

THINK GREEN-BLUE ACT ON LAND, AIR, AND SEA

BY ANNE DONOVAN, CZM

Going green has been “hot” since global climate change was catapulted into the media spotlight by Al Gore’s Oscar-winning film, *An Inconvenient Truth* (Best Documentary, 2006). From driving less to installing low-flow toilets to buying dog toys made of recycled soda bottles—there are seemingly endless suggestions on how to be kinder to the Earth. Although change is hard and the options can feel overwhelming—it’s good to know that small, individual efforts can collectively make a big difference—especially for our coasts and oceans. And since it’s all connected (a basic tenet of environmentalism, and of life), many of the actions that can make the biggest difference for the coast actually focus on the land or the air.

Three major challenges facing Massachusetts Office of Coastal Zone Management (CZM)—rising sea levels from greenhouse gas emissions, reduced water quality from urban and suburban land use, and habitat loss from ever-increasing human encroachment—illustrate these green-blue connections.

THE LAND-SEA CONNECTION: RUNOFF

RED FLAGS FOR SWIMMING AND SHELLFISHING

Clam rake in one hand and swimsuit-clad child in the other—a day splashing in the surf while digging up dinner is certainly a treat. In this idyllic summer scene, it’s unlikely that your car’s leaking cooling system is on your mind, let alone your septic system. But maybe they should be . . .

Unlike Las Vegas, what happens on land doesn’t stay on land. Rainfall and snow melt flowing over and through the ground pick up pesticides, animal waste, oil and grease, trash, and other pollutants, carrying contaminants to the nearest water

body. Such runoff is known as nonpoint source (NPS) pollution, and it often carries contamination to coastal waters. This problem is exacerbated with increased development—the greater the impervious surface coverage (i.e., the area with surfaces like concrete, asphalt, and rooftops that prevent water from seeping into the ground)—the greater the quantity and contamination levels of the runoff.

NPS pollution is the number one coastal water quality problem in the United States, and the impacts are felt by all of us. Bacteria from septic systems and pet wastes can close shellfish beds for harvesting and beaches for swimming. Excess fertilizers from lawns trigger algae growth, leading to reduced water clarity and oxygen levels, and ultimately to fish kills and odor problems as the algae decays. Oil and antifreeze from roads are toxic to marine life, directly killing sensitive species and interrupting the food chain. Cigarette butts carried to the sea by storm drains litter the shoreline.

THREE THINGS CZM IS DOING ON LAND FOR THE SEA

1. **COASTAL POLLUTION GRANTS** - Between 1996 and 2007, CZM has awarded more than \$5.5 million for NPS pollution control projects. CZM's Coastal Pollution Remediation (CPR) Grant Program supports projects that assess and address runoff pollution from paved surfaces, or that design and construct boat waste pumpout facilities. (See www.mass.gov/czm/cprgp.htm.) CZM's Coastal Nonpoint Source Grant Program supports efforts to assess NPS pollution impacts, develop local planning tools, educate the public on pollution control strategies, design "smart growth" techniques to reduce pollution, and/or manage septic system or marina pollution. (See www.mass.gov/czm/coastalnpsgrants.htm.) CZM also provides assistance to coastal municipalities on stormwater management planning, water quality monitoring, and other NPS management issues.
2. **COASTAL SMART GROWTH PROGRAM** - Recognizing the connection between land and sea, CZM launched the Coastal Smart Growth Program in 2004. Through the nationally award-winning Green Neighborhoods Alliance, CZM's Smart Growth Program works with a mix of municipalities, developers, realtors, engineers, conservation organizations, and regional and state agencies to promote Open Space Residential Design—a local land-use strategy that uses flexible incentives for developers to preserve open space, promote mixed housing types and land uses, and ensure minimal disturbance to the natural terrain. In addition, CZM promotes Transfer of Development Rights, a regulatory approach that harnesses private market forces to "transfer" development from areas a community wants to protect to areas where growth is encouraged. The Coastal Smart Growth Program also focuses on educating communities and builders on the benefits of Low Impact Development or LID (an integrated approach to site design, stormwater runoff management, and water conservation that protects the natural terrain and water flow and infiltration; see www.mass.gov/czm/smartgrowth).

3. **CLEAN MARINAS** - Marinas, yacht clubs, and boatyards provide critical services to the boating public—maintaining, mooring, fueling, storing, and launching vessels of all kinds. Perched on the edge of the sea, however, marinas can easily contaminate coastal water quality. CZM provides technical assistance to the more than 300 marinas, yacht clubs, and boat yards in the Commonwealth to help them comply with water quality regulations. Specifically, CZM produced and regularly updates the *Massachusetts Clean Marina Guide*, which provides information on cost-effective strategies and practices aimed at reducing marina and boating impacts on the coastal environment. (See www.mass.gov/czm/marinas/guide/macleanmarinaguide.htm.)

THREE THINGS YOU CAN DO ON LAND FOR THE SEA

1. **GO "GREEN" WITH YOUR LAWN** - A super-green, lush carpet of grass that's the envy of your suburban neighbors can cause big water quality problems. Because fertilizers and pesticides applied in excess are washed to rivers, streams, and the sea, limiting their use can make a big difference. Even better, convert manicured lawn to natural meadow, beds of native perennials and shrubs, or forest. You'll save time and money with lower lawn maintenance, and provide nesting, resting, and feeding areas for wildlife—from songbirds to toads to cottontail rabbits.
2. **SCOOP THE POOP** - It's a dirty job, but if you don't do it, you're directly contributing to local water quality problems. Pet waste contains parasites that can cause human (and pet) health problems, and it contributes to beach and shellfish bed closures by elevating bacteria levels. So get a bag and a shovel, and dispose of your pet's droppings properly (ideally by flushing them down the toilet, but at least by throwing them in the trash).
3. **DON'T BE A DRIP** - Oil, gasoline, and antifreeze from cars, trucks, lawnmowers, and boats are highly toxic to marine life. If you notice a leak, fix it immediately to keep these toxins from washing to the sea.

THE AIR-SEA CONNECTION: AIR POLLUTION

SHRINKING SHORES AND MORE

The feel of the wet sand as the waves gently lap your toes is undeniably one of the joys of summer in the Bay State. As you appreciate this shining seascape, are you thinking about how you left your air conditioner running at home or that your family car needs a tune up? Here's why you should . . .

What goes up must come down—and pollutants released to the air often settle on the sea. Called atmospheric deposition, this process transfers nitrogen, sulfur, mercury, pesticides, and other toxics from the air to the ocean. The sources of these air pollutants include burning fossil fuels for power, vehicle emissions, industrial releases of chemicals, and trash incineration.

The air pollution/global warming link also has serious consequences for the coast. Burning of fossil fuels, such as oil and coal, along with widespread forest cutting have led to significant increases of heat-trapping "greenhouse gases" in the atmosphere. Like the glass panels of a greenhouse, these gases insulate the earth and prevent heat from escaping to space. Escalating levels of these greenhouse gasses are increasing global temperatures, melting ice caps and glaciers and warming ocean waters (causing them to expand). The results—rising sea levels and increased frequency and severity of storms—exacerbate shoreline erosion and increase coastal storm damage. (See *CZScience: Sea Level Rise and Shrinking Salt Marsh* on page 72 for more.)

THREE THINGS CZM IS DOING FOR SHRINKING SHORELINES

- I. **STORMSMART COASTS** - CZM launched this nationally award-winning program in 2006 with the hard work of a Coastal Management Fellow funded by the National Oceanic and Atmospheric Association's Coastal Services Center. StormSmart Coasts is based on the No Adverse Impact (NAI) approach, which requires that public and private projects are designed and completed in such a way that they do not: 1) pose a threat to public safety, 2) increase flood or storm damage to public or



CZM's Robin Lacey Named Educator of the Year by Mass Marine Trades

By Anne Donovan, CZM



In recognition of his dedicated work to help marina owners and operators comply with existing and emerging water quality regulations, CZM's Robin Lacey was presented with the Educator of the Year Award by the Massachusetts Marine Trades Association (MMTA) on January 29, 2008. "For almost 10 years, Robin has patiently and proactively educated Massachusetts marine businesses on their responsibilities as stewards of the coastal environment. If one of our member firms is overwhelmed with the complexity of a specific environmental compliance regulation, they can count on Robin to swiftly answer their questions with clear and concise information," said MMTA's Greg Glavin. "In doing so, he has shepherded an entire industry in the direction of environmental compliance solutions that are effective, attainable, and affordable," he continued.

"Robin is firmly committed to helping make all of this easier for the marina operators, who are more than willing to do all they can to keep the water that their businesses depend on as clean as possible," said CZM Director Leslie-Ann McGee. "We are very proud that he was recognized by MMTA for his efforts, and look forward to our continued partnership with them."

For more on clean boating and marina operations, see CZM's Marinas in Massachusetts web page at www.mass.gov/czm/marinas, which includes links to the *Massachusetts Clean Marina Guide*.



private property, and/or 3) strain municipal budgets by raising community expenditures for storm-damage protection, stormwater management, emergency services, and disaster recovery. To help your community prepare for the potentially devastating consequences of sea-level rise, see the StormSmart Coasts website at www.mass.gov/czm/stormsmart.

2. **SMART ENERGY** - Through the Coastal Smart Growth program, CZM works to promote strategies that improve energy efficiency and support energy conservation. Some specific techniques include:

- *Traditional Neighborhood Design and Transfer of Development Rights, which promote building homes near stores and other businesses, reducing car trips and greenhouse gas emissions.*
- *Green Buildings, the utmost in energy efficiency, reducing dependence on fossil fuels.*
- *LID building options, like green roofs, where vegetation is planted on a rooftop (increasing insulation of the building and decreasing fuel consumption for heating and cooling). These plants also absorb carbon dioxide and release oxygen, improving air quality.*

See the Executive Office of Energy and Environmental Affairs (EEA) Smart Growth Toolkit at www.mass.gov/envir/smart_growth_toolkit/pages/mod-energy.html for more.

3. **PROJECT REVIEW** - CZM has the authority to review federal activities in the Massachusetts coastal zone to ensure that they are consistent with our enforceable policies. In addition, CZM reviews and comments on proposed projects that may have coastal and ocean impacts in Massachusetts through state permitting and licensing processes, including Massachusetts Environmental Policy Act (MEPA) review. Through project review, CZM balances development with environmental protection. CZM is responsible for reviewing renewable energy projects in the coastal zone, including the proposed Nantucket Sound and

Buzzards Bay wind energy projects and the tidal current power projects in Nantucket Sound and Vineyard Sound.

THREE THINGS YOU CAN DO TO CLEAN THE AIR FOR THE SEA

1. **SWITCH BULBS** - Replacing your five most-used conventional light bulbs with “Energy Star” bulbs means big savings. According to the U.S. Environmental Protection Agency (EPA), if every household in America made this switch, the reduction in greenhouse gas emissions would be substantial—as much as removing 10 million cars from the road.
2. **UNPLUG** - A staggering but true fact from the U.S. Department of Energy—75 percent of the electricity used to power electronics is drawn when the equipment is turned off! To help your wallet while lowering greenhouse gas emissions, unplug your equipment and/or turn off your power strip!
3. **SLOW DOWN** - The faster you go the greater the wind resistance on your car—reducing your gas mileage. Moderating your driving patterns by reducing the rate of acceleration (and the need for aggressive breaking) makes an even a bigger difference. According to edmunds.com, driving the speed limit can reduce gas usage by an average of 12 percent on a long trip, and letting up on the lead foot saves an average of 31 percent.

THE DEVELOPMENT-HABITAT CONNECTION:

SUBURBAN SPRAWL ❖ WILDLIFE'S FALL

The Adirondack chair cradles your back as you put your feet up and survey your expanse of lawn. All is quiet. Too quiet? Here's why . . .

Centuries of expanding human population in Massachusetts have scarred the natural landscape, with thousands of acres of coastal wildlife habitat transformed to cityscape, ports, homes, cottages, farms, and other developed areas. When Europeans first began to populate these shores in the middle of the 16th century, tens of thousands of Native

Americans inhabited what would ultimately become Massachusetts. By 1930, the state's population grew to 4,249,614—and by 2000, it rose to 6,349,097. Between 2000 and 2005, the Bay State's population increased an additional 1.71 percent, while the number of households increased by 5.39 percent (indicating that housing levels are outpacing population, adding to the development burden). In coastal counties, population growth and household growth far exceed statewide averages, with the exception of population growth in Suffolk County (which represents the population shift out of city centers to the suburbs and beyond).

The impacts of this growth and development are destroyed, degraded, and disjointed coastal habitats—such as salt marsh, dunes, eelgrass beds, mud flats, and other areas vital to coastal and ocean species. The consequences for wildlife populations can be substantial. Salt marsh, for example, is one of the most productive ecosystems in the world. The marsh grass and other plant material, microscopic organisms, algae, and decaying matter provide critical feeding and breeding opportunities for migratory birds, fish, crabs, and shrimp, including commercially important species, such as soft-shell clams, striped bass, flounder, menhaden, tomcod, and tautog. Eelgrass beds, which grow in clear waters near the shore, are another critical coastal habitat—providing underwater refuge and breeding areas for fish, crabs, clams, and other invertebrates, including the economically valuable bay scallop and American lobster. Both salt marsh and eelgrass beds play a vital role in maintaining coastal water quality by filtering pollutants and protecting shorelines from storm damage.

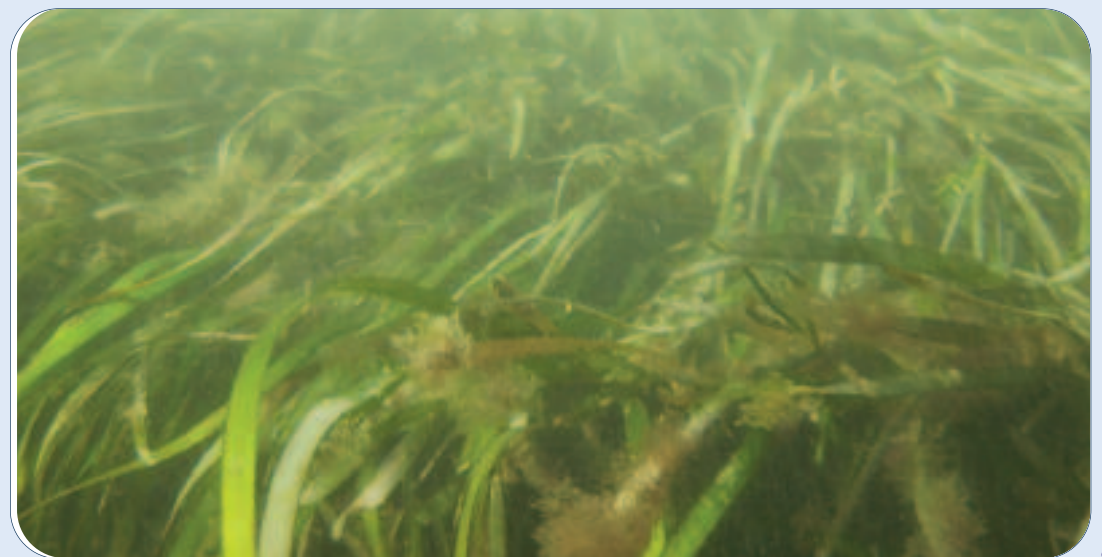
THREE THINGS CZM IS DOING FOR COASTAL HABITATS

1. **WETLANDS RESTORATION PROGRAM** - Since the late 1700s, Massachusetts has lost approximately one-third of its wetlands. Many of our remaining wetlands have been degraded, reducing their capacity to provide wildlife habitat, flood protection, water quality improvements, and other vital environmental services. To address these problems, CZM's Wetlands Restoration Program helps people voluntarily restore

degraded and former coastal wetlands. The program identifies projects, organizes teams, provides technical assistance, secures project funding, and helps manage and coordinate restoration activities from start to finish. See www.mass.gov/czm/wrp for details.

2. **EELGRASS RESTORATION** - CZM actively supports efforts to protect and restore these valuable habitats. For example, CZM was part of an innovative effort that began in 2006 to salvage plants from an eelgrass bed that had to be cleared to make way for a new combined sewer outfall pipe at Pavilion Beach in Gloucester. This project included hundreds of volunteers and partners from CZM, the state's Division of Marine Fisheries, the Massachusetts Institute of Technology's Sea Grant program, EPA, and the city of Gloucester. The project was a tremendous success—especially in increasing awareness about the value of eelgrass to our coastal waters. See www.mass.gov/czm/coastlines/2007/ebbflow/eelgrass.htm for details. CZM and our partners are continuing restoration efforts by analyzing appropriate sites in the Annisquam River in Gloucester to see where eelgrass can be successfully transplanted. Read more at www.mass.gov/czm/docs/pdf/eelgrass.pdf.

An underwater view of eelgrass habitat—this essential part of the coastal ecosystem is a focus of CZM's protection efforts.



Bay State Banning Boat Sewage!

By Anne Donovan, CZM

The solution to pollution is prevention, not dilution. This is the tried-and-true theory behind No Discharge Areas, or NDAs—designated bodies of water where the discharge of all boat sewage, whether treated or not, is prohibited. And Governor Deval Patrick has set the goal of designating all coastal waters of Massachusetts as no discharge.

Boat sewage can contain bacteria and viruses, nutrients, and chemicals that can be harmful to water quality and public health. Even small quantities of microorganisms from boat sewage can introduce diseases like hepatitis to people in contact with the water, and can contaminate shellfish and make them unsuitable for human consumption. Boat sewage, even when treated by on-board sanitation devices, also contains high quantities of nitrogen. Nitrogen fuels the growth of algae—creating water quality and clarity problems in sensitive coastal waters. Finally, the chemicals used in some boat heads are toxic to marine life.

A statewide NDA directly addresses these human health and environmental concerns. To help make this coast-wide boat sewage ban a reality, CZM is working with coastal communities to increase boat pumpout facilities so that proper sewage disposal is more convenient for the boating public. In addition, CZM is coordinating efforts among municipal officials, harbor masters, and nonprofit organizations as they develop applications to the U.S. Environmental Protection Agency for no discharge status of their coastal waters.

See www.mass.gov/czm/nda for details on NDAs, and for more on where you can find a boat pumpout facility, see www.mass.gov/czm/nda/pumpouts.

3. **AQUATIC INVASIVE SPECIES** - Known by many names—nuisance species, exotic species, non-indigenous species, or pests—these plants and animals, including purple loosestrife and the European green crab, have forever changed the ecology and economy of Massachusetts. To address these threats, a variety of state and federal agencies and nonprofit organizations have formed the Massachusetts Aquatic Invasive Species Working Group. With leadership from CZM, this group works to prevent

new introductions, monitor for new invasions, and quickly respond to invasive species that show up in Massachusetts waters before they spread out of control. For more, see www.mass.gov/czm/invasives.

THREE THINGS YOU CAN DO TO TREAD LIGHTLY ON COASTAL HABITATS

1. **GO NATIVE** - Whether landscaping your sandy, shore-side property or inland lot, use native species whenever possible. These hardy plants are adapted to the sometimes-extreme growing conditions of New England, and often require much less watering and fertilizer than exotic alternatives. Also, many of these species provide food and cover for local wildlife, providing sanctuary from suburban sprawl. For more, see www.greenscapes.org and www.massnativeplants.org.
2. **SLOW AND STEADY** - Bay State beaches are crowded places, providing very little real estate for shorebirds and other animals to call home. When walking through these areas, stay on the paths and off sensitive dunes and vegetation. And when driving, slow down and watch for animals, particularly the threatened Piping Plover, whose well-camouflaged chicks like to hunker down and hide in tire tracks on the beach.
3. **DON'T LET THOSE CREATURES GO** - Although exotic animals can be great pets and ornamental plants can make beautiful decorations, many of these species are invasive. In fact, some of the characteristics that make these species desirable, like hardiness and rapid growth, are the same characteristics that allow them to out-compete native plants and animals in the wild. So never release aquarium pets or bait into the water. Also, use native plants and animals in water gardens, since predators like the Great Blue Heron often carry water-garden residents to neighboring habitats. For more on what you can do, see www.mass.gov/czm/invasives/prevent.