



6TH ANNUAL
CAPE COASTAL CONFERENCE
DECEMBER 4-5, 2018



Improving Water Quality through Stormwater Management

Three Bays Watershed

April Wobst, Restoration Ecologist



Stormwater 101

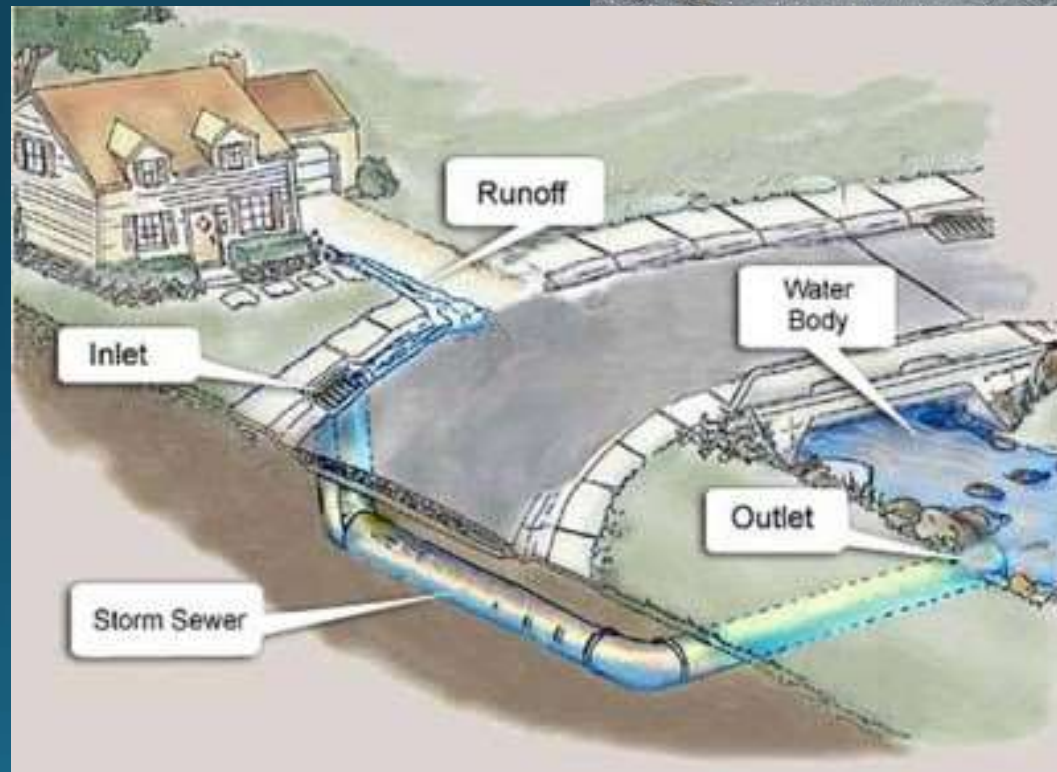
rain



impervious
surfaces



runoff



Why is stormwater a problem?

nutrients

**thermal
stress**

pesticides

trash

salts

**bacteria &
pathogens**

oil

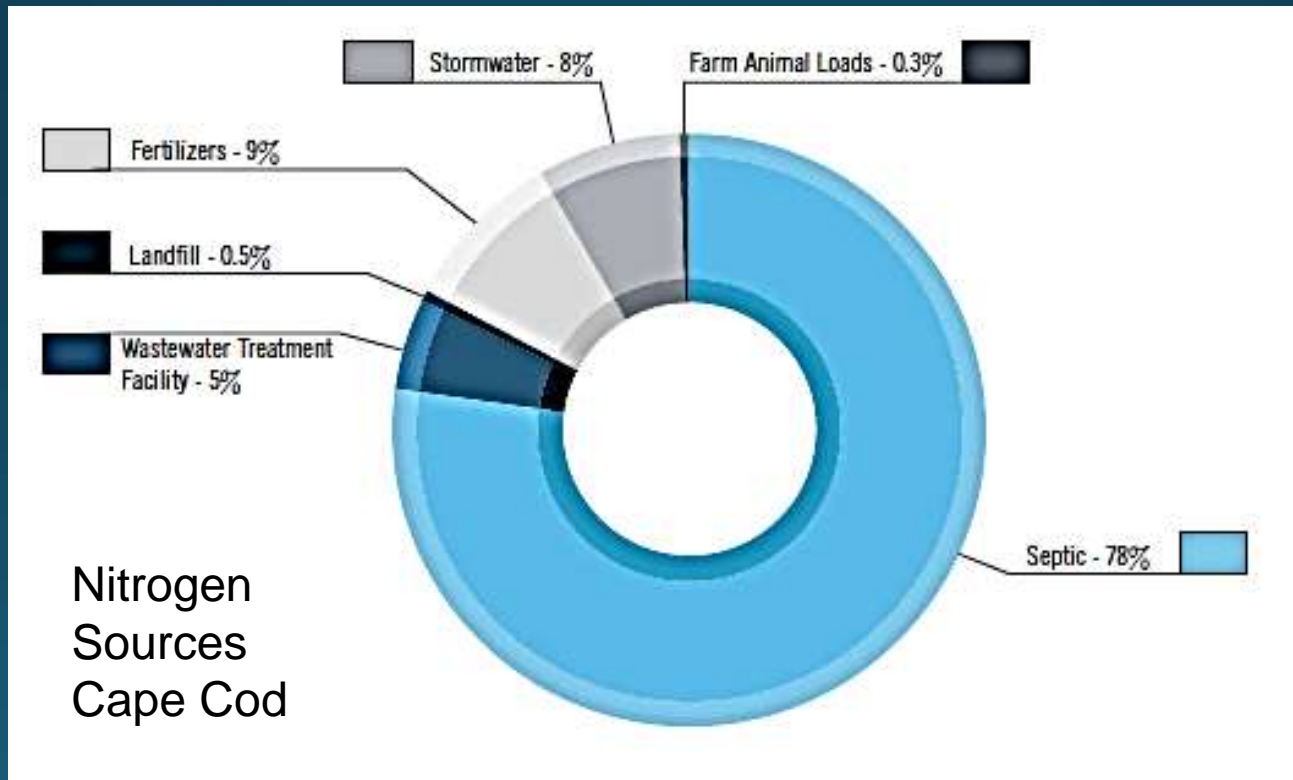
metals

sediment



Nitrogen and Stormwater

On average 8% of nitrogen in estuaries across the Cape is from stormwater runoff, and 9% from fertilizer use.



Negative Effects on the Environment and Community



A "blue economy"

*livelihood and
sustenance brought
forth from the sea*



Conventional Stormwater Management



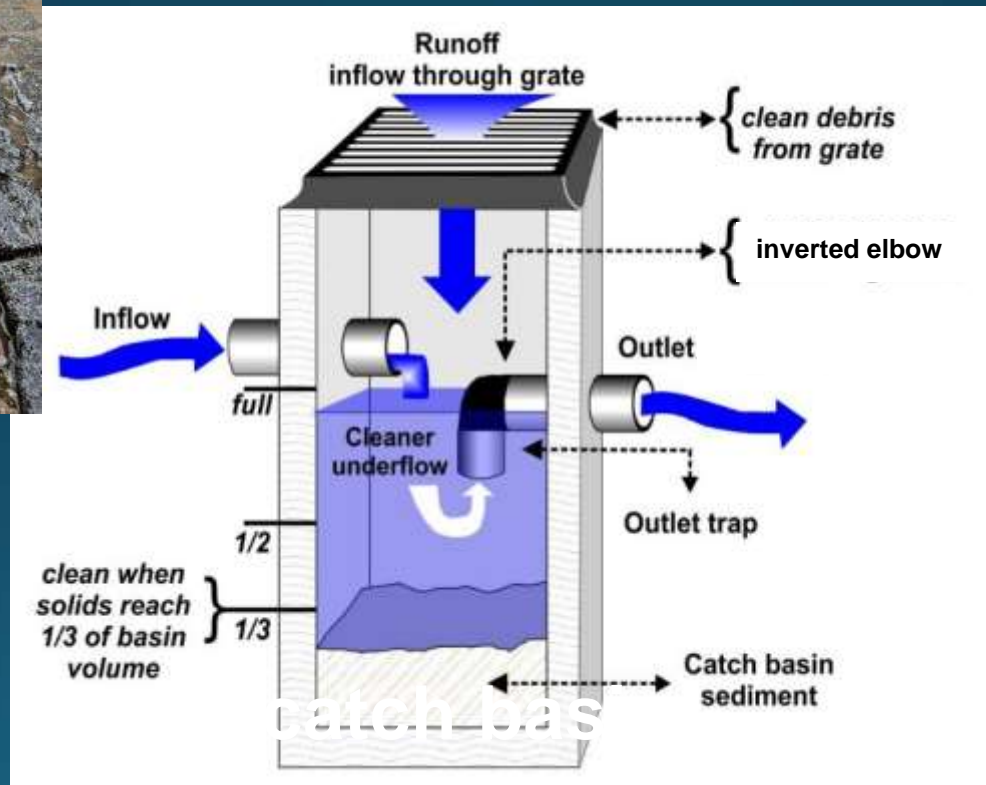
catch basin

roadway
safety

reduce
puddling

pre-
treatment

water
quality is
secondary



Green Infrastructure

Stormwater Management

green

**modeled
after
nature**

**reduces
volume**



**biological
treatment**

**treats
close to
source**

**cost
effective**

Project Overview

A photograph of a sunset over a body of water. The sun is low on the horizon, creating a bright, golden glow that reflects on the water's surface. The sky is filled with dark, dramatic clouds. In the foreground, the dark silhouette of a boat's bow is visible, pointing towards the horizon.

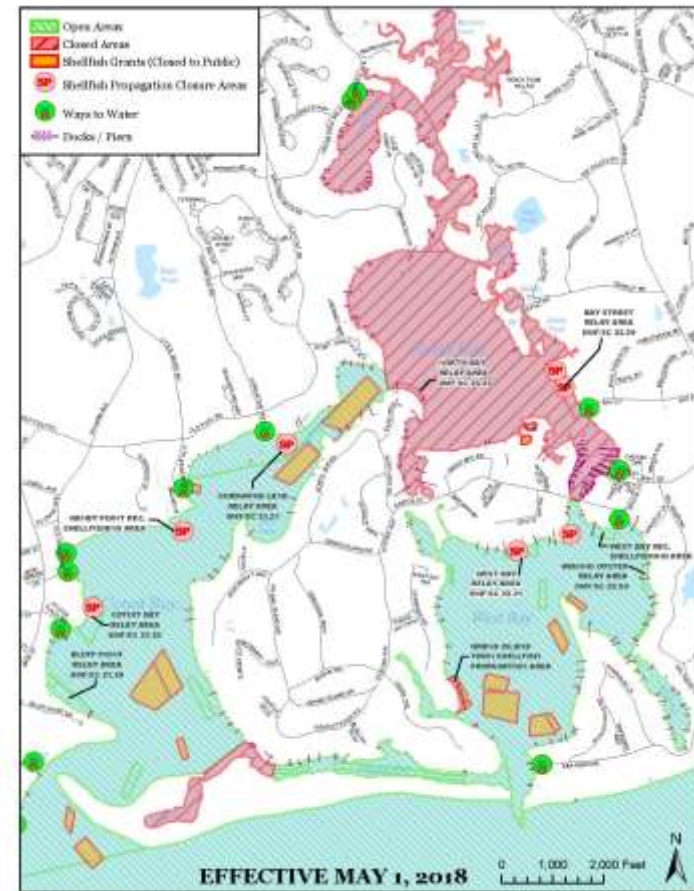
5 Year Project

Total Cost: \$1.2 million

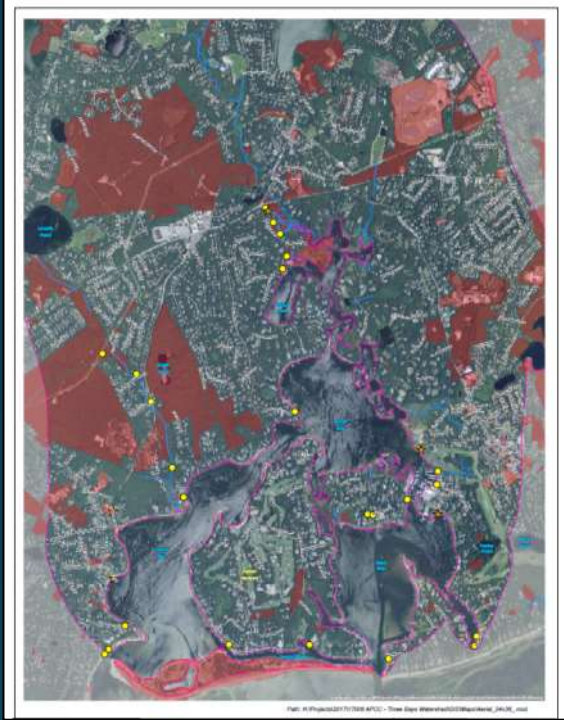
\$941,576 from state and federal grants

\$301,045 from project team match

Three Bays Impaired by Excess Nitrogen and Bacteria

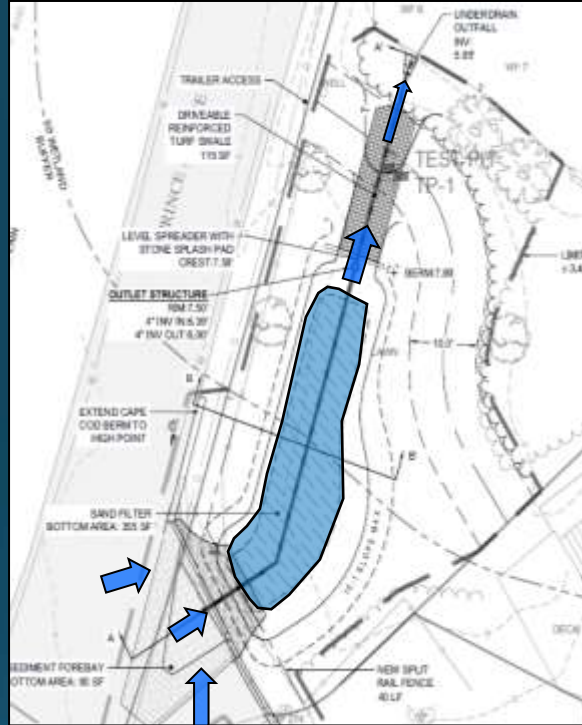


Approach



Assessment and Prioritization

Phase 1: March – Aug. 2017



Design and Permitting

Phase 1: 2017 – 2018

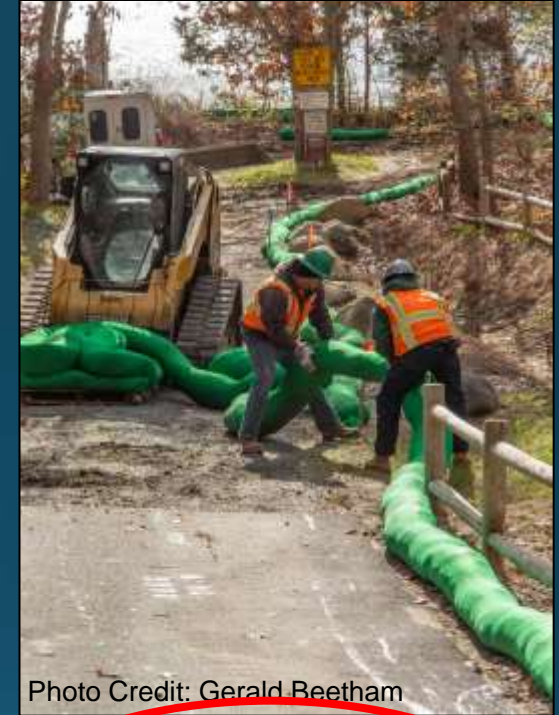
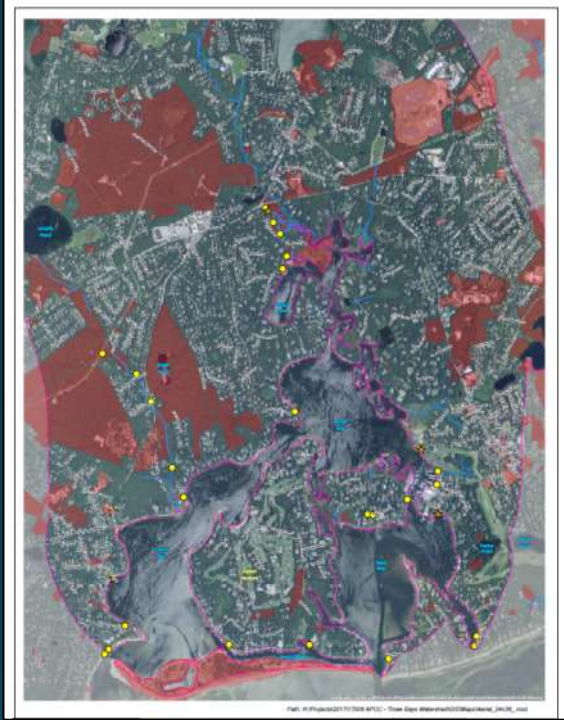


Photo Credit: Gerald Beetham

Installation

Phase 1: October 2018 –
January 2019

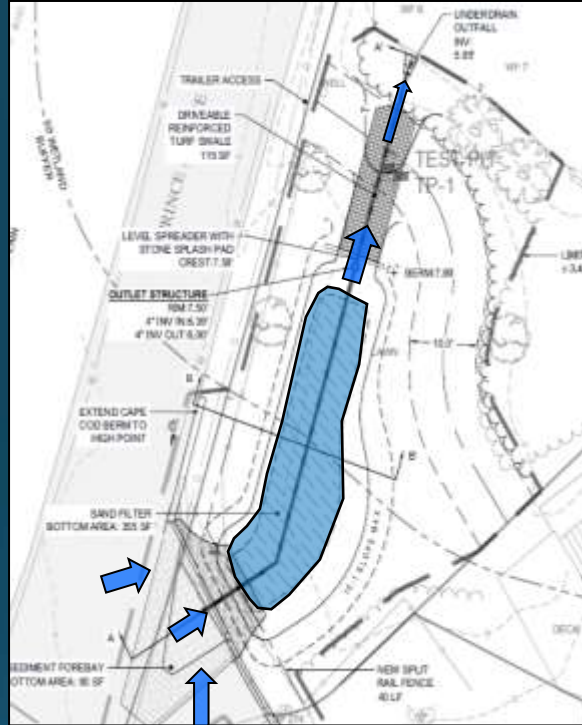
Approach



Assessment and Prioritization

Phase 1: March – Aug. 2017

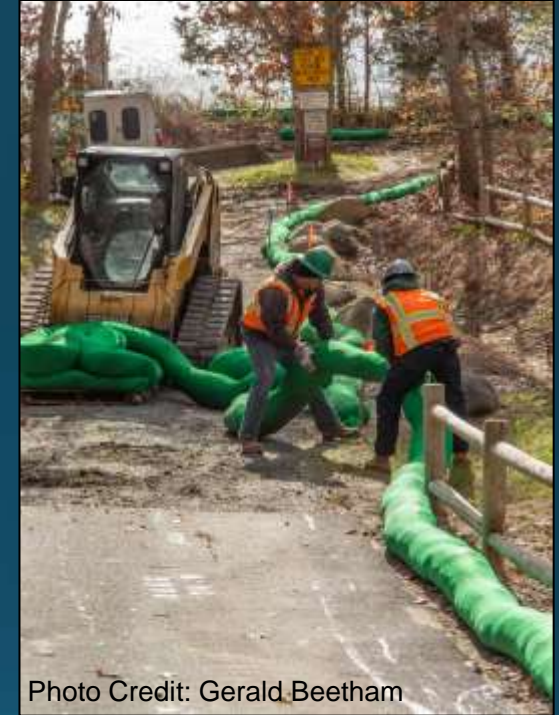
Phase 2: September 2018 – February 2019



Design and Permitting

Phase 1: 2017 – 2018

Phase 2: 2019



Installation

Phase 1: October 2018 – January 2019

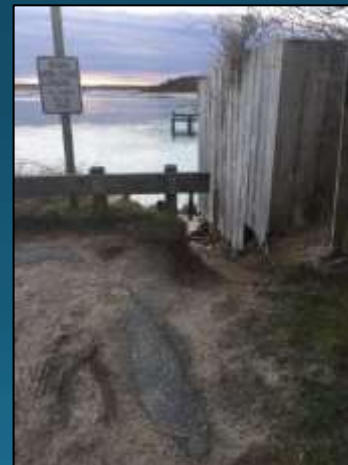
Phase 2: Spring 2020



Project Area

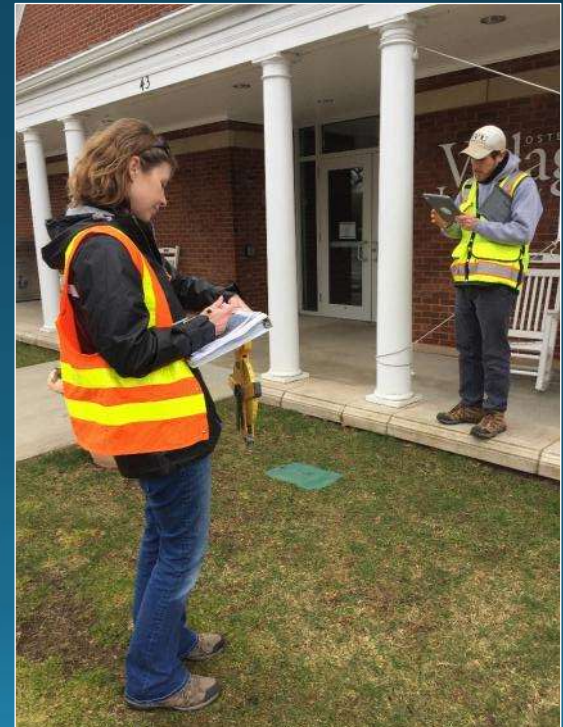
2018
20 Sites

2017
42 Sites



Field Assessment

- Collect data on iPads loaded with existing info
- Visit pre-identified areas
- Talk to the experts/locals



Prioritization of Sites

- **Pollution Removals**
- **Cost**
- **Ease of Implementation**
- **Additional Benefits:**
 - Public Education
 - Direct benefits to the key resources? (shellfish beds, beaches, fish, etc.)
- **Input from Public**



SHORT-TERM RESULTS

- Complete design and permitting for 8 BMPs
- Install a minimum of 4 BMPs
- Eliminate 70-85% of bacteria and 55% of nitrogen from runoff at retrofit sites
- Provide education and outreach to public and stormwater managers

LONG-TERM GOALS

- 50% reduction in beach and shellfish closures
- Reduction of algal blooms and fish kills
- Improve habitat for fish, shellfish and wildlife
- Support commercial and recreational uses
- Develop project model that can be transferred

Education and Outreach

- Rain Garden Workshop
- Cotuit Stormwater Walking Tour
- O&M Workshops
- Educational Videos
- Eco-landscape Lecture Series
- Green Your Yard Campaign
- Public Meetings



Photo Credit: Horsley Witten Group



What You Can Do

1. Reduce use of fertilizers and pesticides
2. Reduce area of lawn
3. Install native plants
4. Mulch leaves and grass clippings
5. Pick up pet waste
6. Only rain down the drain
7. Rain barrels or gardens
8. Support town projects and funding request to complete stormwater work



Questions?

