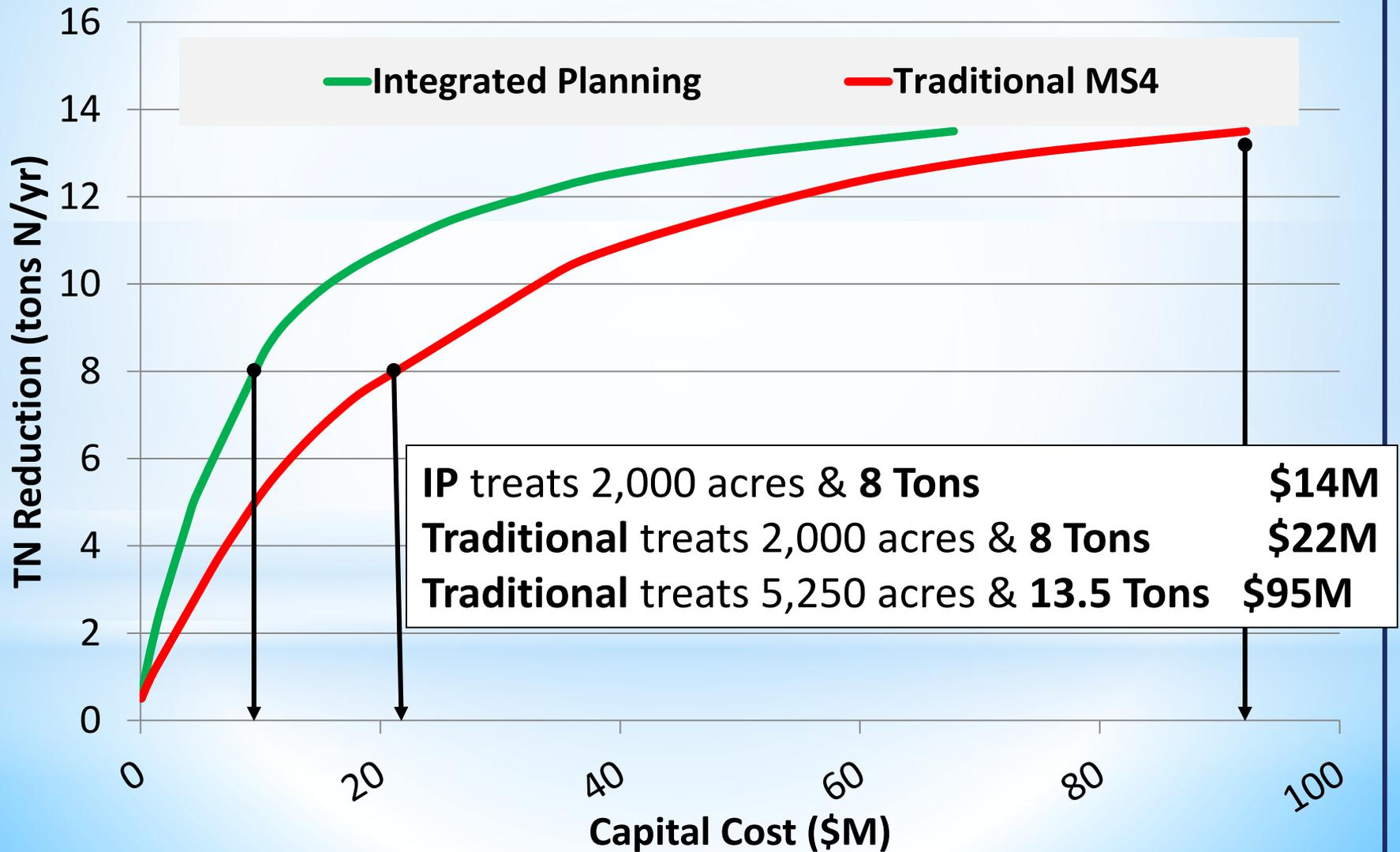


High-efficiency Bioretention - Commercial Impervious

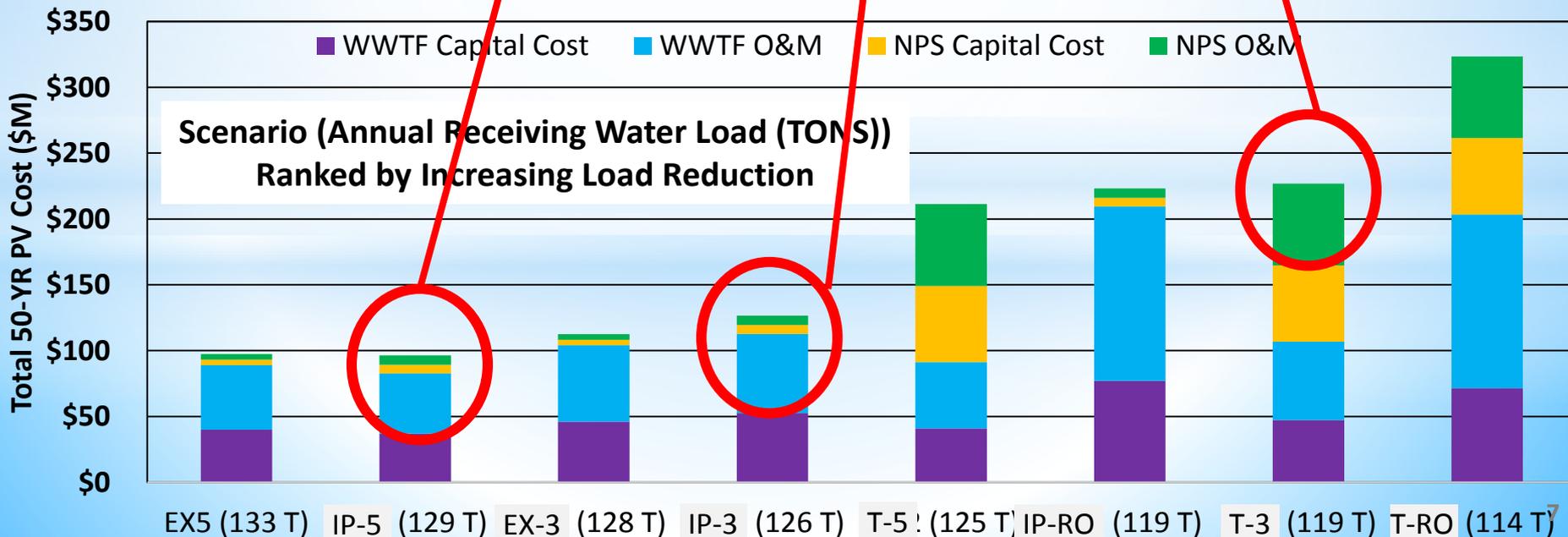
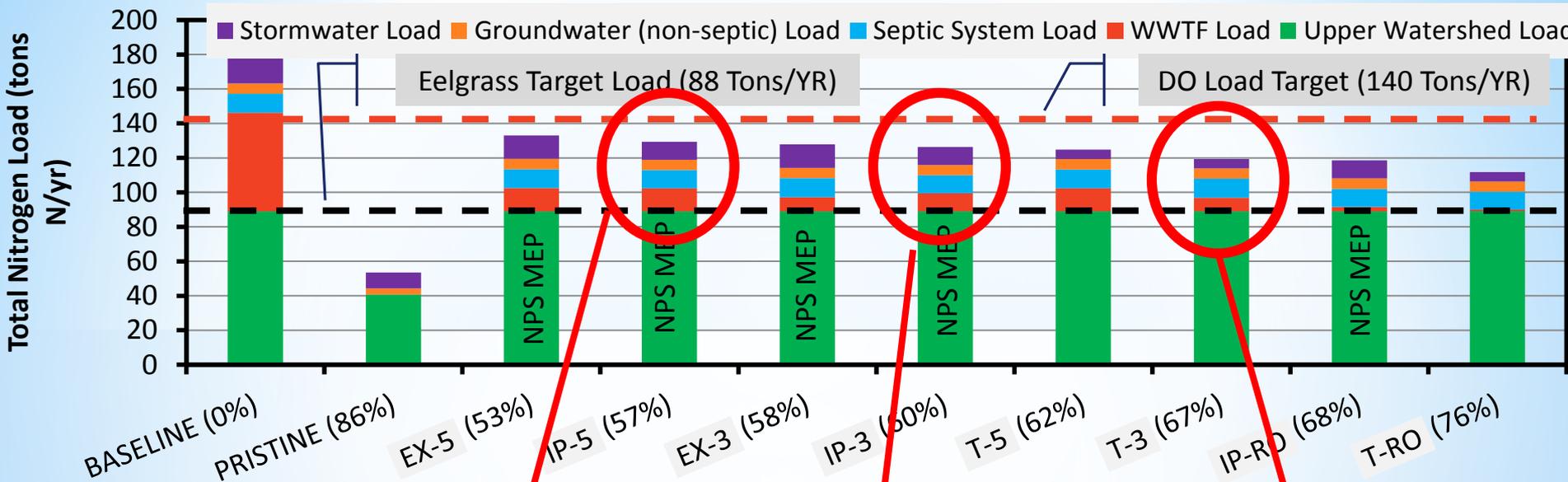
- \$40K can build one large system or 4 smaller systems
- An additional 27 lbs of nitrogen per year at nearly equivalent costs, or approximately 315% increase.



# BEST COST SOLUTION



# ANNUAL LOAD VS. PRESENT VALUE



# IP3/IP6: MUNICIPAL COSTS

<b>Town</b>	<b>Total NPS Implementati on Cost (\$M)</b>	<b>Municipal NPS Implementati on Cost (\$M)</b>	<b>WWTF Upgrade Cost (\$M)</b>	<b>Total Cost to Town (\$M)</b>	<b>Annual Cost to Town (30 yrs) (\$M)</b>
Exeter	\$8.55	\$4.90	\$85.95	\$90.85	<b>\$3.03</b>
Newfield s	\$1.33	\$0.76	\$2.17	\$2.94	<b>\$0.10</b>
Stratham	\$3.74	\$1.94	\$3.26	\$5.20	<b>\$0.17</b>

- A portion of the proposed BMPs are intended to treat “municipal” land uses, which the town would implement themselves. These include BMPs treating:
  - Institutional land uses
  - Roads
  - Outdoor and other built-up land (i.e. parks)

# SHARED IMPLEMENTATION COSTS PUBLIC AND PRIVATE

- 1. \$163,000 or 57% of the total annual non-point source implementation cost (capital and O&M) will be incurred by the municipality for controls on municipally owned land (i.e., roads, parks, schools)**
- 2. \$122,000 (or 43%) annually is estimated to be covered by the private sector for the redevelopment and operation and maintenance of non-town owned properties occurring primarily in commercial, industrial, and residential areas.**

# WISE PROJECT TEAM



**Robert Roseen, Project Director**  
**Renee Bourdeau, Project Manager**  
**Chad Yaindl, Senior Staff Engineer**



**Alison Watts, Watershed Science Lead**



**Cliff Sinnott and Theresa Walker, Intended User Representatives**



**Doug Thompson and Eric Roberts, Collaboration Experts**



**Paul Stacey, Science Investigator, Steve Miller, Training Program and Climate Adaptation**



**Jennifer Royce Perry, Public Works Director, Exeter**  
**Don Clement, Council**  
**Paul Vlasich, Town Engineer**  
**Sylvia VonAulock, Town Planner**



**Paul Deschaine, Town Administrator, Stratham**  
**Lincoln Daley, Town Planner**



**Clay Mitchell, Town Planner, Newfields**  
**Bill Meserve, Municipal Rep.**



**Mark Voorhees, Newton Tedder, Dan Arsenault, David Pincumbe, Carl Deloi**



**Rich Langan, Funding Agency Director**  
**Kalle Matso, Program Manager**



**Ted Diers, Matt Wood, Phil Trowbridge, Barbara MacMillan, Sally Soule, Eric Williams**

# ADDITIONAL INFORMATION



**WATERSTONE  
ENGINEERING**  
INNOVATIVE STORMWATER MANAGEMENT

<http://www.wisenh.net/>

**The WISE project has been completed!**

The final [WISE Integrated Plan](#) for Stratham, Exeter and Newfields, dated December 2015 is now available.

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# Questions/ Comments?

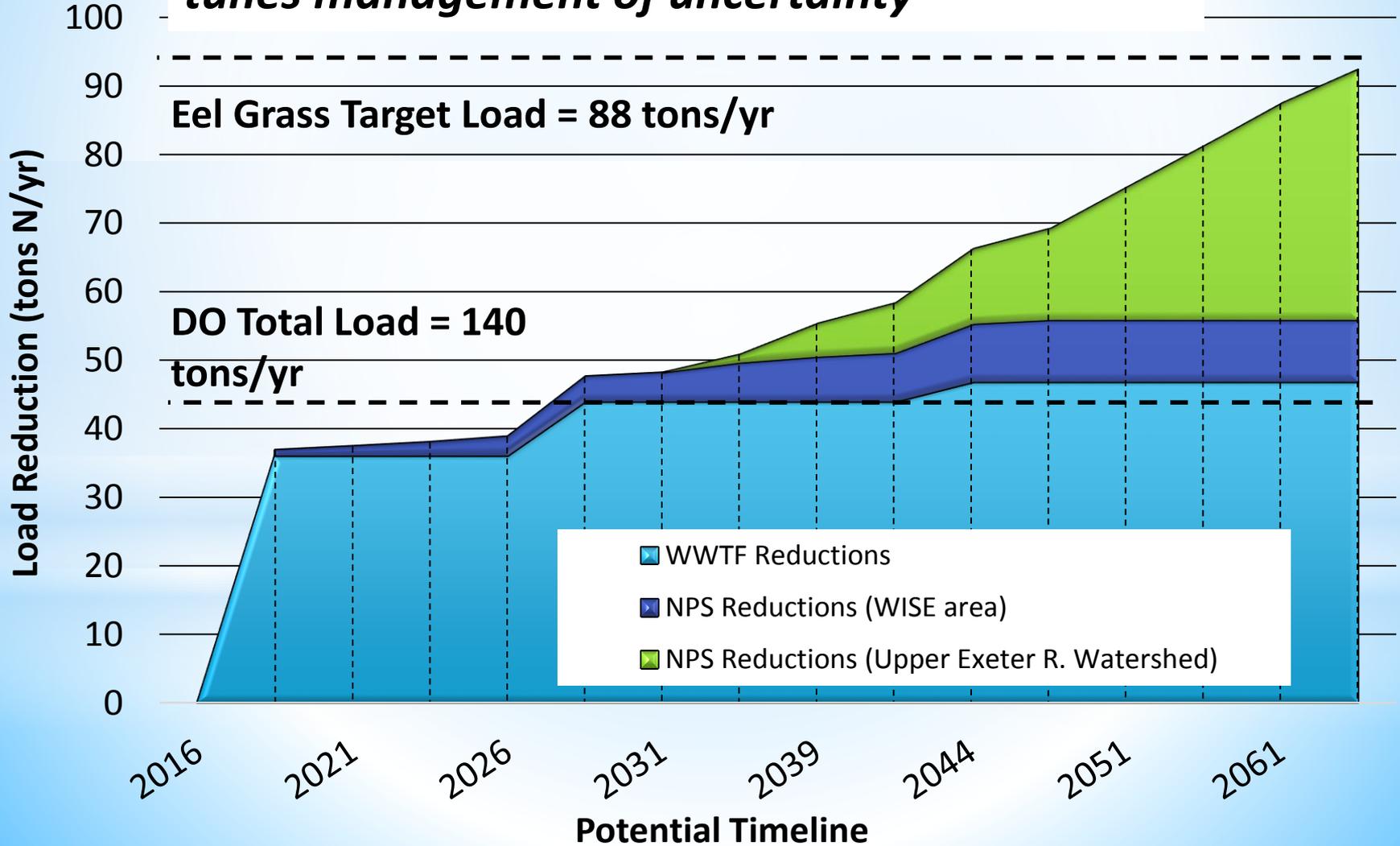
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**2016 Environmental Merit Award  
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# POTENTIAL UPPER WATERSHED CONTRIBUTIONS TO MEET WATER QUALITY GOALS

*Adaptive management and monitoring fine tunes management of uncertainty*



# APPLICATIONS

- The new proposed small MS4 permits for NH and MA include a requirement for optimizing and ranking retrofits opportunities.
- Optimization of designs used at the watershed scale can significantly reduce costs for achieving load reduction targets for nitrogen, phosphorous, and other pollutants.
- Optimization can be conducted for volume reduction for climate resiliency.
- Adaptive management and monitoring fine tunes management of uncertainty