

21<sup>st</sup> Annual Non-Point Source  
Management Conference  
NEIWPC – Plymouth, MA  
May 17, 2010



## Cape Cod Regional Wastewater Management Plan (RWMP)

Tom Cambareri  
Water Resources Program Manager

MAY | 2010

*"The environment is our economy"*



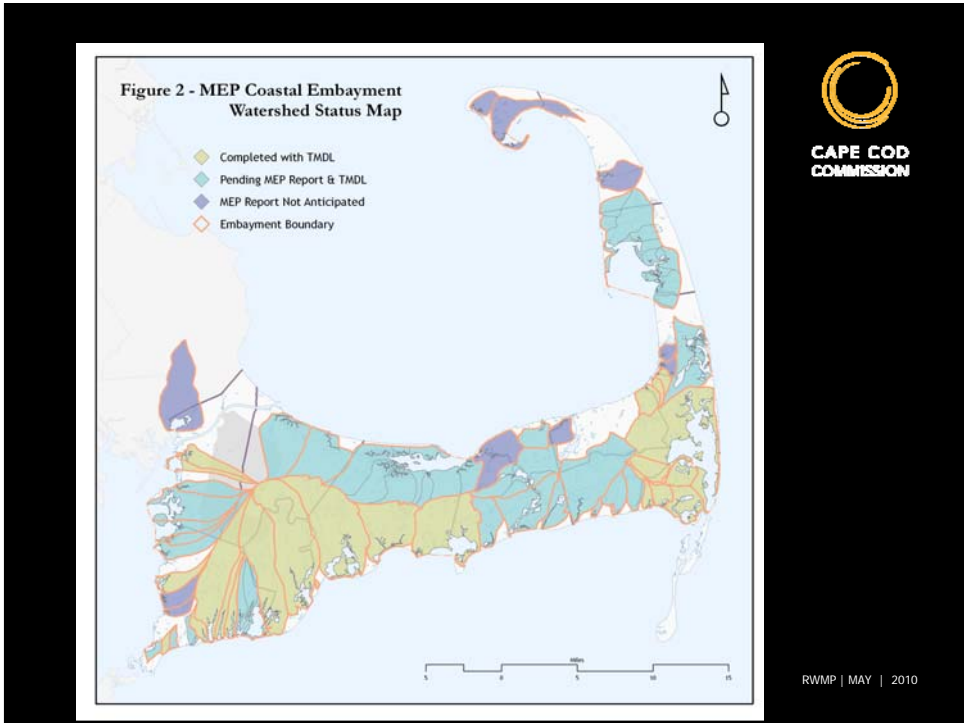
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# THE PROBLEM

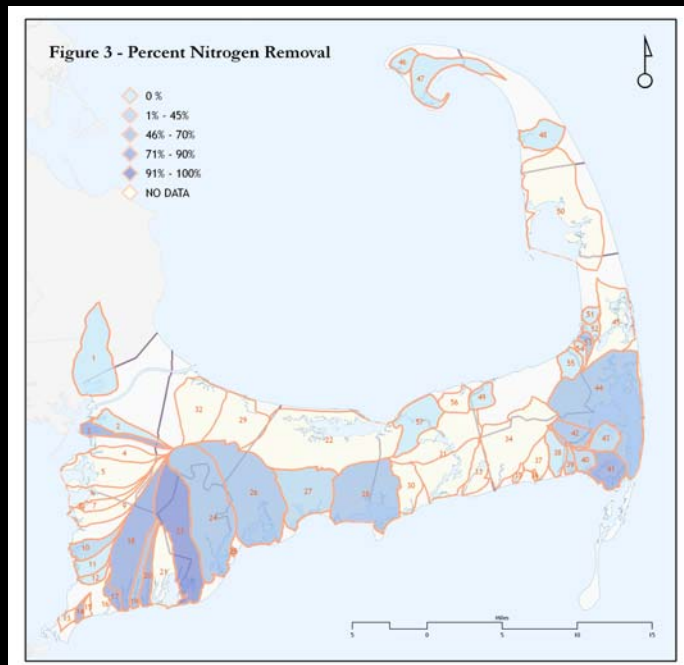
## Why is Wastewater Infrastructure Needed on Cape Cod?

- 85% of Cape Cod uses on site septic systems to dispose of wastewater
- Nitrogen is released from brand new Title 5 systems
- Nitrogen causes deterioration of groundwater, lakes, ponds, bays and coastal water quality
- Lack of wastewater infrastructure places restraints on growth

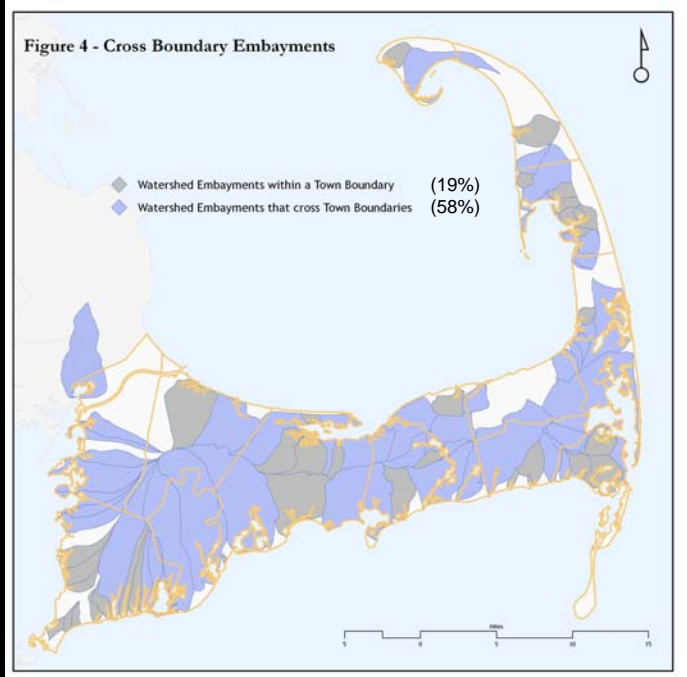
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## Nitrogen Removal Necessary in Sensitive Watersheds



# THE PLAN



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## Cape Cod Regional Wastewater Management Plan (RWMP)



Objective Restore degraded water bodies through regional nutrient management policy promoting appropriate infrastructure and growth management mechanisms while protecting taxpayers from unnecessary costs.



### Goal Policy Integrating:

- Environment
- Affordability
- Infrastructure
- Growth Management

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## Strategies and Measures



### STRATEGY & MEASURES

POLICY	ENVIRONMENT	<b>Strategy:</b> Science Based Nutrient Management Program <b>Measure:</b> Complete CWMP's
	AFFORDABILITY	<b>Strategy:</b> Maximize SRF and other funds <b>Measure:</b> Towns obtain 0% SRF loans and long term financing mechanisms
	INFRASTRUCTURE	<b>Strategy:</b> Limit infrastructure to limit cost & unintended growth <b>Measure:</b> MOA's for shared systems
	GROWTH MANAGEMENT	<b>Strategy:</b> Limit development where Title V would have limited or prohibited it. <b>Measure:</b> Towns adopt flow neutral regulations.

## Other Purposes of the RWMP



- Zero % State Revolving Fund (SRF) Construction Loans for identified 'Flow-Neutral' Communities
- Inform Cape Cod Commission on Development of Regional Impact review of CWMPs

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# Affordability

## Costs to Sewer

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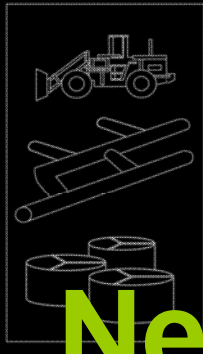
A red and white graphic with the text "Vote NO OCT. 13th barnstablesewers.com". The word "Vote" is in white on a red background. "NO" is in red on a white background. "OCT. 13th" is in white on a red background. The website "barnstablesewers.com" is in red on a white background.

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## Overbuilding Expensive



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CAPITAL COSTS

\$\$

+

New Growth

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## Coordination of Wastewater & Land Use Planning Important



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CAPITAL COSTS

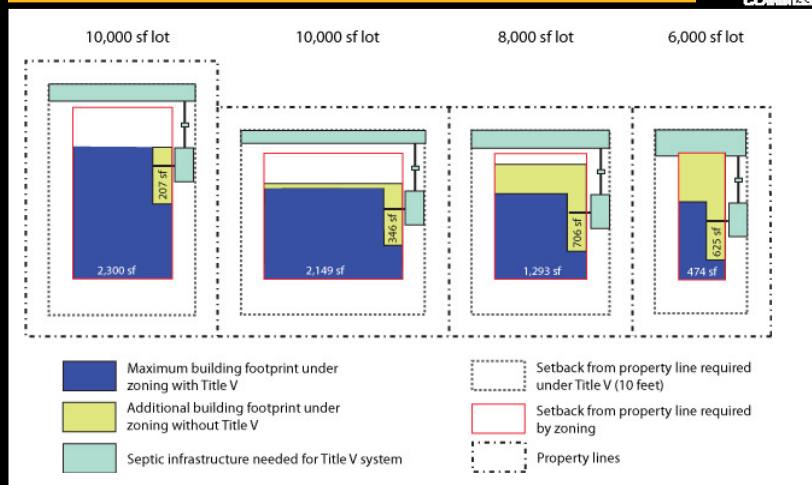
Smart Growth

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# Sewers & Smart Growth



# Building Footprint With/Without Title V



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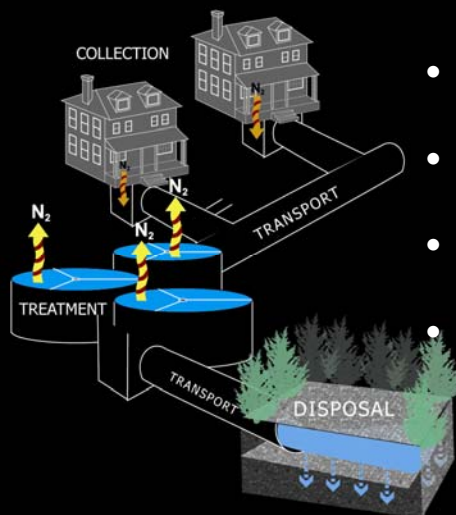
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# Infrastructure

## Elements of Typical Wastewater Management System



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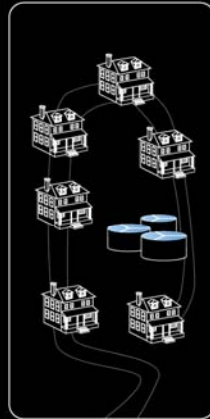
- Collection 65%
- Transport 2%
- Treatment 25%
- Disposal 8%

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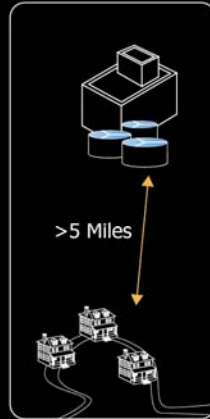
# A Mix of Systems is Appropriate



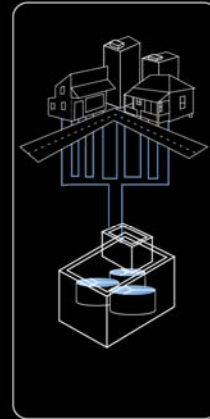
TITLE V / IA



CLUSTER

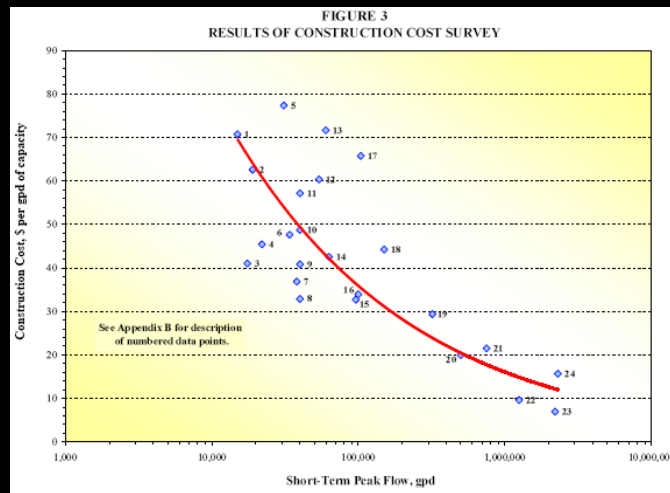


SATELLITE



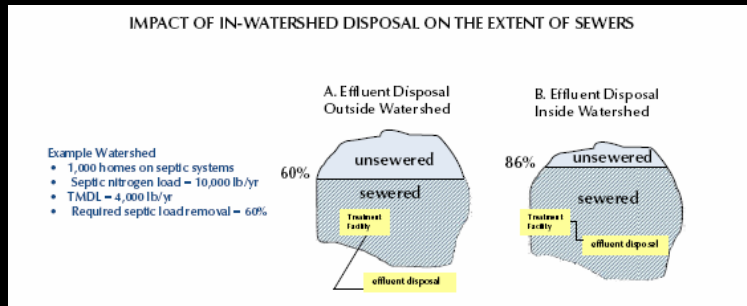
CENTRALIZED

# Economies of Scale Wastewater Comparison Paper –April 2010



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# Locate Effluent Disposal Outside of Sensitive Areas

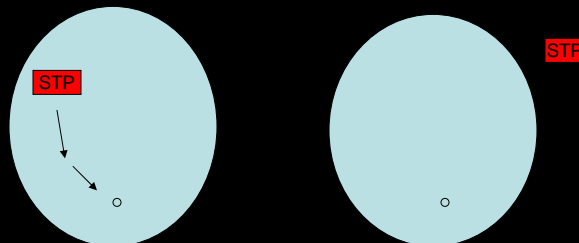


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# Effluent Discharge into a Zone II Groundwater Discharge Limits of Total Organic Carbon to address emerging compounds of concern

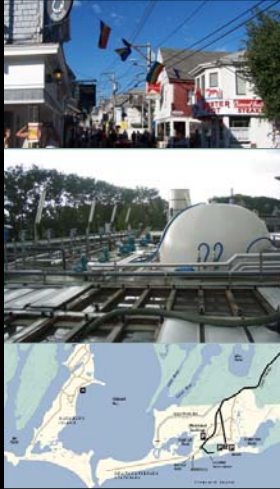


TOC removal is achieved by carbon filtration or Reverse Osmosis for considerable Capital Cost and on-going O&M



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## Cost Considerations in Watershed Based Planning

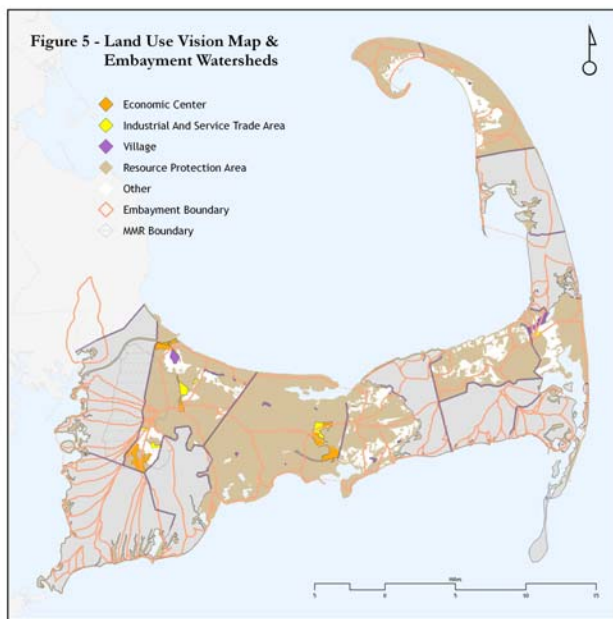


- **Collection and Transport**  
**Density**
- **Treatment**  
**Appropriate Scale**
- **Disposal**  
**Nitrogen Sensitive Areas,  
Zone II's Town Owned Land**



## Growth Management

**Coordination  
With  
Regional  
Land Use  
Planning  
Objectives**



## **Unplanned Growth = Increased Cost**



No Controlled Growth  
Potential 45% increase in population=  
**Dramatic increase in cost**



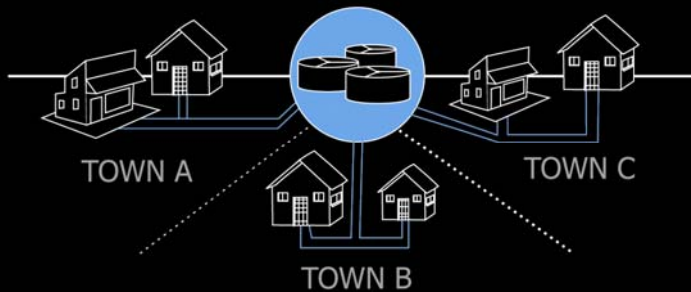
## Growth Management Saves Cost



\$\$ Cost Savings \$\$



## Benefits to Shared Wastewater Systems

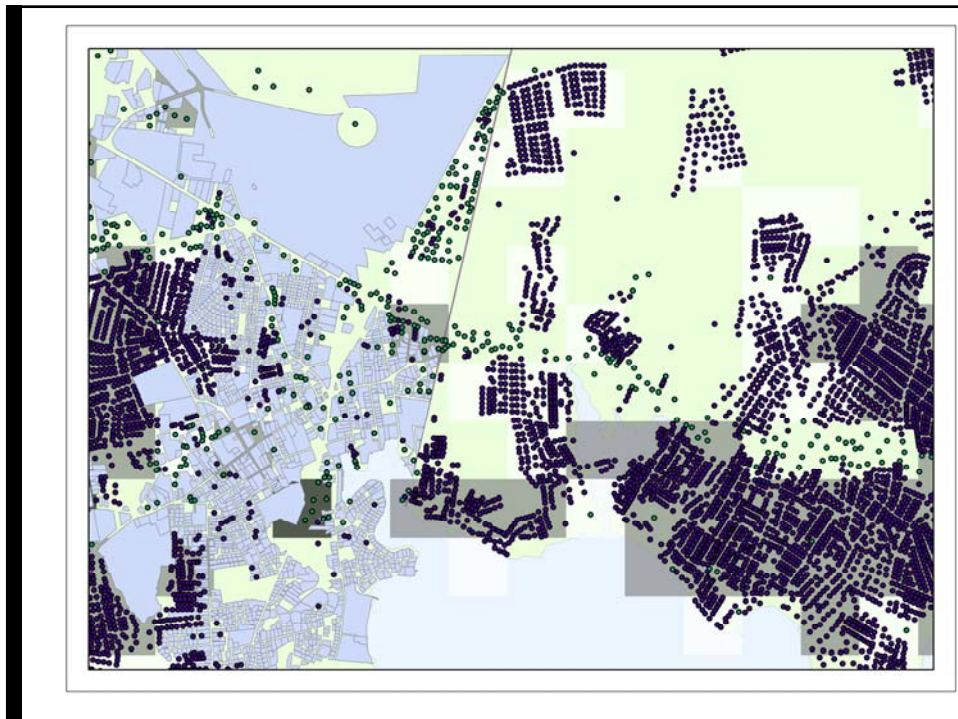




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## IMPLEMENTING THE PLAN

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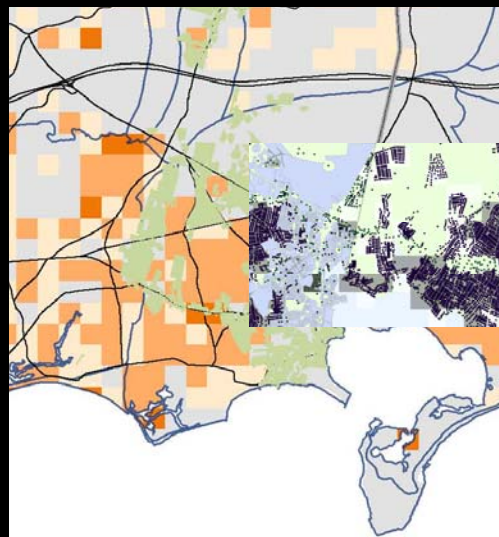
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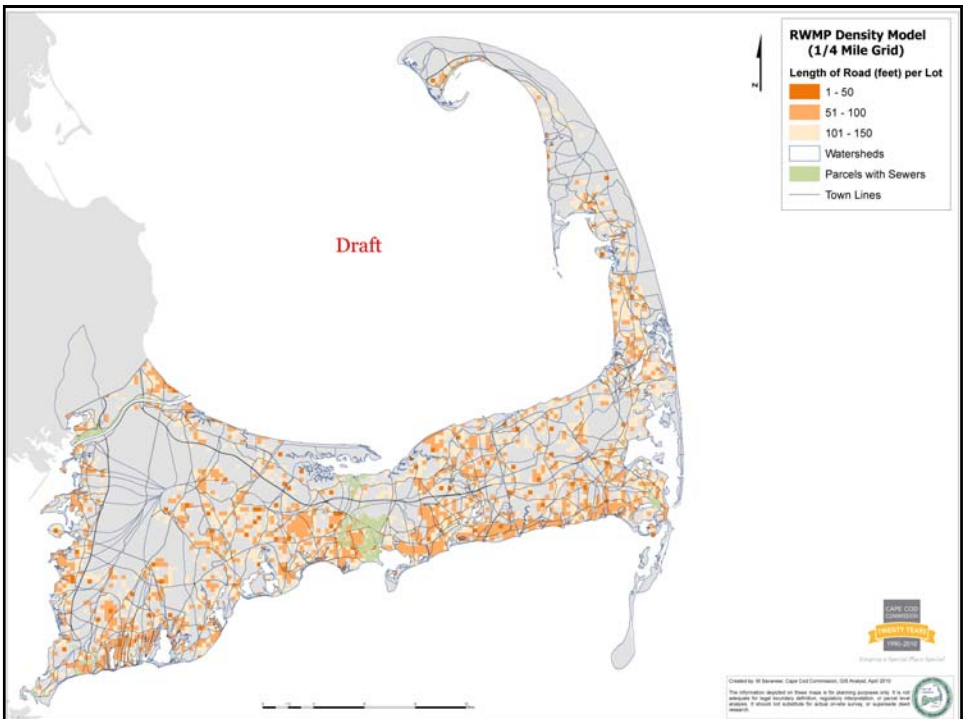
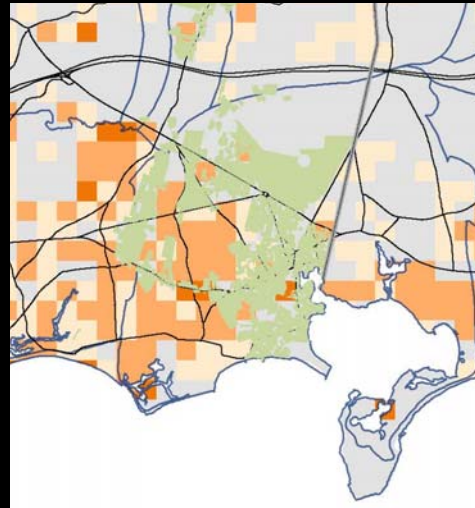


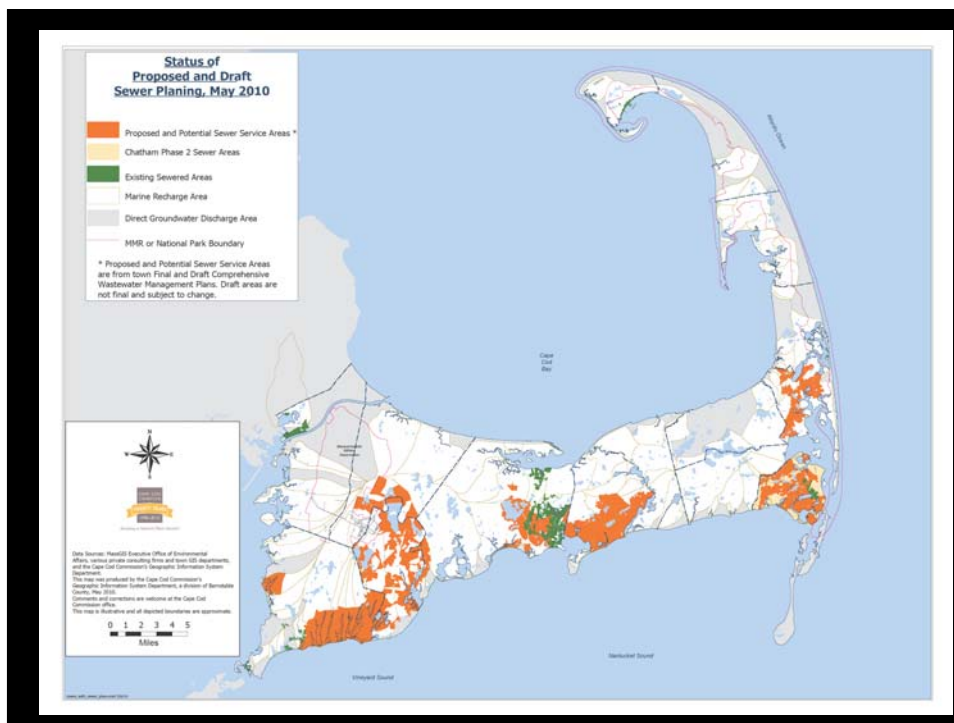
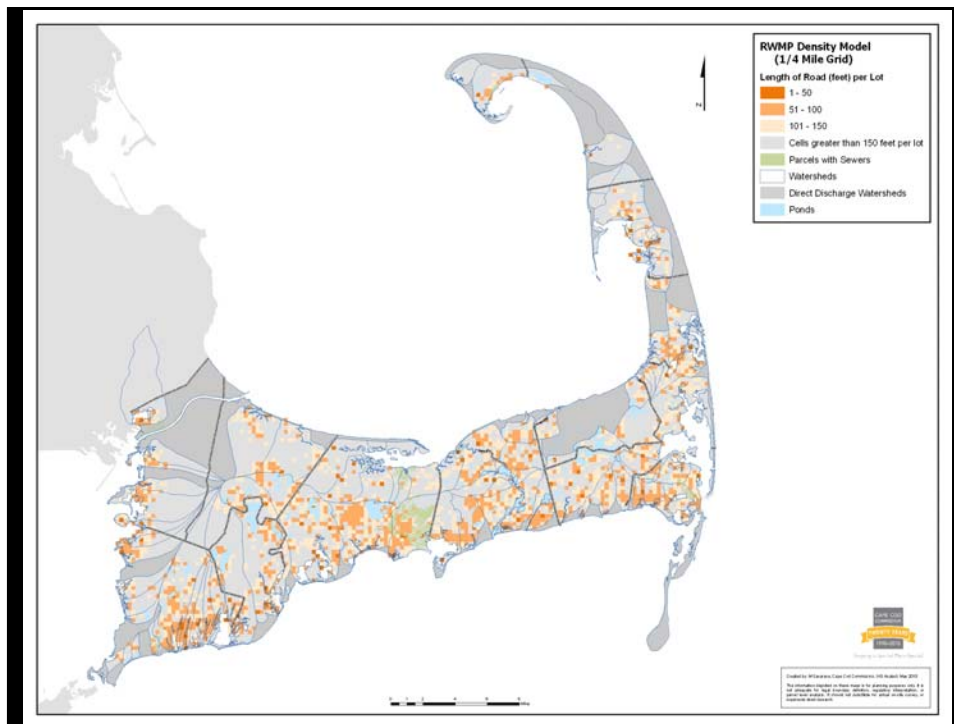
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### RWMP Density Model (1/4 Mile Grid)

Length of Road (feet) per Lot

-  1 - 50
-  51 - 100
-  101 - 150
-  Watersheds
-  Parcels with Sewers
-  Town Lines







# Acknowledgements

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Patty Daley – Cape Cod Commission  
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Mike Domenica – CH2MHill  
Tabitha Harkin– Cape Cod Commission  
GIS Staff –Cape Cod Commission  
Cape Cod Water Protection Collaborative  
Barnstable County Commissioners

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