

Catching the Next Wave: Building the Blue Economy Through Innovation and Collaboration

A white paper on what is possible
for the SouthCoast of Massachusetts

Presented by:



Sponsored by:

SouthCoast
Development
Partnership

UMass Dartmouth





August 21, 2018

Dear reader:

On April 19, 2018, UMass Dartmouth and the Council on Competitiveness convened a critical dialogue about the future of the SouthCoast of Massachusetts, a region whose history, culture, and economy have been defined by the sea for centuries.

Sponsored by the SouthCoast Development Partnership and the Massachusetts Clean Energy Center, “Catching the Next Wave: Building the Blue Economy Through Innovation and Collaboration” brought 100 leaders from industry, government and academe together at UMass Dartmouth to consider a new horizon for the region.

The SouthCoast, which inspired Melville to write Moby Dick more than 150 years ago and today is emerging as a hub of offshore wind energy, is rich in blue economy assets: multiple higher education and research institutions, two major ports, more than 40 miles of coastline, and an impressive combination of mature and emerging marine-related companies. At the center of it all is UMass Dartmouth, the only Massachusetts Tier 1 national research university south of Boston.

The challenge now is to build on these valuable assets and accelerate their job-creating power through an unprecedented level of innovation and collaboration. The following pages offer data and perspectives on the current state of the region’s blue economy and ideas about what is possible.

It is our hope that “Catching the Next Wave” and this document are just the beginning of an action-oriented initiative to accelerate, broaden, and deepen the expansion of this potentially bountiful ecosystem. We look forward to your feedback. Let’s get started!

Sincerely,

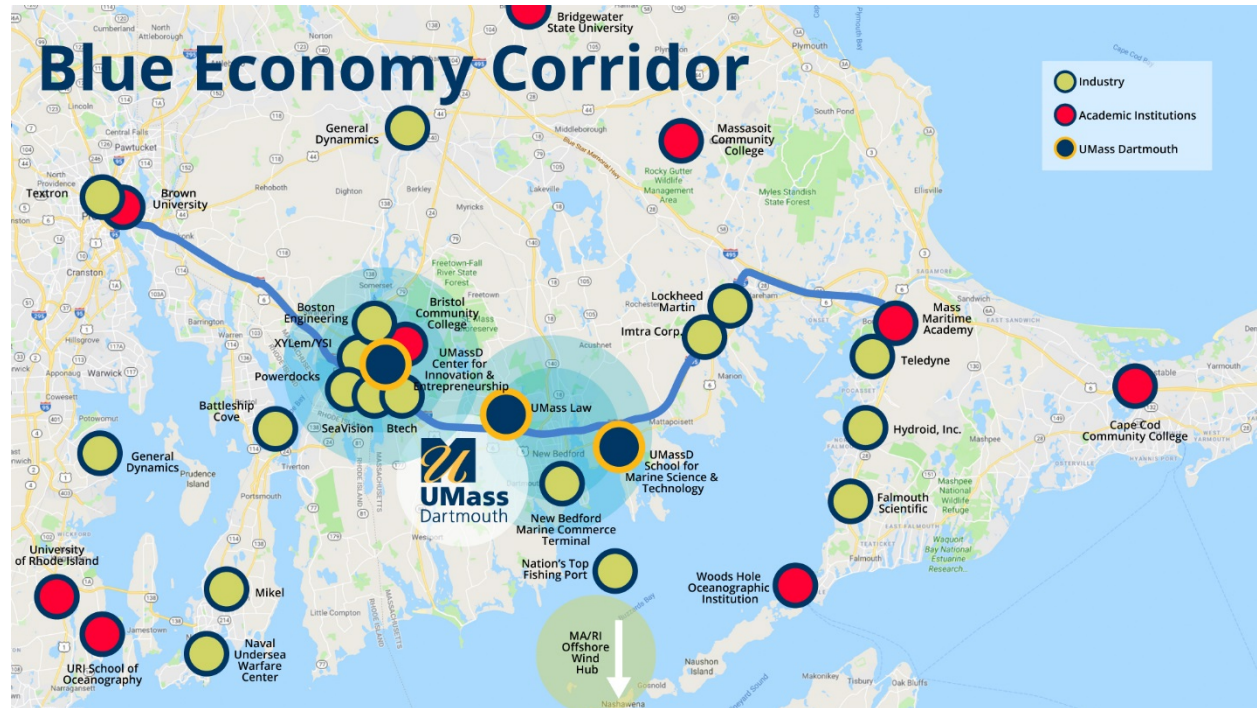
Robert E. Johnson Ph.D.
Chancellor
University of Massachusetts

William C. Bates
Executive Vice President
Council on Competitiveness

SouthCoast Blue Economy Corridor Initiative

Table of Contents

Introduction	5
Increasing Regional Collaboration	6
The Role of the University of Massachusetts Dartmouth.....	6
The Future of Work.....	8
Recent Blue Economy Initiatives.....	8
Next steps	9
How Does the Blue Economy Measure Up?	10
Living Resources.....	12
Marine Construction	13
Ship and Boat Building and Repair	14
Tourism and Recreation.....	15
Transportation and Marine Technology	15
Existing Regional Blue Economy Assets	16
Catching the Next Wave: Building the Blue Economy through Innovation and Collaboration	18
Presenters, panelists and speakers.....	21
Organizations Represented.....	22



This map illustrates the major blue economy assets of the SouthCoast region and its neighbors to the east (Cape Cod) and west (Rhode Island).



Figure 1: LEFT TO RIGHT: MASSACHUSETTS LT. GOV. KARYN POLITO, CHANCELLOR ROBERT E. JOHNSON, COUNCIL ON COMPETITIVENESS EXECUTIVE VICE PRESIDENT WILLIAM C. BATES

“THIS REGION OWNS THE MARITIME ECONOMY...WE NEED TO PROTECT WHAT WE HAVE, LEVERAGE WHAT WE HAVE, AND GROW WHAT WE HAVE.”

-- MASSACHUSETTS LT. GOV. KARYN POLITO

“THE QUESTION FOR US TODAY IS HOW DO WE ORGANIZE TO ACCELERATE, BROADEN, AND DEEPEN THE EXPANSION OF THIS ECOSYSTEM? WE ARE HERE TO IMAGINE THE POSSIBILITIES FOR THE REGION.”

-- UMASS DARTMOUTH CHANCELLOR ROBERT E. JOHNSON

“THE CHALLENGE IS...CREATING AN ENVIRONMENT FOR INNOVATION WHEN ECONOMIC REGIONS CUT ACROSS POLITICAL JURISDICTIONS...IT TAKES COLLABORATIONS ACROSS BOUNDARIES TO SUCCEED.”

-- COUNCIL ON COMPETITIVENESS EXECUTIVE VICE PRESIDENT WILLIAM C. BATES

Introduction

As populations migrate toward the ocean in some regions and away from the coastline in others, the prosperity of nations, states, and communities will increasingly depend on their collective ability to balance economic imperatives and environmental constraints.

The SouthCoast of Massachusetts has been a hub of marine-related industries since the earliest days of the nation. In the 19th century, the Port of New Bedford was considered the most important whaling port on earth and the Port of Fall River was a maritime manufacturing powerhouse. While these two working ports remain active, the mainstay economic drivers of the coastal Massachusetts economy south of Boston, especially in the region along Interstate 195, have encountered difficult challenges for the past several decades.

Yet, heritage and a physical connection to the coastline have fertilized promising clusters of

maritime-based economic activity, from commercial fishing to marine technology to offshore wind energy to tourism, creating an emerging SouthCoast Blue Corridor in Massachusetts, from the Rhode Island border to the Cape Cod Canal. A cohesive and collaborative regional approach to developing this Blue Corridor, including outreach across the state border and canal, is now needed to create innovation-based, job-creating economic opportunity for the people and communities of this region.

Research by the UMass Dartmouth Public Policy Center has shown that the areas in the southeastern region of Massachusetts, including the SouthCoast and Cape Cod, operate as separate functional economic regions. In addition, because the region's interaction with Greater Boston has been limited, thus excluding the region from the Greater Boston innovation economy over the past several decades, a new and focused regional economic strategy is overdue. According to the Organization for Economic Co-operation and Development, the maritime economy could more than double its contribution to the global economy – reaching



Figure 2: Battleship Cove, Fall River



Figure 3: New Bedford harbor

\$3 trillion by 2030, with an anticipated 40 million full-time jobs.¹ With the advent of new technologies in blue economy-related industries, such as undersea robotics, marine sensing, renewable energy, biotechnology, communications hardware, information technology, and advanced materials, the region is poised to organize and build an ecosystem just as the global maritime economy is growing.

Increasing Regional Collaboration

The SouthCoast and Cape Cod comprise the largest cluster of marine technology companies on the Atlantic Coast. This cluster is complemented by several Rhode Island-based organizations such as the New England Undersea Warfare Center in Newport.



Figure 4: State Rep. Patricia Haddad, lead sponsor of Massachusetts offshore wind legislation

The ports of New Bedford and Fall River are re-emerging as marine economy drivers. At the same time, the SouthCoast region and Rhode Island have multiple marine economy assets that have the potential to complement each other. An improved sense of inter-regional, inter-state and inter-municipality collaboration can help improve economic innovation and growth.

The UMass Dartmouth-based SouthCoast Development Partnership, a consortium of 50-plus higher education, business, and civic leaders, exists to formulate regional economic development strategy.

It is time, due to both necessity and possibility, for a formal initiative designed to strengthen collaboration. As UMass Dartmouth Chancellor Robert E. Johnson has said, “It is time to stop fighting for a slice of the pie and start expanding that pie so that there is plenty for all to eat.”

The Role of the University of Massachusetts Dartmouth

As the only Tier 1 Massachusetts Research University south of Boston and due to its central location on the SouthCoast, UMass Dartmouth is well-positioned and eager to serve as a catalyst for the creation of an interconnected, interdisciplinary marine science and technology Blue Corridor along the SouthCoast.

UMass Dartmouth has always played a leading role in the economic development of Southeastern Massachusetts. Originally founded as a school to meet the workforce needs of a

¹ The Organization for Economic Co-operation and Development, “The Ocean Economy in 2030,” <https://www.oecd.org/sti/futures/the-ocean-economy-in-2030-9789264251724-en.htm>.

thriving textiles industry in the late 1800s, UMass Dartmouth has continued to be the leading provider of educated workforce talent in the region.

Since joining the University of Massachusetts system in 1991, UMass Dartmouth has continually and steadily strengthened its educational and research activities to support the region's marine economy. UMass Dartmouth's first Ph.D. program was Electrical Engineering with a focus on Marine Applications. Our research faculty in this area have won numerous awards, started marine technology companies, and are internationally recognized, particularly in the area of underwater acoustics.

The School of Marine Science and Technology is recognized for having saved the New Bedford scallop fleet by developing and implementing new technologies to assess the fisheries resource; and UMass Dartmouth has expanded its marine research foci to include significant programs in water quality, marine robotics and marine renewable energy, and internationally prominent work in marine systems simulation.

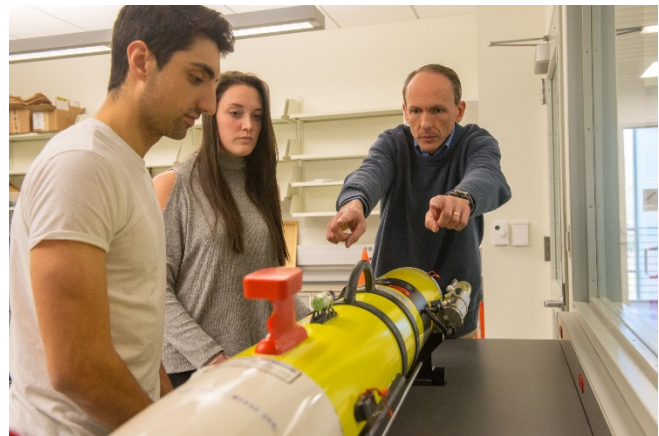


Figure 5: Dr. Dan MacDonald, UMass Dartmouth School for Marine Science and Technology and grad students

To capitalize on this burgeoning strength, the university is forming a new Center for Marine Environmental Research Innovation and Technology (MERIT Center) that brings together outstanding faculty from seven departments in three colleges who focus on critical areas of marine technology research and who are in the process of developing new degree and other training programs to support the marine economy.

Building on the strength of its faculty, UMass Dartmouth is poised and prepared to increase its training programs in marine science and marine technology, both for traditional and non-traditional students; and has begun the process of expanding its partnerships, both within and beyond Southeastern Massachusetts to leverage our shared talent and maximize the impact and reach of new program development.

For these reasons, UMass Dartmouth is ready to lead Blue Economy development on the SouthCoast.

The Future of Work

As the region emerges as a blue economy leader, it is important to recognize that this sector, like others, will undergo rapid and unanticipated change over the next decade.

During their lives, students enrolling in UMass Dartmouth this fall will hold 17 jobs in five different industries, and three of those industries do not yet exist. An Oxford Study says 47% of all jobs will be automated by 2033. The result is that almost half of today's jobs will be completed by machines in the near future, meaning people will need uniquely human skills that cannot be replicated by robots. Success in this hyper-connected, innovation-driven economy, therefore, will depend on the individual's ability to develop a skillset AND a mindset that adds value to their employers and their communities.

UMass Dartmouth is aligning its academic programs to respond to this Future of Work reality so that it can prepare students for jobs that do not exist, utilizing technologies that have yet to be invented to solve problems that have not been identified. The university is re-organizing its teaching and research around three areas of strength and impact: marine science, homeland security, and community resilience, all of which will support the multi-dimensional development of a blue economy.

In addition, the university is planning to create a Future of Work Academy and Boot Camp to prepare the SouthCoast workforce to create the jobs of the future. These boot camps will give the traditional and non-traditional labor force the skillset and mindset to compete in a rapidly changing hyper-connected world. The region will be uniquely positioned to evolve and thrive in this volatile, uncertain, complex and ambiguous world. UMass Dartmouth will be the epicenter for job creation economic development and entrepreneurship throughout the region and at the forefront of the Blue Economy.

Recent Blue Economy Initiatives

- June 2018 -- SeaPerch International Competition for 600-plus future engineers from around the world held at UMass Dartmouth in collaboration with Naval Underwater Warfare Center and Raytheon.
- June 2018 - Reauthorization of the Massachusetts Life Science bill being considered by the Legislature, including \$21 million for UMass Dartmouth biology, chemistry, and other labs.
- May 2018, Massachusetts and Rhode Island announced contracts for two companies to develop offshore wind farms that will generate a combined 1,200 MW of electric power. In 2019, Massachusetts will solicit an additional 800 MW.
- May 2018 -- Marine Energy Conference held at UMass Dartmouth Center for Innovation and Entrepreneurship in Fall River.

- April 2018 -- UMass Dartmouth Public Policy Center (PPC) launches Offshore Wind Economics Project to inform evidence-based policymaking and maximize the economic and community benefits associated with current and future offshore wind developments.



Figure 6: Dr. Michael Goodman, UMass Dartmouth Public Policy Center; Jay Ash, Mass. Secretary of Economic Development; and Molly Donahue Magee, Executive Director, Southeastern New England Defense Industry Alliance

- April 2018 -UMass Dartmouth and Council on Competitiveness host “Catching the Next Wave,” convening 100 key business, policy, and academic leaders to focus on the future of the regional blue economy.

- March 2018 - Vineyard Wind and UMass Dartmouth School for Marine Science and Technology enter into a collaborative agreement to plan and conduct pre- and post-construction assessments of fisheries and associated ecological conditions related to offshore wind.
- September 2017 - UMass Dartmouth opens a \$55 million, 64,000 square foot marine science facility (SMAST East) -- tripling the University’s marine science presence in New Bedford.
- UMass Dartmouth Center for Innovation and Entrepreneurship currently houses multiple marine tech start-up companies and has graduated several more.
- SouthCoast Development Partnership makes development of regional “blue corridor” a priority.

Next steps

- U.S. Economic Development Administration grant proposal by UMass Dartmouth and SouthCoast Development Partnership to develop Blue Corridor strategic plan.
- UMass Dartmouth interdisciplinary Marine Environmental Research Innovation and Technology Center (MERIT Center), which will connect the university’s most prominent researchers from seven different departments in three different colleges to collaborate in critical areas of marine technology research:
 - Marine AI and Robotics

- Sensing
 - Communication and Simulation
 - Marine Restoration and Water Resources and Marine Renewable Energy.
 - Faculty from this newly forming center are also working to develop innovative academic programs that focus on the marine environment and marine technology to attract students from all over the world to the region, and train them to meet the workforce needs and scientific challenges faced by the SouthCoast marine technology sector.
- UMass Dartmouth is planning the construction of new STEM teaching building and renovation of its Science and Engineering building.
 - Pending research collaboration MOU between UMass Dartmouth and The Woods Hole Oceanographic Institute.
 - Pending workforce development and research MOU between UMass Dartmouth, Mass. Maritime Academy, and Bristol Community College.

How Does the Blue Economy Measure Up?

Standard industrial classifications define the blue economy as consisting of the following six sectors: living resources, marine construction, offshore minerals, ship & boat building & repair, tourism & recreation, and transportation & marine technology.

A 2017 study by the Public Policy Center at UMass Dartmouth titled, “Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy,” highlights the current impact of the maritime economy thus defined in Massachusetts. As of 2015, the maritime economy consisted of 5,555 establishments, paying \$3.4 billion in total wages to more than 90,000 workers. This accounted for \$6.4 billion in gross state product. The maritime economy of Massachusetts represents 2.6 percent of direct employment and 1.3 percent of direct gross state product for the Commonwealth.²



Figure 7: Rusty Kollmorgen, Vice President, Strategy and Business Development for Maritime & Strategic Systems, General Dynamics; Laura Foley Ramsden, MF Foley Fish Company

² Public Policy Center at UMass Dartmouth, “Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy”, 2015, p. 11.

Massachusetts has a very high concentration of maritime economy industries compared to the rest of the United States. The state is 14 percent more dependent on marine economy industry sectors as a source of employment than the nation at-large.³

The Massachusetts maritime economy has encountered sizeable growth. From 2005 to 2015, employment in the sector grew by 18.2 percent compared to the 8.4 percent statewide industry total.⁴ Gross State Product (48.0% vs. 32.1%) and Real Gross State Product (36.7% vs. 11.4%) for the maritime industry compared to the statewide totals was also favorable.⁵ The industry is also resilient to economic downturns as evident by its steady growth during the Great Recession.

Meanwhile, the SouthCoast and Cape Cod have seen significant employment growth in the marine science and technology space over the last decade. From 2005 to 2016 employment growth in this sector grew from 2,230 in 2005 to 4,750, averaging 229 new jobs per year or about 10.7 percent growth. (See Table below).

Marine Science and Technology Employment Growth, 2005-2016			
YR	Cape Cod	South Coast	Project Region
2005	1,280	950	2,230
2006	1,427	1,032	2,459
2007	1,574	1,114	2,688
2008	1,721	1,196	2,917
2009	1,868	1,278	3,146
2010	2,015	1,368	3,375
2011	2,162	1,442	3,604
2012	2,309	1,524	3,833
2013	2,456	1,606	4,062
2014	2,603	1,688	4,291
2015	2,750	1,770	4,520
2016	2,870	1,852	4,749
Annual Growth Rate	12.7% or 147 jobs/yr	8.6% or 82 jobs/yr	10.7% or 229 jobs/yr
Sources: Cape Cod Blue Economy, Cape Cod and UMass NE Marine Science & Technology Report			

Based the employment growth trend documented above, it is conservatively estimated that new employment for the marine science and technology sector will grow by 5 percent annually from 4,750 to 7,737 jobs by 2027.

³ Ibid., p. iii.

⁴ Ibid., p. i.

⁵ Ibid.

Living Resources

The most historic maritime industry in Massachusetts, especially on the SouthCoast, is the Living Resources sector, which includes industries such as commercial fishing, fish hatcheries & aquaculture, seafood markets, and seafood processing. The Port of New Bedford is annually ranked as one of the top-producing fishing ports in the nation, in terms of value of catch. Commercial fishing and processing have been the mainstays of the region for hundreds of years. Massachusetts claims 10 percent of total U.S. fishing landings value which totaled \$524.7 million in 2015.⁶



Figure 8: The New Bedford fishing fleet

The living resources sector contains 561 establishments that pay \$321.1 million in total wages to 5,717 workers (full-time and part-time) and generates \$687.9 million in Gross State Product.⁷ The fishing industry employs 42 percent of Living Resources workers and makes up 54 percent of Gross State Product.⁸ The main subsector of the fishing industry is shellfish, which makes up 81.1 percent of landings value.⁹ Scallops alone have brought in more revenue (\$264.9 million) than all finfish species combined.¹⁰

Massachusetts is 192% more dependent on Living Resources than the nation at-large. This activity is concentrated in the SouthCoast due to the large fishing industry based out of New Bedford.¹¹ The Port of New Bedford was responsible for the largest share of Massachusetts' landings, in terms of both pounds (47.5%) and value (67.5%).¹² The Port of New Bedford has also seen significant growth compared to other fishing ports in Massachusetts. Revenue grew 256 percent in the period of 1981 to 2015 and 97 percent since 2010.¹³

⁶ "Commercial Fisheries Statistics." <https://www.st.nmfs.noaa.gov/commercial-fisheries/>.

⁷ Public Policy Center at UMass Dartmouth, "Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy", 2015, p. 17.

⁸ Public Policy Center at UMass Dartmouth, "Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy", 2015, p. 17.

⁹ "Commercial Fisheries Statistics." <https://www.st.nmfs.noaa.gov/commercial-fisheries/>.

¹⁰ Ibid.

¹¹ Public Policy Center at UMass Dartmouth, "Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy", 2015, p. 17.

¹² "Commercial Fisheries Statistics." <https://www.st.nmfs.noaa.gov/commercial-fisheries/>.

¹³ Ibid.

Marine Construction

The Marine Construction industry consists of submarine oil and gas pipelines, harbor dredging, pier and marine construction, beach nourishment, and estuary restoration industries. In Massachusetts, there are 99 establishments that pay \$85.3 million in total wages to 1,922 workers, which accounts for \$91.7 million of Gross State Product.¹⁴



Figure 9: Battleship Cove, Fall River

Many firms in this sector are involved in engineering construction around major ports such as Fall River and New Bedford. Employment in this sector increased by 140.5 percent between 2005 and 2015, but wages decreased over this time period.¹⁵ This is attributed to an increase of low-skill positions. This sector is poised to experience growth due to new opportunities in offshore wind.

In 2016, the Governor of Massachusetts signed legislation that solicited proposals to construct 1,600

megawatts worth of offshore wind production in the Commonwealth by 2027, and in May 2018 the Commonwealth assigned 800 megawatts of offshore wind development to one of three local developers. At the same time, Rhode Island assigned an additional 400 megawatts to one of the other two.

These multiple offshore wind projects will help meet emission reduction standards and provide many economic opportunities for the state. A 2018 workforce assessment by the Public Policy Center at UMass Dartmouth in collaboration with the Massachusetts Clean Energy Center and Bristol Community College predicts significant regional job growth due to offshore wind development.

Besides reducing carbon emissions, offshore wind in Massachusetts will lead to employment in manufacturing, fabrication, installation, operations, and maintenance. The New Bedford Marine Commerce Terminal will be the main staging ground for offshore wind deployment. In total, it is estimated that more than 20 distinct occupations in various disciplines will be necessary to plan, construct, and operate these offshore wind farms, not including supply chain and manufacturing.¹⁶

¹⁴ Public Policy Center at UMass Dartmouth, "Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy", 2015, p. 26.

¹⁵ Ibid., p. 27.

¹⁶ Ibid., IX.

Construction activity related to the 1,600 megawatts for Massachusetts is estimated to create between 2,279 and 3,171 direct job-years.¹⁷ In total, between 6,878 and 9,852 job-years are estimated to support construction activities, which include direct, indirect (supply chain), and induced impacts.¹⁸

After construction, and once power is being produced, operations and maintenance of the wind farms are estimated to yield 35 to 64 direct jobs over the life of each wind farm for a total between 140 to 256 jobs annually for all four projects.¹⁹ This does not include any ongoing jobs related to manufacturing activities or jobs supporting offshore wind development in other states.²⁰

The direct impact on Massachusetts' economic output of just construction on the four wind farm installations is estimated to be between \$678.8 million to \$805.1 million.²¹ In total, planning, construction, and operations are estimated to generate between \$1.4 billion to \$2.1 billion of economic activity, which includes direct, indirect, and induced impacts.²²

Offshore Minerals

While Offshore Minerals is the largest maritime economic sector in America due to oil and gas extraction, this is not a significant industry of Massachusetts or the SouthCoast. Massachusetts does not allow offshore drilling for natural gas or oil, which is the vast majority of product in this sector. However, the Limestone, Sand, and Gravel industry is the largest in this sector, making up 63 percent of employment and 60 percent of wages.²³

Ship and Boat Building and Repair

Southern New England is a powerhouse for the Ship & Boat Building & Repair sector of the blue economy. This activity is centered in nearby Rhode Island and Connecticut, but there are 40 such Massachusetts establishments that pay \$17 million in total wages to 375 workers, which generates \$17.9 million in Gross State Product.²⁴

In Massachusetts, most of the maritime business falls into the Boat Building & Repair industry (76%), though Ship Building & Repair offers similar quantities of employment, wages, and Gross

¹⁷ Massachusetts Clean Energy Center, 2018, *2018 Massachusetts Offshore Wind Workforce Assessment*, p. VI.

¹⁸ Ibid.

¹⁹ Ibid., VII.

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

²³ Public Policy Center at UMass Dartmouth, "Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy", 2015, p. 29.

²⁴ Public Policy Center at UMass Dartmouth, "Navigating the Global Economy: A Comprehensive Analysis of the Massachusetts Maritime Economy", 2015, p. 32.

State Product.²⁵ While not as prominent as the sector was historically, this sector follows the growth of others. For example, if the living resources sector is booming, there will be an increased demand for boat maintenance. Similarly, offshore wind will lead to an increased demand for Crew Transfer Vessels. Currently, Massachusetts' firms are much more likely to make high-tech marine navigational equipment than the boats and ships themselves.²⁶

Tourism and Recreation

Tourism & Recreation in Massachusetts pays \$1.177 billion to more than 70,000 people, which amounts to \$3.34 billion in Gross State Product.²⁷ The sector consists of Amusement & Recreation Services, Boat Dealers, Eating & Drinking Places, Hotels & Lodging Places, Marinas, Recreational Vehicle Parks & Campsites, Scenic Water Tours, Sporting Goods Retailers, and Zoos & Aquaria. Eating & Drinking Places make up 78% of employment with Hotels & Lodging Places employing 14% of the sector's employment.²⁸



Figure 10: Horseneck Beach, Westport

These establishments are located along the entire coast of Massachusetts. Cape Cod is a primary driver in this sector, though the SouthCoast is beginning to realize the opportunities that are available. Growth in this sector has remained steady and has grown much faster than national averages. However, there is no cohesive tourism strategy for the SouthCoast.

Transportation and Marine Technology

The Transportation and Marine Technology sector is profitable for Massachusetts, with the Boston area and the SouthCoast dominating. Gross State Product for this sector is \$2.3 billion with more than 11,000 employees.²⁹ Constituent industries include Deep Sea Freight, Passenger Transportation, Warehousing (related to shipping), Marine Services (Port Operations, Cargo Handling, Navigational Services), and Search, Detection, Navigation, Guidance, and Nautical Systems/Instr. Mfg.

²⁵ Ibid., p. 32.

²⁶ Ibid., p. 34.

²⁷ Ibid., p. 36.

²⁸ Ibid., p. 36.

²⁹ Ibid., p. 40.

The U.S. Navy contributes to this sector, providing more than \$36 million of Massachusetts SBIR/STTR awards in 2015.³⁰ Massachusetts ranks second among U.S. states in total dollar value.³¹ With emerging technologies and better public-private, civilian-military partnerships in place, this sector has potential to grow in the future.

UMass Dartmouth plays a particularly active role in this sector, performing millions of dollars per year in marine technology research, recruiting and training a substantial portion of the marine technology workforce, and incubating a large number of marine technology companies at its Center for Innovation and Entrepreneurship.

Existing Regional Blue Economy Assets

Numerous assets already exist within the Blue Corridor extending from the Massachusetts/Rhode Island border to Cape Cod. These include, but are not limited to:

Higher Education research and workforce development

- UMass Dartmouth
 - School for Marine Science and Technology (New Bedford)
 - College of Engineering
 - Charlton College of Business
 - College of Arts and Sciences
 - School of Law
 - College of Visual and Performing Arts
 - Center for Innovation and Entrepreneurship (Fall River)
- Massachusetts Maritime Academy
- Bristol Community College
- Cape Cod Community College

³⁰ Ibid., p. 47.

³¹ Ibid.

Employer examples

Aquabotix
Battleship Cove/Heritage Park
Boston Engineering
Btech
Eastern Fisheries
Fairhaven Shipyard
Fall River Manufacturing Co., Inc.
Gladding Hearn
GS Rubber Industries LLC
Hydriod Inc.
Imtra Corp.
L3 Ocean Server

Littoral Power Systems
Lockheed Martin
New Bedford Fishing Fleet
New Bedford Marine Commerce Terminal
New Bedford Whaling Museum
Northern Wind
Powerdocks
SeaVision Underwater Solutions
Teledyne
Teufelberger
Yates Rubber Corp

Additional academic, commercial, and cultural assets exist **near** the SouthCoast Blue Corridor, both benefitting from and adding value to those assets located within the corridor. These include, but are not limited to:

Higher Education research and workforce development

Woods Hole Oceanographic Institute
Naval Undersea Warfare Center
Bridgewater State University
Brown University

University of Rhode Island
Marine Biological Laboratory
Massasoit Community College

Employer examples

American Oversea Marine
Apex Systems
Brooks Marine Group
Falmouth Scientific
General Dynamics
Independent Marine Systems
KVH Industries

Marine Acoustics
Mikel
Newport Nautical Supply
Ryan Marine, Inc.
Seven Star Marine
Siren Marine
Textron

Any strategy designed to realize the full potential of the SouthCoast Blue Corridor will be strengthened by cross-border and cross-canal collaboration.

Catching the Next Wave: Building the Blue Economy through Innovation and Collaboration

On April 19, 2018, UMass Dartmouth and the Council on Competitiveness convened 100 thought leaders from business, government, and academia to consider the opportunities and challenges of building the regional blue economy, comprising offshore wind, marine science and technology, commercial fishing and fish processing, tourism, and other marine-related industries. The SouthCoast Development Partnership and Massachusetts Clean Energy Center also sponsored in the event.



Figure 11: Left to Right: UMass Dartmouth College of Engineering Interim Dean Ramprasad Balasubramanian; Bob Anderson, Founder, L3 Ocean Server; Leslie-Ann McGee, Assistant Director, Woods Hole Oceanographic Institution Center for Marine Robotics

The following includes notes and observations made at the symposium:

Massachusetts Is Investing In Coastal Communities

- Massachusetts state government is committed to preserving our coastlines and supporting industries that utilize the coastline.
- \$6 million has been committed to communities to assess their coastline vulnerabilities.
- Massachusetts government has invested \$28 million for capital infrastructure along the coast, including 61 grants to 36 communities.
- There is a proposal for an additional \$50 million of state investment over next five years for coastline infrastructure.
- The budget includes \$500,000 in seed money to technology companies looking to solve maritime problems.
- The budget includes \$50 million for dredging of harbors.
- Massachusetts has the talent pipeline to fuel the blue economy.

Regional Collaboration Is Critical

- We need to stop fighting over slices of the same pie and start growing the pie so we all have enough to eat.
- The existing assets of the region are impressive. Our challenge is to organize, connect, and unleash them all.
- UMass Dartmouth is ready and willing to lead and convene.

- We need to think of ourselves as a region and not as cities or states.
- Geographic and political boundaries should not be barriers to regional economic success.
- We need to be “Competimates” - sometimes competitors, sometimes teammates.
- Assets are only part of what makes a region economically successful. Regions need “an ability or willingness to plan or act as a region.” They need to develop strategies and act collaboratively.
- We need cross-sector coordination
- The better a region does at creating economic opportunities, the better able it will be to attract new talent and investment.
- Partnerships between academic institutions have accelerated and are essential to creating a cutting-edge ecosystem of technology, science, and research. We need to encourage, facilitate and expand higher education partnerships.
- Many organizations and institutions are already working together in the region because no one can do it alone.
- We need to do a better job at collaborating because we’re much more powerful together than individually.
- We have the assets but we need to put all the pieces together.
- Regional approach needs should be ingrained in the culture.

Innovation = Jobs

- Knowledge discovery through research helps propel maritime industries.
- Offshore wind will intersect with many aspects of the Blue Economy, including marine science, tourism and recreation, ship and boat building, water transportation, marine technology, and marine construction.
- UMass Dartmouth is an anchor for marine research in the region.
- UMass Dartmouth is focused on fisheries science, aquaculture, coastal restoration and resilience, underwater sensing and communication, marine policy and law, ocean modeling and observation, and marine robotics and autonomous platforms.
- We need to educate the future workforce to keep momentum in the blue economy.
- Research is necessary to help the fishing industry become more profitable while not hurting the ecosystem.
- New Bedford is a key hub of offshore wind industry job opportunities.
- Massachusetts is leading the nation with its offshore wind initiative.



Figure 12: Travis McCready, President and CEO, Massachusetts Life Science Center

- SMAST is playing a crucial role in studying the impacts of how offshore wind will affect the fishing industry and the marine ecosystem.
- UMass Dartmouth can help facilitate workforce development for new industries and help workers evolve their skills.
- The frontiers of oceanographic research have applications in biopharmaceuticals and other life sciences.
- The Massachusetts Life Sciences Center is investing in coastal research.
- Many people do not realize how much life sciences research takes place along coastal Massachusetts.

The Story Needs To Be Told

- UMass Dartmouth helps show the world that the SouthCoast is a leader in the global blue economy.
- This is the “Silicon Valley of undersea technology.” We need to brand the region better.
- We need to market ourselves better and share the successes of the region, not just our own institutional successes.
- Innovation and collaboration is necessary to brand and grow the blue economy.
- “We’re all thinking the same thing. UMass Dartmouth is the epicenter” of the blue economy.
- We need to emphasize planning when developing the corridor.
- The SouthCoast already has a unique niche in the blue economy and needs to tell that story.
- We need to celebrate everyone’s successes and work together for new ones.
- We should realize what we have already accomplished and then go out and find more things to accomplish.
- We need to listen to the people of the region to get a full picture of the initiative.
- All the factors to create a successful economic region are in place.
- We cannot overlook existing assets that can help the blue economy move forward.
- Undersea technology is already a very strong strategic advantage for Southeastern New England.

A Matter of National Security

- The Navy is always eager to work with civilian groups to propel maritime sciences and technologies.
- Maritime superiority is paramount to American interests.
- The Navy began using the SouthCoast as a research base in 1869.
- The SouthCoast has already played an important role in strengthening the nation’s security.
- There is a need for innovation across all sectors to help build up maritime superiority.

Presenters, panelists and speakers

- Robert E. Johnson, Chancellor, UMass Dartmouth
- Karyn E. Polito, Lt. Governor, Commonwealth of Massachusetts
- William Bates, Executive Vice President, Council on Competitiveness
- *William R. Keating, Congressman, Massachusetts-9th District
- *Joseph P. Kennedy III, Congressman, Massachusetts-4th District
- Patricia Haddad, Speaker Pro Tempore, Massachusetts House of Representatives
- Bob Anderson, Founder, L3 Ocean Server
- Jay Ash, Secretary of Housing and Economic Development for the Commonwealth of Massachusetts
- Ramprasad Balasubramanian, Interim Dean of UMass Dartmouth College of Engineering
- Joe Donovan, Chair, New England Council, Defense Group
- Laura Foley Ramsden, Owner, MF Foley Fish Company
- Michael Goodman, Director, Public Policy Center at UMass Dartmouth
- Chris Kiely, Deputy Director, Massachusetts Business Roundtable
- Rusty Kollmorgen, Vice President, Strategy and Business Development for Maritime & Strategic Systems, General Dynamics
- Steve Lohrenz, Dean, UMass Dartmouth School of Marine Sciences and Technology
- Molly Donohue Magee, Executive Director, Southeastern New England Defense Industry Alliance
- Travis McCready, President and CEO, Massachusetts Life Science Center Leslie-Ann McGee, Assistant Director, Woods Hole Oceanographic Institution Center for Marine Robotics
- Vic Ricci, CTO, US Naval Undersea Warfare Center
- Toby Stapleton, Director, UMass Dartmouth Center for Innovation and Entrepreneurship
- Bill White, Senior Director for Offshore Wind, Massachusetts Clean Energy Center

*By video

Organizations Represented

1024tm	MSBDC
AD Makepeace Companies	National Wildlife Federation
Adler Pollock and Sheehan BayCoast	Naval Undersea Warfare Center
Bank	Nelson Mullins
BCube Analytics Inc.	Northwind Strategies
Blue Incubator	nU-Boats, LLC
Blue Institute at Cape Cod, Inc. Boston	Ocean Solutions
Engineering Corporation Boston	Orsted
Harbor Now	Plymouth Boat Yard, LLC
Bristol Community College Brookfield	Port of New Bedford
Renewable	Potentia Holdings, LLC
C-2 Innovations Inc.	PowerDocks LLC
Cape & Plymouth Business News Cape	Preti Strategies
Cod Blue Economy Project Cape Cod	Public Policy Center at UMass
Chamber of Commerce Cape Cod	Dartmouth
Community College	QinetiQ NA
Clean Energy Center	Raytheon
Douglas E. Denninger, Esq.	Rockland Trust Company
Eaton Vance Investment Counsel	SENEDIA
Eversource	SouthCoast Chamber of Commerce
FarSounder Inc.	SouthCoast Development Partnership
Freedom Energy Logistics	Southcoast Health
Geisel Consulting	Terra Cura Inc.
General Dynamics	The City of Fall River
Globe Composite Solutions	The Standard-Times
Greater New Bedford Workforce	Town of Barnstable
Investment Board Inc.	Truston Technologies
IBM	U.S. Department of Commerce
Island Foundation	UMass Dartmouth Center for Innovation
L3 OceanServer	and Entrepreneurship
Marine Marketing Services	UMass Dartmouth School of Marine
Mass. Business Roundtable	Sciences and Technology
Mass. Division of Economic	UMass President's Office
Development	University of Connecticut
Mass. Division of Marine Fisheries	University of Rhode Island
Mass. House of Representatives Mass.	University of Rhode Island Coastal
Life Science Center	Resources Center and RI Sea Grant
Mass. Maritime Academy	Verizon
Mass. Office of Business Development	Woods Hole Oceanographic Institute
MF Foley Fish Company	
MPM Consulting	