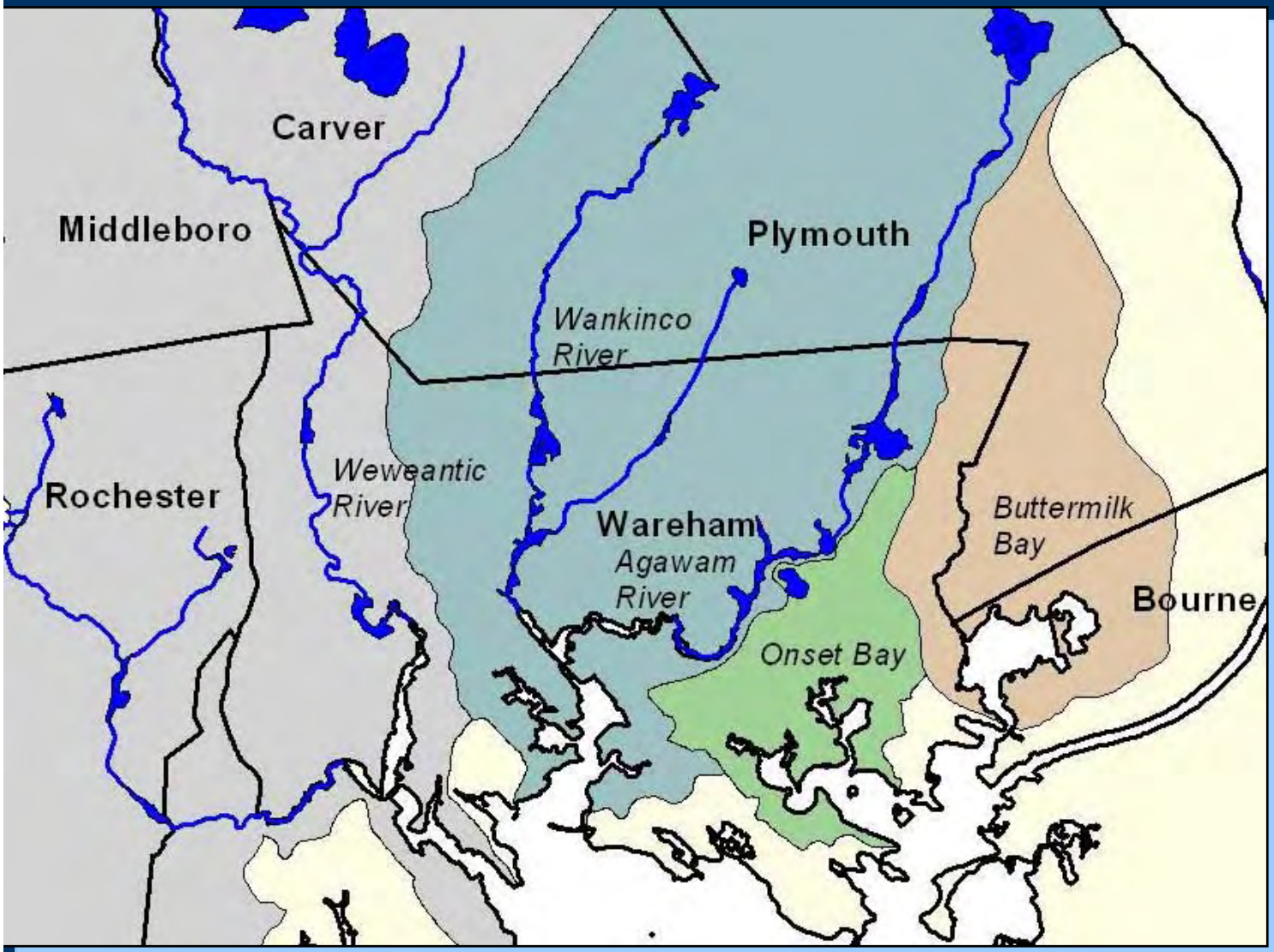
Proposed Wastewater Nitrogen Management Bylaw for Wareham, MA



Presentation to Town Meeting

Dr. Joe Costa
Buzzards Bay National Estuary Program

April 30, 2007

Wareham's Watersheds

The Problem with Nitrogen
Nitrogen is a pollutant

More Nitrogen (**ammonia and nitrates from sewage disposal, fertilizer**)

>> More Algae,

>> Less Eelgrass (important habitat)

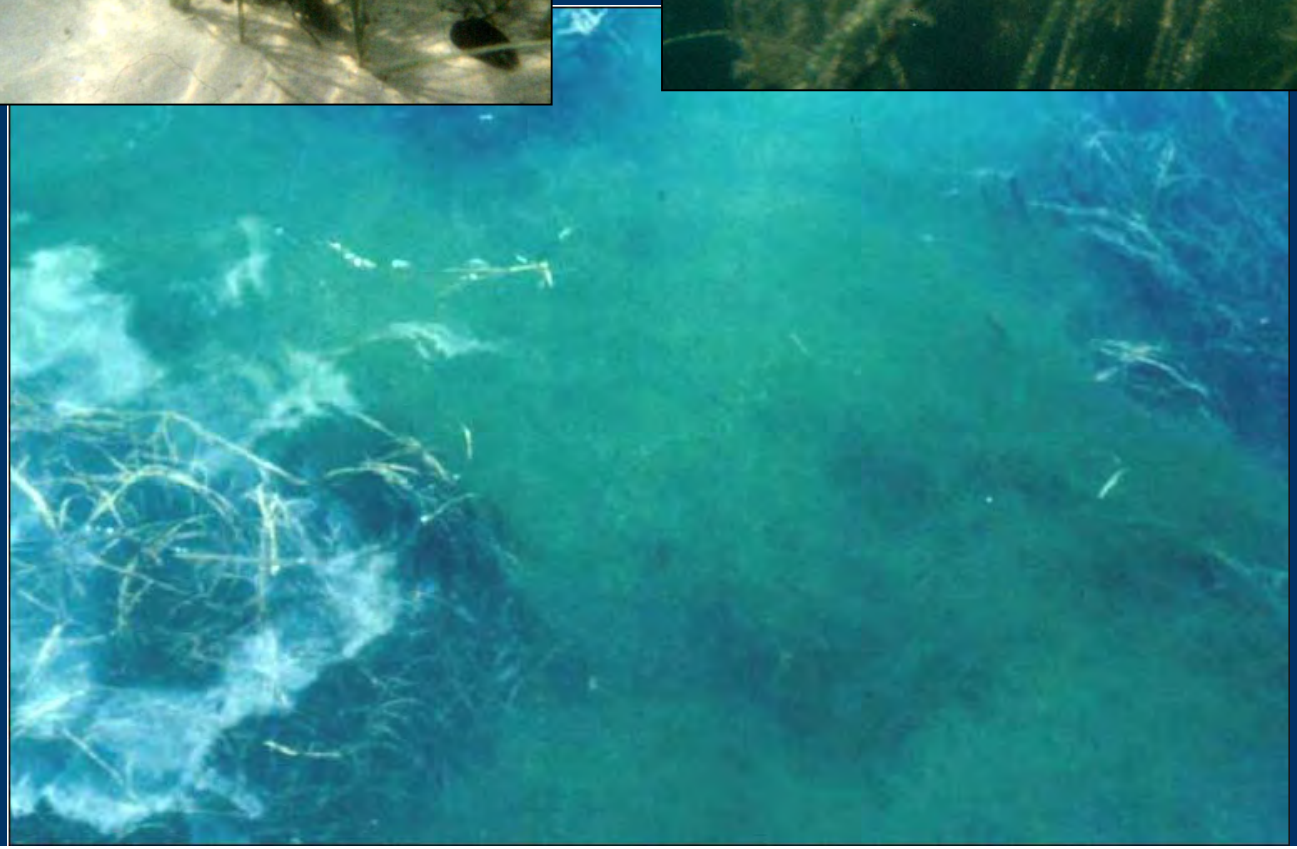
>>Less Shellfish Habitat,

>> Poor Water Quality,

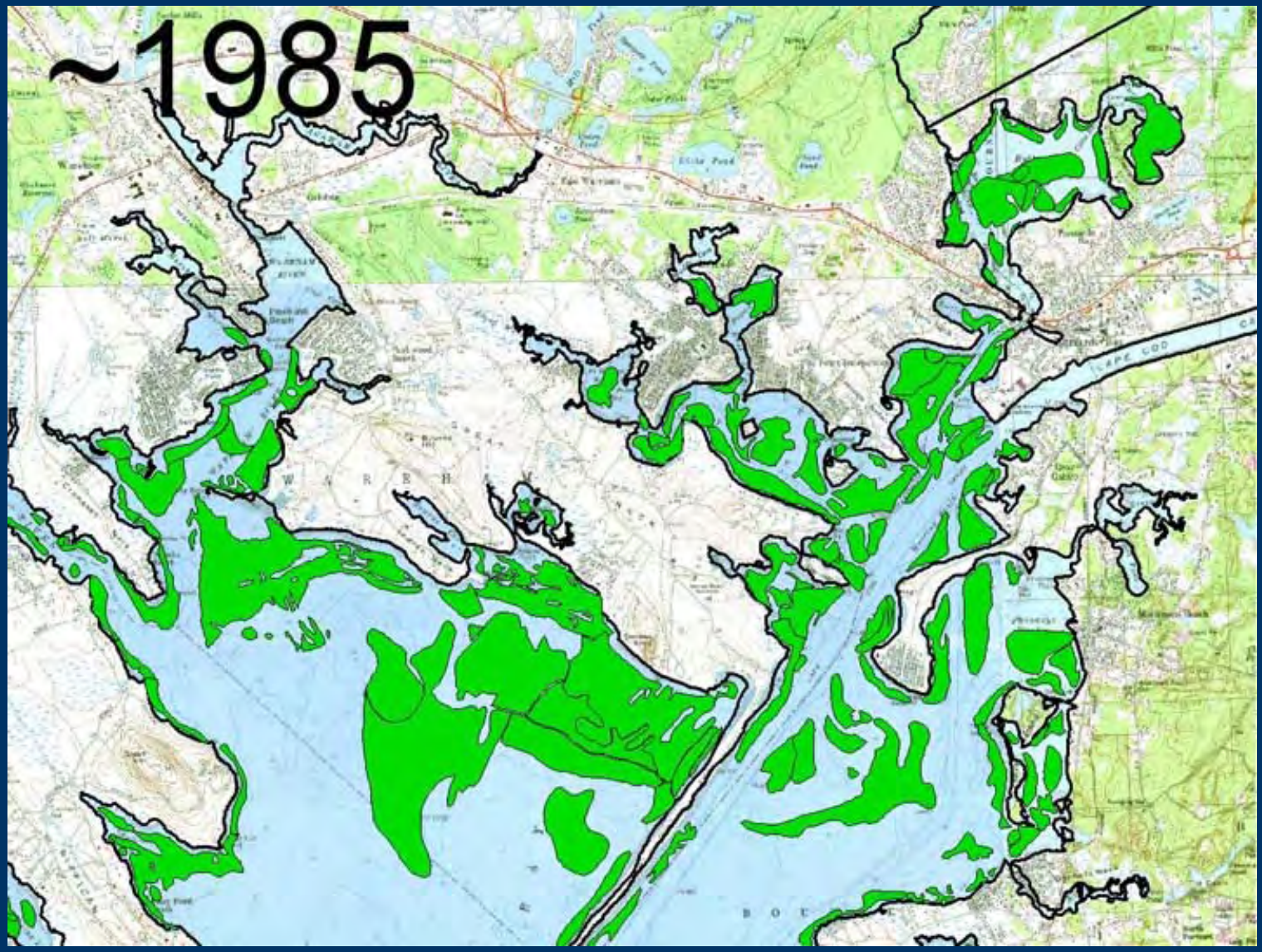
>> Less Oxygen,

>>and even fish kills

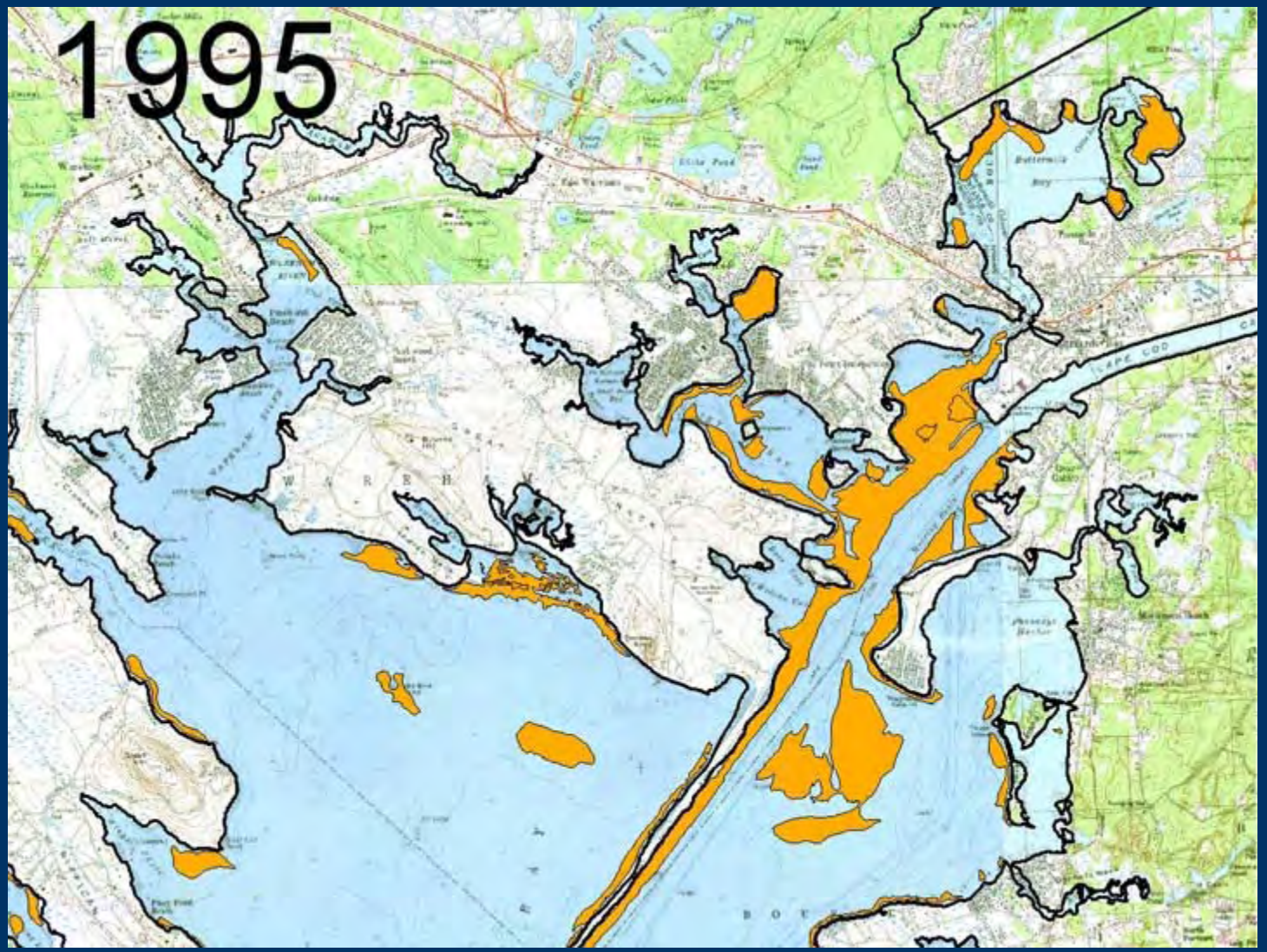
One Problem with Nitrogen: Eelgrass Loss



Dramatic Loss of Eelgrass in Wareham - 1985

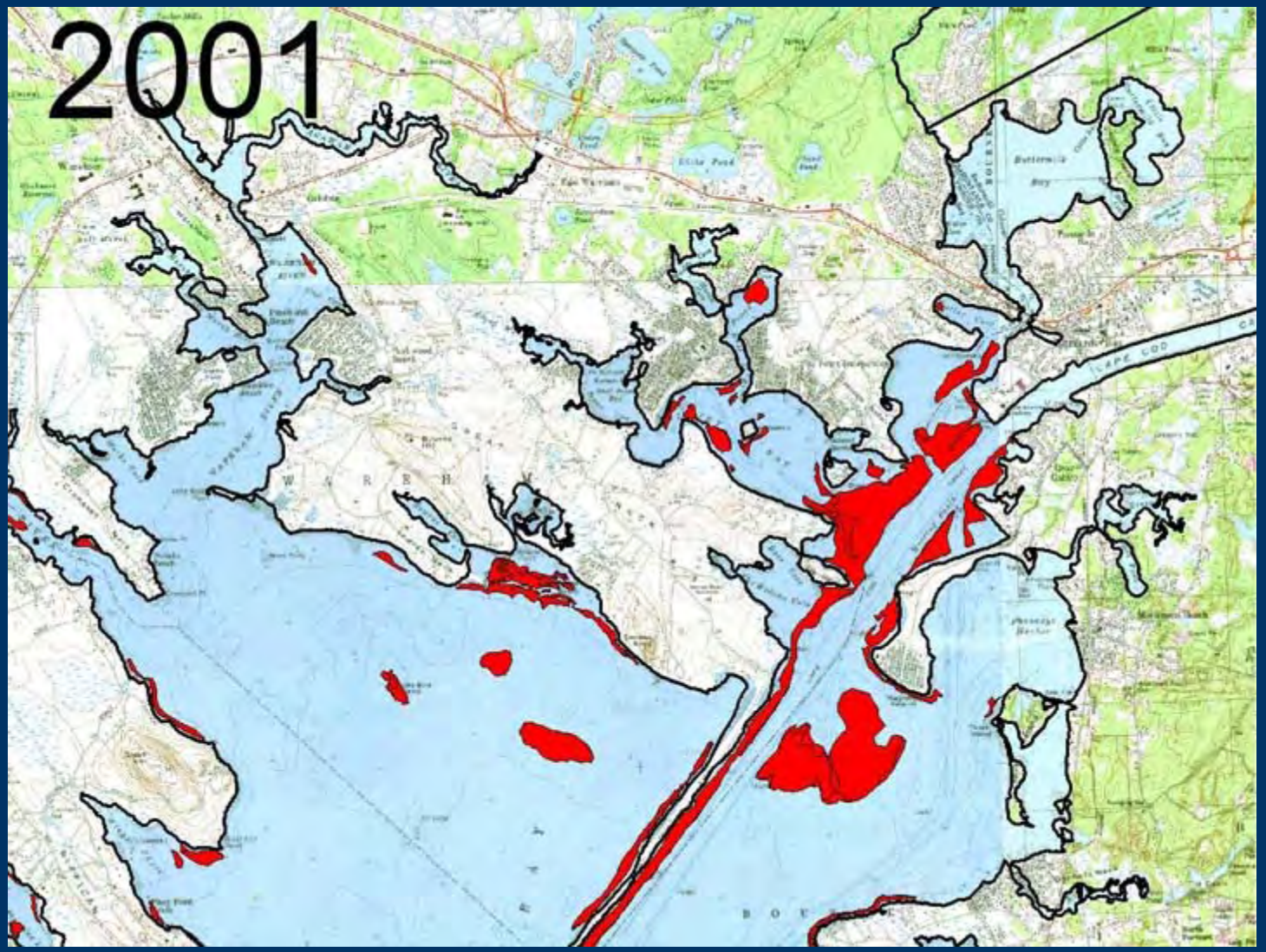


Dramatic Loss of Eelgrass in Wareham - 1995



Dramatic Loss of Eelgrass in Wareham - 2001

3,165 acres to 956 acres
=70% decline



Bacteria Pollution Closes Shellfish beds, Nitrogen Pollution destroys Shellfish Beds

- Shellfish die, are smothered by algae
- No eelgrass or good bottom habitat
- Bottom like Black Mayonnaise
- Shellfish catch declines, shellfish permits

What's replacing eelgrass? Algae

Little Harbor Beach.
Decay, odor, smothering of animals, nuisance to bathers.

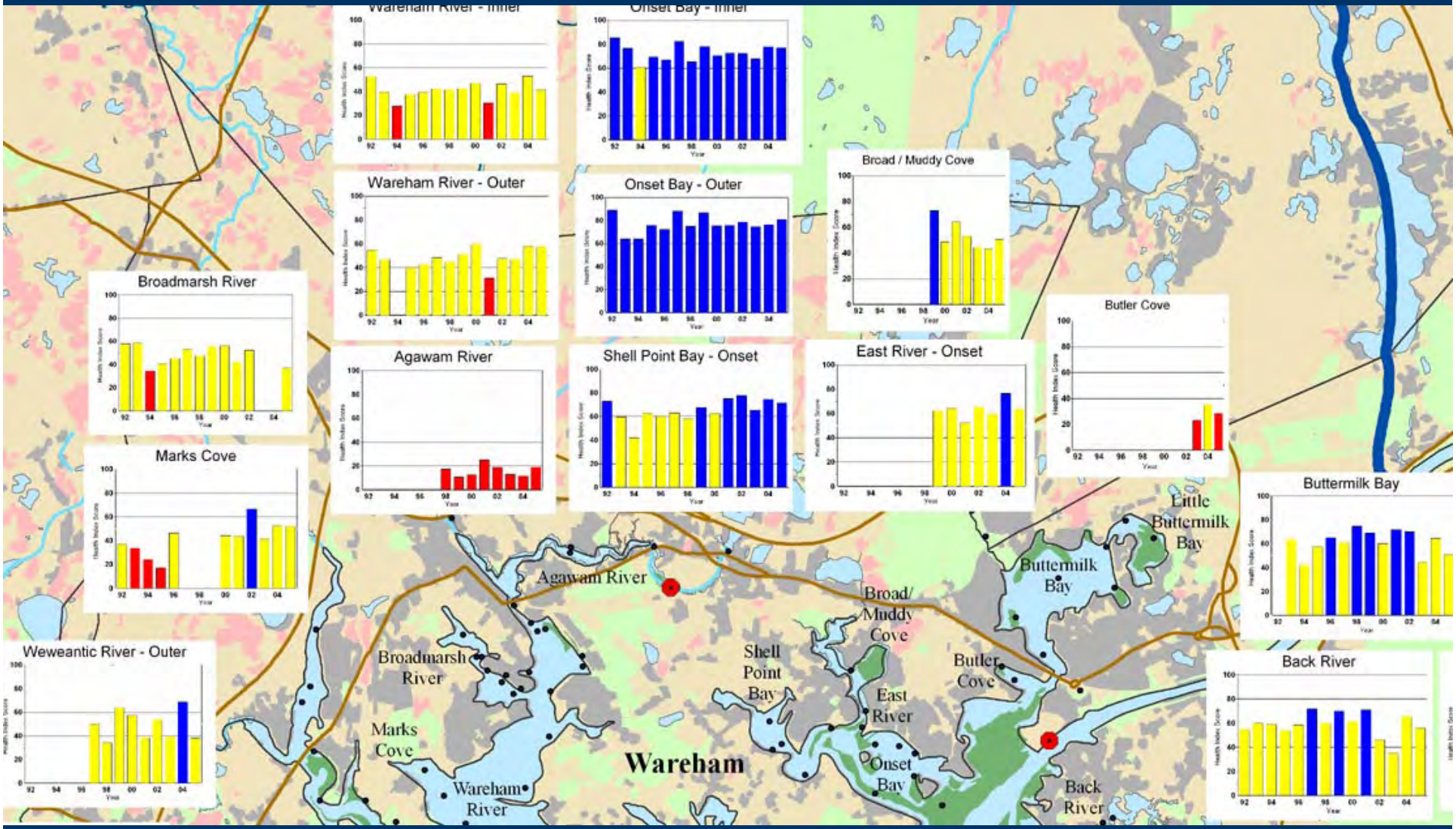
Photo by Dr. Joe Costa

Invasive nuisance algae Codium

Fish Kills in summer during the right conditions

Coalition for BB Water Quality Monitoring

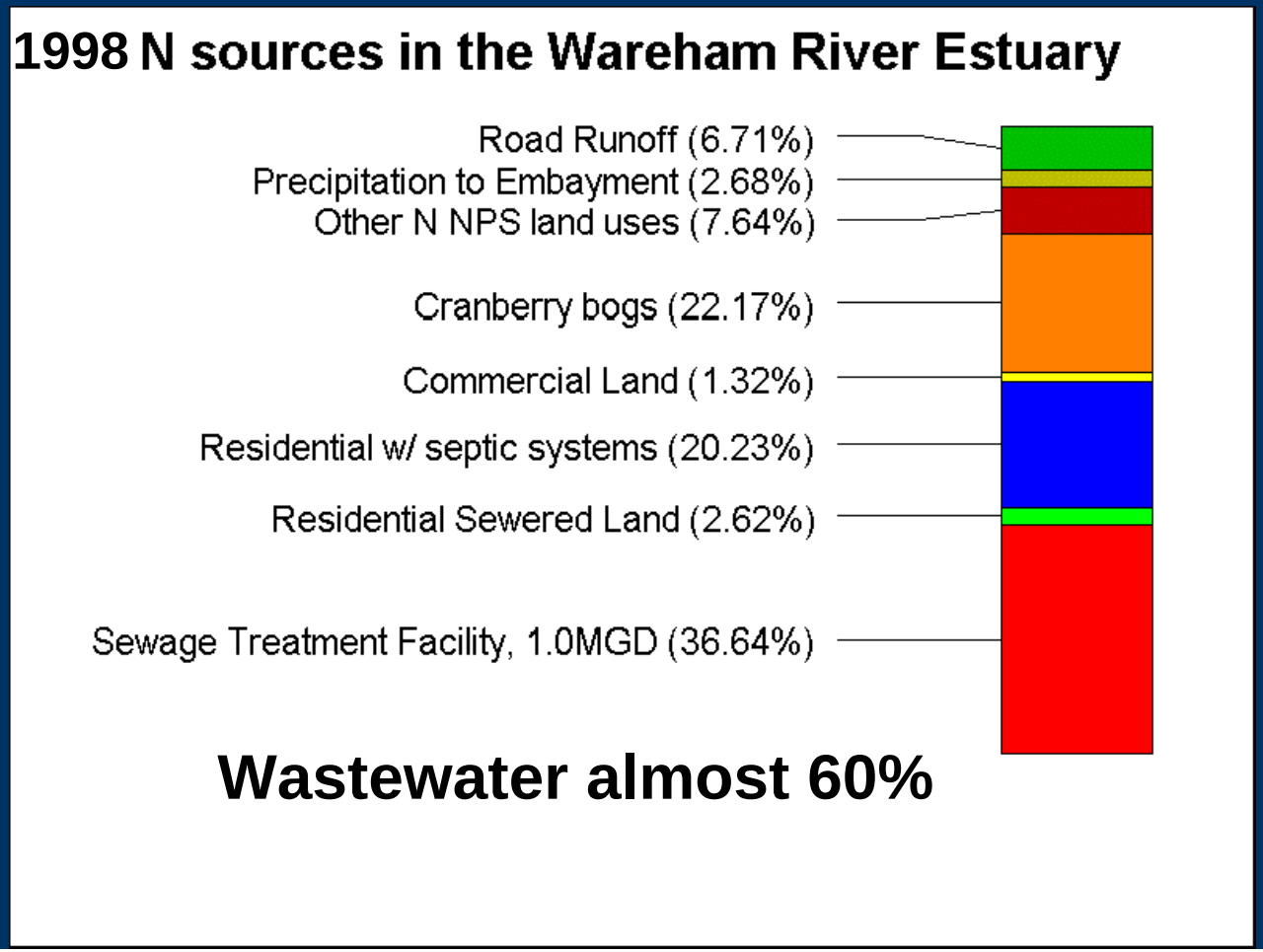
State already classifies much of Wareham's waters as impaired (degraded):
Agawam River Estuary classified as "B" salt waters (only 3 in Buzzards Bay)



Where is most of the nitrogen coming from?

On unsewered lots = septic systems (78%)

(Lawns second largest source)



Feds Required Sewage Treatment Facility upgrade in Wareham to remove N

New Treatment level <4 ppm for 7 months

Expanded sewering

Reducing 50,000+ lbs/yr to the Wareham River.

Eliminating failed septic systems helps reopen shellfish beds.

$27 million dollars for the plant, plus millions for the sewer expansion

Wareham's waters will improve in the next several years

But new development will negate the benefits of sewering and the sewage facility upgrade

- Potential for thousands more new homes in just Wareham alone
- Will add back all the nitrogen you have removed.
- Will rob you of the millions invested to improve water quality.

Who is carrying the financial burden for clean water in Wareham?

The sewer customers.

5,550 current customers,
and another 2,000 soon-to be customers.

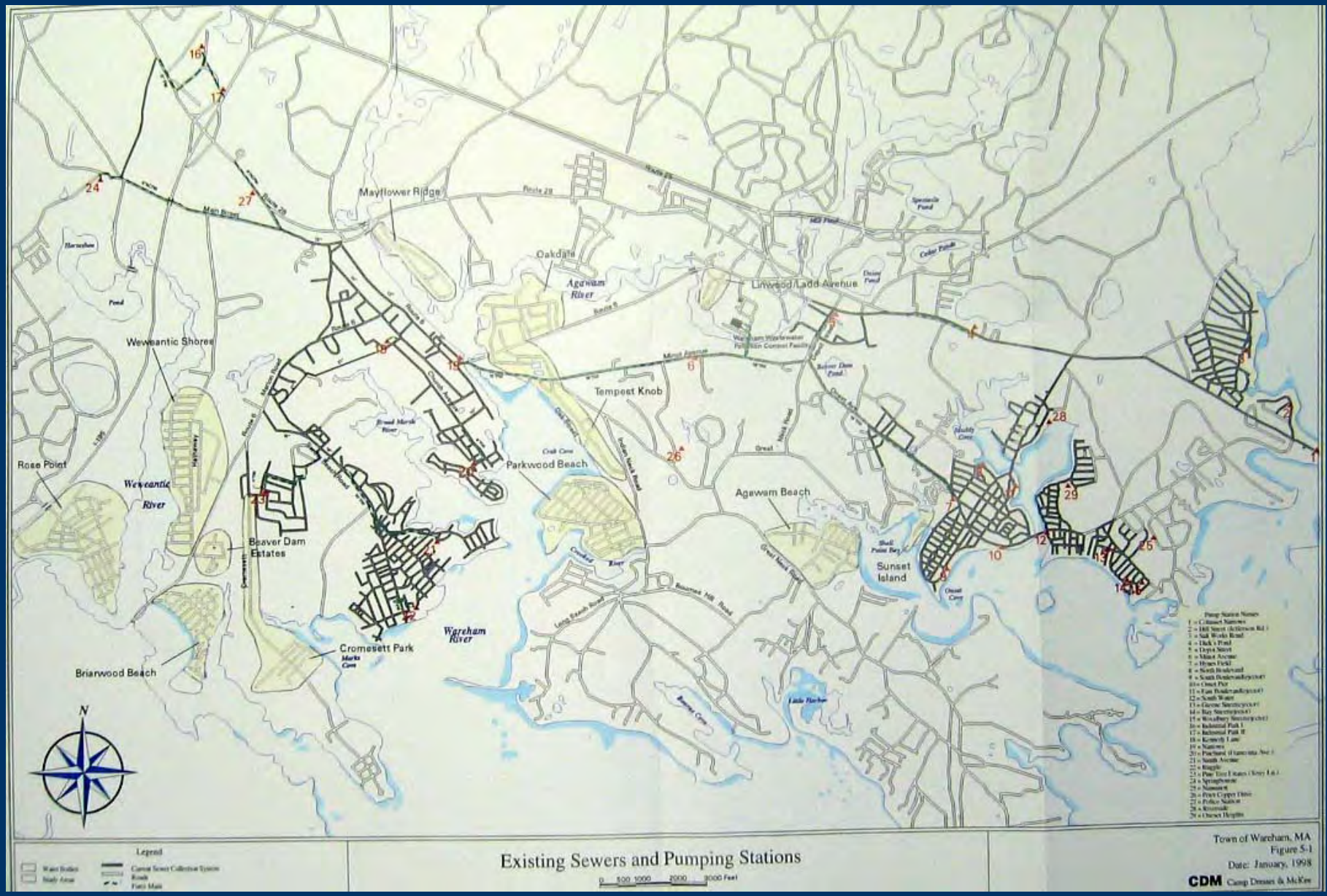
$662 annual sewer fees
$12,000 sewer expansion or betterment fees

Septic system owners have had a free ride.

About 6,000 units with septic? Cost to sewer these much higher)

Town growth potential: 4,000 units?
(Cost of sewering >1/2 acre lots much higher)

Sewered areas



DEP's Massachusetts Estuaries Project will recommend a "Total Maximum Daily Load" (TMDL) for each estuary

Results from the Cape:

The most polluted estuaries will need widespread sewering to restore them.

Falmouth says it will cost $500 million

($80,000 to $100,000 per house)

Chatham says $350 million

($100,000 to $150,000 per house)

MEP Wareham River report due in summer 2007

For Wareham: What will be the cost of additional treatment plant expansion and sewering more dispersed homes?

Wareham's Long Term Solution

Sewer as much as you can.

**(but you could never afford to sewer everything.
Costs per house can skyrocket with lots >3/4 acre)**

Require community-size wastewater treatment facilities on new large development projects.

Better manage nitrogen from the remaining onsite septic systems.

Nitrogen Limits not new:

The Commonwealth of MA now requires Nitrogen Removal in two situations:

Groundwater discharges of more than 10,000 gpd (23 homes, mall, etc.) must already discharge 10 ppm

Since 1997, DEP limits residential growth to **4 bedrooms per acre** in municipal well recharge areas ("Zone 2s")

(**More bedrooms allowed with N removal systems**)

Chapter 40Bs and Nitrogen pollution

Avoid well recharge areas (4 bedrooms per acre).

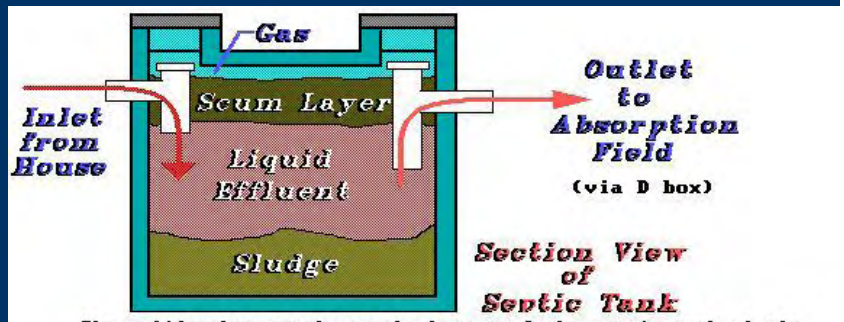
..and are exempt from local environmental regulation.

…<u>But</u> having an objective nitrogen limit standard is a point of negotiation.

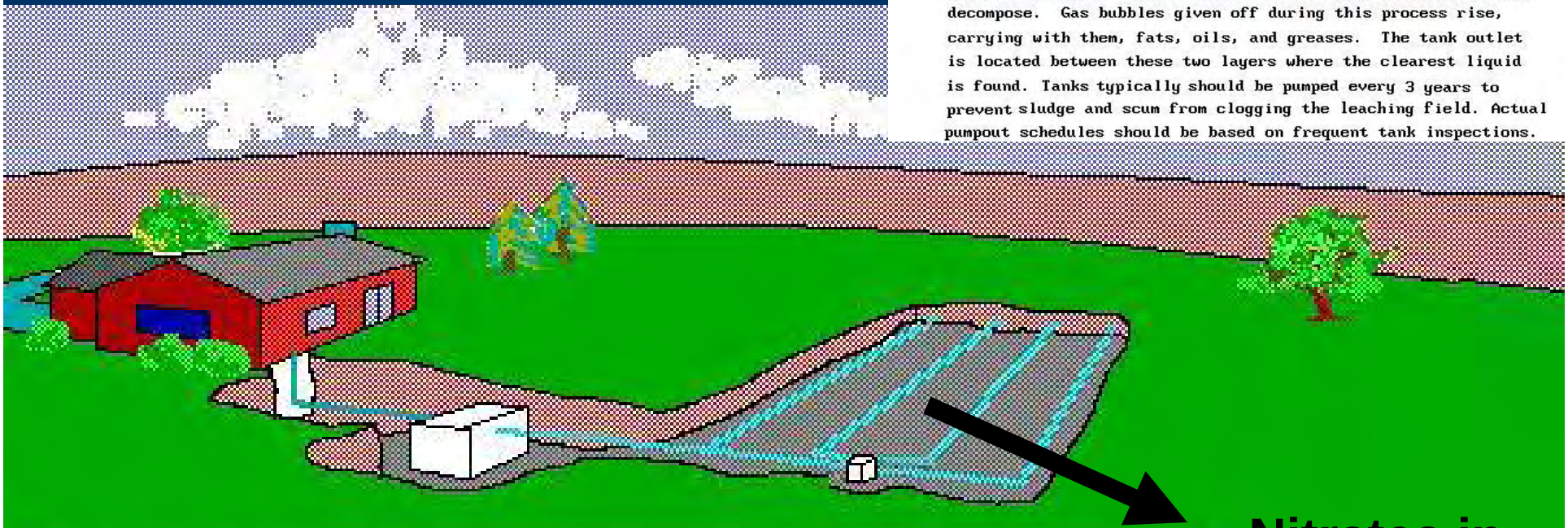
The Town of Falmouth has a nitrogen loading bylaw, and all Chapter 40B projects have N removal systems because this issue is a priority for the town.

Conventional Septic System removes modest amounts of nitrogen

Working number is typically
30-34 ppm reaching groundwater.



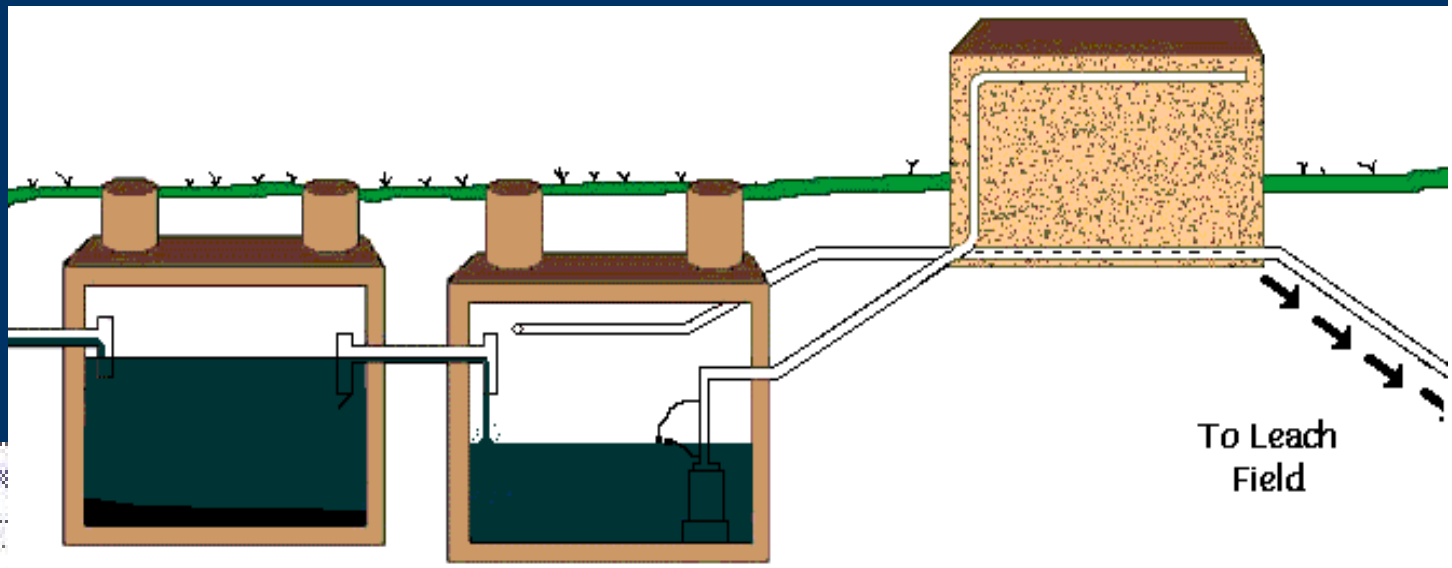
The solids that settle to the bottom of the septic tank slowly decompose. Gas bubbles given off during this process rise, carrying with them, fats, oils, and greases. The tank outlet is located between these two layers where the clearest liquid is found. Tanks typically should be pumped every 3 years to prevent sludge and scum from clogging the leaching field. Actual pumpout schedules should be based on frequent tank inspections.

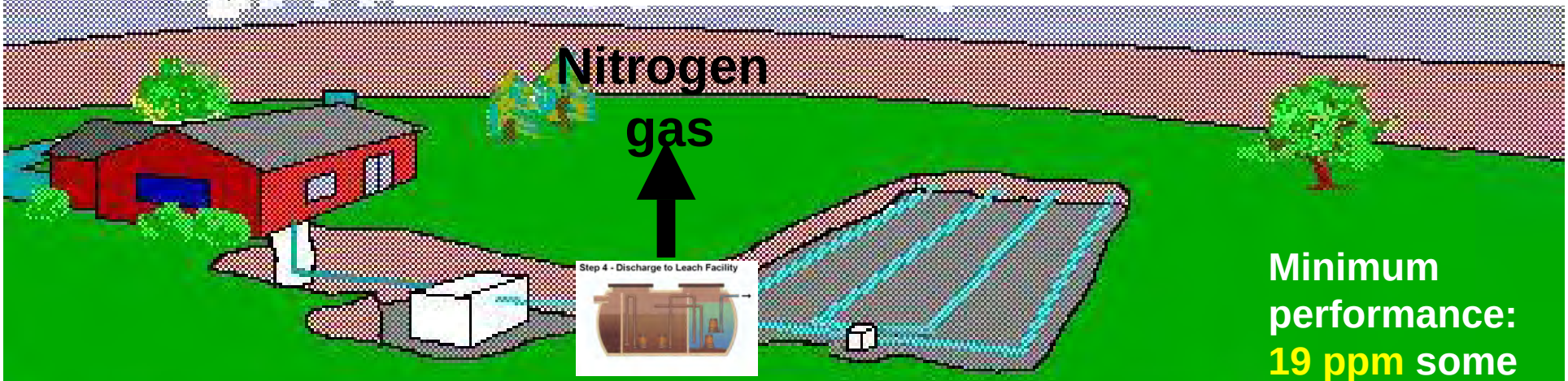


A typical septic system has three main components.

Nitrates in groundwater

N-Removal Septic Systems





On Cape Cod there are 1,100 nitrogen removal septic systems.

Minimum performance: 19 ppm some do better than 14 ppm (>50%).

This bylaw creates a local permit program, under local control

Board of Health, developers, septic system installers note:

Cape Towns allow N removal systems (general and provisional use systems) to be installed under the state "general permit". This means the homeowner does not comply with state nitrogen rules. This gives the town and homeowner more flexibility with the program.

Adopting this bylaw does not make development any easier than under existing regulations.

Alternative Septic System Costs

Cape Cod Prices:

On an “Easy Lot”, a conventional system might cost $10-$12,000

(Complying with just title 5 can be expensive on a “hard lot”)

The cheapest alternatives would add $5,000-$6,000 to a Title 5 on an easy lot.

(an alternative would add to the costs of a title 5 system on a hard lot).

Operation and Maintenance contracts $350+

Electricity use varies $15 per month not unusual (some cheaper, some more expensive)… a refrigerator $16/mo at 11 cents kwh

Important: Cost of a new sewer program for Wareham will be higher than your existing sewer expansion program.

Wastewater N Management General Bylaw 1

General Bylaw: Simple Majority for Approval. Can be amended on the floor.

No town board, officer, or employees thereof shall issue a permit or approval for the installation, repair, or replacement of an onsite wastewater disposal system, or use thereof, that will result in the discharge of a wastewater nitrogen loading rate that exceeds 7.5 pounds per acre.

Sets a nitrogen standard of 2.5 bedrooms per acre or equivalent for commercial permits as standard

Enforced by multiple Boards, but especially building department and Board of Health.

Provisions to encourage “smart growth”, clustering, setting aside open space to meet nitrogen loading goals. (It is ok to save the developer money with clustering and narrower roads if it also protects the environment.)

Wastewater N Management General Bylaw 2

1) Sewered areas, and planned sewered areas are exempt

2) Existing homes unaffected (no matter how many bedrooms)
(except:
-failed systems (usually declared during property transfer)
-or bedroom expansion

3) New construction 4 bedroom on >=1.6 acres unaffected

4) New Construction: Guarantees a 3 bedrooms on any small lot
but require a N removal system.

5) Would require N removal systems on most bigger projects, but encourages creative solutions by developers like open space protection and transfer of development rights.