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How healthy are Barnstable's waters?

Update from state Estuaries Project will present some answers

By David Still II

How are Barnstable's embayments doing? A meeting Monday night at town hall will answer that question with scientific detail.

Monday's meeting, which begins at 5 p.m., will present the results of 2003 water quality sampling. Dr. Brian Howes of the UMass Dartmouth School of Marine Science and Technology will discuss the data from last year's seven sampling events and its implications.

Howes will also detail the nutrient manage-

ment tools developed for Popponesset Bay using water quality data collected there over the past few years. Similar tools will be developed for the rest of the Barnstable estuaries using the water quality data collected by citizen volunteers.

The data collected this year have been mated with prior year's testing to show how the health of the town's embayments are trending. By and large, the data are expected to be unchanged, as there has been no significant project or management program to address the main culprits of poor embayment health: septic systems.

"It hasn't dramatically changed over the three years we've been looking at it," said John Jacobson, who coordinates the estuaries monitoring program for the Department of Public Works, about the sampling areas.

The most problematic areas can be found in

Barnstable's southwestern embayments, which is not surprising given the density of development and the geography of the shoreline.

"To make things better, you have to improve the flushing or reduce the load," Jacobson said.

In simple terms, embayment health is a balancing act between flushing and nutrient loads. Flushing is the rate at which water turns over. Northside embayments, such as Barnstable harbor, have good flushing, with a 10-foot tide and few impediments to water flow, which translates to some of the best water quality in town.

Southside embayments have a much lower tidal range, only three feet in some upper reaches, and some significant bottlenecks affecting water flow, translating to some of the

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most challenging coastal water quality issues for Barnstable.

The combination of high nutrient loading and a low flushing rate is a recipe for poor water quality. Tidally restricted areas, such as the Prince Cove and the upper Centerville and Bumps rivers, don't see a high rate of water exchange and are notably high in nutrients.

The work of the Estuaries Project, which is looking at 89 embayments across Southeastern Massachusetts, is to determine the level of nutrients entering a system and what level a system can support on its own.

Jacobson said that once the health of the town's embayments has been determined and charted through the sampling program, the data will be used to determine what can and should be done about overloaded systems.

The town will then be able to request different modeling scenarios based on possible solutions to determine the best approach.

Barnstable has been talking about the complexity and expense of the problem for the last decade, and in the last two years, greater regional attention is being paid to the issue, as seen in efforts by the Cape Cod Commission and the Association to Preserve Cape Cod in developing the concept of a regional wastewater authority.

The Culprits

Nitrogen and nitrates are the nutrients that cause the greatest problems for saltwater embayments. These get into the groundwater as part of the daily discharge from residential septic systems and eventually make their way to coastal waters, where they serve as a food source for the algae and bacteria.

Improving the flushing means increasing the water flow, and that typically means dredging. Reducing the nutrient load is a land-side, management program, which can mean collection and treatment systems. Neither is cheap and determining the best approach to better water quality is one of the elements that the state Estuaries Program will help identify.

Among the advantages to the state program is that options can be plugged into a computer model to check their effectiveness. Jacobson said that the power of that modeling will play an

important role for how the town eventually chooses to proceed:

As was done with the town's wastewater facilities plan, a related but distinct effort, a residents group will be assembled as a sounding board for ideas on possible options. The Citizens Advisory Committee for the facilities plan proved to be a valuable part of that program. Jacobson said that the advisory committee for the nutrient management plan is expected to be equally beneficial.

While the estuaries program is looking at embayments townwide, the western part of town is expected to be the focus of remediation efforts. Jacobson said that the eastern part of town has fewer problem areas and also has greater ability to tie into the existing sewer system as a potential remedy. Many of the problem areas are already covered by the sewer system, including Barnstable Village and South Hyannis.

The first report from the state Estuaries Project involving a Barnstable embayment will be for Popponesset Bay, which Barnstable shares with Mashpee. That report is now in draft form, which is being circulated for comment, according to Jacobson.

Now with three years of sampling data in hand, Barnstable can move into the next step of analysis.

The privately-funded Three Bays project gave the sampling program a solid head start. The Estuaries project report on Three Bays area is expected to be completed by the end of the year.

Prior Findings

As part of the presentation in 2003, the following conclusions were reported about the nutrient health in different estuarine systems:

- Upper regions of all Nantucket Sound Embayments are showing nutrient-related water quality declines.

- Popponesset Bay is severely nutrient-overloaded

- 3 Bays is nutrient-overloaded in its upper regions, but of moderate to high quality in the lower regions (Coituit & West bays)

- Centerville Harbor System is poor to moderate quality in its upper regions, but high-quality in the larger basins

- Hyannis Harbor System is nutrient-moderately overloaded in its upper regions, but of moderate to high quality in central Lewis Bay.