FALL/WINTER 2008

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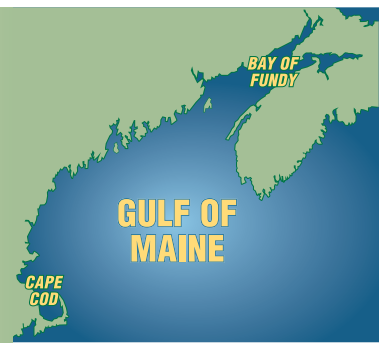
Gulf of Maine Times



Promoting Cooperation to Maintain and Enhance Environmental Quality in the Gulf of Maine

Bruce Carlisle, Gulf of Maine visionary from Massachusetts. ***Story Page 8***

INSIDE

PHOTO COURTESY OF THE NATURAL RESOURCES COUNCIL OF MAINE

The Stetson project in Washington County, Maine.

Harnessing the Gulf's winds, tides for reliable energy independence

By Melissa Waterman

In an era of volatile oil prices and growing concerns about future energy supplies, government and business alike are casting their eyes and their dollars toward the sea as a source of much needed energy.

From tidal power plants in Nova Scotia and New Brunswick to proposed offshore wind farms from Maine to Massachusetts, the latent energy-producing possibilities from the Gulf of Maine have become the focus of state and provincial interest. Those who can tap that energy may find substantial rewards.

According to Professor Habib Dagher, director of the Advanced Structures and Composites Laboratory at the University of Maine, the Gulf of Maine contains 100 gigawatts (GW) of wind energy potential, equivalent to approximately 10 percent of the United States' energy needs for a year.

"You can think of the winds off the coast of Maine as a seasonal crop that can help heat the state," Dagher said.

Walter Musial, senior engineer at the National Renewable Energy Laboratories in Golden, Colorado, also thinks the Gulf of Maine (GOM) is capable of supplying New England's electricity needs in the future.

In a presentation at the Power of the Gulf conference in Northport, Maine, in June, he noted it is the 22 densely populated states on the east, west and Gulf of Mexico coasts which use 78 percent of the 3,500 TW hours of electricity consumed each year in the U.S.

Drawing energy from the ocean which borders these states makes logical sense, Musial said. "They can't be served by land-based renewable energy sources alone. We need to find ways to generate energy where people live," he explained.

Wind Power

Offshore wind farms in the GOM could be one way to meet that need.

Musial said offshore wind farms benefit from greater and more constant wind velocities and are far enough from shore that many people say they have little aesthetic impact on coastal landowners, although a Massachusetts project has generated much opposition for

*See **Energy** Pages 6-7*

Collaboration turns dangerous debris into power

by Catherine Coletti

To the unknowing observer, it might look just like any dumpster. But history is being made here at the Yankee Fishermen's Cooperative in Seabrook, New Hampshire.

A recently formed partnership of the Blue Ocean Society for Marine Conservation, University of New Hampshire (UNH) and the Waste Management company not only keeps marine debris out of the ocean – it goes a step further to use it as an energy source.

Marine debris is one of the biggest problems facing marine life, which can be killed or hurt through entanglement and ingestion. It is estimated that thousands of fish, marine mammals and birds are impacted by debris annually.

For the first time in New Hampshire, fishermen have a place to dispose of damaged fishing gear, such as nets, rope and line, and most of what ends up here is taken by Waste Man-

*See **Debris** Pages 11*

A kilowatt (KW) is 1 thousand watts; a megawatt (MW) is 1 million watts; a gigawatt (GW) is 1 billion watts; a terawatt (TW) is 1 trillion watts. To put these figures in perspective, an incandescent lightbulb consumes between 25 to 100 watts of electrical energy and compact fluorescent bulbs consume between 5 to 30 watts. According to the Maine Public Utilities Commission, the average Maine household consumes 6,000 KW hours of electricity each year. A KW hour is 1,000 watts consumed per hour. The six New England states generally use approximately 27,000 MW per day in the summer months, when air conditioner use is prevalent.

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The Gulf of Maine Council on the Marine Environment was established in 1989 by the governments of Nova Scotia, New Brunswick, Maine, New Hampshire and Massachusetts to foster cooperative actions within the Gulf watershed. Its mission is to maintain and enhance environmental quality in the Gulf of Maine to allow for sustainable resource use by existing and future generations.

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Editor's Notes

The many parts of the Gulf of Maine — the power and energy, the fishermen and fish, the visionaries

The Gulf of Maine is an ecosystem beyond compare. In this issue of the Gulf of Maine Times, you will learn of many of the efforts being made around the Gulf to harness the renewable energy sources available in the power of the Gulf's winds and tides.

There's also a report on a New Hampshire project that turns dangerous marine debris into energy, ridding the ocean of a hazard to sea life while recycling the trash into a much-needed commodity.

The lobster harvesters who live around the Gulf could have used an alternative energy source this year, as skyrocketing fuel costs affected all the basic fishing needs that must be transported to them -- from bait to the salt that preserves it -- and the necessities that are made from petroleum products, such as totes.

This year's energy and economic crises were stark reminders that our ecosystem is an integrated one, not just made up of the flora and fauna that live in and around the Gulf, but of the residents who populate its perimeter and rely on its resources for their livelihoods.

Two books examined in this issue look at different aspects of areas of the Gulf, but both take into consideration the variety of uses we expect from our coasts and consider both the human impacts and the impacts on humans.

Meanwhile, scientists continue to study and learn more about the various fish stocks that provide both food and commercial value and indicators for the health of the Gulf and other regions. Tagging systems that track the movements of fish are surprising scientists with unexpected information such as the 'haddock highway.'

Last but far from least, are the people who never cease to work on behalf of the Gulf of Maine, the Gulf of Maine Council's Visionaries. This year's array of outstanding winners, like their predecessors, have contributed in their unique ways — as volunteers, mentors, organizers, scientists and stewards.

— Nancy Griffin

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Promoting Cooperation to Maintain and Enhance Environmental Quality in the Gulf of Maine

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Fish tagging technologies help solve a mystery

Where do the fish go? Some go down the 'haddock highway'

by Rebecca Zeiber

PHOTO: REBECCA ZEIBER

Dr. Molly Lutcavage.

The movements of fish can be extremely difficult to track in the vast ocean waters, but years of collaboration between fishermen and scientists have helped to improve fisheries stock assessment models and tracking technologies.

Various fish tagging initiatives have led to much-needed improvements in fisheries stock assessment models and tagging technologies, experts say.

The 2008 Northeast Regional Tagging Symposium, held last fall at the University of New Hampshire (UNH) in Durham, attracted approximately 140 people. Attendees, including commercial and recreational fishermen, fishery biologists and managers, and university faculty and students, learned about how fish tagging data is used for stock assessments and for evaluating closed areas for commercial fishing.

Molly Lutcavage, director of the Large Pelagics Research Center (LPRC) at UNH, one of the symposium's two keynote speakers, offered a presentation on bluefin tuna movements in the Atlantic.

Electronic tags, particularly pop-up satellite tags, have been essential in determining the movements of bluefin tuna, she said. The tags estimate geolocations of the fish based on the angle of the sunlight. Overall, these tags have provided a wealth of information regarding the migration patterns of this species.

Some of the more recent findings from the electronic tags show that bluefin seem to be homing to a forage ground near Nova Scotia, Lutcavage pointed out. In addition, the LPRC recently began a program called "Tag a Tiny" to learn about the movements and associated thermal gradients of juvenile bluefin tunas.

Fish as young as three to five years old have been found crossing the Atlantic, something that had previously thought to be associated only with the adults.

"Without electronic tags, there would be no way we'd figure out bluefin tunas have such diverse dispersal patterns," Lutcavage said.

Others speakers told of the use of tagging studies in locations closed to commercial fishing. In particular, researchers wanted to learn if fish used these closed areas as a "safe zone" by staying inside the boundaries.

While some closed areas seemed to lack an obvious pattern of fish movement, areas such as the Western Gulf of Maine closure area seemed to have areas where fish stayed inside the closed areas.

In particular, one researcher described a "haddock highway" where this species would travel along a route in the closed area and would turn around once it reached the boundary, only to travel the same route back.

Tom Nies from the New England Fishery Management Council weighed in with his perspective on why data from tagging studies are important in determining fishery management plans.

"Tagging studies are helping to get at the root of the situation, and the answers they provide will only help improve our understanding of the fish populations," Nies said.

Other speakers discussed how fish species are being tracked to improve their stock assessments. Using mark-recapture studies with simple tags, researchers have learned about the mortality rates and movements of striped bass, yellowfin tuna and Atlantic cod in the western Atlantic Ocean. Thanks to years of tagging efforts by fishermen and researchers, fishery managers will be able to develop more accurate population estimates to protect and enhance stocks of various species.

Keynote speaker David Welch from the Kintama Research Corporation in British Colombia, Canada, spoke about the Pacific Ocean Shelf Tracking (POST) array, a highly advanced fish tracking system. POST relies on a number of wireless platforms deployed in the waters near Vancouver Island, along the coast of Alaska and into some rivers of the western United States. The platforms are receivers for the tag signals inserted in fish such as salmon and dogfish. As fish with tags swim near the receivers, the date, time and tag number are recorded.

"It's like a fish EZ Pass," Welch said. "This is a tracking system that's so good, we can learn exactly how many fish from a certain release are moving through a particular area."

The Pacific populations of economically valuable fish including black cod and salmon are expected to benefit from these technologies. The POST array data have already had huge impacts on improved population models thanks to detailed information on the fish movements.

"When you can do experiments like this directly in the ocean, it helps to move science forward much faster than more traditional studies," Welch added.

The symposium was funded by the National Oceanic and Atomospheric Administration's NOAA Fisheries, NH Sea Grant, the Northeast Consortium and several fish tag manufacturers. A publication based on the symposium will be available early next year. For more information on its availability, keep an eye on www.seagrant.unh.edu.

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Mapping Muscongus Bay — unique and available for all

By Nancy Griffin

A new publication that maps the coastal marine areas of Muscongus Bay offers specific information about this one bay area, but also offers a framework for people in other estuaries, communities and organizations to do the same.

The introduction states, "The Atlas is for anyone who has an interest in learning more about Muscongus Bay. It is also for people who like maps."

The Muscongus Bay Atlas 2008 was produced by the Quebec-Labrador Foundation/Atlantic Center for the Environment in Ipswich, Massachusetts, which has a Marine Program based in Waldoboro, Maine, directed by Jennifer Atkinson.

"The Atlas is for anyone who has an interest in learning more about Muscongus Bay. It is also for people who like maps."

A quote from the introduction to the Atlas explains why the project was conceived:

"Although located at the midpoint of Maine's long coastline, Muscongus Bay is not all that well known to many in New England... often overshadowed by... Penobscot Bay to the east and the... Damariscotta River Estuary to the west. Those who live here (close to 23,000 year round), however, are passionate about its beauty, its 'out of the way' location, and its traditional, rural character."

Atkinson and Stephen T. Engle, GIS director for QLF, produced the Muscongus Bay Atlas 2008, but the acknowledgments include a long list of fishermen, environmentalists, scientists, municipalities, academic and historical groups.

The Muscongus Bay Atlas 2008

by Jennifer Atkinson and Stephen Engle

Quebec-Labrador Foundation, Ipswich, Massachusetts

50 pp, $15

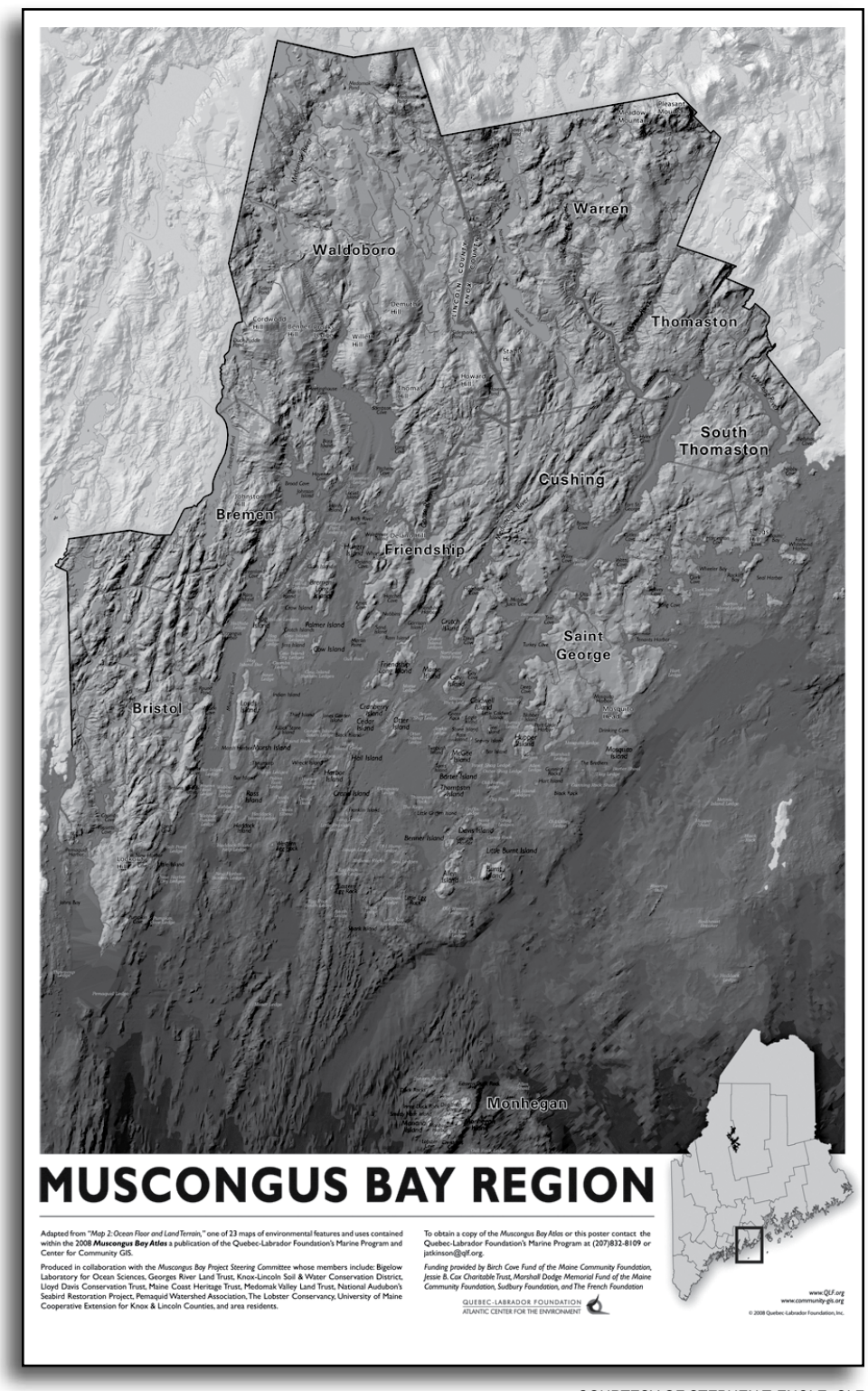
The Atlas is "an experiment. In all our searches, we found nothing like it," Atkinson said. "While a lot of GIS data changes, it's the digital library that underlies the Atlas that is the true power behind it. We can update that much more frequently than the published maps." Two other marine regions have already inquired about producing similar resources.

Set up as one page of data describing the map that appears opposite it, the Atlas covers commercial fisheries, with special maps for the lobster fishery, geology, the ocean floor and land terrain, kayaking areas, watersheds, sea level rise predictions, sailing areas, soils, population and housing growth, working waterfronts and more.

"This collection of maps gets us... into new possibilities for using maps and digital data in local decision-making," wrote Atkinson in the Atlas. "It is a launching point from which we can begin to visualize and discuss our common issues and resources."

The huge file is available in several formats -- to view or download online in its entirety, in sections or just images. Print copies cost $15 in bookstores, plus $5 S&H ordered by mail.

Besides QLF, the Atlas was funded by the National Oceanic and Atmospheric Administration, the Birch Cove Fund of the Maine Community Foundation, Davis Conservation Foundation, Jessie B. Cox Charitable Trust, Knox County Fund of the Maine Community Foundation, Maine State Planning Office, Marshall Dodge Memorial Fund of the Maine Community Foundation, The French Foundation and University of Maine Cooperative Extension for Knox & Lincoln Counties.



COURTESY OF STEPHEN T. ENGLE, QLF

A poster promoting the Muscongus Bay Atlas.

Wind Energy in the the Gulf

PHOTO: DAVID COLVILLE

Wind turbine in Grand Etang, Inverness County Cape Breton. This is one of Nova Scotia Power's Vestra (0.66MW) turbines that has been in service since 2002.

Fishermen protecting fish is not a paradox

Book Review

Sharing the Ocean: Stories of Science, Politics, and Ownership from America's Oldest Industry

Reviewed by Lee Bumsted

While it may seem paradoxical to assert that commercial fishermen are some of the best people to manage and protect the New England inshore fishery, that is precisely what Michael Crocker does in Sharing the Ocean: Stories of Science, Politics, and Ownership from America's Oldest Industry.

He makes a persuasive case that inshore fishermen, with their detailed knowledge of local ecosystems and a desire to conserve the resource they harvest, should have a greater role in determining fishing regulations.

Various management plans to stem the decline of the New England groundfish population have been tried over the past 30 years. Crocker summarizes these regulations and chronicles some of the missteps taken by well-intentioned federal regulators and environmentalists.

He describes how quotas on the amount of fish taken and days-at-sea limits have disproportionately hurt fishermen working on smaller vessels with limited ranges. These fishermen often hail from rural coastal ports, so their loss of income or livelihood radiates out to their communities as well.

Crocker worked as the communications director for the Northwest Atlantic Marine Alliance (NAMA) from 2001 to 2006, and he devotes a chapter of this book to the work of NAMA and an extensive survey it conducted. The nonprofit organization promotes community-based management of the fishery in which fishermen join scientists, environmentalists, and policy makers in collaborating on regulations.

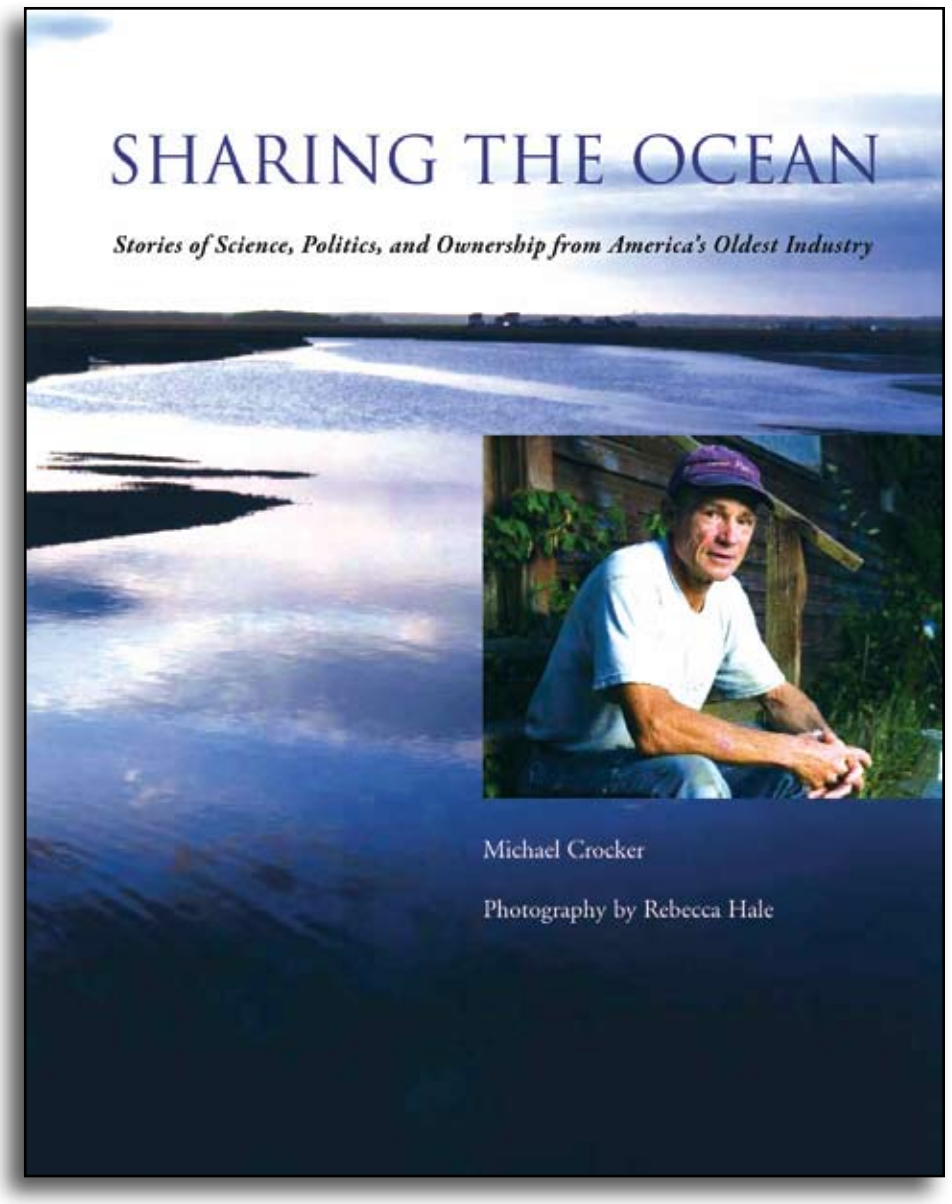
NAMA's Fleet Visioning Project looked for common threads in the replies to a survey distributed to New England groundfish permit holders, researchers, marine business people and managers. Respondents were asked their vision of the future of the groundfish fleet, why it is important to them, and how they could help. Survey results were shared at regional workshops, sent to participants and fishery managers, and published online at www.namanet.org.

The final segment of Sharing the Ocean makes compelling reading, and is the section most accessible to general readers. It consists of 31 short narratives gathered from the Fleet Visioning Project. In their own words, stakeholders tell why they want to help the local fishery succeed. Their stories are paired with full-page color portraits by Rebecca Hale, a studio photographer for National Geographic.

Howdy Houghton from Bar Harbor, Maine is one of the many fishermen profiled. He said: "....we need to consider just how dependent our communities are on fisheries as a food source and take care of the fish. We must use wise local stewardship to maintain healthy local seafood ecosystems for future generations, and for cultural, economic, and local seafood security."

Jennifer Brewer, a geographer in New Harbor, Maine, offered this observation: "If we lose our fishing industry, or allow it to consolidate unduly, we lose a big chunk of our soul -- as individuals, communities, states, and society at large."

These narratives and portraits bring alive the values of those involved in the inshore fishery. They also support Crocker's thesis that local commercial fishermen have much to contribute to solving the fishery management dilemma.



Sharing the Ocean: Stories of Science, Politics, and Ownership from America's Oldest Industry

By Michael Crocker, Photography by Rebecca Hale

Tilbury House, Publishers, Gardiner, Maine and Northwest Atlantic Marine Alliance, Windham, Maine

160pp., $20.00, paperback, ISBN 978-0-8848-306-9 (2008)

Around the Gulf

PHOTO: REBECCA ZEIBER

At about 7:30 a.m. on a cool October morning, Ray Konisky (front) of The Nature Conservancy, and Krystin Ward (back), research technician at the Jackson Estuarine Laboratory, released about 3,000 juvenile oysters into the Oyster River in Durham, New Hampshire as part of the Oyster Conservationist project. The oyster conservationists are volunteers who raise baby oysters off of their own docks on Great Bay, which has 200 miles of tidal shoreline and is framed by five N.H. towns. Once the oysters are big enough, they are collected and "planted" to help restore declining populations. Besides being a food source for humans and animals, oysters are natural water purifiers and help filter increasing pollutant loads in Great Bay.

Energy *continued from Page 1*

its visibility. He adds they can be located near demand centers, such as Portland or Boston.

"You can build them big," he said. "You can't ship the big wind turbine towers on land because they won't fit [in one piece] under the interstate system's bridges."

At 60 to 80 meters (197 to 262 feet) of water depth in the Gulf of Maine, the mean wind speeds are 21 miles per hour (MPH) or more than 9.5 meters per second, a velocity that Musial called "outstanding." Unlike the offshore turbines, most current commercial turbine models, such as those produced by Siemans of Germany or Vestas of Denmark, are designed for shallow water depths where they are fixed to the seabed.

Offshore turbines must float above deep waters, but also must have a system that keeps them anchored in one place in order to withstand storms. Currently one of the world's deepwater offshore systems, called the Talisman Field, operates in Scotland. Its turbines are the largest in the world, with individual wind blades of 61.5 meters (201 feet) in length.

No offshore wind towers currently pull power from the sky in the GOM. The 41 existing wind turbines that feed electricity to Nova Scotia Power are all land-based. The Nova Scotia Department of Energy recently set up a new online wind atlas (http://www.nswindatlas.ca) developed with the University of Moncton and Nova Scotia Community College, which shows that some of the province's peninsulas in the Gulf have definite wind energy potential.

The maps, drawing on Google satellite images, show wind speeds based on velocity at 30, 50 and 80 meters (32, 54 and 87 yards) above ground. The department predicts the number of wind turbines in the province will grow to more than 300 by the year 2013, although it is unclear if any of those new facilities will be offshore.

In Maine this past February the Governor's Task Force on Wind Power Development released its report on wind power potential for the state. The task force, which included both land and state waters in its study, concluded the state should aim to generate at least 2,000 MW of electricity from wind power by 2015 and 3,000 MW by 2020. By 2020, 300 MW of that electricity should be drawn from offshore wind projects.

Currently the state has several land wind farms installed or in the construction stages, including Mars Hill (28 turbines generating 42 MW of electricity), Kibby Mountain (44 turbines potentially generating 130 MW) and Stetson Ridge (potentially generating 57 MW).

Former independent governor Angus King jumped into the wind world when he founded Independence Wind in 2007. In 2008 King said in a speech at Bowdoin College that the Gulf could be a "Saudi Arabia of wind" in terms of its potential for power generation. He called for a Manhattan Project-style endeavor to create a $15 billion network of offshore wind turbines that would feed into the New England grid system.

In September, a Massachusetts-based company called Blue H came calling in Maine with plans for an offshore wind farm employing 90 turbines that could produce up to 450 MW of electricity, although the company identified no specific Maine site. Blue H set up a successful demonstration turbine in waters off Italy and plans to begin construction of a full-scale project there in 2009.

The company also has filed an application with the U.S. Minerals Management Service to lease submerged Massachusetts lands, approximately 23 miles (37 km) from Martha's Vineyard and 45 miles (72 km) from New Bedford, for a similar demonstration project. The company says, if successful, the facility would include 120 turbines generating more than 400 MW of electricity.

The Massachusetts wind project that has generated years of controversy, while not in the Gulf of Maine, does illustrate the difficulties of siting large-scale energy facilities, even non-polluting ones, within sight of the shore.

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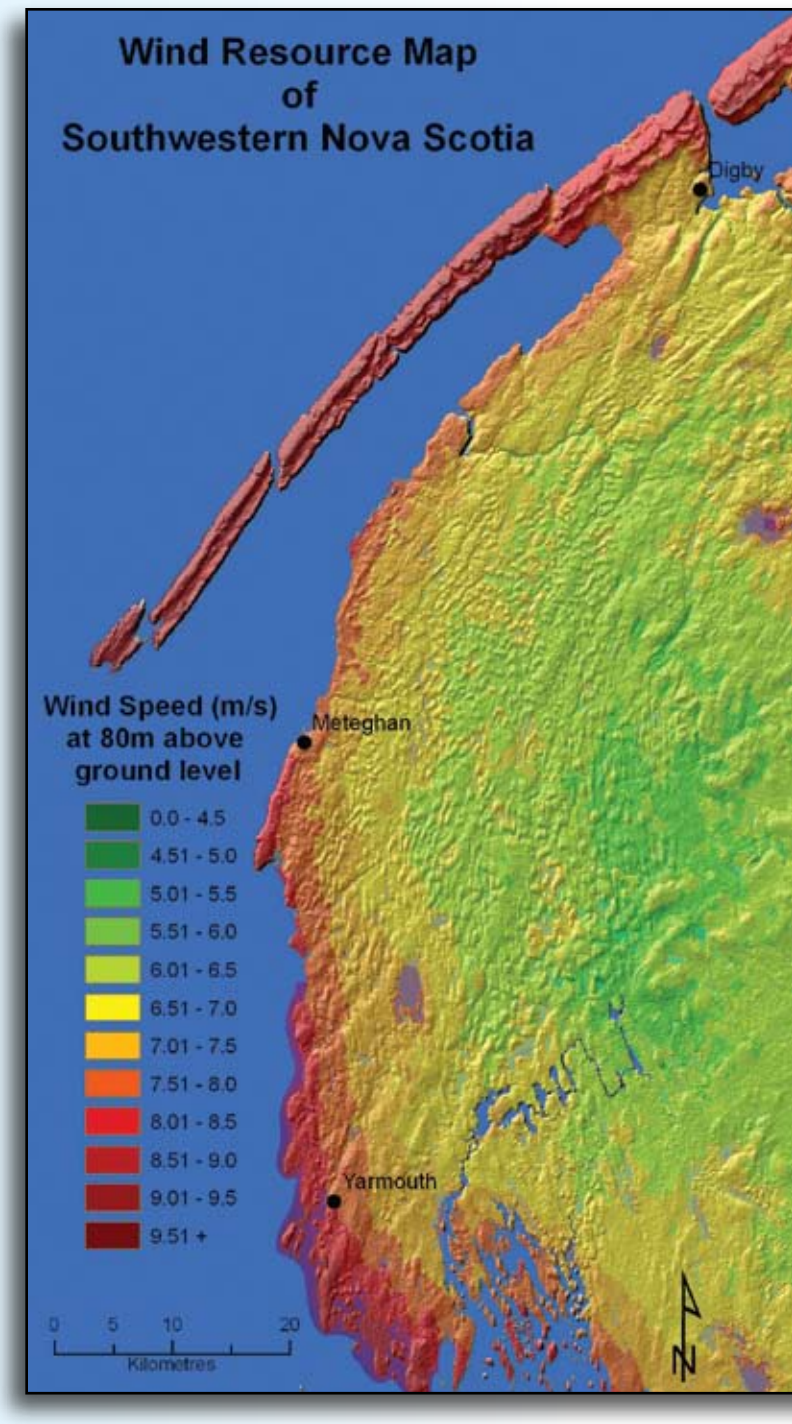

COURTESY OF THE NOVA SCOTIA DEPARTMENT OF ENERGY

The Nova Scotia Wind Atlas has been developed for the Nova Scotia Department of Energy by the Universite de Moncton and the Applied Geomatics Research Group. It was created to help identify Nova Scotia's wind resource and to stimulate its use. Maps have been created to show the wind resource at 30m, 50m, and 80m above ground level. This Wind Resource Map shows the annual average wind speeds at a height of 80m in the Digby to Yarmouth area of Nova Scotia. Interactive online access to the Wind Atlas is available at www.nswindatlas.ca

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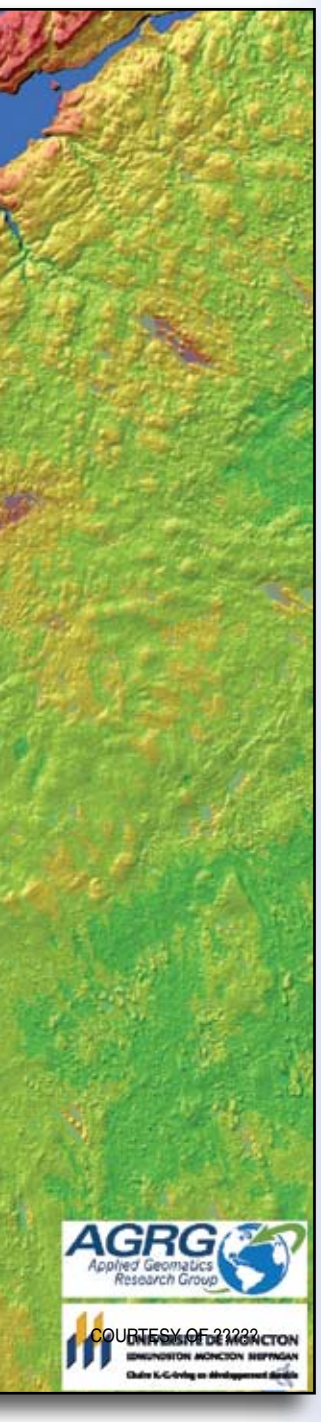

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PHOTO COURTESY OF THE NATURAL RESOURCES COUNCIL OF MAINE

moving water holds a lot of energy, a fact that hasn't gone unnoticed in Maine or the provinces. Back in 1982, a small tidal dam was built in Annapolis, Nova Scotia, to capture some of the Bay's tidal energy. The mechanism is charmingly low-tech.

The dam lies across the tidal marsh. On the high tide the gates of the dam close to impound the water. Vents at the bottom of the dam release the water past turbines that turn to generate electricity. Even after more than two decades, the Annapolis turbine still generates 20 MW of electricity per year, enough to power approximately 4,500 homes.

During the past two decades, tidal energy devices have advanced considerably in design and efficiency. The device of the moment is a tidal turbine. A tidal turbine is much like a windmill.

The moving tide rotates a series of blades, the blades then spin a generator that produces electricity. Tidal turbines can be arrayed underwater in rows, similar to turbines in a terrestrial wind farm. The key requirement, however, is a strong coastal current running at least four knots, according to Mark Cote, chairman of the Maine Maritime Academy (MMA) engineering department, located in Castine, Maine.

In 2007 the MMA filed an application with the U.S. Federal Energy Regulatory Commission (FERC) for a tidal energy device evaluation center on its campus. MMA serves as the host institution for a consortium of public agencies and three private companies – Maine-based Cianbro Corporation, Marinus Power and OceanWorks International. The proposed center would take advantage of the vigorous tides of the Bagaduce River to test new tidal energy equipment.

Cote said tidal energy is absolutely suited to Maine and to the school's engineering program.

"The center would create a facility to test and evaluate tidal energy devices designed by U.S. and international companies," he said. "MMA students and faculty would be involved in research and educational opportunities at the proposed center, which is intended to facilitate and advance development of tidal energy." One of the center's goals is to generate electricity for the campus and even send excess power to the local power grid.

In the Maritime provinces, Nova Scotia has vowed to draw nearly 20 percent of the province's electricity supply from renewable sources by 2013. In 2008, Clean Current, Nova Scotia Power and Minas Basin Power and Pulp Company began working jointly on a project to demonstrate tidal devices in the Bay of Fundy. Minas Basin Pulp and Power Corporation is constructing the infrastructure that would allow all the tidal turbines to connect to the existing power grid.

Funds for the project come from a $4.7 million (Canadian) grant from the Nova Scotian Ecotrust for Clean Air and Climate Change program, a $3 million loan from EnCana Corporation's Environmental Innovation Fund and contributions from each of the successful developers. Nova Scotia's Department of the Environment is also

*See **Energy** Page 10*

Visionaries work to protect the Gulf of Maine

Each year, members of the Gulf of Maine Council on the Marine Environment (GOMC) honor people in the three states and two provinces who have used their talents, energy and commitment to improve the marine environment of the Gulf of Maine.

This year, at the June meeting in Salem, Mass., the GOMC presented three special awards, as well as the 10 Visionary Awards to people from Massachusetts, New Hampshire, Maine, New Brunswick and Nova Scotia and 13 Distinguished Service Awards to GOM contractors and consultants Recipients are identified by the positions they held at the time the awards were presented.

Bruce Carlisle, assistant director of the Massachusetts Office of Coastal Zone Management (CZM), was awarded the Susan Snow-Cotter Leadership Award, bestowed on one person from the region who shows outstanding leadership or exceptional mentoring in the watershed.

Snow-Cotter, director, had appointed him assistant director at the agency, and when she died, he stepped into her role and guided the CZM through a year described as "extraordinarily trying times."

Starting as a CZM intern in 1993, Carlisle became coastal nonpoint coordinator in 1997, then director of the Massachusetts Wetlands Restoration Program, which was moved into the coastal program to protect it in a difficult political period. Later, Snow-Cotter appointed him CZM assistant director.

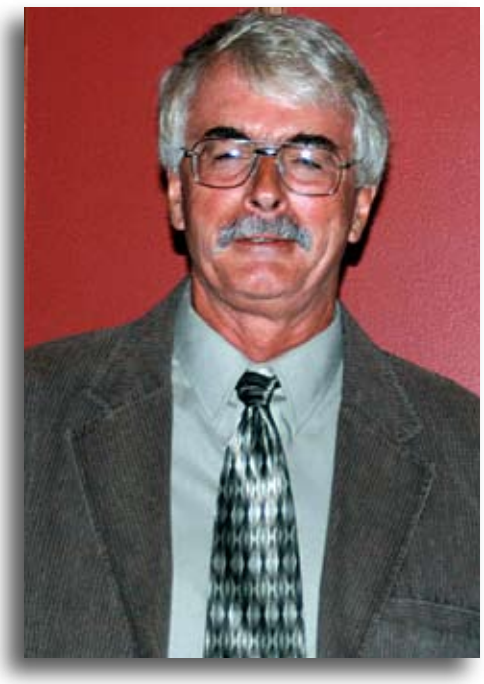
Carlisle received the award for his willingness and ability to assume leadership roles, for helping ensure the continuity of the state's coastal programs, earning the respect of his peers around the country, and for mentoring others along the way.

The Longard Volunteer Award is given annually in memory of Art Longard, a founding member of the GOMC and long-time Working Group member to an individual who has shown great commitment to volunteer programs dedicated to environmental protection and sustainability of natural resources.

Longard award winner, **Lawry Reid** of Massachusetts, made significant contributions to the conservation and management of local resources in the watershed by founding the 30-member Straits Pond Watershed Association in 2000 and serving as its president.

Straits Pond is a critically impaired 100-acre coastal salt pond in Hull, part of the Weir River Estuary, a state-designated area of critical environmental concern.

His association helped establish a $2.5 million culvert reconstruction and tide gate management project to restore critical estuarine fish and invertebrate habitat, provide improvements to intertidal habitat, and improve habitat and forage area for wading and diving birds. The association also conducts education, outreach and coordination, seasonal water quality monitoring, and annual pond clean-ups.



PHOTOS: NATURESOURCE COMMUNICATIONS | NATURESOURCE.NET

Top left: Lawry Reid, right: John Kachmar. Second row, left: John Terry, right: Fred Whoriskey and Jane Spavold Tims. Third row, left: Bob Sweeney, center: David Delaney, right: David Keeley

Visionary Awards

The annual Gulf of Maine Visionary Awards are given in each of the five jurisdictions to recognize innovation, creativity, and commitment to marine protection by businesses, environmental organizations, or individuals who are making a difference to the health of the Gulf.

New Hampshire

Dr. David M. Burdick of the Jackson Estuarine Laboratory: For his efforts in salt marsh restoration, marine and estuarine education, and promotion of the function and services that wetlands and coastal habitats provide. He has freely given time as a volunteer and provided professional services to solving environmental issues, improving environmental quality, and working toward long term sustainability of these systems.

Susan Foote, Seabrook Planning Board and Seabrook Conservation Commission: For her tireless work in managing and protecting Seabrook's critical resources—fresh water wetlands, tidal wetlands, wildlife habitat, and beaches and dunes, as well as her dedication to the preservation and maintenance of conservation lands in connection with the development of commercial, industrial and residential projects.

Maine

John Terry, Gulf of Maine Institute: For his efforts to inspire youth and adults to act in partnership to support environmental stewardship of the Gulf of Maine through projects which include mapping and controlling invasive species, cleaning up marine debris, supporting habitat restoration of fish, environmental justice, low carbon diets and more. While Terry lives in Maine, his impact is felt throughout the Gulf.

Evan Richert: For his extraordinary leadership as director of the Maine State Planning Office for Governor Angus King, as chair of the Gulf of Maine Ocean Observing System, and as director of The Gulf of Maine Area program. Richert is credited with changing the way people think about marine science and ecosystem-based management at the regional

PHOTOS: NATURESOURCE COMMUNICATIONS
NATURESOURCE.NET

The Snow-Cotter family celebrates his award with Bruce Carlisle, right. Middle row, from left: Michele Tremblay, Christine Tilberg, Cindy Krum, Bottom: Meg Gresh, left, Leslie-Ann McGee.

and national level, and is recognized as a national leader in advocating sustained funding for ocean observations and research.

New Brunswick

Sweeney International Management Corporation: For commitment to work with its clients to ensure long-term environmental sustainability, under the leadership of Bob Sweeney. Depending on the client's particular needs, SIM Corp. provides a full range of professional services to the aquaculture industry by conducting pre-site assessments for finfish aquaculture growers, providing recommendations on the suitability and sustainability of proposed sites, and conducting annual monitoring programs. Bob Sweeney also serves on the Steering Committee for the South West New Brunswick Bay of Fundy Marine Resource Planning Initiative.

Dr. Frederick G. Whoriskey, Atlantic Salmon Federation: For the development of improved sonic tracking systems—in cooperation with an engineering firm, Vemco Ltd, Halifax—to follow the movements of Atlantic salmon in rivers and the ocean. The worldwide leading-edge technology has tracked smolt more than 1000 km (621 miles) at sea, and tracked salmon for several months after their release from sea cages in Cobscook Bay into the Gulf of Maine. He has spoken on his work to meetings of ICES (International Council for the Exploration of the Seas) and many other organizations and universities. Dr. Whoriskey also directs field courses for McGill University students.

Massachusetts

David G. Delaney: For mixing research and outreach in creative and innovative ways. Delaney works to increase public awareness of environmental problems. He brings inner city youth to marine environments to conduct hands-on learning as part of his international research program. As director of the Invasive Tracers, which brings together biologists and volunteers to monitor GOM areas for native and invasive species, for the last three years Delaney has recruited and supervised approximately 1000 people to monitor more than 60 sites from New Jersey to Canada.

Edward Thomas, Esquire: For his extensive pro bono public assistance to the Massachusetts Office of Coastal Zone Management StormSmarts Coast Program. His dedication and expertise has significantly bolstered the program's ability to promote coastal community resiliency through the No Adverse Impact Approach. His enthusiasm is exceeded only by his commitment to the preservation and protection of the coastal residents, businesses, and environmental resources of the area.

Nova Scotia

Dr. Tony Charles, Saint Mary's University: For his teaching and research on interdisciplinary aspects of natural resource management, notably in fisheries, aquaculture and coastal management. Dr. Charles coordinates the university's Fisheries and Coastal Seminar Series, is involved in a wide range of community service and has been extensively published. For much of the 1990s, he served on Canada's Fisheries Resource Conservation Council, and currently is national director of the Ocean Management Research Network.

Union of Nova Scotia Municipalities): For demonstrating leadership and commitment to sustainability by establishing a Municipal Sustainability Office in January 2007. The office helps municipalities in Nova Scotia become more sustainable by facilitating the sharing of information and expertise on environmental best practices. An online sustainability guide provides the 55 municipalities with timely and practical information on energy efficiency, renewable energy, adaptation to climate change and environmental sustainability as it relates to municipal governments and communities.

Distinguished Service Awards

Distinguished Service Awards are given by the GOMC to recognize the dedication and commitment of its contractors, consultants, or anyone involved with the organization, who are instrumental in protecting the Gulf's resources.

This year, a special Distinguished Service Award honored **Patricia Rae Hinch**, of the Nova Scotia Department of Environment and Labour, who has served tirelessly as a Working Group member, including several years as chair, since nearly the council's inception.

During one of those years, she also absorbed the role of council coordinator while also providing leadership as Working Group chair. In giving her the award, the council said, "It would be challenging to find someone who believes in, cares for, and promotes more the Council's mission and goals. Patricia Rae Hinch has truly worked tirelessly to create an international conservation legacy."

The Distinguished Service Awards were presented to: **Jim Cradock**, systems administrator, data architect and programmer; **Sara Ellis**, GOMMI coordinator; **Meg Gresh**, administrative assistant; **Lori Hallett**, finance assistant; **Karin Hansen**, outreach committee education and marketing coordinator; **Steve Jones**, Gulfwatch coordinator; **Jon Kachmar**, habitat restoration partnership coordinator; **David Keeley**, policy and development coordinator; **Cynthia Krum**, executive director, US Gulf of Maine Association; **Peter Taylor**, science translator and web producer; **Christine Tilberg**, ESIP program manager; **Michele L. Tremblay**, council coordinator and **Lori Valigra**, editor, *Gulf of Maine Times*.

Calendar

December 2-4

Gulf of Maine Working Group meeting, Halifax, Nova Scotia, Tuesday and Wednesday, followed by Gulf of Maine Council on the Marine Environment meeting, Thursday.

Energy continued from Page 7

providing $300,000 for environmental and permitting work.

In May of this year, New Brunswick offered leases on 11 submerged land sites in the Bay of Fundy to businesses and organizations that would conduct up to two years of research on the sites' tidal energy potential. The leases include Head Harbour Passage and Western Passage in Passamaquoddy Bay, an area near Chignecto Bay and one off Cape Spencer near Saint John.

Irving Oil, in partnership with the Huntsman Marine Science Center, won the rights to the sites. Currently the public-private partnership is testing the strength of the daily tidal currents through an array of floating sampling devices.

New institute says wind power best for Maine

The Ocean Energy Institute, a research facility first envisioned two years ago by energy banking expert Matthew Simmons, a part-time resident of Rockport, Maine, says wind power makes the most economic sense for Maine.

The nascent institute is concentrating on devising ways to harness the wind power of the Gulf of Maine rather than other energy sources, such as tidal and thermal energy.

George Hart is the chief technical officer (and sole employee) of the institute, which remains a virtual rather than bricks-and-mortar facility.

"If Matt Simmons is at all right about the kind of prices facing us, we have a bad time coming in Maine," Hart said. Simmons predicted this past spring that oil prices would reach $300 a barrel because the world has passed through the era of peak oil production.

Hart received his Ph.D. from the University of Maine in the 1970s, and later worked in Washington, D.C. at the Naval Research Laboratory and the Missile Defense Agency. Upon joining the institute, Hart undertook a study of Maine's business and residential energy needs.

"I did a financial energy audit of the state's energy needs in terms of transportation, heating, etc.," Hart said. "Then turned to what would make most sense for Maine given the resources we have here."

Hart found that back in 1998 Maine families spent 15 percent of their household budget on health costs and 7 percent on energy. By the winter of 2008, those costs had increased to 30 percent for health and 22 percent for energy.

"That leaves only about half the budget for things we call 'living' such as mortgage, food, clothing and other things," Hart explained. In 10 years, he predicts 35 percent of a family's income will be spent on health costs and a full 45 percent on energy costs.

"Twenty percent for everything else? That just won't work," he added.

To reduce energy costs, Maine needs to draw on its available resources, Hart argues, and one of those resources is offshore wind.

"Offshore wind dominates by a factor of 50 to 100 what you can get from thermal or tidal power," Hart said. As an added bonus, Gulf winds increase in intensity during the winter months, a time of year when Maine residents use the most energy.

Thus the Ocean Energy Institute has turned its attention to developing large-scale offshore wind farms in the Gulf to provide electrical power to Maine. Hart estimates that electricity can be generated at $3 to $4 per installed watt, a higher cost than the $2.50 per installed watt produced by land-based wind turbines.

"But one of the benefits of offshore is that it is not in people's faces," Hart noted. He said the institute would like to test an offshore turbine array off Mt. Desert Rock in concert with the university and Statoil Hydro of Norway.

"Then we would like to accelerate as much as possible with a commercial project in eight or nine years," he said.

With George Hagerman, an offshore wind expert with the Center for Energy and the Global Environment at Virginia Tech, now on retainer to the institute, Hart is promoting the concept of offshore wind farms among leaders in the research and political realms of Maine.

"Bob Kennedy [University of Maine president] and I met with Angus King last February and showed him the cost numbers," Hart said. "I've talked to Don Perkins [president of the Gulf of Maine Research Institute], George Baker and Philip Conkling at the Island Institute, Dylan Voorhees and Pete Didisheim at the Natural Resources Council of Maine, and Habib Dagher at the University of Maine [director of the Advanced Engineered Wood Composites Center]."

Producing renewable energy for Maine people at a reasonable cost is not the institute's only goal.

"It makes sense to make the turbine blades here with advanced composite technology," Hart said. "The blades are strongest if they are made in one piece [not separated for ease of transport]."

He envisions using space at Maine's Brunswick Naval Air Station, currently being decommissioned, for construction of the blades, as well as drawing on the expertise of Bath Iron Works and Cianbro Corporation to make the steel turbine towers.

"The key to this is that Maine has all these waterfront assets that aren't being fully used compared to one hundred years ago," said Hart. He cites the space at the Naval Air Station as an example. "You need some place to store and stage the turbines when you have to wait for the weather or some other factor. The Air Station is worth its weight in gold as a place to keep inventory."

While the Ocean Energy institute is still in its infancy, its aims are grand. "The real impact in Maine [of the Institute's endeavors] will be job creation and saving the $5 billion which Maine residents and businesses spend each year on oil," Hart said.

--MW

Several private companies have announced their intentions to locate tidal turbines in Maine and New Hampshire tidal waters. Maine Tidal Energy Company, a subsidiary of Oceana Energy of Washington, D.C., received a preliminary permit from FERC in June to study developing a tidal power project in the Kennebec River just north of Bath.

In 2007, FERC gave the company permission to spend three years studying sites on the Penobscot River near Bucksport and Verona Island to determine if the area is suitable for an array of submerged tidal generators.

Ocean Renewable Power Company (ORPC), a Miami, Florida firm, tested its pilot tidal turbines at two locations in Eastport this spring. Working with students at the Washington County Community College Marine Technology Center, company president Chris Sauer and his team created a demonstration turbine generator unit that hangs 300 feet down into the water column from a stationary barge.

The $1.2 million device, (U.S.) which can generate 32 KW in a 6-knot tidal current, was completed and installed in December, 2007. In April it began producing limited electrical power. The company predicts the turbines eventually will send 250 KW into the local power grid.

In a presentation at the Power of the Gulf conference Sauer noted, "Expertise in maritime trades is key to success [of the company]. We have been blown away by the capabilities of the people in Washington County. Initiatives [like his project] are coming and with the high price of oil, they are coming even sooner."

The New Hampshire Tidal Energy Company, also owned by Oceana Energy, received its preliminary permit from FERC in 2007 to study the potential for tidal power in the Piscataqua River, shared by Maine and New Hampshire. A rival company, the Underwater Electric Kite (UEK) Corporation, plans to do the same. Each company predicts that their respective turbines placed appropriately in the Piscataqua River could generate between 40 to 100 MW of power.

Offshore Oil and Gas

And of course, there's always the traditional source of energy, oil and natural gas. The specter has once again raised its head of opening the Gulf of Maine, specifically Georges Bank which is shared by the U.S. and Canada, to oil and gas exploration.

Offshore oil and gas were hot topics in New England and the Maritimes back in the 1970s and 1980s. Late in 1979, 13 oil companies paid more than $816 million (U.S.) for 5-year leases to drill for oil and gas approximately 130 to 170 miles (209 to 273 km) off Cape Cod. Ultimately only five companies actually drilled eight wells in the Georges Bank area.

In 1982 Shell and Tenneco struck the same natural gas pocket about 145 miles (233 km) out to sea, but later that year the oil companies all announced they were pulling out of Georges Bank saying none of the exploratory wells found significant amounts of oil.

In 1983, two other oil companies said they would return to Georges Bank to drill wells to tap the natural gas deposits. The Conservation Law Foundation filed suit in federal court to prevent a second 5-year lease sale. The organization won the case. President Reagan later issued an executive order banning further outer continental shelf lease sales. Congress had previously passed a Congressional ban on offshore oil exploration in the form of a rider in the annual federal appropriations bill.

Flash forward to 2008. President Bush lifted Reagan's executive order in July. Congress lifted its 27-year ban when it passed the federal appropriations bill in September. Currently both Canada and the United States have agreed to a moratorium on Georges Bank exploration until 2012.

The U.S. energy bill passed in September by the House and Senate included a moratorium on oil and gas exploration on Georges Bank while opening other sections of the Atlantic coast to drilling.

The Canadian and Nova Scotian moratorium legislation requires provincial and federal governments to decide by 2010 whether another extensive review process is necessary to assess the status of Georges Bank before deciding on whether to rescind or continue the moratorium.

Reports from Canada's federal Department of Fisheries and Oceans show haddock stocks on Georges Bank have rebounded from an absolute low in the early 1990s to a 50-year high. The relative strength of the high-value stocks could influence the moratorium decision-making process.

The question that can't be answered definitively by any players on either side of the international boundary is just how much oil lies in the Gulf of Maine and whether it exists in easily accessible reservoirs. The U.S. uses approximately 6.6 billion barrels of oil each year, according to the Energy Information Administration (EIA), part of the federal Department of Energy. Identified reserves of oil within the U.S. total 21 billion barrels which lie within the onshore and offshore areas of Texas, Alaska, California and Louisiana.

The U.S. Minerals Management Service states there are at least 18 billion barrels of oil "reserves" waiting to be recovered from submerged lands currently off-limits to exploration (the U.S. east coast, western side of Florida, and northwest coast). The U.S. Geological Survey says there are approximately 18 billion barrels of "undiscovered conventionally recoverable resources" in the off-limits areas of the outer continental shelf.

The two terms mean different things. "Reserves" are oil deposits that have actually been found; "resources" means geological structures where oil is likely to be found.

A report issued in 2007 by the EIA said that "access to the Pacific, Atlantic, and eastern Gulf regions would not have a significant impact on domestic crude oil and natural gas production or prices before 2030. Leasing would begin no sooner than 2012, and production would not be expected to start before 2017."

Many experts still debate whether the global moment of peak oil has come and gone. Coal, oil and natural gas are finite in quantity and thus we can expect the price paid for their use to increase, as it has done in the past year. Yet the energy that may be harnessed from the ocean's tides and winds is not finite.

Experts all agree it seems inevitable that as the cost of traditional energy grows, more and more businesses and governments will turn entrepreneurial eyes to the energy potential of the Gulf of Maine.

Debris continued from Page 1

agement to a waste-to-energy plant in North Andover, Massachusetts, where it's burned to generate electricity.

Appropriately dubbed the marine debris to energy project, so far 3.38 tons (3 metric tons) of debris have been collected since last April. What cannot be processed at the plant, such as certain metals, is separated out and recycled or disposed of by Waste Management.

"The cool thing about the project is that it's a cooperation between us and the fishermen. It's a non-confrontational relationship," said Blue Ocean Society for Marine Conservation Director Jen Kennedy.

The goal of the project is to get as much lost and damaged fishing gear as possible out of the water, where it poses a serious navigational hazard to fishermen and life-threatening risk to marine wildlife. Fishermen often encounter this derelict gear at sea. Prior to the project they had nowhere to put it if they pulled it up.

What may be surprising to those not familiar with commercial fishing is the sheer size of the gear. For instance, gill nets, which have vertically placed panels of 100 feet plus (30.4 meters), end up ripping out and getting into the marine environment.

"The reason I got involved with the project is that I wanted to work with the industry to mitigate impacts of gear," said Ken La Valley commercial fisheries specialist at the New Hampshire Sea Grant, who approached the Yankee Fishermen's Co-op about collecting used and abandoned fishing gear onsite.

Fishermen also have the unique opportunity to enter the specific latitudinal and longitudinal location of where they find the gear at sea using a website that was created as part of this project.

Wave action often causes long lines, nets and bulky gear to mesh together, creating a mass that lies in wait to ensnare a fishing boat or unsuspecting marine mammal. In 2007, the Provincetown Center for Coastal Studies confirmed 30 cases of entangled whales in Northeast U.S. and Canadian waters.

PHOTO: CATHERINE COLETTI

Marine debris from New Hampshire is collected by Waste Management and transported to a waste-to-energy plant for conversion to electricity.

Atlantic Large Whale Disentanglement Network members work together to free whales from the life-threatening gear. However this process is extremely dangerous for humans and not all reported wildlife is able to be rescued or even relocated.

During the summer of 2007, Dr. Jenna Jambeck of UNH and Kennedy worked together on a survey to analyze where debris was coming from with the goal of developing improved outreach and prevention strategies. Jambeck was surprised by the high amounts of ocean-based debris recorded in New Hampshire, noting that more ocean-based debris was recorded on International Coastal Cleanup Day data cards in New Hampshire than in Florida.

The missing link: fishermen.

Jambeck and Kennedy partnered with La Valley, who has served as a point of contact to fishermen throughout the project. Then, enter Waste Management, which donated both the dumpster and removal services, and Wheelabrator Technologies, a subsidiary of Waste Management that makes its business turning trash into energy.

This A-team received a grant from the National Oceanic and Atmospheric Administration's (NOAA) Marine Debris Grants Program to conduct the project. The project has funding through February and partners are currently looking for additional grant funding to continue.

Fishermen at the Yankee Co-op say they are happy to finally have a place to dispose of damaged gear and derelict gear found at sea. However, curbing general dumping on nights and weekends when co-op members are not there, remains a challenge. La Valley is hoping the new lockable dumpster lid will do the trick.

Another part of the project is monofilament bins placed at five locations throughout the seacoast, targeted to recreational fishermen. Monofilment takes 600 years to break down in the environment, and in the meantime can continue to kill and injure plenty of marine wildlife.

PHOTO: CATHERINE COLETTI

From left: Jenna Jambeck, University of New Hampshire; David Goethel, commercial fisherman; Congresswoman Carol Shea-Porter; Jen Kennedy, Blue Ocean Society for Marine Conservation; Rob Morin, Waste Management; Alan Davis, Waste Management, and Ken La Valley, University of New Hampshire Cooperative Extension.

CSI Debris

Nobody knows for sure how much derelict fishing gear lies beneath, but La Valley predicts that it must be an astounding amount based on the day he spent out mapping it using a multi-beamed sonar in Portsmouth Harbor.

Where it all comes from is now being recorded into a database into which anyone can enter data via a website that is quickly becoming the data collection point for marine debris reporting. Further website development is underway, and users will soon be able to generate reports and maps detailing what types of debris have been found where. The educational possibilities are endless. For instance, teachers will be able to take students on a cleanup and see the results on a map.

Massachusetts is doing a similar campaign called "fishing for energy." Other projects outside the region are happening on the West Coast. Kennedy hopes that this project will become a model for others in the Gulf of Maine region.

To learn more, go to the New Hampshire Marine Debris to Energy Project Web site at www.nhmarinedebris.org.

Spiraling fuel costs, world financial woes inflict 'perfect storm' on GOM lobstermen

PHOTO: NANCY GRIFFIN

Port Clyde, in one of Maine's largest lobster fishing areas, looks peaceful at sunset. But many harvesters worried their businesses might not survive the winter.

Lobstermen around the Gulf of Maine can usually predict to some degree the kind of economic season they'll have by the number of lobsters they catch.

If their catches are high, their price may drop a little. If lobsters are scarce, prices are higher.

But this season, all the usual predictors were turned upside-down when harvesters faced what one Maine lobsterman described as "the perfect storm" of events affecting the industry — a combination of high fuel prices, the lowest prices for lobster in two decades, a global economic meltdown that lowered domestic and foreign demand, and plenty of lobsters.

"It's a perfect storm," said David Cousens, president of the Maine Lobstermen's Association. "We've never seen anything like it before."

Starting in May and June, diesel prices shot through the roof in concert with precedent-setting oil prices above $130 per barrel. Diesel quickly nudged its way upward above $4 (US) per gallon, more than twice the price of one year ago.

As the cost of oil increased, besides diesel fuel, each of the basic items lobstermen need rose in price — bait, plastic lobster totes, bait barrels and rubber bands.

Herring, the preferred bait of many Gulf of Maine lobstermen, nearly doubled in price. In the U.S. this was partly due to restrictions imposed by the New England Fisheries Management Council on mid-water trawlers fishing for herring from June to the end of September, meaning fewer pounds of herring available for bait.

The combination of scarcity and increased fuel costs led to a price of $40-$45 per tote (1.5 bushels), according to Robert Thompson, operations manager for the Spruce Head Fishermen's Co-op in Spruce Head, Maine.

"It's hard," he said, "it's going up every year." A member of the co-op who did not wish his name used added, "In August I fished four days and brought in $1,200.54 worth of lobsters. My expenses were $1,200. And then I had to pay my sternman $200."

Also due to rising fuel costs, the cost of salt to preserve the bait rose. Lobster prices failed to rise and then, in October, plummeted.

As the world's financial systems retracted and stock markets tumbled, Canadian processors with lines of credit with Icelandic banks found those short-term credit sources closed to them.

As a consequence, the Barry Group, Ocean Choice International and Clearwater Fine Foods Inc., among others, stopped buying U.S. lobsters at the height of the fall season. Other markets for processed or frozen lobster, such as resorts, cruise ships, or restaurants, also cut back on their purchases as a result of the financial meltdown.

Cousens believes that with higher prices for all things related to oil, lobstermen are facing a hole from which they cannot climb out.

He argues it makes no sense in a time of rising expenses for Maine harvesters to fish hard in the summer months in the U.S. for a poor quality lobster that fetches a low price from the buyers.

"Shedders are a lousy product," Cousens said of lobsters which recently molted and are usually caught in summer. "They are soft, they die easily. You get a high rate of shrinkage shipping them."

Shrinkage refers to the pounds of lobsters that die while being stored or shipped.

"Set maybe fifty traps during the summer, to sell to the tourists," he said. "Then go back to your normal trap limit in September and fish until December. Leave the lobsters on the bottom and then catch a good hard product next April."

Many lobsters from Maine and Canada ship to Europe for Christmas sales. European consumers have long purchased environmentally-responsible products and a state-appointed Maine committee is investigating the possibility of certification from the Marine Stewardship Council (MSC) for the lobster industry.

In October, Maine's governor called together a group of state financial agencies, banks and lobster industry representatives to try to figure how to help fishermen who may otherwise lose their businesses.

One Maine lobsterman said, "It's not just 'will you lose your boat?' now, it's 'will you lose your bedroom?'"

Because the Canadian lobster fishery in Nova Scotia and New Brunswick operates under sequential seasonal openings with limits on the number of traps per lobsterman, the fishery is perhaps more efficient in its use of fuel and materials, but that fact doesn't mean Canadian lobstermen were unaffected by spiraling fuel costs.

Nova Scotia lobsterman Wayne Spinney said harvesters in his lobster fishing area 34 spent an average of $17,000 (Canadian) during last year's 6-month season, an unprecedented amount and nearly double the usual fuel expenditure for most boats.

While diesel fuel prices had dropped just before the start of the next 6-month season in late November, the combined economic problems warned of disaster.

"My buyer told me he'll be done buying by December 20," said Spinney. "Others are telling fishermen they might as well tie up after a week."

While buyers in his area, north of Yarmouth, were not affected by the Icelandic bank crisis, local banks warned they wanted the lobsters to keep moving.

"No one's holding right now," said Spinney. His buyer told Spinney if he wanted a place to keep his lobsters, to use his facility. "But I can't afford to hold lobsters. I've got bills."

-- MW & NG

PHOTO: NANCY GRIFFIN

Vinalhaven, an island in Maine's Penobscot Bay, is home to many lobster fishermen and lobster buyers. The economic problems of the world reached into the smallest fishing villages this season.