



Connecticut Department of Energy and Environmental Protection



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

Connecticut's Nitrogen Reduction Program

December 6, 2017

ACWA Nutrients Permitting Workshop

Rowland C. Denny



Connecticut Department of Energy and Environmental Protection

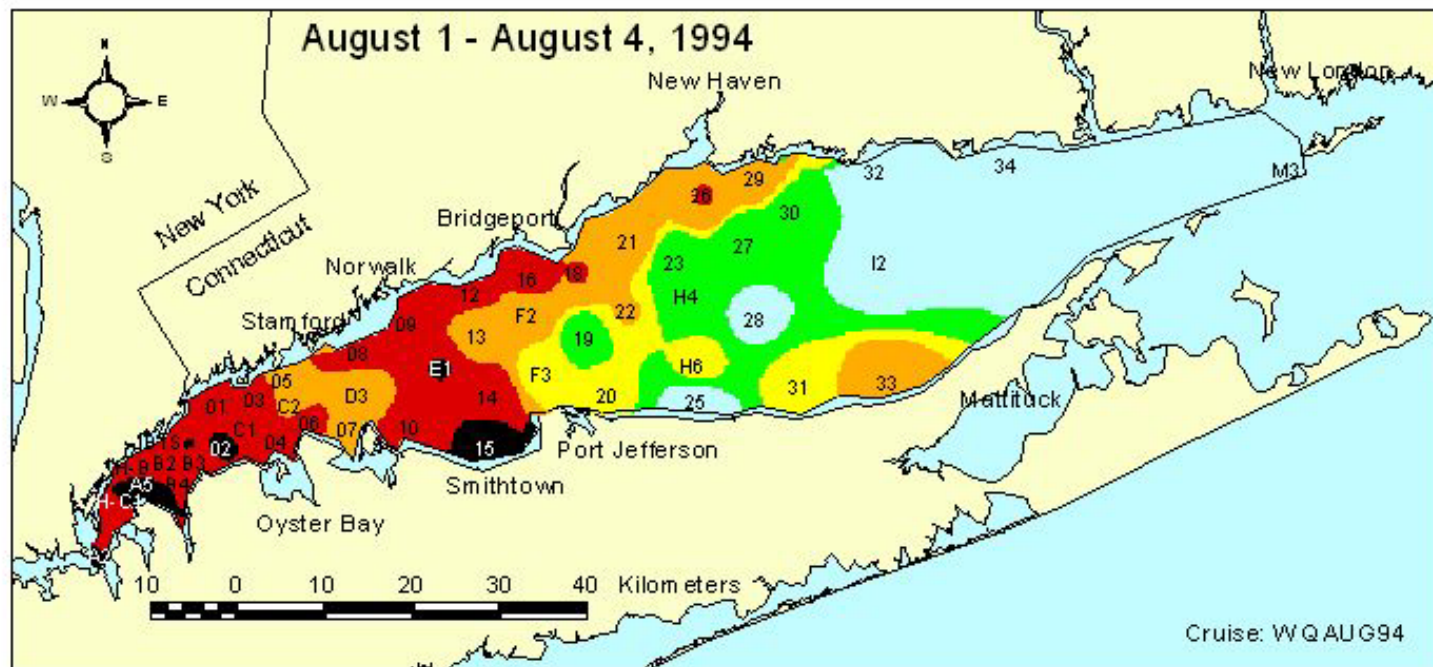
Connecticut's Nitrogen Reduction Program

- The TMDL
- Permitting
- Trading



The TMDL

Dissolved Oxygen in Long Island Sound Bottom Waters



Dissolved Oxygen	Severity of impact
0.0 - 0.99 mg/L	Severe
1.0 - 1.99 mg/L	Moderately severe
2.0 - 2.99 mg/L	Moderate
3.0 - 3.49 mg/L	Marginal
3.5 - 4.79 mg/L	Interim management goal
4.8 + mg/L	Excellent - Supportive of marine life



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The TMDL

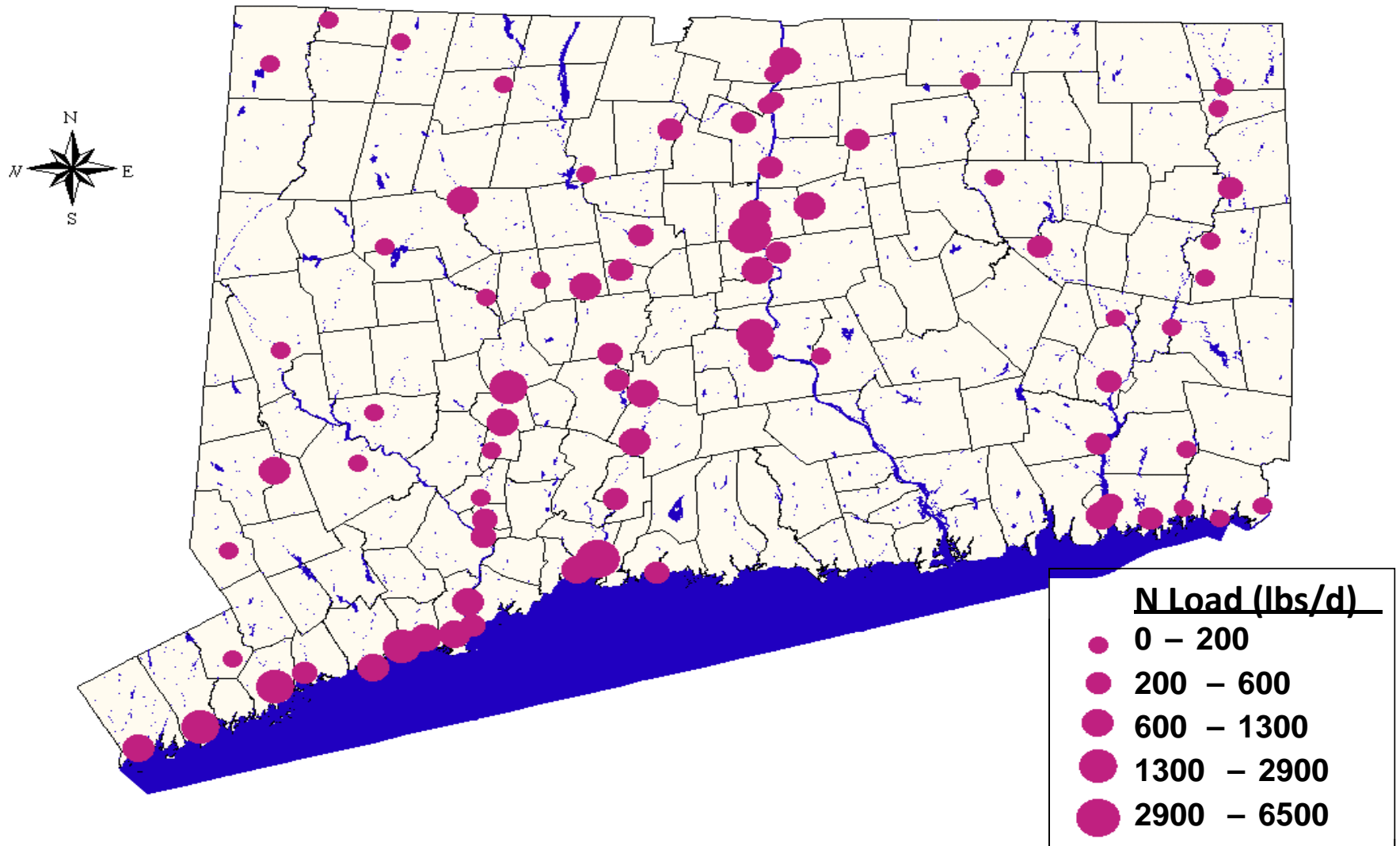
Long Island Sound TMDL

To meet Water Quality Standards:

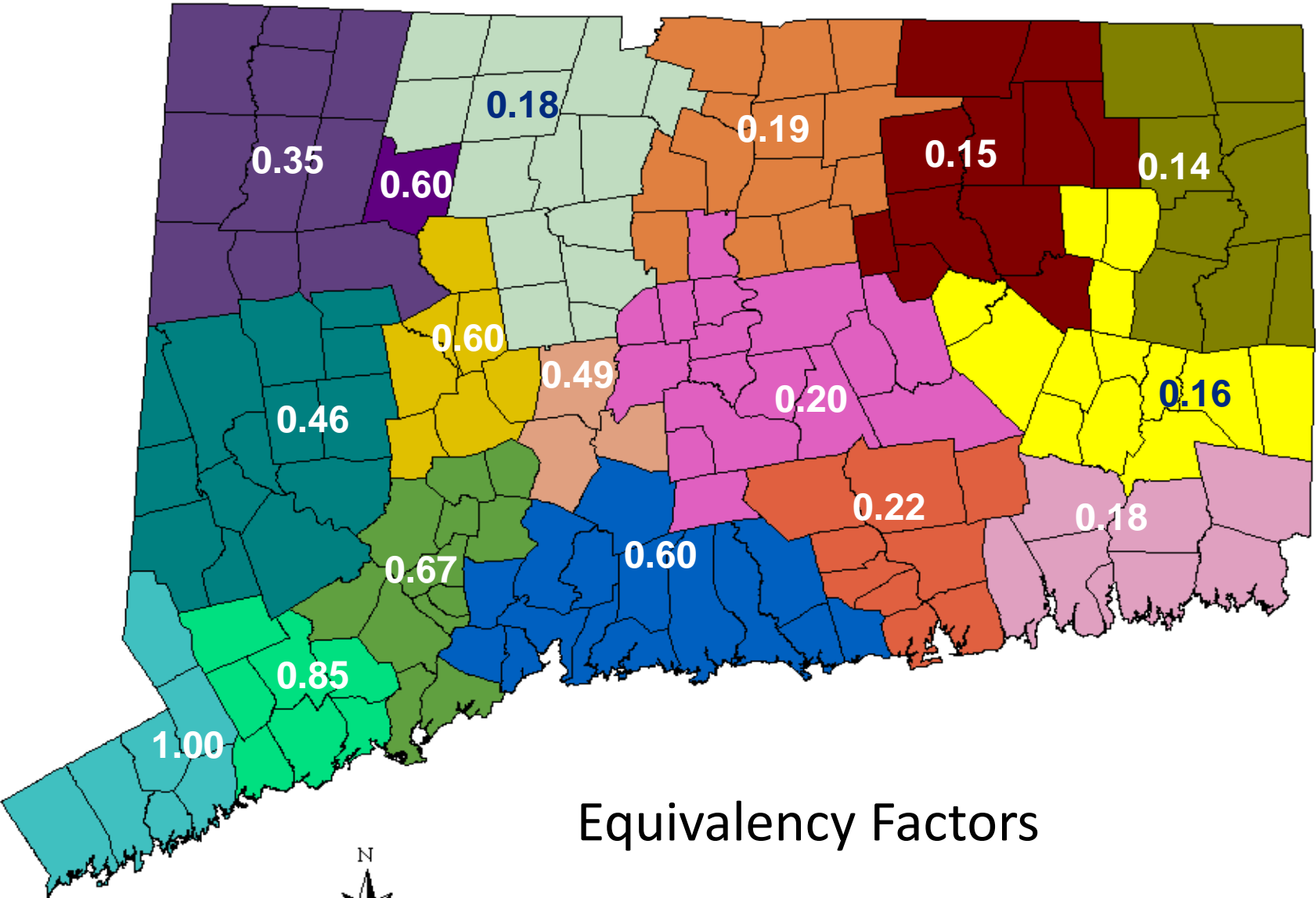
- In-basin Nitrogen Reduction Goal
 - 58.5%
- Enforceable Schedule – final reductions due 2014
- Allows “Trading” between POTWs
- Future Actions
 - Out of State Sources (runoff –10%, point sources – 25%)
 - Atmospheric Deposition (CAIR Rule and SIPs)
- Periodic Revision (Adaptive Management)



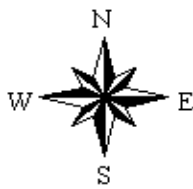
STP Nitrogen Baseline Loads



**Distribution of 79 Connecticut STPs participating in nitrogen trading.
Dots are proportional to baseline, end of pipe nitrogen loads (lbs/day).**



Equivalency Factors



Permitting

Using NPDES Permits to set limits

- Your Pipe
- Your Permit
- Your Problem
- High Compliance Cost
- High Non-Compliance Cost
- Rewards those that go last

Difficult to implement



Permitting

Using a General Permit and Trading to meet goals

- Our Pipe
- Our Permit
- Our Problem
- Lower Compliance Cost
- Lower Non-Compliance Cost
- Rewards those that go first

Incentive to reduce nitrogen



General Permit for Nitrogen Discharges

- Public Act 01-180, An Act Concerning Nitrogen Reduction In Long Island Sound – GP authority
- First issued January 1, 2002
- Latest version expires December 31, 2018
- Lists POTWs covered
- Authorizes the discharge of Total Nitrogen
- Requires operation of installed processes
- Allows for trading to meet limits



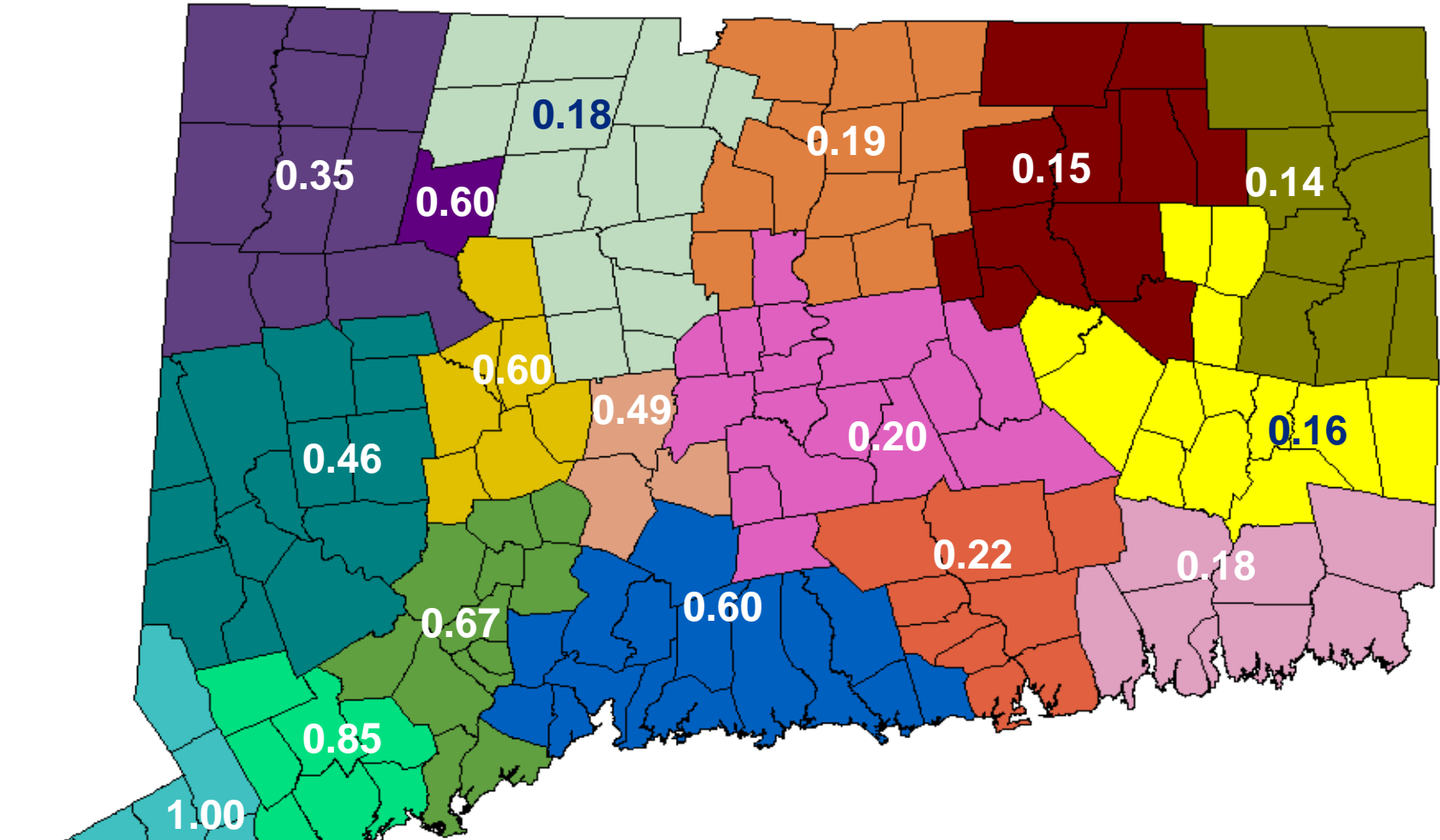
General Permit for Nitrogen Discharges

Sets limits from TMDL stepped over 14 years

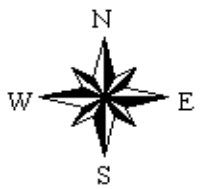
Sets frequency of monitoring:

- Total Nitrogen Concentration
- POTWs Less Than 10 MGD Design - Weekly
- POTWs Greater Than 10 MGD Design - Twice per Week
- Average Flow - Daily
- Sample Location - Final Effluent
- Sample Type - Daily Composite





Nitrogen Trading Zones



Connecticut's Nitrogen Trading Program

- Governed by the General Permit
- Public Act 01-180, An Act Concerning Nitrogen Reduction In Long Island Sound – Establishes NCAB
- Incentive Based – Not Free Market
- Managed by Nitrogen Control Advisory Board (NCAB)
- NCAB Sets Credit Prices Based on Set Formula
 - Annual CWF Project Capital Costs and Annual O&M Costs
- Scheduled Annual Trades
- Transactions through the State “Bank”



Goals of the Trading Program in 2002

Meet the TMDL by 2014 cost-effectively by

- Encouraging denitrification at STPs - grants
- Spreading out upgrades over thirteen years
 - Western and larger facilities expected first
- Efficiently using funding and resources

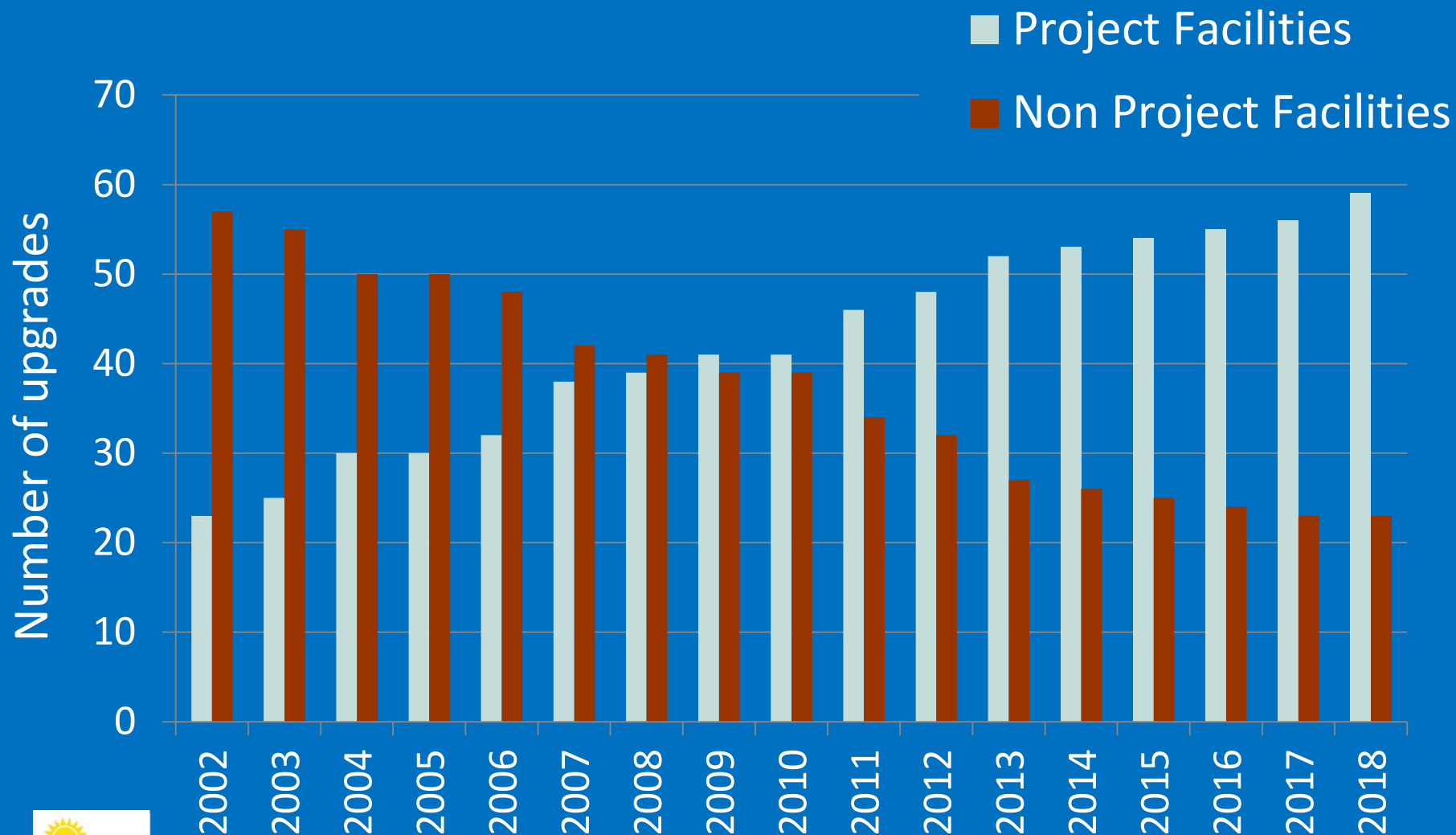


Trading Program Accomplishments

- Cost-effective implementation of the TMDL
 - (cost savings of \$325 – 425 million)
- 59 facility upgrades
 - \$450 million invested in CWF project facilities to remove TN
- Compliance with the TMDL in 2013



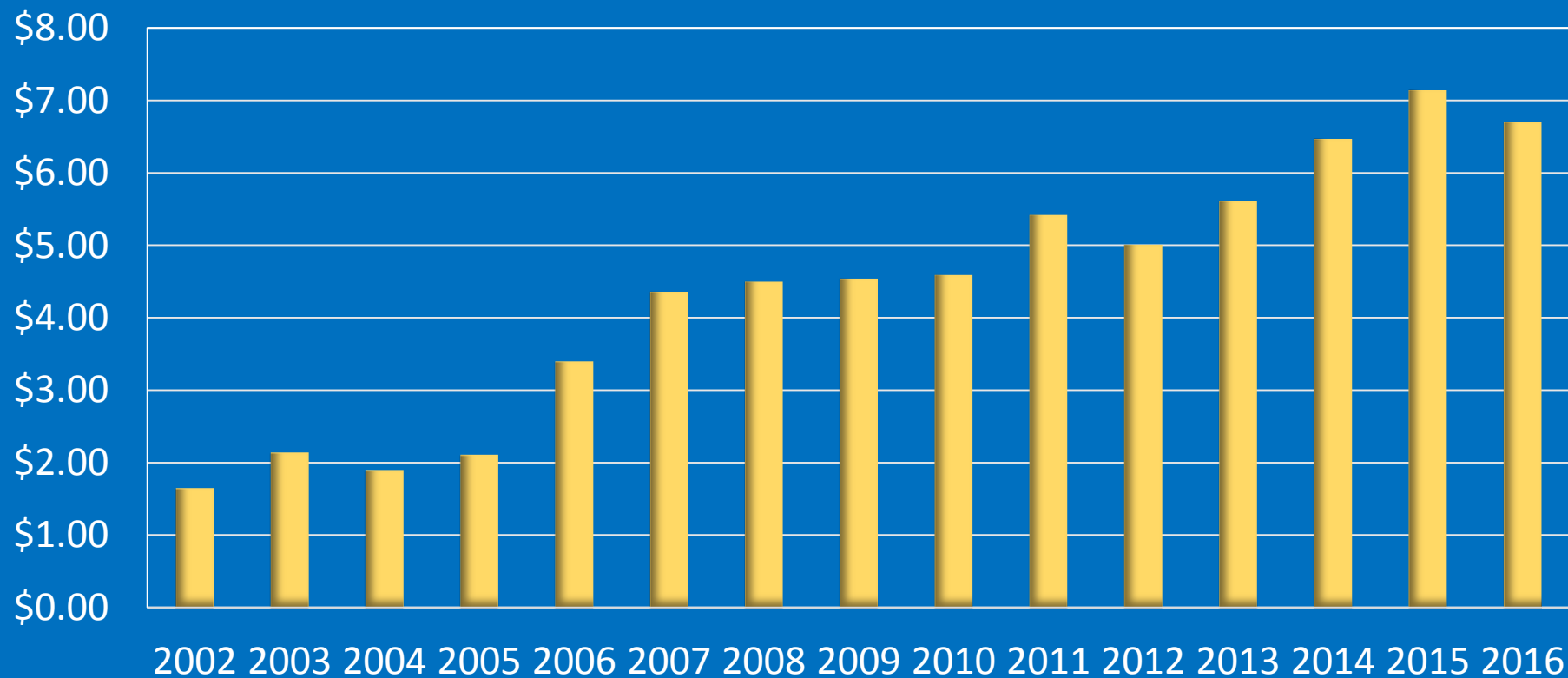
Trading Program Accomplishments



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Trading Program Accomplishments

Price of Nitrogen Credits



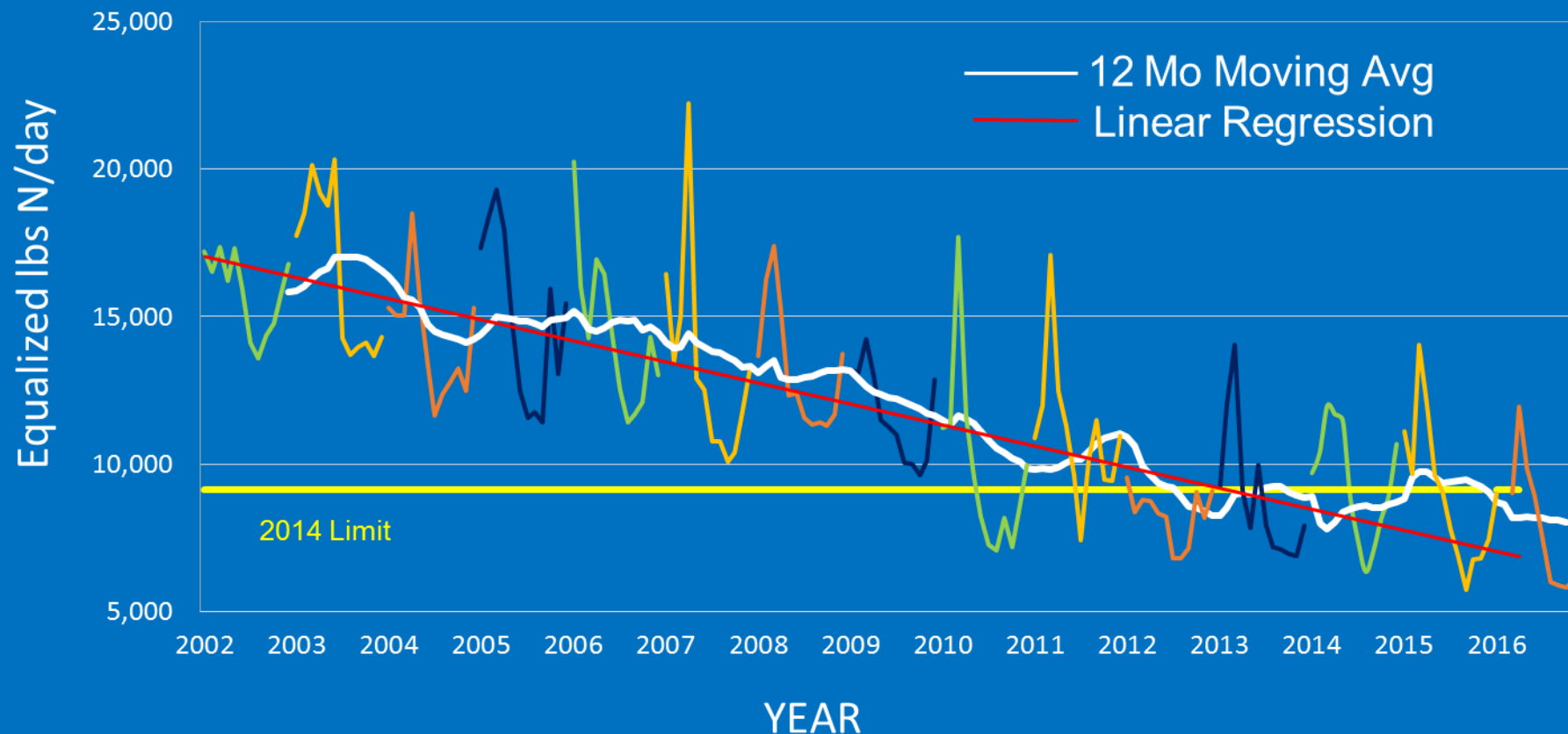
* In 2016 – the price of a credit for sellers is \$2.66



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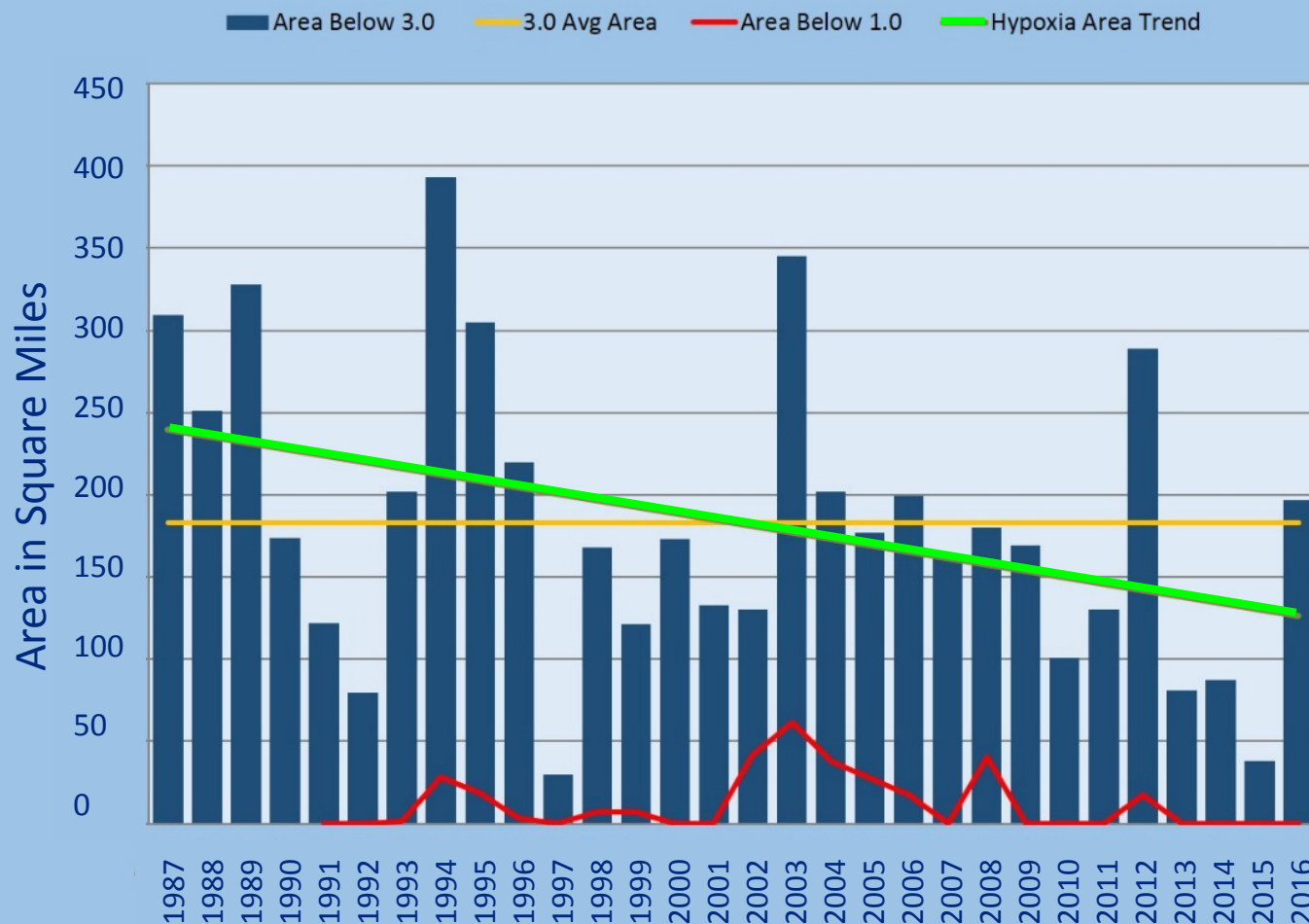
Trading Program Accomplishments

Monthly Average Total Equalized Nitrogen Loading to Long Island Sound



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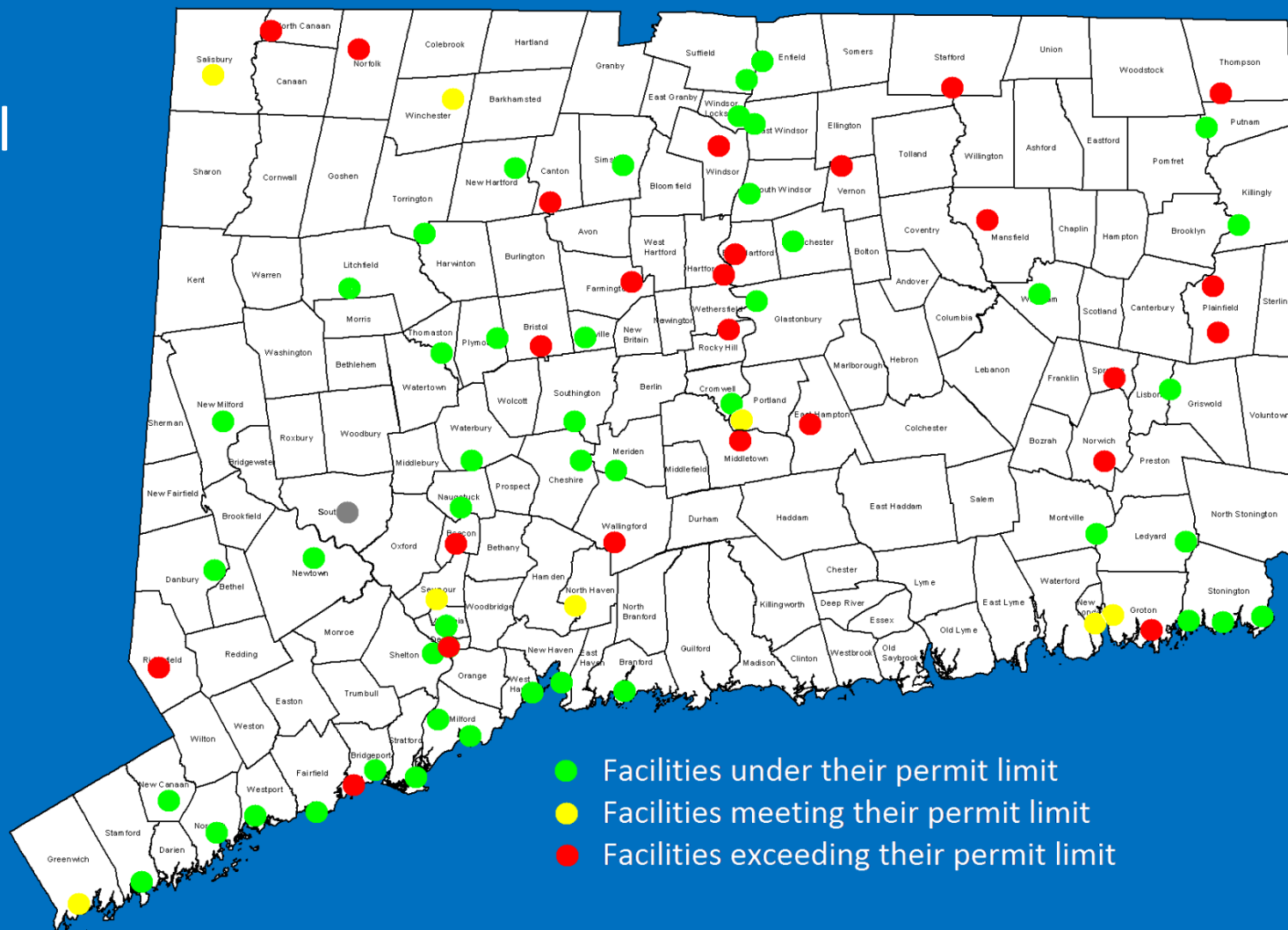
Trading Program Accomplishments



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Trading Program Accomplishments

2016
Actual



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Trading Program Accomplishments

2017 – 2022 Nitrogen Upgrades:

- Under Construction
 - Farmington
 - Middletown Abandonment
 - Rocky Hill
- Under Design
 - Norwich
 - Ridgefield
- In Planning
 - Plainfield
 - Sprague
 - Vernon
 - Wallingford



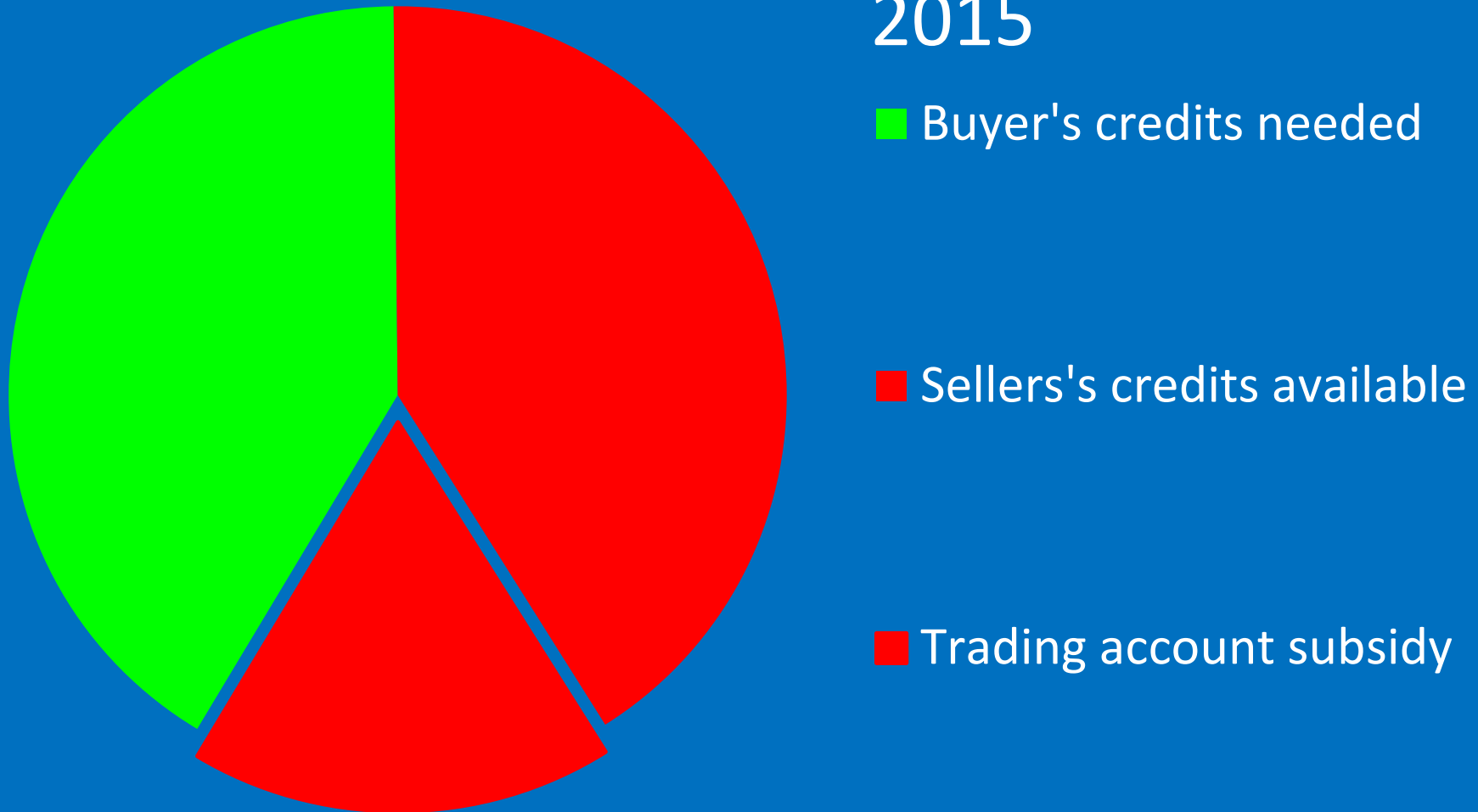
Changes to the Trading Program

- Continue to maintain compliance with TMDL
 - Encourage optimized denitrification at WWTPs
 - Continue efficient use of resources & funding
 - Continue support of data collection
- Continue utilization of General Permit
 - Renewal coming due at the end of 2018
- Maintain Options for future TMDL compliance
 - Continue to incentivize upgrades
- Moved the trading program to self-sufficiency



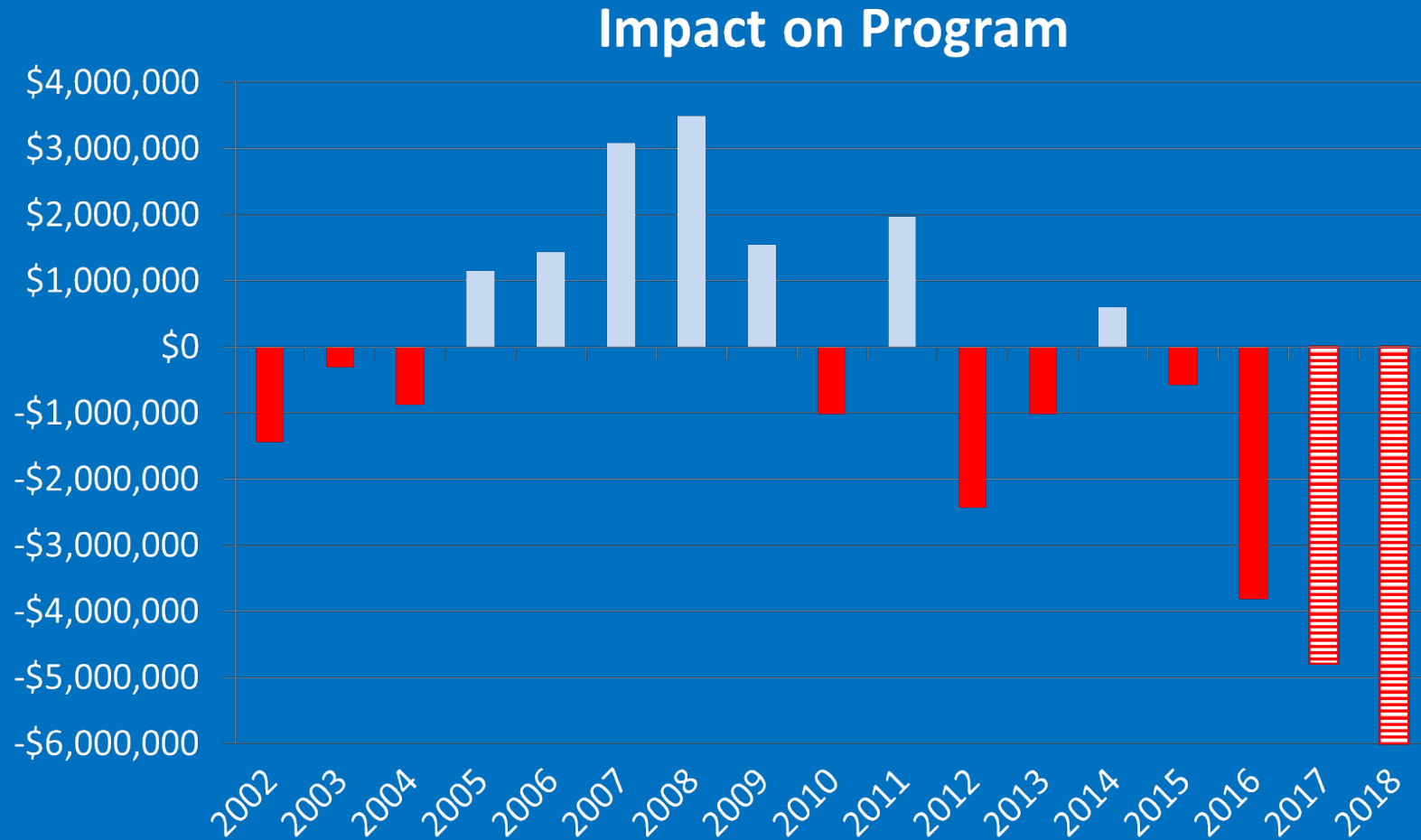
Changes to the Trading Program

2015



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Changes to the Trading Program



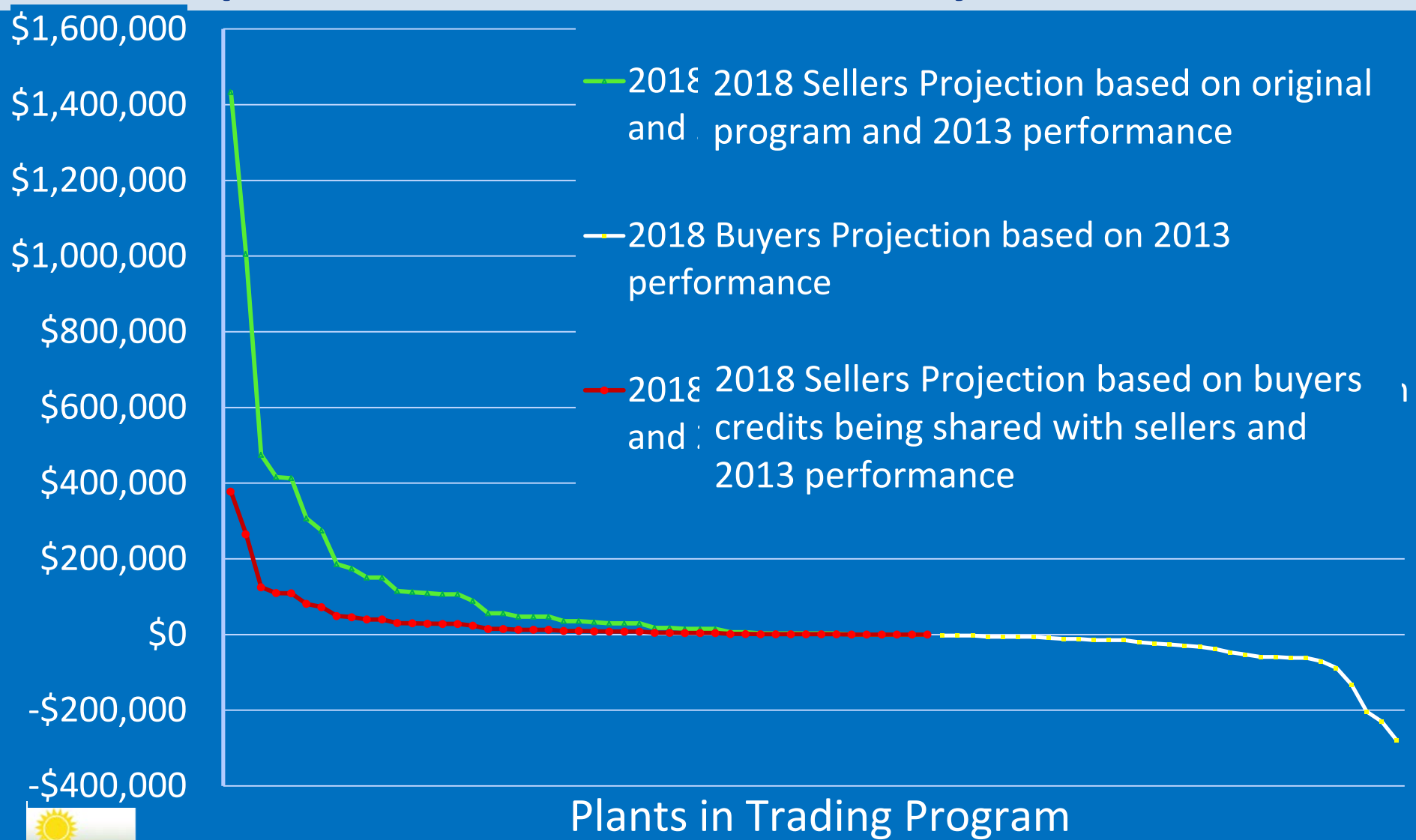
Changes to the Trading Program

Self-sufficient scenarios evaluated

- Discontinue the trading program
- Drop low producing sellers
- Drop inefficient sellers
- Buyers buy all of the credits produced
- Buyers buy the credits they need to meet their General Permit limit and those payments are shared by the sellers



Proposed self-sufficiency scenario



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Next steps

- Changes to the TMDL
- Public participation



Questions?

www.ct.gov/deep/municipalwastewater

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