

The Marine Science and Technology Industry in New England

Structure, Market Drivers, and Opportunities

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Sources for Presentation

- Barrow, C., R. Loveland, and D. Terkla,
"The Marine Science and Technology Industry in
New England"

<http://www.donahue.umassp.edu/docs/coastal-marine-econ-ma1>

- "An Assessment of the Coastal and Marine
Economies of Massachusetts"

<http://www.donahue.umassp.edu/docs/marine-science-tech-neng>

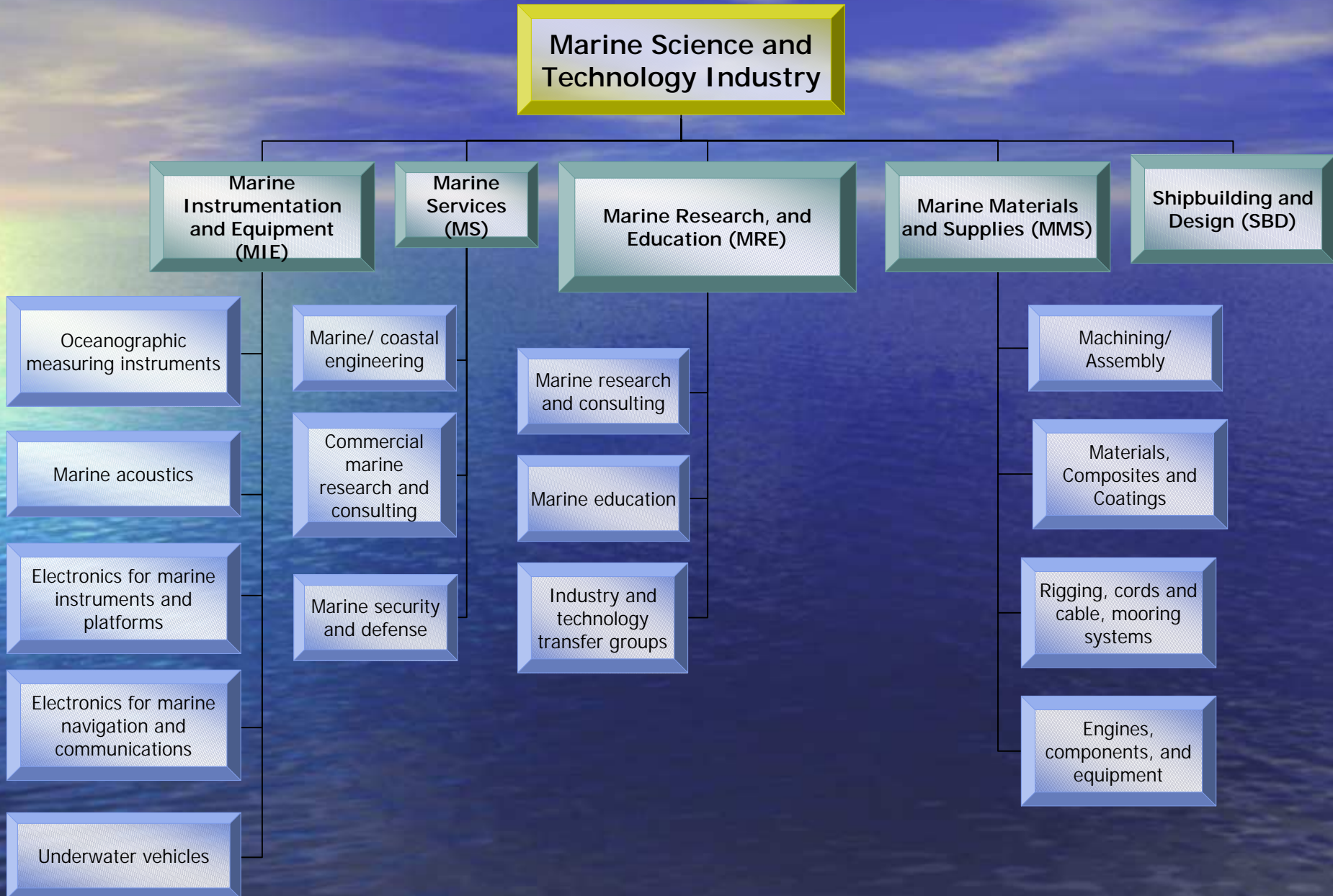
Outline

- Industry Structure, Employment and Sales in New England
- MA Cluster and Major Markets
- National Comparisons
- Economic Impact Analysis
- Importance of Research
- Company Survey
- Emerging Markets and Strategic Opportunities

What is the marine science and technology industry cluster?

Companies, institutions and organizations providing science- and technology-based products and services related to research, exploration, operations, monitoring and defense in marine settings.

NE Sectors and Subsectors



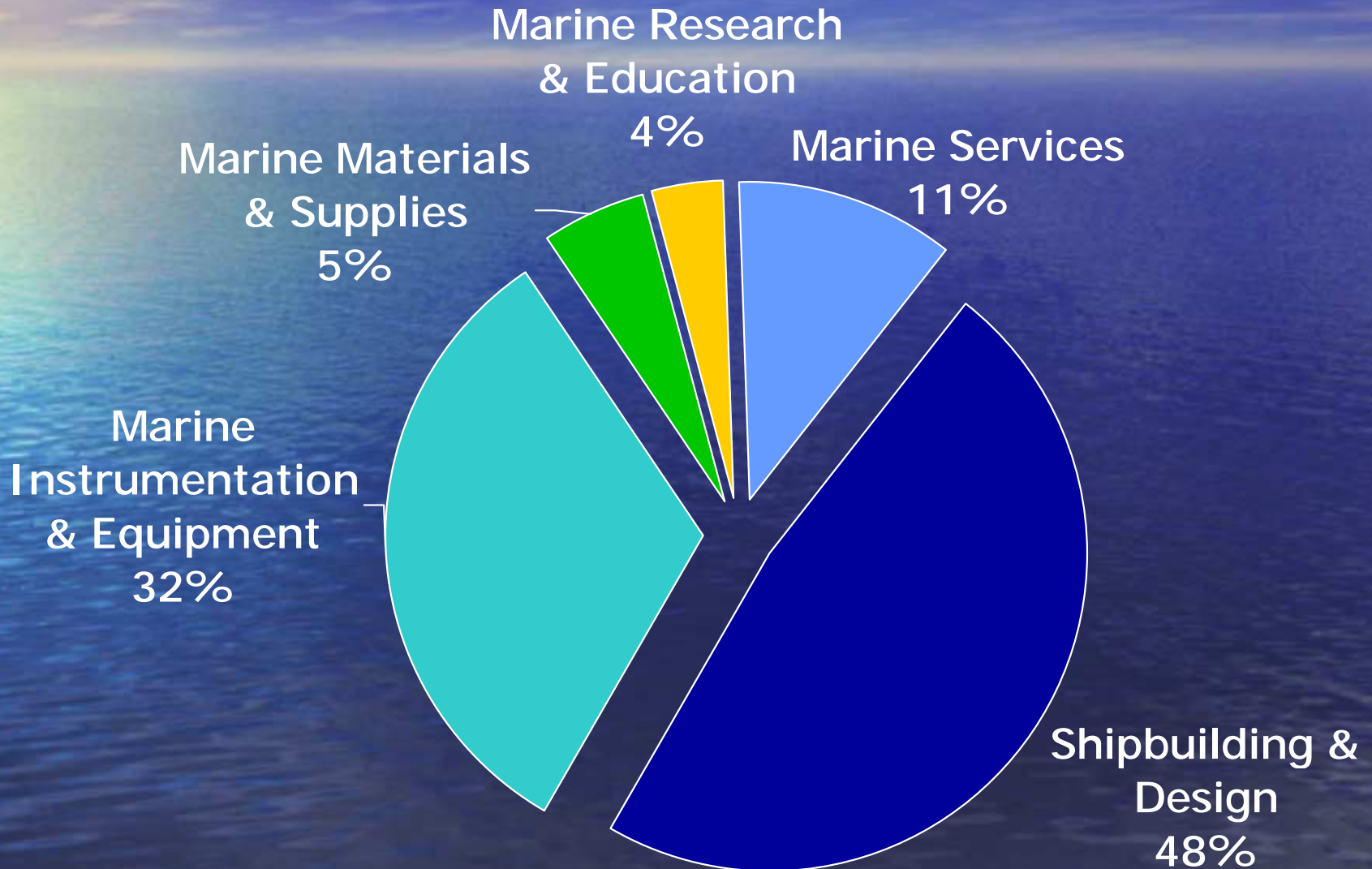
Varying levels of business involvement in the cluster

- **Core (210 companies out of 481)**
50%-100% of companies' sales are marine related
- **Partial (233 companies out of 481)**
25%-50% of companies' sales are marine related
- **Second tier (38 companies out of 481)**
less than 25% of companies' sales are marine related

New England Cluster, 2004

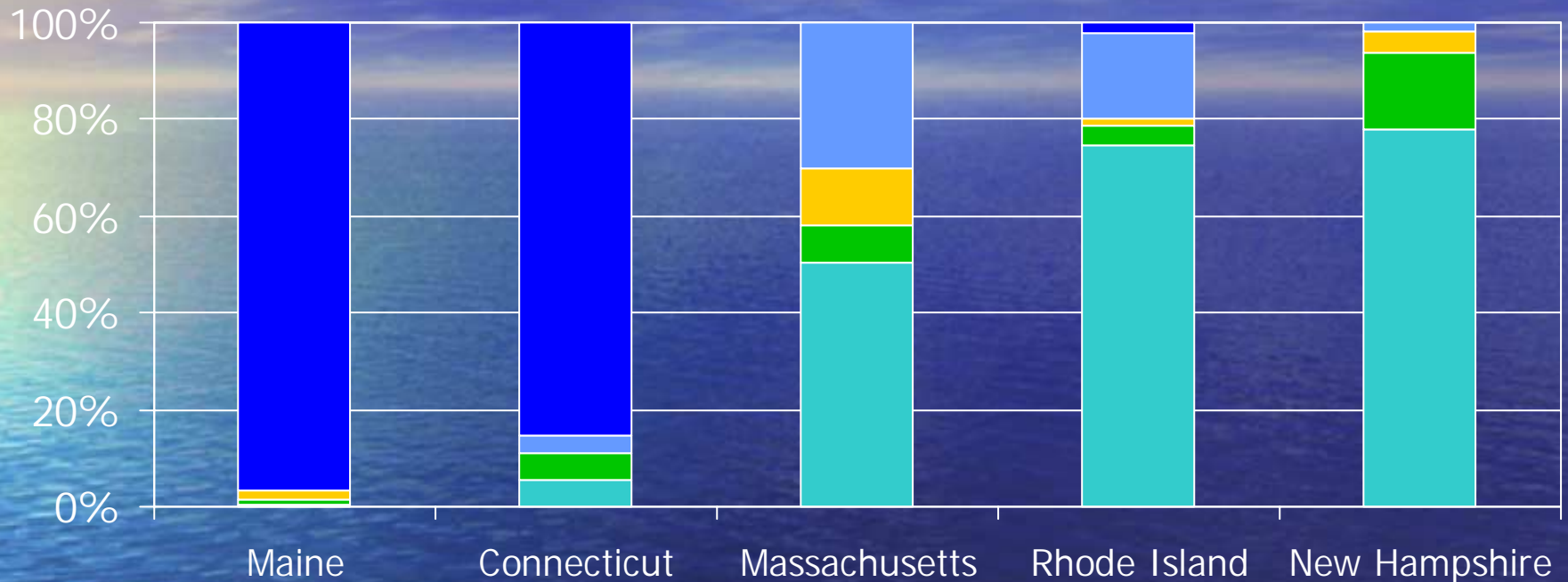
State	Employment	Establishments
Maine	10,773	19
Connecticut	9,389	61
Massachusetts	8,863	298
Rhode Island	6,944	74
New Hampshire	2,938	29
New England	38,906	481

MST Employment by Sector, New England



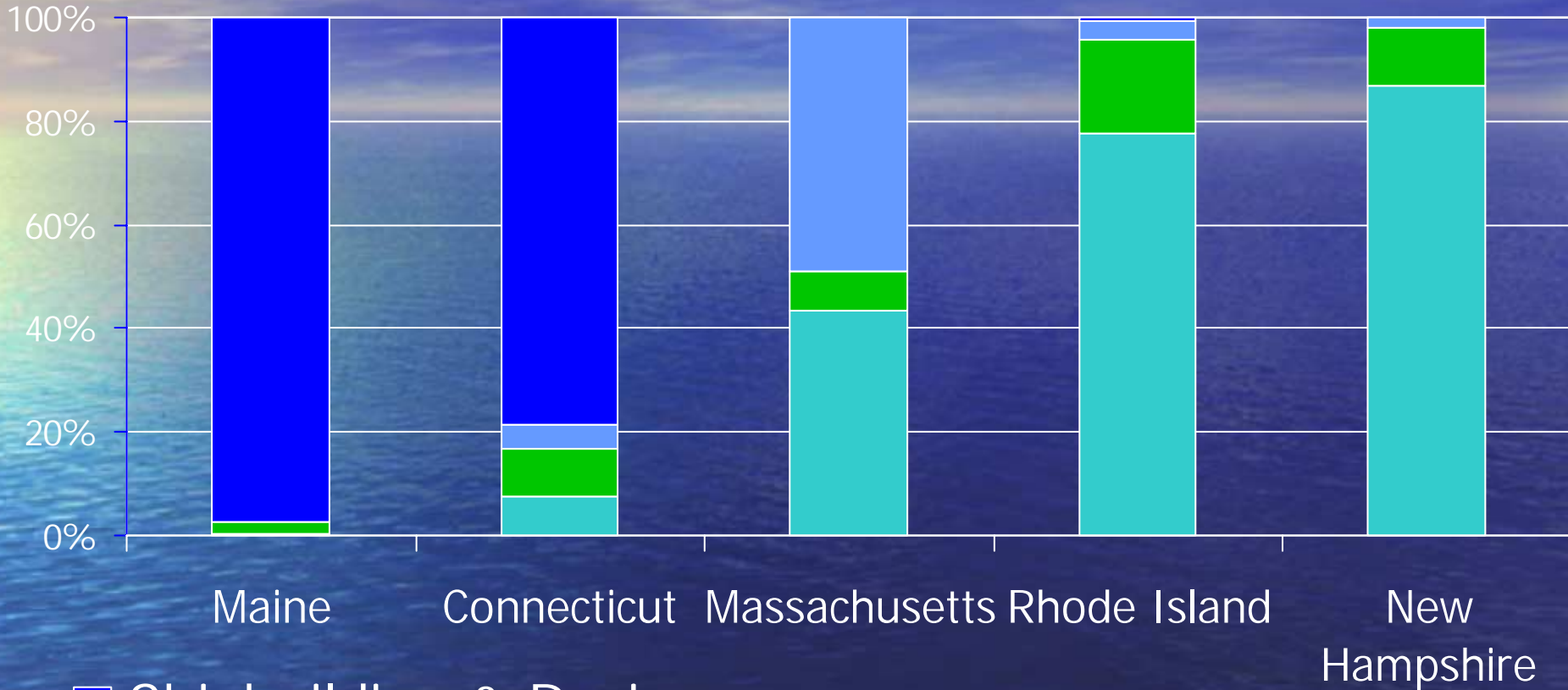
Marine Employment by Sector

The industry in MA and RI is more diversified than in ME and CT



- Shipbuilding & Design
- Marine Services
- Marine Research & Education
- Marine Materials & Supplies
- Marine Instrumentation & Equipment

Marine Sales by Sector

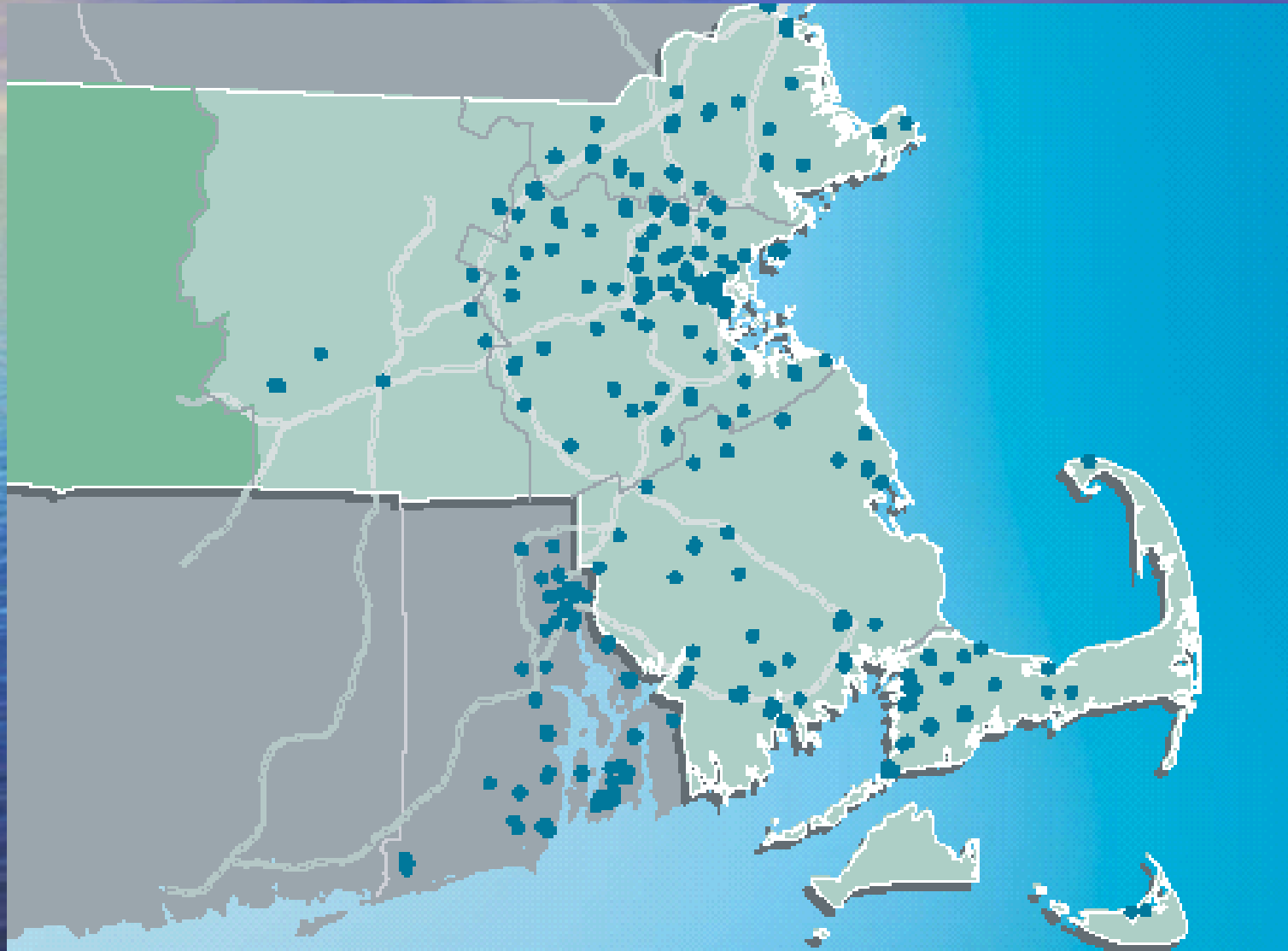


- Shipbuilding & Design
- Marine Services
- Marine Materials & Supplies
- Marine Instrumentation & Equipment



MA and RI are geographic hot spots in the New England cluster

Marine Science and Technology Firms, Eastern Massachusetts and Rhode Island



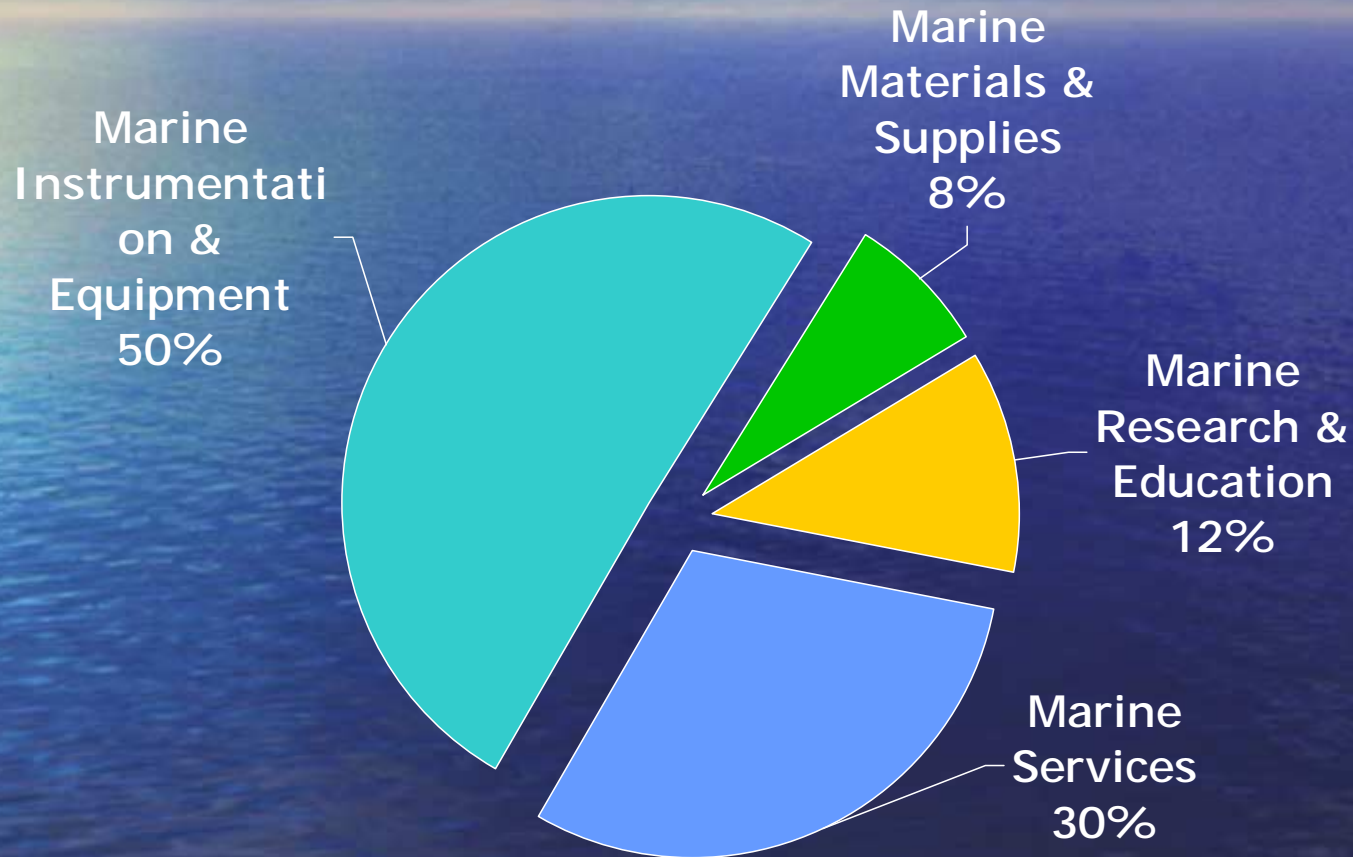
What's special about the MA cluster?

- Sector diversity
- High value-added segments
- Nationally competitive
- Large-scale economic impacts
- High wages
- Importance of research (military and scientific)
- Collaborative initiatives

Company Profile

- Companies are primarily small to medium sized firms (65% under 16 employees)
- Median current revenue is \$1.2 million dollars
- 75% of the companies have focused on the marine market 25 years or less
- Almost all stand alone firms - not divisions of larger companies (92%)

MST Employment by Sector, MA



Major Markets

- **Oceanographic**– regional: WHOI; MIT; MBL; SMAST; international
 - Analytical and navigational instruments
 - AUV's for exploration / monitoring
 - Research fleets
- **Defense/Security** – regional: Naval Undersea Warfare Center (Newport); Raytheon (Portsmouth); SAIC (Newport); international
 - Instruments
 - Research: optics; acoustics; signal + information processing; underwater propulsion
 - Materials
 - AUV's for security, monitoring and defense
 - Systems engineering

Major Markets

- Offshore oil and gas
 - AUV's for surveillance, repairs
 - Marine engineering and construction; materials
 - Ocean flow forecasting for equipment development and siting; oil spill risk analysis
- Fisheries
- Atmospheric/environmental
 - Ocean / atmosphere interaction research
 - Tsunami warning system
 - Ocean circulation, cyclone, storm surge and wave forecasting models
- Offshore and far offshore wind energy



MA cluster is nationally competitive

National Comparisons 1997-2004

- "Subset" of MA Core Sector Firms Only (80 firms, 910 employees, \$163 mil sales)
- Ranked NINTH in # of businesses every year except 2001 and 2002 (10th)
- Ranked SEVENTH in employment in 1997, EIGHTH in 2004
- Ranked FIFTH in sales in 1997, NINTH in 2004
- Nationwide, employment down 20%, sales up 185%, # of firms up 14%
- MA, employment down 61%, sales constant, # of firms down 2%

Economic Impacts



ECONOMIC IMPACTS: DEFINITIONS

- *Output* is the value of goods and services produced by an identified establishment or industry.
- *Employment* is the number of people employed by the identified establishment or industry, including wage and salary employees, full-time and part-time employees, and self-employed persons.
- *Personal income* is the wages, benefits, and other income derived from employment that is linked geographically to the identified establishment or industry.

ECONOMIC IMPACTS: DEFINITIONS

- *Direct impacts* are the economic activities carried out at a business establishment or construction project and are therefore an immediate consequence of the economic activity that would not have occurred in the absence of the business establishment or construction project.
- *Indirect impacts* derive primarily from off-site economic activities that are attributable to the identified business activity. These economic activities occur mainly as a result of non-payroll expenditures. Indirect impacts originate entirely off-site, although the indirect impacts would not have occurred in the absence of the identified activity.
- *Induced impacts* are the multiplier effects of the direct and indirect impacts created by successive rounds of spending by employees and proprietors.
- *Total impacts* are the sum of the direct, indirect, and induced impacts.

Total Economic Impacts: Massachusetts, 2004

	Direct	Indirect	Induced	Total
Output/ Sales	\$1.540 B	\$0.328 B	\$1.092 B	\$2.96 B
Employ- ment	8,863	2,434	11,099	22,396
Payroll	\$0.661 B	\$0.131 B	\$0.472 B	\$1.26 B

Average Annual Wage, 2004

	Marine Technology	All Industries
New England	\$51,363	\$43,827
Massachusetts	\$55,948	\$46,332

The Importance of Research



MA MST Research Institutions Research Spending, 2004

- Annual Spending (Research Funds) – \$ 170, 396, 912 million
- Employment – 1,348 full and part time
- Payroll - \$72,409,642 million

MA Small Business Innovation (SBIR) Awards

- MA receives 12% of its total SBIR funding from projects related to marine science and technology through the Navy SBIR program
- MA captures 15% of national SBIR awards from the Navy
- MA converts about 48% into Phase II Awards



Collaborative initiatives

MST Business Collaboration

- Government Agencies/Departments 85%
- Colleges/Universities 83%
- Marine Technology Firms 81%
- Other firms 81%
- Oceanographic Research Institutions 67%



2005 Survey of MST businesses in New England

Top Markets

- Defense 66%
- Oceanographic 64%
- Atmospheric/environmental 33%
- Offshore oil and gas 33%
- Homeland security 28%
- Fisheries 24%

Top Products and Services

- Defense-related equipment manufacturing 40%
- Ocean/environmental surveying and monitoring 38%
- Marine science equipment manufacturing 36%
- Oceanography 29%
- Consulting 24%
- Underwater Vehicles 24%

Obstacles to Business Success

Of great or moderate concern:

- 74% - lack of labor with required skills/expertise
- 73% - product cost
- 60% - access to capital
- 54% - export restrictions to foreign markets

Recruitment Difficulties

- 53% report difficulty recruiting engineers
- 45% report difficulty recruiting technicians
- 43% report difficulty recruiting sales/marketing
- 40% report difficulty recruiting production workers

Business Assistance Needs

- Grants to support proof of concept research 45%
- Forum for strategic alliances to secure funds for large-scale research, development, and demonstration projects 33%
- Center for product development, testing, and demonstration 29%
- Market research studies for products 27%

New and Emerging Markets

- Homeland security
- Oceanographic and atmospheric monitoring
- Offshore energy development
- Developing countries and foreign navies

Strategic Opportunity

- To take advantage of these new markets further encourage large-scale alliances between industry and research institutions
- Help facilitate interactions within the cutting-edge sectors of the industry by promoting and facilitating collaborations among firms in different sectors
- Direct attention to meeting the workforce needs of this sector