FALMOUTH MOVES FORWARD ON NITROGEN
By Jill Holdren and Christopher Neill

Falmouth has made important progress in its efforts to address the nitrogen problem threatening its coastal and fresh waters this fall with two significant accomplishments:

• In September, the Town submitted the Comprehensive Wastewater Management Plan (CWMP) to the state for review.

• At the November 13 Town Meeting, a bylaw aimed at reducing nitrogen runoff from fertilizer use was passed with overwhelming support.

The CWMP is the document that will guide the overall waste management strategy for Falmouth for the coming two decades. It is a product of many years’ work by numerous committed citizens and professionals. The plan lays out a broad roadmap for meeting the Nitrogen Total Maximum Daily Loads (TMDLs) in our estuaries and salt ponds (as determined by the Massachusetts Estuaries Project) with the goal of not only protecting them from further degradation but ultimately restoring them to full ecological health.

Importantly, the plan will be implemented using the concept of adaptive management, in which the specific strategies, technologies and approaches that are used throughout its lifetime can change (with state approval) as new technologies emerge, technologies become more cost-effective and are proven efficacious, new codes and regulations arise, or environmental monitoring demonstrates how coastal water quality is responding to management efforts.

The CWMP outlines strategies for managing wastewater and nitrogen for the Town from 2015 to 2035, within the context of a forty year outlook (ending in 2055).

Wastewater and Nutrient Management Vision as articulated by the Selectmen:

“By comprehensively and effectively managing its wastewater and other nutrient sources, Falmouth will improve water quality, protect public health and enhance the town’s economic vitality. Falmouth will offer its residents, visitors and future generations healthy waters in order to sustain the town’s property values and vibrant economy.”

The primary components of the plan are:

1. Demonstration Projects of Non-Traditional Wastewater and Nitrogen Management Technologies and Approaches, including:
   • Shellfish cultivation projects
   • Inlet widening (Bournes Pond and/or Little Pond)
   • Composting toilet demonstration projects
   • Eco-toilets (e.g., urine-diverting) demonstration projects
   • On-site denitrification systems.

2. Expansion of the Blacksmith Shop Wastewater Treatment Facility in phases both to accommodate a higher volume of wastewater as well as to incorporate treatment improvements. An essential component of this expansion and upgrade is determining where the treated water will go since West Falmouth Harbor cannot accommodate significant additions of even highly treated water without suffering adverse consequences. As of now, no suitable discharge sites have been identified. One possibility that is under discussion is the construction of an ocean outfall, which would bypass the problem of identifying a discharge site that does not impact already compromised watersheds by discharging the treated water into an offshore zone where its environmental impacts...
MORE ON SEA LEVEL RISE & EFFECTS OF CLIMATE CHANGE ON FALMOUTH  
By S. Jeffress Williams

Previous articles in the FACES newsletter described the dynamic nature of the coast of Cape Cod and particularly Falmouth, dominated by both long-term and storm-event erosion, opening and closing of tidal inlets, sediment transport over roadways, and widespread and frequent flooding.

The climate is warming and changing on a global scale but the effects are varied and have region-specific impacts. Scientific evidence over the past three decades overwhelmingly shows that the changes are due to dramatic increases in carbon dioxide and other ‘greenhouse gases’ in the atmosphere caused by the burning of fossil fuels and other human activities. Coastal scientists agree that coastal communities, especially low-elevation highly vulnerable ones like Falmouth, will be faced with much greater risks from sea level rise and major storms than those experienced during the past 50 years. The impacts of climate change are especially dire for coastal areas that rely on tourism and recreation and depend on wide and attractive sandy beaches and expensive real-estate for much of the tax base and economic sustainability.

The devastating impacts of Hurricane Sandy in late October 2012 on the New Jersey and New York coastal regions, which caused an estimated $70+ billion in damages, $30 billion of that in New York City alone, should be a wake-up call to Falmouth to begin seriously planning for such events. Falmouth should follow-up on guidance from the State Office of Coastal Zone Management and develop town-wide comprehensive plans for adapting to the sea level rise and more intense storms that are an inevitable part of our future.

Sandy was a massive tropical storm 900 miles in diameter with record low central barometric pressure and high sustained winds. It was three times larger than Hurricane Katrina, which devastated New Orleans and the Louisiana-Mississippi coast in 2005. Early indications are that Sandy’s magnitude was enhanced by the record warm temperatures of the Atlantic Ocean and the Gulf Stream Current, its arrival onshore during a high tide, and the fact that sea level has risen 50% faster during the past two decades than in previous decades due to ocean warming and melting ice sheets.

Moreover, due to natural land subsidence, Falmouth, along with much of the New England–mid-Atlantic region, is actually experiencing much higher relative sea

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FACES News

Winter 2012/2013

Join FACES Today!

FACES is a 501c3 non-profit organization that is mainly supported by member dues and donations from neighborhood associations, community organizations, local businesses, and concerned citizens.

With your help, FACES can continue to work to protect and preserve our estuaries, bays, saltponds and freshwater ponds and waterways.

MEMBERSHIP DUES

Individual $20
Family $25
Organization $40
Supporting $50
Benefactor $100

Dues/donations may be sent to:

FACES
PO BOX156
Falmouth, MA 02541

Or pay or donate online:
www.facesfalmouth.org

THANK YOU FOR YOUR GENEROUS SUPPORT!

Donations and dues to FACES are always tax-deductible.

FACES RECEIVES STORMWATER EDUCATION GRANTS

Stormwater runoff accounts for around 10% of the nitrogen entering Falmouth’s coastal waters, which means that it’s a significant source of pollution, and one that each of us can work to reduce through changes to the way we do things in and around our homes and workplaces.

FACES received two grants this fall to support a stormwater education campaign in Falmouth. The first was from the Sounds Conservancy, a part of the Quebec-Labrador Foundation; the second was from the Cape Cod 5 Foundation. FACES extends a sincere thank you to these foundations for supporting our work to protect Falmouth’s fresh and coastal waters.

The funds received will be used to develop public outreach and education materials to expand people’s awareness of simple, often free, and always cost-effective (when compared to increased sewerage) steps they can take as individuals, businesses and institutions to reduce their contributions to the nutrient and other pollution destroying our salt ponds and estuaries.

A FACES team is working with the Falmouth Department of Public Works (DPW) to identify effective and exciting ways to disseminate information to citizens of all ages.

As part of the town’s stormwater reduction efforts, DPW’s AmeriCorps volunteer will be coordinating a series of storm drain stenciling events this spring. Drains are stenciled with ‘No Dumping: Drains to Waterway’ as a reminder to people to avoid dumping leftover paints, chemicals, motor oil, soaps, trash, yard waste or anything else into storm drains or streets since our storm drains empty directly into our precious and highly threatened fresh and coastal waters.

Drain stenciling events are great ways for neighbors to meet each other and learn more about how they can prevent stormwater runoff. If you’re interested in participating in one or more of these stenciling events let us know by contacting FACES at info@facesfalmouth.org or DPW AmeriCorps volunteer Sara Cawley at scawley@falmouthmass.us.

SEWER SOCIALS

If your community organization, business, church, neighborhood association or school is interested in learning more about what’s going on with wastewater and water quality in Falmouth, contact us to set up a sewer social.

We’ll give an overview of the big issues and you’ll have a chance to ask questions about what individuals and organizations can do to contribute to solutions.
would likely be fewer. Ocean outfalls are not currently legal here, because the Massachusetts Ocean Sanctuaries Act prohibits discharge of treated (or untreated) wastewater in all of the ocean waters surrounding Falmouth. Acquiring a variance would require that the town or region prove it has no reasonable alternatives for solving its wastewater problem.

3. Phased Construction of the Wastewater Collection System (WCS). While in an earlier version of the CWMP Phase 1 and 2 included sewage in each major peninsula (A through E on the map on p. 4), the current version recommends only sewage portions of Davis Straits, Maravista, and Falmouth Heights in the Little Pond Watershed. The hope is that the projects will yield positive results and that some of these technologies will be more cost effective and lower impact options than sewer.

4. Phased Construction of Treated Water Recharge Facilities. This element involves a pump station at the Blacksmith Shop Rd. WWTF and a treated water force main to new recharge locations.

5. Non-Wastewater Management Components. The Town will also explore and develop a series of other nitrogen reduction strategies, including management of stormwater and fertilizer usage, inlet widening, watershed modifications (such as constructed ponds and wetlands), shellfish cultivation, permeable reactive barriers, eco-toilets and on-site denitrification systems.

While stormwater runoff and fertilizer are each estimated to contribute only around 10% of the total controllable nitrogen influx to coastal waters (with some variations depending on watershed), reducing their N contributions is likely to be a cost-effective way to help achieve TMDLs and reduce the need for some amount of additional (and expensive) sewer or other higher cost technologies in the future.

In 2025 or so, existing and new technologies, strategies and regulations will be reviewed and a new CWMP will be initiated to ensure the town’s coastal water quality over the next twenty year period (2035 to 2055).

FERTILIZER BYLAW

The second major step the town took this fall to address the nitrogen issue is the passage of a fertilizer bylaw, which restricts fertilizer use by all residents, businesses and institutions. The bylaw, drafted by the Water Quality Management Committee and approved with some amendments by the Board of Selectman, received strong support at Town Meeting on November 13.

About 10% of the nitrogen entering our salt ponds and estuaries is from fertilizer use. While reducing or eliminating fertilizer use will not solve the nitrogen problem, it can, at no cost, reduce the amount of sewer or other costly strategies that must be employed to meet our nitrogen TMDLs.

The box on the next page illustrates the main components of the fertilizer bylaw. Exemptions to these restrictions include:

• Application of nitrogen for agriculture and horticulture uses
• Application of fertilizer to golf courses (golf courses must comply with recommendations on the type of fertilizer used)
• Application of nitrogen to gardens, including vegetable and flower, trees, shrubs and indoor applications including greenhouses

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FERTILIZER BYLAW from page 5

- Application of nitrogen for the establishment of new vegetation in the first growing season, or repairing of turf in the first growing season, after substantial damage.
- Use of compost or other similar materials that are primarily organic in nature and are applied to improve the physical condition of the soil.

In addition to restricting fertilizer use seasonally and geographically, the bylaw also makes a series of additional recommendations for minimizing fertilizer’s impacts to our fresh and coastal waters, including:

1. As little nitrogen fertilizer should be used as possible.
2. Any single application of N should be less than or equal to 0.5 pounds per 1000 square feet and not more than 1.0 pounds per 1000 square feet (cumulative) per year.
3. If N is applied, it should be organic, slow-release, and water-insoluble.

We at FACES hope that Cape Codders will begin to reject lush green fertilizer-dependent lawns and embrace the equally attractive natural landscapes that will help to reduce our nitrogen footprints.

For those who are reluctant to forfeit their lawns altogether but are committed to eschewing fertilizer, it is noteworthy that atmospheric deposition provides about 0.25 pounds of N per 1000 square feet per year annually, which is sufficient to fertilize a lawn, if not to the lush green standard to which people are accustomed.

Lawns Aren’t the Only Option. Photo by Jill Holdren

FERTILIZER BYLAW AT A GLANCE

- The application of fertilizer is prohibited between October 16th and April 14th.
- Fertilizer may not be applied to any impervious surface including parking lots, driveways, roadways, sidewalks or ice.
- Fertilizer may not be applied directly before or during a heavy rain event.
- The application of nitrogen/fertilizer is prohibited within 100 feet of Resource Areas as defined in Falmouth’s Wetlands Regulations (i.e., any kind of water body or wetland).

Not only is reducing or, better yet, eliminating your fertilizer use a simple and cheap way to help solve our nitrogen problem, but it’s also a relatively quick one. The Marine Biological Lab in Woods Hole acquired a building two years ago at which time students measured the amount of nitrogen in water leaching from the soil. Measurements were around 7mgN/l, indicating the lawn had been regularly fertilized. The students re-tested the water after one year and found levels had dropped to significantly less than 1 mgN/l.

FACES has long promoted a reduction in fertilizer’s contributions to nitrogen pollution through its award-winning Falmouth Friendly Lawns program, launched in 2005. We applaud the town for the passage of the bylaw and encourage all of Falmouth’s citizens to do their part to reduce their N footprints by either eliminating their fertilizer use or reducing it and adhering to the guidelines outlined in the bylaw.
level rise rates than the global average.

Fortunately, Falmouth received just a glancing blow from Hurricane Sandy with some high winds, minimal rainfall and modest surge flooding as it came ashore in New Jersey hundreds of miles to the west. Coastal erosion, overwash and flooding were common in many parts of town as seen in the photos on p. 2 and 7, but the impact and damage could have been much worse for Falmouth and other parts of the Cape had Sandy struck a more direct hit.

As Sandy moved north along the mid-Atlantic coast from North Carolina a large atmospheric high pressure system was positioned over Greenland. This high redirected Sandy’s path and deflected it to the northwest, toward New Jersey, in a most unusual storm-track pattern. Otherwise, Sandy might have taken a more traditional track as it moved up the coast and curved eastward, bringing it more on a course for eastern Long Island or Cape Cod, similar to the tracks of the 1938 Hurricane or Hurricane Bob in 1991. The result for Falmouth with a more direct hit from Sandy might have been sustained hurricane-force winds, rainfall of 10 inches or more, and storm-surge elevations of 10 to 15 feet along the south coast and even more, 15 to 20 feet, in the upper reaches of Buzzards Bay, due to the funnel shape of the Bay.

Clearly, Falmouth and the rest of Cape Cod ‘dodged a bullet’ with Sandy, but major storms like Sandy are in Falmouth’s future. In addition, sea level will continue to rise, flooding streets, docks and lots with increasing frequency, especially at spring high tides.

While sea level rose about 10 inches in the last century, it is projected to rise as much as five feet by the end of this one.

The impacts of climate change will also have impacts on waste-water treatment systems and drinking water supplies and must be factored into the Town’s long term plans. A good start would be for Falmouth to participate in the Federal Emergency Management Agency’s (FEMA) National Flood Insurance Program’s (NFIP) Community Rating System (CRS). This is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements.

As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: 1. reduce flood damage to insurable property; 2. strengthen and support the insurance aspects of the NFIP, and 3. encourage a comprehensive approach to floodplain management.

If Falmouth were to meet FEMA’s CRS requirements, premiums on individual flood insurance policies could be reduced from 5% to as much as 45%, which could be a significant annual savings for each property owner holding a policy.

Most importantly, Falmouth would be much better prepared for adapting to the inevitable impacts of climate change.

S. Jeffress Williams is a Coastal Marine Geologist He is Scientist Emeritus with the USGS in Woods Hole and an affiliated faculty in the School of Ocean and Earth Science and Technology at the University of Hawaii, Manoa.
This fall, FACES participated in the “Environmental Summit” organized by the Association for the Preservation of Cape Cod (APCC). The Summit is described here by APCC Executive Director Ed Dewitt.

This past September, APCC convened a summit of Cape Cod’s land trusts, water quality organizations and other federally tax exempt environmental nonprofit groups to discuss the region-wide problem of wastewater.

This first-of-its-kind summit brought together an impressive 36 organizations from across the Cape with the goal of reaching consensus on a set of core principles centered around the impacts of wastewater on Cape Cod’s water resources. Attendees drafted a “Cape Cod Environmental Summit Consensus Statement” that identified wastewater as “the region’s number one environmental priority,” and which said that “immediate action on the part of government, business, and every citizen” was needed to find effective solutions to the problem.

The consensus statement was ratified by FACES in December of 2012 and is in the process of being ratified by the other participating organizations.

Summit participants agreed on the following fundamental findings:

- Nutrients and wastewater threaten the quality of Cape Cod’s groundwater, ponds and coastal waters.
- There is technically sound scientific evidence of nutrient enrichment in our groundwater, coastal waters and ponds.
- Excess nutrients from wastewater and other sources are contributing to the decline of water quality on Cape Cod.

Environmental organization representatives adopted basic principles that underscore the importance of this issue to Cape Cod, agreeing that both fresh and salt water resources define the character and quality of life on the Cape, and that the Cape’s economy is inextricably linked to the environmental health and productivity of its water resources.

The consensus statement includes a 10-point set of principles for addressing the challenge. Included among the principles is acknowledgement that there is no single wastewater management solution for all situations. In addition to laying out the need to identify and fund necessary wastewater infrastructure, the statement also encourages communities to adopt a holistic approach that takes into account land use practices, open space preservation, growth management, zoning, stormwater management, drinking water protection, wastewater management, and water quality enhancement.

The statement concludes with the following: “We the undersigned organizations declare the need to address wastewater and nutrient loading of Cape Cod’s groundwater, ponds and coastal waters caused by human activity and waste as the number one environmental priority of the region. Each organization… is committed to advancing the principles contained herein and making clean water a reality. We recognize that each organization, business owner, homeowner, citizen, and visitor, not only on Cape Cod but also throughout Massachusetts, benefits from clean water on Cape Cod, and we believe that each should bear a fair and equitable portion of the cost of necessary solutions. Cape Cod is a valuable local, state and national resource.”

View the complete text at apcc.org or www.facesfalmouth.org.

CITIZEN SCIENCE: REPORT FISH KILLS WITH NEW PHONE APP

The Woods Hole Group has developed a new iphone — and soon, android — app to track fish kills in Buzzards Bay.

Interested citizens can download the mCrowd app for free from the itunes store (once downloaded, choose Buzzards Bay Fish Mortality as a task).

The app enables users to enter the date, time, location, number of dead fish and type of fish they encounter as well as add photos and comments.

The fish kill data is collected in a database at the Woods Hole Group. Scientists in that group will analyze the data in an effort to track fish kill events, understand their causes, and explore related questions.

Download the app and become a citizen scientist today!
BE A CITIZEN SCIENTIST: VOLUNTEER WITH POND WATCH!

The FACES Pond Watch Program performs weekly water quality monitoring at fifteen ponds in Falmouth.

Program volunteers measure dissolved oxygen, water temperature, salinity and turbidity. The data are reviewed and consolidated by Dr. Chris Weidman of Waquoit Bay Estuarine Research Reserve (WBNERR) and then published each week in the Friday Falmouth Enterprise.

FACES initiated the Pond Watch Program in 2006 in an effort to stimulate public interest in protecting estuaries and salt ponds by making information about their health available to the public.

In addition to increasing public awareness, Pond Watch monitoring provides important information to the scientific community on changes in water quality over time.

The Pond Watch Program is always looking for new volunteers. Volunteers work in teams and collect samples once a month for a couple of hours on a Monday or Tuesday morning. It’s a great opportunity to get to know Falmouth’s beautiful ponds, meet new and interesting people, and make a difference.

If you would like to get involved, or simply learn more about the program, please contact Ted Schmuhl at (781) 929-9803 or teds@cape.com, or contact FACES staff by emailing us at info@facesfalmouth.org.

FACES ORAL HISTORY UPDATE

FACES continues to move forward on its oral history project — Falmouth Water Resources: Then and Now.

The goals of the project are to:

1. Capture and preserve local knowledge about Falmouth’s changing natural history over the past many decades.
2. Demonstrate how impaired water quality is impacting the local landscape and local lives by integrating and contrasting historical knowledge of the area with scientific and documentary information on the state of Falmouth’s coastal and freshwater health and species prevalence today.
3. Inspire people, young and old, to work together to preserve and protect our coastal and freshwater resources.

A FACES team has identified a group of old-timers and local scientists to interview. In addition, the team has nearly completed a studio production class with Falmouth Community Television (FCTV) and is about to embark on a field production class. Once the group is certified in field production, we will begin the interview process.

If you have skills in the areas of filming, interviewing, video editing, studio production or related talents, we could use your help. And if you know any old timers who we should interview for this project, let us know!
JOIN OUR BOARD

FACES is looking for new board members. If you're concerned about the state of our estuaries, salt ponds and freshwater resources, consider joining us in our efforts to raise awareness about water issues and identify solutions.

Our board meetings are held the second Wednesday of each month at 7 pm in the Faxon Conference Room #2 at Falmouth Hospital. You are welcome to attend and learn more about who we are and what we do. For more information, contact us at info@facesfalmouth.org.

Whether you care about fishing, sailing, boating, eating local seafood, lazing on the beach, swimming in salt water or fresh, admiring a water view, building sandcastles, catching crabs, bird watching, maintaining your property values or continuing to attract tourists to Cape Cod, healthy waters matter. Join FACES today and take another step toward restoring and protecting our precious coastal and freshwater resources.