

# Coastal Features



VOLUME 9, ISSUE 4

SUMMER, 2001

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## NOAA Forecast for 2001 Atlantic Hurricane Season Predicts Normal Storm Activity

### • NOAA Says 5 to 7 Hurricanes Could Threaten Region

Top hurricane experts from the National Oceanic and Atmospheric Administration (NOAA) have predicted that the 2001 Atlantic hurricane season will have normal levels of activity, bringing fewer storms than the past three years. However, officials advised residents in Atlantic and Gulf Coast states to be prepared for storms, high winds and flooding throughout the season, which begins June 1.

At a recent news conference at the Ronald Reagan National Airport near Washington, D.C., NOAA officials said the absence of strong La Niña conditions this year will likely result in a number of storms, but relatively fewer compared to the last three seasons. In 2000, there were 14 named storms, of which eight became hurricanes.

A normal Atlantic hurricane season typically brings eight to 11 tropical storms, of which five to seven reach hurricane strength, with two to three classified as major. A major hurricane packs sustained winds greater than 110 mph and is classified at Category 3, or above, on the Saffir-Simpson Hurricane Scale. Seasons with normal hurricane activity average one to two land-falling hurricanes in the United States, and one in the Caribbean.

"Although we expect an average level of activity this season, that is no cause to become complacent. With the possibility of five to seven hurricanes, residents in hurricane prone areas can't afford to let their guard down," said Scott Gudes, NOAA's acting administrator. "Just one storm can dramatically change your life." The news conference also marked the start of a nationwide Hurricane Awareness Week campaign led by NOAA, the Federal Emergency Management Agency (FEMA) and storm-vulnerable states to increase preparedness and safety among residents.

Gudes pointed to continuing improvements in technology and research that enabled forecasters to produce the 2001 outlook. "Better data from NOAA's weather satellites, better models, the latest supercomputers and an improved ability to monitor and understand global climate patterns are helping to create better long term forecasts," Gudes said.

Retired Air Force Brig. Gen. Jack Kelly, director of NOAA's National Weather Service, said without a strong La Niña or El Niño the key climate patterns guiding this year's expected activity are long-term patterns of tropical rainfall, air pressure and temperatures of the Atlantic Ocean and Caribbean Sea.

### Coastweeks 2001

The annual nationwide celebration of the coast is only a few months away. Please turn to page 7 for information on this year's planned festivities, and how you can become a *Coastweeks 2001* event sponsor. The initial response indicates that *Coastweeks 2001* will be the largest ever in RI.

**Coastweeks**  
A Celebration of the Coast

You are cordially invited to join in the 19th annual nationwide celebration dedicated to fostering awareness of the importance of our coasts, the diversity of their uses, and the urgent need for improved planning and management.

Support of the Coastweeks 2001 Campaign by the National Oceanic and Atmospheric Administration and the Rhode Island Coastal Resources Management Council





## Aquaculture Research Grant to Roger Williams University



CRMC Aquaculture Coordinator Dave Alves recently reported that Roger Williams University (RWU) has been awarded a grant from the US Department of Commerce, Economic Development Agency, to conduct research to enhance the quahog fishery in Rhode Island. The research will test two variables, **seed size** and the effect of **shell hatch**.

**Seed Size:** Previous research at other locations along the Atlantic coast has provided ample evidence to suggest that seed clams planted at larger sizes tend to have a higher survival rate than smaller seed clams. The assumption follows that a predator refuge is attained as the size of the clam increases.

The RWU research will test whether a similar result, that is, increased survival among larger sized clam seed, also occurs in Narragansett Bay. While increased survival lends the assumed advantage of an increased harvest, the study will also track the economic implications of planting larger clam seed. Although survival to harvest using larger seed might increase, it is not clear that the added cost of obtaining large clam seed is justified by that increased harvest.

*Coastal Features* is published by the RI Coastal Resources Management Council. It is financed in part by a grant from the National Oceanic and Atmospheric Administration pursuant to the Coastal Zone Management Act, as amended. This issue of *Coastal Features* was edited by Kevin R. Cute. To comment on any article or to make address changes please contact the CRMC.

Two seed sizes will be tested during the study. The smaller sized seed will have an average shell length of 5.0mm, and the larger sized seed will be 15.0mm. It is assumed that these two sizes are sufficiently different to allow differential survival (should it occur) as well as different costs of production.

**Shell Hatch:** Either by providing protection or altering the current flow patterns, the addition of shell hatch (crushed quahog shell used as protective cover over the seed clams) dramatically increased the survival rate of clam seed in a study by Peterson et al. (1995) in North Carolina. They showed a roughly 27% survival rate where shell was present vs. 5% (sand), 12% (seagrass) and 8% (mud) where shell was not present. The addition of shell hatch is included in this study as it represents a relatively inexpensive way to enhance production over a large area should the results warrant such an expansion.

**Study Sites:** The experimental plantings will occur in Narragansett Bay. Several sites are under consideration, with site selection to be determined, among other variables, by sediment types that provide good quahog habitat. Plots of soft bottom will be selected at various locations throughout the Bay. Planting will take place during the fall and early winter, as past experience has shown that planting during this time leads to increased clam seed survival over summer planting.

The research will be lead by Dr. Timothy Scott, Director of the Center for Economic and Environmental Development, Roger Williams University. ✨



*If you would like to be added to the Coastal Features mailing list, contact the CRMC at the address shown on the back cover of this issue. Please include your name and indicate the address that you want your free subscription to be mailed to. Coastal Features is intended to inform the public about issues of importance to Rhode Island's coastal zone and its resources. Please feel free to submit story ideas to the editor.*



## *Federal Task Force Supports Northeast Regional Panel on Aquatic Invasive Species*

An aquatic species may be considered "invasive" when it is introduced to a location where it does not naturally occur, and represents a potential threat to the ecosystem or native species. Or as defined by the federal Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA, as amended): "*aquatic nuisance species*" means a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters.

In response to the growing recognition of such threats to Rhode Island's aquatic species and ecosystems, the CRMC has been participating in the formation of a Northeast Regional Panel under the auspices of NANPCA, Section 1203, "Regional Coordination," which encourages a regional approach to the problem of aquatic invasive species.

During the past few months, the CRMC has been part of a working group on aquatic invasive species that includes representatives from federal agencies (EPA, US Fish & Wildlife Service), state agencies (Rhode Island, Massachusetts, Vermont, Maine, New Hampshire, New York) a regional organization, the New England Interstate Water Pollution Control Commission, and the Canadian province of Nova Scotia. The unanimous support of a regional approach to aquatic invasive species by the working group prompted Sandra Keppner, US Fish and Wildlife Service (USFWS), and a working group member, to submit a request by the working group to the federal Aquatic Nuisance Species Task Force (Task Force), to consider the designation of a Northeast Regional Panel under the provisions of NANPCA, Section 1203, (c) (1) (2).

The Task Force itself was established by Section 1201 of NANPCA, and consists of representatives from the following federal agencies:

- NOAA (Co-chair)
- USFWS (Co-chair)
- US Coast Guard
- Army Corps of Engineers
- EPA
- Department of Agriculture
- Department of State

The Task Force had a very positive response to the working group's request and encouraged its continued work of defining membership and mission. The working group will be reporting its progress back to the Task Force later this summer, the next step toward the official designation of a Northeast Regional Panel.

## Policy News & Notes...



### Providence River Shipping Channel

*FEIS Release: August 2001*

The long-awaited Environmental Impact Statement (EIS) by the US Army Corps of Engineers (ACOE) for the maintenance dredging of the Providence River Shipping Channel will be released this August. The project calls for returning the shipping channel to its authorized depth of 40 feet below sea mean level. Including dredged material from non-federal projects such as terminals and marinas, the total amount of material expected from this project is approximately 4.5 million cubic yards. Possible disposal options being discussed include confined aquatic disposal (CAD), upland, and open water. The ACOE hopes to begin dredging in the fall of 2002, and will be seeking public comment on the EIS at that time.

### Program Changes:

*Application Fees for "Urban Core Projects"*

The CRMC has adopted the allowance of reduced application fees for certain commercial projects within defined urban core coastal communities, and within mill revitalization areas as defined by statute. The purpose of this revision is to facilitate project development in areas where such development is targeted for growth or where impacts to the coastal zone are minimized. The CRMC worked with, and received strong support from the Rhode Island Department of Administration, Division of Planning, to develop these changes to help meet State Guide Plan objectives for such redevelopment projects.





(continued from page 1)



NOAA Graphic

“Forecasters will monitor these climate patterns, especially leading up to the August – October peak period of the season,” Kelly said. “One of the most valuable forecast tools is the information gathered by NOAA and US Air Force reserve personnel who fly directly into these storms,” Kelly added.

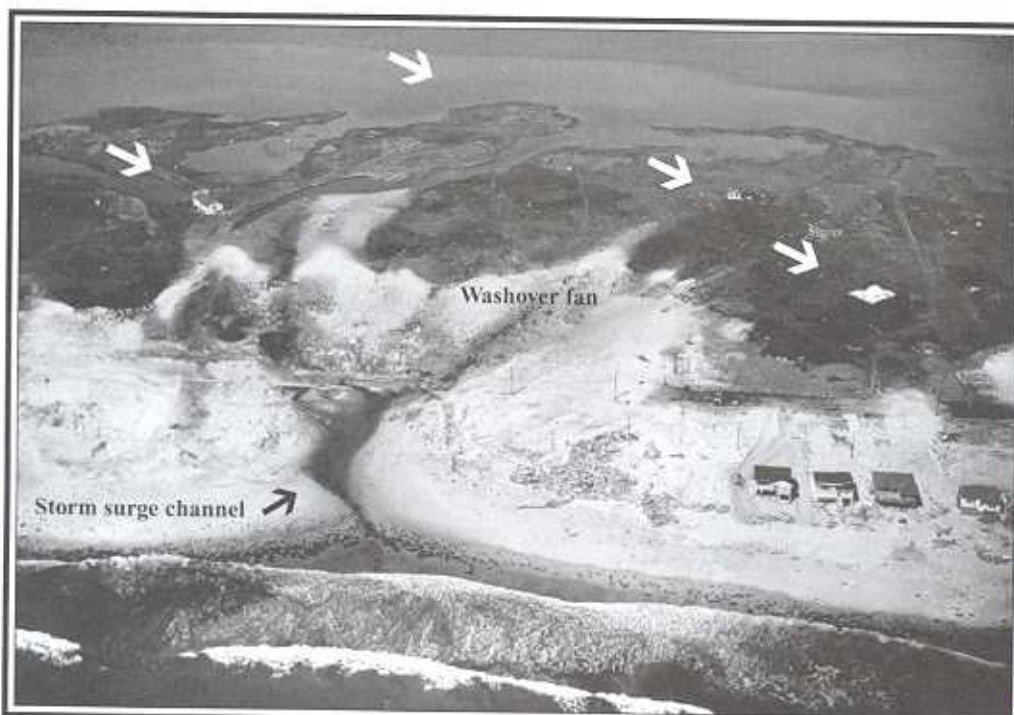
Max Mayfield, director of NOAA’s National Hurricane Center in Miami, said hurricane-spawned disasters occur even in years with normal, or below-normal, levels of activity. Hurricanes Donna of 1960, David and Frederic of 1979, and Elena, Gloria and Juan of 1985 are reminders of the destruction that can occur during seasons with normal hurricane activity, he said. Hurricane Andrew of 1992, the costliest hurricane on record, developed during a season of below-normal hurricane activity, Mayfield added. “[Hurricane] Donna killed 50 people

in the United States, and [Hurricane] Andrew caused more than \$25 billion in damage in Florida,” Mayfield said. “We don’t want people to be caught off guard by a land-falling storm because the hurricane outlook calls for normal storm activity.”

Mayfield also highlighted the dangers of inland flooding. “In 1999, Hurricane Floyd brought record flooding to the East Coast. Fifty of the 56 deaths during Hurricane Floyd were a direct result of inland flooding. That kind of threat remains with each approaching storm.” Mayfield added, “Storm surge from hurricanes bring the greatest potential for loss of life. When an evacuation order is given, residents should treat it as a life or death matter.”

Brig. Gen. Robert Duignan, deputy to the Chief of Air Force Reserve, said the Air Force Reserve Command mission significantly narrows the coastline warning made by the National Hurricane Center. “This warning saves millions of dollars for businesses and, more important, saves the lives of citizens located in the storm’s path,” Duignan said.

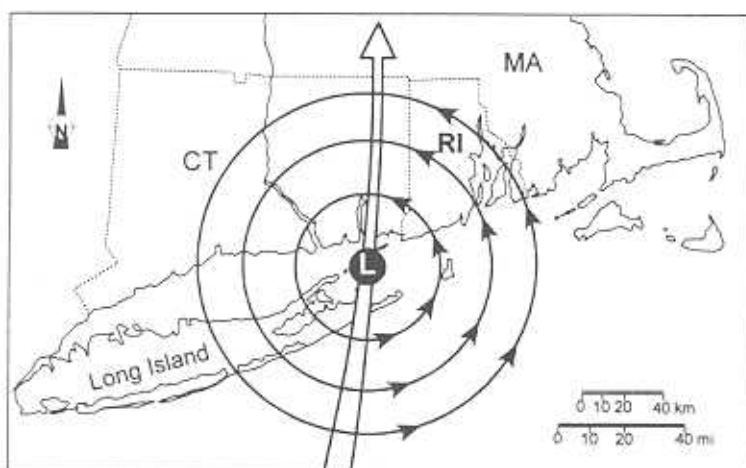
“Studies have shown the high accuracy data from our Air Force Reserve and NOAA aircraft have improved the forecast accuracy by about 25 percent. Aircrews in these storms also have detected sudden, dangerous changes in hurricane intensity and movement, which are currently very difficult to detect by satellite alone,” added Duignan. “The Hurricane Hunters are proud to serve as a vital link in the hurricane surveillance and warning network, alerting vulnerable populations.” The Atlantic hurricane seasons ends Nov. 30. As always, NOAA forecasters will issue an updated hurricane outlook in August. *(This article is reprinted by permission of NOAA)*



*The photo at left shows the aftermath of a storm surge wave that Hurricane Carol slammed into the Rhode Island coast between Misquamicutt and Weekapaug on August 31, 1954. Note the storm surge channel cutting into the beach, and the washover fan of sand surrounding it. Arrows in the photo point to houses that formerly stood within this high impact zone, that were blown off the beach and into the adjacent salt marsh and Winnapaug Pond behind it.*

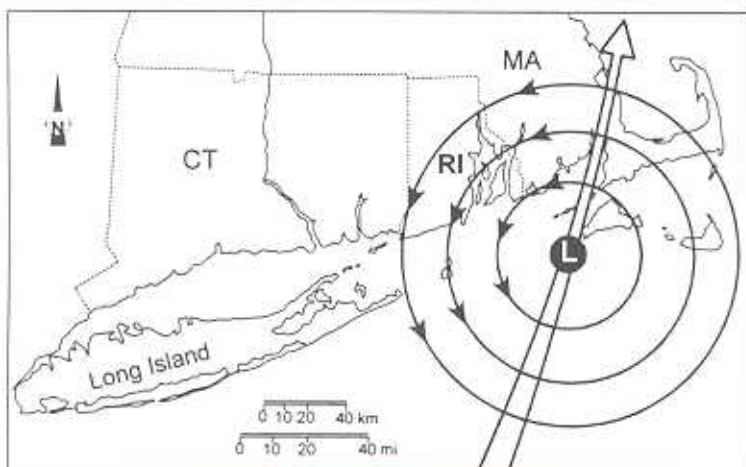
## Some Facts on Hurricane Severity in Rhode Island

### HURRICANE and EXTRATROPICAL STORM PATHS and ASSOCIATED WIND PATTERNS



#### PASSAGE TO THE WEST

- Maximum Onshore Wind
- Severe Storm-Surge Flooding



#### PASSAGE TO THE EAST

- Offshore Wind
- Minimum Storm-Surge Flooding

Graphic by Dr. Jon Boothroyd, URI

The above illustration shows the paths and associated wind patterns of hurricanes that come onshore in southern New England. In the northern hemisphere, winds move in a counterclockwise direction around low pressure centers. The eye of a hurricane is a small area of low pressure that can move rapidly over the open ocean encircled by high velocity winds. When the eye passes to the west of Rhode Island, the wind blows onshore along the south shore barriers and headlands. This is the most destructive path because the wind moving across the Rhode Island coastline has the combined velocity of the wind circulating around the eye plus the velocity of the storm system as it moves onshore. During the September 1938 hurricane, which passed to the west, the onshore winds reached 150 mph due to this combined velocity effect.

When hurricanes pass to the east of Rhode Island, winds along the south shore blow offshore and at relatively slower velocity because the velocity of the storm system is subtracted from the velocity of the circulating winds. The latest hurricane to strike the Rhode Island coast, Hurricane Bob which occurred in August 1991, passed over Block Island, diagonally across Rhode Island Sound, to go ashore in the Sakonnet area. Thus the south shore of western Rhode Island was spared the full brunt of the storm, but the southeastern Massachusetts shoreline received the maximum winds, waves, and storm surge. ❄





## The Scoop on Boat Engines

This article is reprinted by permission of Anne Donovan,  
Massachusetts Office of Coastal Zone Management

### The Bad - Conventional 2-Stroke Outboard Engines

Conventional Motorboat and Personal Watercraft (PWC) engines use a carbureted 2-stroke outboard system, available from 2 to 300 horsepower (hp). These engines do not completely burn fuel, instead releasing as much as 20 to 30 percent into the air or water. The reason is that both the intake and exhaust ports of the engine are open at the same time, allowing fuel to pass directly through. These engines not only pollute the air and water, they waste \$2 to \$3 dollars for every \$10 boaters spend on gas.

### The Good - Direct Fuel Injection Engines

Newer 2-stroke technology has led to higher fuel efficiency and lower hydrocarbon emissions levels. These Direct Fuel Injection (DFI) engines spray fuel into the cylinder when the piston covers the intake and exhaust ports, preventing this direct release of unburned fuel. Available in the 75 to 250 hp range, they weigh about 10 percent more than conventional engines.

### The Best - 4-Stroke Engines

Although DFI engines are good, 4-strokes are the cleanest outboard engines currently available up to 130 horsepower (although a 225-horsepower model is anticipated to be available this summer). Intake and exhaust valves are never open at the same time, preventing the release of unburned fuel from the combustion chamber. This technology leads to excellent fuel efficiency. The 4-stroke engines weigh about 25 percent more than conventional engines.

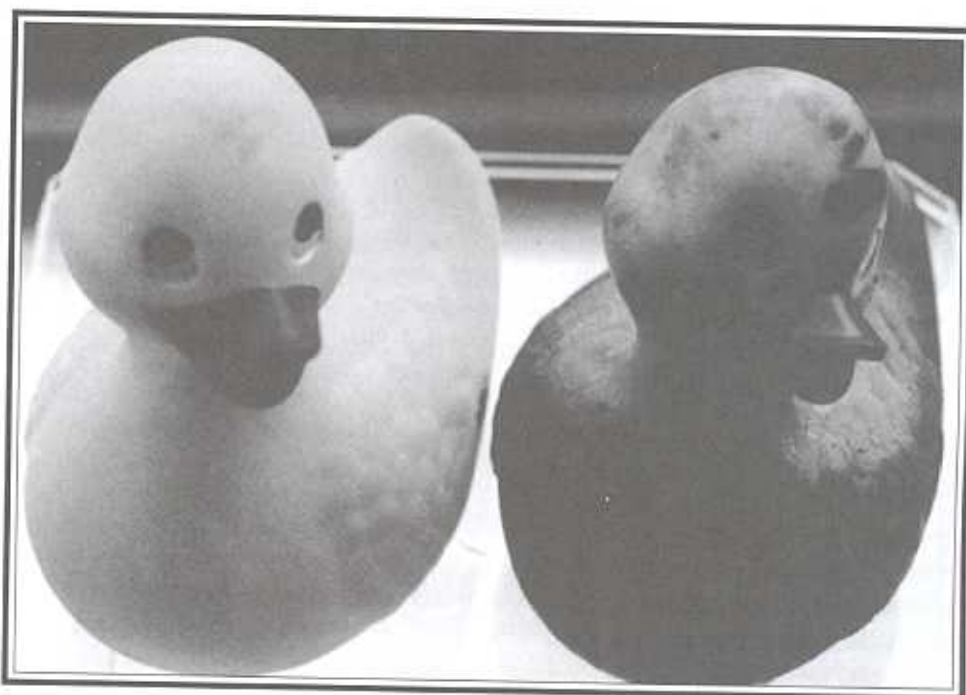
### The Benefits

When compared to conventional 2-stroke engines, 4-stroke and DFI engines:

- Improve fuel efficiency (25-45% DFIs, more for 4-strokes)
- Reduce hydrocarbon emissions by 75-90%
- Reduce smoke smell
- Are quieter
- Improve drivability with smoother combustion
- Start more easily under both hot and cold conditions

In addition, DFIs decrease oil consumption by 50 percent, while 4-strokes run on straight gasoline (rather than oil/gas mix), so no oil is consumed during combustion, reducing oil released to the air and water. Even though these new engines cost about 20 percent more than conventional 2-strokes, they quickly save the boater money in lower fuel and oil costs. ✱

*Can you tell which ducky was swimming with a conventional outboard motor? When testing the pollution released from boat engines, the California Air Resources Board ran different engines in enclosed tanks. Duckies swimming in the tank with a new 4-stroke engine came out looking like the one on the left, while those sentenced to swim with the conventional 2-stroke engine, like the ducky on the right, came out the worse for wear. (Thanks to EOE's Sonia Hamel for the use of the duckies!)*





## Coastweeks 2001

Join in the celebration  
September 15 to October 8, 2001  
[seagrant.gso.uri.edu/riseagrant](http://seagrant.gso.uri.edu/riseagrant)

## Be on the lookout for *Coastweeks 2001*

the 20th annual nationwide celebration of the coast

### *YOU ARE CORDIALLY INVITED TO JOIN IN THE CELEBRATION!*

Rhode Island Coastal Resources Management Council and Rhode Island Sea Grant are pleased to sponsor Coastweeks 2001, a series of events that runs from Saturday, September 15 to Monday, October 8, 2001. Each year, Coastweeks offers free or low-cost activities designed for individuals, families, and groups to make new discoveries about the coast. This year we are planning boat trips, a lecture and cooking demonstration with Channel 10's Frank Terranova, trawling excursions, seining with a naturalist, movie nights, a coastal cleanup, and much more. Past Coastweeks events have included festivals, harbor walks, canoe treks, and even a puppet show. Past event sponsors include the Audubon Society of Rhode Island, Bank Boston, Blackstone Valley Tourism Council, Common Fence Point Improvement Association, Cross' Mills Public Library, Friends of the Waterfront, Narragansett Bay National Estuarine Research Reserve, R.I. Department of Environmental Management, Rhode Island Sea Grant, Save The Bay, the Wood-Pawcatuck Watershed Association, and others. ✨

**Don't miss out on this year's events.** Check out the Rhode Island Sea Grant Web site in August to see the latest listings at: <http://seagrant.gso.uri.edu/riseagrant>, or contact us at any time to be added to the Coastweeks Calendar of Events mailing list.

Want to sponsor an event? We are always looking for new event sponsors! Fill in the form below, call, or e-mail and let us know the title, date, time, cost (if any), brief description of your event, and contact information, and we will include the information in our widely distributed Coastweeks Calendar of Events.



- I would like to be added to the Coastweeks mailing list (continue to address)  
 I would like to sponsor an event (fill in event and address info.)

Event: \_\_\_\_\_ Date(s): \_\_\_\_\_ Time(s): \_\_\_\_\_

Cost: \_\_\_\_\_ Person to contact (include name and tel.): \_\_\_\_\_

Event description: \_\_\_\_\_

Name: \_\_\_\_\_

Street: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

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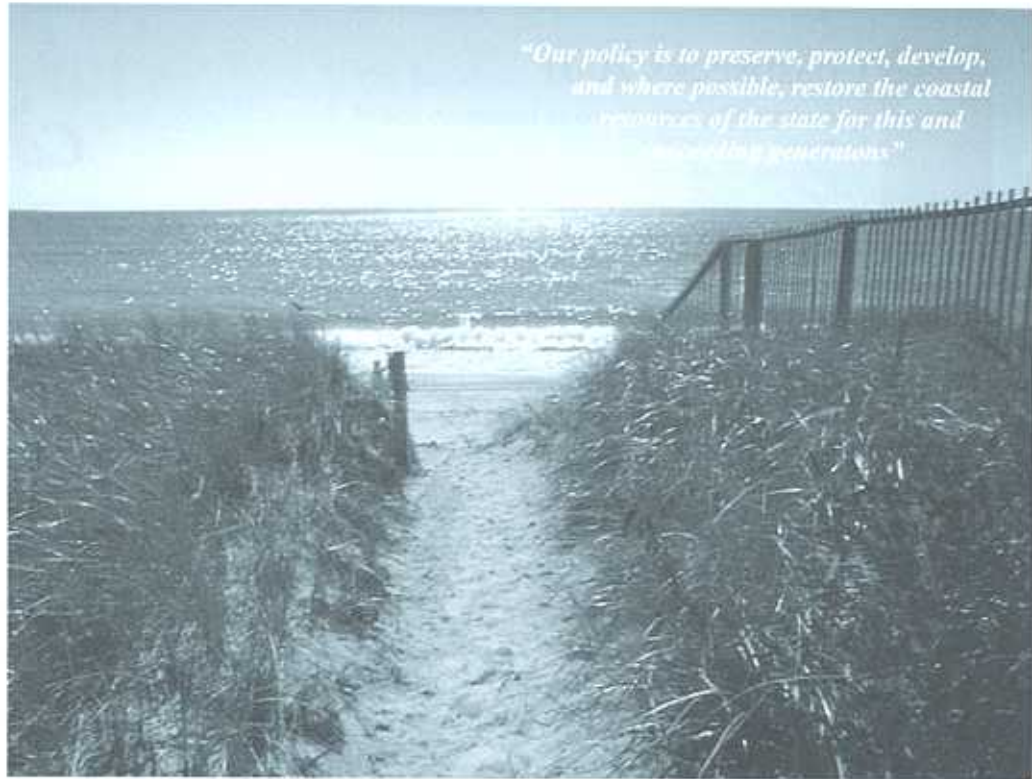
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*"Our policy is to preserve, protect, develop,  
and where possible, restore the coastal  
resources of the state for this and  
succeeding generations."*

Photo: Janet Freedman, CRMC

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