

## Appendix Three

### Marine Science Technology Industry Survey Summary of Key Findings

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#### 1. Survey Responses

**Total valid survey response rate = 17% (58 completed of 345 eligible respondents).**

- Total surveys administered = 400
- Number of surveys returned as undeliverable = 36
- Number of companies found to not be marine science on telephone follow-up = 15
- Number of companies found to not be marine science on through survey = 4.
- 25% MOTN member response rate (18 out of 72 companies).

#### 2. Company Profile and Sample Characteristics<sup>1</sup>

##### *Company Location*

Companies whose executives completed surveys came from each of the five New England states (MA, RI, CT, ME, and NH). Over 60% of respondents are Massachusetts firms, with the second largest group based in Rhode Island (19%). Of the respondents based in Massachusetts, 40% are located on Cape Cod. Almost all of the companies are stand alone firms and not divisions of larger companies (92%).

The table below presents a state-by-state comparison of the geographic location of marine science companies within the survey sample to the total population (limited to New England firms). There appears to be no significant response bias based on location.

State	Sample (%)	Population (%)	Difference (%)
Connecticut	10.3	12.9	-2.6
Massachusetts	60.3	58.9	1.4
Maine	6.9	3.0	3.9
New Hampshire	3.4	6.9	-3.5
New York	0	.5	-.5
Rhode Island	19.0	17.8	1.2

##### *Company Size*

In general, respondent companies are small- to medium-sized firms with most of their employees based in New England. 65% report 15 or fewer employees, while 21% employ more than 50. There is one large outlier in the data set; a federal agency that employs substantially more employees than other respondent companies. The table below presents a comparison of the current employment of marine science companies within the survey sample to the total population (limited to New England firms). The sample is skewed somewhat toward smaller (6 to 15 employee) companies, but is balanced, overall.

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<sup>1</sup> Total population data were developed from multiple list sources.

Current Employment	Sample (%)	Population (%)	Difference (%)
0 to 5	29.3	29.0	.3
6 – 15	35.4	25.0	10.4
16 – 50	15.5	18.7	-3.2
51 +	20.7	27.3	-6.6

### *Revenue*

The median annual revenue of respondent firms is \$1.2 million dollars. In terms of total revenue, 14% of respondent companies report less than \$200k in the current year, and 22% report between \$200K and \$500K in total revenue. The table below presents a comparison of the current year revenues of marine science companies within the survey sample to the total population (limited to New England firms). The comparison shows that companies with the smallest and largest total revenues are underrepresented in the survey sample. Again, the sample includes a balanced portfolio of respondents.

Current Revenue	Sample (%)	Population (%)	Difference (%)
up to \$200k	13.7	20.1	-6.4
\$200k to 500k	21.6	9.6	12
\$500k to 1.5m	23.5	20.1	3.4
\$1.5m to 5m	25.5	18.0	7.5
Over \$5m	15.7	30.9	-15.2

### *Years in Marine Market*

Finally, over two-thirds of all reported that their company has focused on the marine market for 25 years or fewer (16% for five years or less; 51% for 6 - 25 years). Comparison data were not available for this characteristic. Thus, a sample to population comparison is not feasible.

## **3. Employment and Revenue Trends**

### *Employment Trends*

In spite of difficult economic times for many New England firms, 53% of respondent companies report growth in employment over the past two years and 74% expect job growth in the next two years. Twenty-five percent of companies reported a decrease in employment over the past two years, but none forecast a decline over the next two years. The mean employment of respondent companies two years ago was 21. In the current year, mean employment has grown to 24, and company forecasts suggest mean employment will increase to 30 by 2006. (Note: these data exclude the very large “outlier” organization.)

### *Revenue Trends*

Overall, the annual revenues of surveyed companies are growing; a trend they expect to continue over the next two years. The median annual revenue of respondent companies grew from

\$800,000 to \$1.2 million over the past two years, and is expected to increase to \$1.5 million by 2006.

Survey data shows that 63% of companies report increased revenue over the past two years, while 25% of respondents report reduced revenues. With regard to anticipated future revenue (two years from now), 85% of respondents anticipate an increase, while 6% expect a decrease. Among the 85% of companies that project an increase in revenues, the mean expected increase is 49% of present year revenues.

#### 4. Marine Products, Services, and Market Characteristics

##### *Products and Services*

Survey respondents were asked to identify which products and services their company specialized in from a list of 16 choices that were developed through company interviews and an analysis of secondary data. Each company was asked to identify all of the products and services that they provide (therefore, response categories are not mutually exclusive).

<b>Products and Services</b>	<b>(%)</b>	<b>Number</b>
Defense Related Marine Equipment	39.7	23
Ocean/ Environmental Monitoring and Surveying	37.9	22
Marine Science Equipment	36.2	21
Oceanography	29.3	17
Consulting	24.1	14
Underwater Vehicles	24.1	14
Communications Equipment	19.0	11
Underwater Photography/ Imaging	15.5	9
Shipbuilding/ Design	10.3	6
Navigation Equipment	8.6	5
Offshore Coastal Engineering	8.6	5
Marine Specific Materials	8.6	5
Computer Modeling	8.6	5
Marine Education	1.7	1
Offshore Construction	1.7	1

Results show a wide diversity of products and services among respondent companies. Most of the companies (55%) reported that they provide more than one marine related product or service. Defense related marine equipment manufacturing (40%), ocean/environmental surveying and monitoring (38%), and marine science equipment manufacturing (36%) were the most frequently cited business products or services. The least frequently reported products and services are marine education and offshore construction (only 1 respondent for each).

There are several statistical associations between various products and services. Correlations show a significant association between defense-related marine equipment and communications equipment. Companies that specialize in navigation equipment or in offshore/ coastal

engineering were also likely to perform underwater photography/ imaging. There is also a consistent relationship between those who perform computer modeling with oceanography services, and with marine specific materials.

*Niche Markets*

Respondents were asked to choose from 9 niche markets and identify those areas that they currently serve. These markets (defense, homeland security, oceanographic, wind/tidal energy, fisheries, atmosphere/ environmental, offshore oil and gas, offshore communication, and transportation) span a wide range of marine science activities. Respondents were directed to identify as many niche markets as they serve.

Currently Serve Niche Markets	(%)	Number
Defense	65.5	38
Oceanographic	63.8	37
Atmospheric/ Environmental	32.8	19
Offshore Oil and Gas	32.8	19
Homeland Security	27.6	16
Fisheries	24.1	14
Transportation	17.2	10
Offshore Communications	13.8	8
Tidal Energy	10.3	6

The most frequently identified niche markets include:

- Defense (66%)
- Oceanographic (64%)
- Atmospheric/ Environmental and Offshore Oil and Gas (both at 33%)

The least frequently identified niche markets include:

- Wind/ tidal energy (10%)
- Offshore communications (14%)
- Transportation (17%)

*Growth Potential*

Survey respondents were also asked which of their market niches they expect to be growth areas in the coming years. The majority of respondents believed that the Defense (55%) and Homeland Security (53%) sectors will continue to offer demand growth. At the other end of the spectrum, 88% of companies serving the wind/tidal energy and offshore communications markets indicated that those markets are not poised for growth.

Growth Potential Niche Markets	(%)	Number
Defense	55.2	32
Homeland Security	53.4	31
Oceanographic	39.7	23
Tidal Energy	12.1	7

Fisheries	13.8	8
Atmospheric/ Environmental	27.6	16
Offshore Oil and Gas	24.3	14
Offshore Communications	12.1	7
Transportation	17.2	10

## 5. Obstacles to commercialization

Respondents were asked to identify the extent to which a range of factors presented an obstacle to commercialization of their products and services. Overall, the three most frequently cited concerns reported by survey respondents were:

- Lack of labor with required skills/ expertise (74% great or moderate concern);
- Product cost (73% great or moderate concern); and
- Access to capital (60% great or moderate concern).

The obstacles of least concern to these companies were:

- Lack of test sites to demonstrate product (66% little or no concern);
- State regulations and permitting (52% little or no concern); and
- Federal regulations and permitting (51% little or no concern).

Obstacles to Commercialization	(%) Great or Moderate Concern	(%) Little of No Concern	Number
Lack of Labor with Required Skills/ Expertise	73.6	26.4	53
Product Cost	72.5	27.5	51
Access to Capital	59.6	40.4	57
Export Restrictions to Foreign Markets	53.7	40.7	54
Foreign Business Regulations	43.5	43.5	46
State Regulations and Permitting	39.3	51.8	56
Federal Regulations and Permitting	39.2	51.0	51
Lack of Test Sites to Demonstrate Product	30.9	65.5	55

## 6. Business Relationships

### *Collaboration*

Survey respondents were asked a series of questions regarding their collaboration with oceanographic research institutions, colleges/universities, government agencies, marine technology firms, and other firms. The table below presents the percentage breakdown of the level of collaboration and the type of collaboration with each of the institution types. All respondents reported that they collaborated with at least one of the listed types of institutions.

Overall, data suggest a healthy level of collaboration exists within the industry and that these firms routinely engage academic, research, government organizations, and/or other marine

technology firms. Firms more frequently report that they collaborate on research and development than on testing and demonstration or other activities.

Institution	No collaboration (%)	Yes, on Research and Development (%)	Yes, on Testing and/or Demonstration (%)	Yes, on other activities (%)
Oceanographic Research Institutions	32.8	37.9	37.9	17.2
Colleges/ Universities	17.2	44.8	37.9	22.4
Government agencies/ departments	15.5	43.1	39.7	25.9
Marine technology firms	19.0	43.1	36.2	20.7
Other firms	19.0	22.4	15.5	13.8

### Supplier Relationships

The survey also inquired about companies’ supplier relationships for various products and services. Generally, respondent companies rely more on New England suppliers than on suppliers from outside the region. The exception is in the area of electronics and sensors, where 59% rely on companies outside of New England, compared to 55% who purchase these goods locally. (Responses are not mutually exclusive.) The three products and services most frequently purchased from New England suppliers include:

- Machining equipment (71% in New England)
- Marine components (62%), and
- Raw materials (59%).

New England Suppliers	(%) Rely on New England Suppliers	Number
Machining Equipment	70.7	58
Marine Components	62.1	58
Raw Materials	58.6	58
Electronic Sensors	55.2	58
Software	37.9	58
Telecommunications/ Imaging	31.0	58

Software development is evenly split, with 38% getting these supplies from within New England and the same proportion sourcing this business to other suppliers.

## 7. Workforce

Survey respondents were asked what percentage of their employees fit into the following job categories: scientists; engineers; technicians; management and administration; production; and sales and marketing. They were also asked whether they have recently experienced difficulty recruiting workers for each of these job positions.

### *Workforce Distribution by Job Type*

Typical of smaller firms in technology driven industries, workforce data reflect an emphasis on knowledge creation, product development, and production; with less focus on management and sales functions. The largest segments of these companies' workforces are:

- Engineers (38% average across the sample)
- Production workers (24%)
- Scientists (24%)

<b>Workforce</b>	<b>Average %</b>	<b>Number</b>
Engineers	38.1	42
Production Workers	23.9	22
Scientists	23.6	26
Technicians	23.0	37
Managers	20.2	42
Sales and Marketing	14.4	33

### *Recruitment*

Pre-survey interviews with industry executives suggested that worker recruitment was a critical concern to the industry; a finding confirmed through this survey. Survey data show that the positions most difficult to fill are engineers (53% report difficulty) and technicians (45%); while the positions that are least difficult to fill include scientists (25%) and managers (33%).

<b>Recruitment Difficulty</b>	<b>% Difficulty Recruiting</b>	<b>Number</b>
Engineers	52.6	38
Technicians	44.7	38
Sales and Marketing	42.9	28
Production Workers	40.0	20
Managers	33.3	36
Scientists	25.0	28

Survey respondents were also asked to write-in what factors, if any, make employee recruitment difficult. Several companies report that it is the nature of the industry itself that makes recruitment difficult. Two illustrative quotes follow:

*“Marine/ ocean engineering is an inherently multi-disciplinary industry. This makes finding well-rounded people difficult.”*

*“Finding people with backgrounds in the ocean industry is such a plus -- these folks are in short supply”.*

## 8. Business Environment

Respondents were asked to rate the various advantages and disadvantages of being located in New England. The factors of interest were separated into three broad areas; business and industry factors, infrastructure factors, and quality of life factors. The respondents were asked to rate each factor as being a significant advantage, modest advantage, neutral, modest disadvantage, or significant disadvantage.

### *Business and Industry Factors*

According to respondents, their New England location presented several advantages to their companies. Chief among these was “access to research institutions”, which was rated as an advantage by 77% of respondents, “proximity to others in the industry” (60%), and “access to labor with technical skills” (59%). The only business and industry-related factor cited frequently as a disadvantage is the cost of doing business in New England, which 70% of respondents identified as a modest or significant disadvantage.

### *Infrastructure Factors*

Of the three infrastructure factors identified on the survey, the most advantageous factor of a New England location is ready access to “high speed data transmission (broadband),” which was identified as a significant or a moderate advantage by over half of respondents in the sample overall (55%). Looking at only Cape Cod companies (14 in the sample) only 39% of the companies felt this was a significant or moderate advantage.

Another factor that was identified as a slight advantage was “physical infrastructure”. Forty-eight percent of respondents viewed this as an advantage while only 11% viewed this as a disadvantage (the rest of the respondents were either neutral or didn’t know). The other factor in this group was “State regulatory policy”, which the 65% of companies identified as neutral or said they did not know. However, of those with an opinion on this factor, 33% viewed it as a disadvantage and only 8% viewed it as an advantage.

### *Quality of Life*

There are two factors included in the quality of life component of this question. These include an overall assessment of the quality of life that New England offers and the cost of housing. Both of these factors were widely discussed during interviews of company executives. Overall, quality of life in New England is viewed very positively, with 75% of respondents indicating that it is a significant or a moderate advantage of their business location. The cost of housing, however, is viewed as a disadvantage by 67% of the respondents. On Cape Cod, the proportion indicating that the cost of housing is a disadvantage is 75%, although this is not a statistically significant difference.

<b>New England Advantage/ Disadvantage Factors...</b>	<b>Significant or Modest Advantage (%)</b>	<b>Significant or Modest Disadvantage (%)</b>	<b>Number</b>
<i>Business and Industry Factors</i>			
Access to research institutions	77.4	1.9	53
Proximity to others in your industry	60.4	11.3	53
Access to labor w/ technical skills	58.9	8.9	56
Proximity to testing facilities and sites	56.6	9.4	53
Proximity to suppliers	43.4	7.6	53
Proximity to markets	41.8	18.2	55
Proximity to deep water shelf	22.0	10.0	50
Access to labor for factory floor	14.3	20.4	49
Access to capital	10.9	14.6	55
Overall cost of doing business	3.7	70.3	54
<i>Infrastructure Factors</i>			
High speed data transmission (broadband)	54.7	5.7	53
Physical infrastructure (roads, ports, etc.)	48.1	11.1	54
State regulatory policy	7.7	32.7	52
<i>Quality of Life Factors</i>			
Quality of life	75.0	3.6	
Cost of housing	13.5	67.3	

## 9. Potential Business Assistance

Survey respondents were asked to rate ten possible business assistance initiatives that interviewees and other industry stakeholders suggested could boost the marine science industry. Respondents were asked to rate each option as “highly beneficial”, “somewhat beneficial”, or “not beneficial”. Favorable responses to this question are presented in the table below, in rank order from the option most frequently to least frequently rated as “highly beneficial.”

Possible Business Assistance	Highly Beneficial (%)	Somewhat Beneficial (%)
Grants to support proof of concept research	44.6	37.5
A forum for strategic alliances to secure funds for large-scale research, development, and demonstration projects	32.7	36.4
A center for product development, testing, and demonstration	28.6	32.1
Market research studies for products	27.3	43.6
A forum to introduce commercialization technologies to potential investors and corporate collaborators	24.1	38.9
Assistance commercializing SBIR Phase II projects	23.6	34.5
Industry targeted job recruitment events and services	16.4	52.7
Seminars and workshops on commercialization, business development and management	12.5	64.3
Entrepreneur mentoring for start up companies	12.3	28.1
Office/ incubator space with shared facilities and tech support	8.9	23.2

Respondent companies were also asked to rank order the three assistance options that they believe would be most beneficial to their company. The option most frequently identified as the #1 option was grants to support proof of concept research. The second highest ranked category was market research studies for new products. Finally, the third was creation of a forum for strategic alliances to secure funds for large scale research, development and demonstration projects.

Companies were also asked to make other recommendations to support the development of marine-focused technology companies in New England. Following are two sample responses:

*“Encourage support of regional aquaculture schools to introduce students to all aspects of marine technology. Follow lead of states which encourage boat building, boat sales, etc. (RI is one)”.*

*“Identify a problem of mutual interest with an exportable solution, e.g. harbor security and related monitoring”.*

## 10. Subgroup Comparison analysis

Survey responses were analyzed comparing various subgroups of companies to uncover meaningful differences in key areas. The areas of comparison were as follows; Cape Cod vs. non Cape Cod companies, Massachusetts vs. non-Massachusetts companies, years focused on the marine market (under 20 years vs. over 20 years), and company size (16 or more employees vs.

under 16 employees). Tables below will present these company comparisons in the key areas of revenue, products and services, business relationships, business environment and potential business assistance. Because of sample size limitations for the subgroup analysis, we are unable to make determinations about statistically significant differences, however, there are several substantive differences in key areas.

## Cape Cod vs. Non-Cape Cod

### *Current Revenue*

Cape Cod companies tend to have revenue earnings in the \$500,000 to \$1,500,000 category. Companies outside of Cape Cod have a very even split across all earnings categories.

Revenue Categories	Cape Cod (%)	# CC	Non-Cape Cod (%)	# non-CC	Difference
up to 200k	16.7	2	13.2	5	3.5
200k to 500k	8.3	1	26.3	10	-18
500k to 1.5m	41.7	5	18.4	7	23.3
1.5m to 5m	16.7	2	26.3	10	-9.6
over 5m	16.7	2	15.8	6	.9

### *Products and Services*

Products and services were sorted by the highest percentage reported on Cape Cod. Over 57% of the Cape Cod companies are reporting they provide ocean/ environmental monitoring and surveying services. The largest area of difference is in underwater vehicles, where half of the Cape Cod companies are reporting this product/ service compared to only 17% of non-Cape Cod companies.

Products and Services	Cape Cod (%)	# CC	Non-Cape Cod (%)	# non-CC	Difference
Ocean/ environmental monitoring and surveying	57.1	8	31.0	13	26.1
Underwater vehicles	50.0	7	16.7	7	33.3
Marine science equipment	42.9	6	33.3	14	9.6
Oceanography	42.9	6	23.8	10	19.1
Underwater photography/ imaging	28.6	4	9.5	4	19.1
Defense related marine equipment	21.4	3	47.6	20	-26.2
Consulting	21.4	3	23.8	10	-2.4
Communications equipment	14.3	2	19.0	8	-4.7
Offshore/ coastal engineering	14.3	2	4.8	2	9.5
Navigation equipment	7.1	1	4.8	2	2.3
Marine specific materials	7.1	1	9.5	4	-2.4
Computer modeling	7.1	1	9.5	4	-2.4
Marine education	0	0	2.4	1	-2.4
Shipbuilding/ design	0	0	11.9	5	-11.9
Offshore construction	0	0	2.4	1	-2.4

## Business Relationships

Cape Cod companies are least likely to collaborate with other firms (nearly 36% report no collaboration). Companies not on Cape Cod are least likely to collaborate with oceanographic research institutions (38% report no collaboration).

Collaboration with...	No Collaboration (%)		Yes, on Research and Development (%)		Yes, on Testing and/or Demonstration (%)		Yes, on other activities	
	CC	Not CC	CC	Not CC	CC	Not CC	CC	Not CC
Other firms	35.7 (5)	14.3 (6)	7.1 (1)	28.6 (12)	7.1 (1)	19.0 (8)	14.3 (2)	14.3 (6)
Government agencies/ departments	28.6 (4)	9.5 (4)	28.6 (4)	50.0 (21)	42.9 (6)	40.5 (17)	14.3 (2)	31.0 (13)
Marine technology firms	21.4 (3)	19.0 (8)	42.9 (6)	42.9 (18)	42.9 (6)	33.3 (14)	14.3 (2)	21.4 (9)
Colleges/ Universities	14.3 (2)	16.7 (7)	42.9 (6)	47.6 (20)	50.0 (7)	35.7 (15)	14.3 (2)	23.8 (10)
Oceanographic research institutions	7.1 (1)	38.1 (16)	50.0 (7)	35.7 (15)	57.1 (8)	33.3 (14)	21.4 (3)	16.7 (7)

## Business Environment

Both Cape Cod and non-Cape Cod companies are reporting very positive advantages in regards to access to research institutions that are available in the New England area (92% for Cape Cod and 75% for non-Cape Cod rate this as a significant or a modest advantage). There is a large difference between Cape Cod and non Cape Cod companies in infrastructure factors; non-Cape Cod companies view high speed data transmission and physical infrastructure in a more favorable light than Cape Cod companies.

New England Advantage/ Disadvantage Factors...	Significant or Modest Advantage (%)		Significant or Modest Disadvantage (%)	
	CC	Not CC	CC	Not CC
<i>Business and Industry Factors</i>				
Access to research institutions	91.7 (11)	75.0 (30)	0 (0)	2.5 (1)
Proximity to testing facilities and sites	75.0 (9)	52.4 (21)	0 (0)	12.5 (5)
Proximity to others in your industry	71.4 (10)	57.9 (22)	7.1 (1)	10.5 (4)
Access to labor w/ technical skills	42.9 (6)	67.5 (27)	14.3 (2)	5.0 (2)
Proximity to suppliers	41.7 (5)	45.0 (18)	8.3 (1)	5.0 (2)
Proximity to markets	38.5 (5)	42.5 (17)	15.4 (2)	17.5 (7)
Proximity to deep water shelf	16.7 (2)	24.3 (9)	25.0 (3)	5.4 (2)
Overall cost of doing business	14.3 (2)	0 (0)	57.1 (8)	74.3 (29)
Access to labor for factory floor	7.1 (1)	17.1 (6)	42.8 (6)	11.4 (4)
Access to capital	0 (0)	15.4 (6)	7.1 (1)	18.0 (7)
<i>Infrastructure Factors</i>				
High speed data transmission (broadband)	38.5 (5)	61.5 (24)	23.1 (3)	0 (0)
Physical infrastructure (roads, ports, etc.)	38.5 (5)	52.5 (21)	15.4 (2)	7.5 (3)
State regulatory policy	15.4 (2)	5.4 (2)	23.1 (3)	32.4 (12)
<i>Quality of Life Factors</i>				
Quality of life	71.4 (10)	78.0 (32)	0 (0)	4.9 (2)
Cost of housing	0 (0)	17.9 (7)	75.0 (9)	64.1 (25)

### *Potential Business Assistance*

Except for two areas, Cape Cod companies were generally less likely to rate potential business assistance strategies as beneficial. Two areas where this pattern doesn't hold are in industry targeted job recruitment and in seminars and workshops on commercialization, business development and management. Nearly 36% of Cape Cod companies felt that industry targeted job recruitment was highly beneficial compared to only 8% of non-Cape Cod companies.

How would each of the following types of assistance be to your company?	Highly Beneficial Cape Cod	Highly Beneficial Non-Cape Cod	Difference
Industry targeted job recruitment events or services.	35.7 (7)	7.7 (3)	27.7
Grants to support “proof of concept” research.	28.6 (4)	52.5 (21)	-23.9
Seminars and workshops on commercialization, business development and management.	23.1 (3)	9.8 (4)	13.3
A forum for strategic alliances to secure funds for large scale research, development and demonstration projects.	23.1 (3)	37.5 (15)	-14.4
A center for product development, testing, and demonstration.	21.4 (3)	31.7 (13)	-10.3
A forum to introduce commercialization technologies to potential investors and corporate collaborators.	15.4 (2)	28.2 (11)	-12.8
Market research studies for new products.	15.1 (2)	32.5 (13)	-17.4
Assistance commercializing SBIR Phase II projects.	8.3 (1)	29.3 (12)	-21.0
Entrepreneur mentoring for start up companies.	7.1 (1)	14.6 (6)	-7.5
Office/ incubator space with shared facilities and tech support.	7.1 (1)	10.0 (4)	-2.9

### **Massachusetts vs. Non-Massachusetts**

#### *Revenue*

The biggest difference between Massachusetts and non-Massachusetts companies is in terms of the \$500,000 to \$1.5 million revenue category. None of the non-MA companies fall into this area while over 36% of the MA companies report this revenue range.

Revenue Categories	MA (%)	N MA	Non-MA (%)	N non-MA	Difference
up to 200k	9.1	3	22.2	4	-13.1
200k to 500k	15.2	5	33.3	6	-18.1
500k to 1.5m	36.4	12	0	0	36.4
1.5m to 5m	21.2	7	33.3	6	-12.1
over 5m	18.2	6	11.1	2	7.1

#### *Products and Services*

Marine science equipment is the largest reported category for Massachusetts companies (46%). This category also shows a large difference compared to non-Massachusetts companies where only 21% are reporting this service.

Products and Services	MA (%)	# MA	Non-MA (%)	#Non-MA	Difference
Marine science equipment	45.7	16	20.8	5	24.9
Defense related marine equipment	42.9	15	33.3	8	9.6
Ocean/ environmental monitoring and surveying	40.0	14	33.3	8	6.7
Oceanography	34.3	12	20.8	5	13.5
Underwater vehicles	31.4	11	12.5	3	18.9
Underwater photography/ imaging	20.0	7	8.3	8	11.7
Consulting	20.0	7	29.2	7	-9.2
Communications equipment	17.1	6	20.8	5	-3.7
Offshore/ coastal engineering	5.7	2	12.5	3	-6.8
Computer modeling	5.7	2	12.5	3	-6.8
Shipbuilding/ design	5.7	2	16.7	4	-11
Navigation equipment	2.9	1	16.7	4	-13.8
Marine specific materials	2.9	1	16.7	4	-13.8
Marine education	2.9	1	0	0	2.9
Offshore construction	0	0	4.2	1	-4.2

### *Business Relationships*

There is a fairly even level of collaboration among different institutions among the Massachusetts based companies. The level of collaboration is, however, quite variable among the non-Massachusetts based companies. Non-Massachusetts companies are least likely to collaborate with oceanographic research institutions (48% report no collaboration) and are more likely to collaborate with marine technology firms and government agencies/ departments.

Collaboration with...	No Collaboration (%)		Yes, on Research and Development (%)		Yes, on Testing and/or Demonstration (%)		Yes, on other activities	
	MA	Not MA	MA	Not MA	MA	Not MA	MA	Not MA
Marine technology firms	22.9 (8)	13.0 (3)	34.3 (12)	56.5 (13)	40.0 (14)	30.4 (7)	20.0 (7)	21.7 (5)
Oceanographic research institutions	22.9 (8)	47.8 (11)	48.6 (17)	21.7(5)	42.9 (15)	30.4 (7)	17.1 (6)	17.4 (4)
Other firms	17.1 (6)	21.7 (5)	17.1 (6)	30.4 (7)	11.4 (4)	21.7 (5)	11.4 (4)	17.4 (4)
Government agencies/ departments	17.1 (6)	13.0 (3)	37.1 (13)	52.2 (12)	42.9 (15)	34.8 (8)	17.1 (6)	39.1 (9)
Colleges/ Universities	17.1 (6)	17.4 (4)	45.7 (16)	43.5 (10)	40.0 (14)	34.8 (8)	14.3 (5)	34.8 (8)

### *Business Environment*

Massachusetts based companies feel that access to research institutions and the proximity to others in the industry are positive aspects of a New England location. While non-Massachusetts companies also feel that access to research institutions is very positive business factor, they are less likely to report the advantages of proximity to others in the industry. Massachusetts companies are reporting this as an advantage at twice the percentage of non-Massachusetts firms.

New England Advantage/ Disadvantage Factors...	Significant or Modest Advantage (%)		Significant or Modest Disadvantage (%)	
	MA	Not MA	MA	Not MA
<i>Business and Industry Factors</i>				
Access to research institutions	87.9 (29)	60.0 (12)	3.0 (1)	0 (0)
Proximity to others in your industry	73.6 (25)	36.8 (7)	2.9 (1)	26.4 (5)
Access to labor w/ technical skills	62.9 (22)	52.4 (11)	5.7 (2)	14.3 (3)
Proximity to testing facilities and sites	60.6 (20)	50.0 (10)	9.1 (3)	10.0 (2)
Proximity to suppliers	51.5 (17)	30.0 (6)	3.0 (1)	15.0 (3)
Proximity to markets	41.2 (14)	42.9 (9)	14.7 (5)	23.8 (5)
Proximity to deep water shelf	21.9 (7)	22.2 (4)	12.5 (4)	5.6 (1)
Access to capital	14.3 (5)	5.0 (1)	8.6 (3)	25.0 (5)
Access to labor for factory floor	11.8 (4)	20.0 (3)	23.5 (8)	13.3 (2)
Overall cost of doing business	6.1 (2)	0 (0)	78.8 (26)	67.1 (12)
<i>Infrastructure Factors</i>				
Physical infrastructure (roads, ports, etc.)	56.6 (19)	33.4 (7)	6.0 (2)	19.1 (4)
High speed data transmission (broadband)	54.6 (18)	55.0 (11)	9.1 (3)	0 (0)
State regulatory policy	9.7 (3)	4.8 (1)	29.0 (9)	38.0 (8)
<i>Quality of Life Factors</i>				
Quality of life	80.0 (28)	66.7 (14)	2.9 (1)	4.8 (1)
Cost of housing	6.5 (2)	23.8 (5)	77.4 (24)	52.3 (11)

### Potential Business Assistance

Ratings for the various kinds of business assistance did not vary much between Massachusetts and non-Massachusetts companies. Nearly 49% of Massachusetts companies feel that grants to support “proof of concept” research are highly beneficial.

How would each of the following types of assistance be to your company?	Highly Beneficial MA	Highly Beneficial Non-MA	Difference
Grants to support “proof of concept” research.	48.6 (17)	38.1 (8)	10.5
A forum for strategic alliances to secure funds for large scale research, development and demonstration projects.	29.4 (10)	38.1 (8)	-8.7
A center for product development, testing, and demonstration.	28.6 (10)	28.6 (6)	0
Assistance commercializing SBIR Phase II projects.	27.3 (9)	18.2 (4)	9.1
A forum to introduce commercialization technologies to potential investors and corporate collaborators.	26.5 (9)	20.0 (4)	6.5
Market research studies for new products.	26.5 (9)	28.6 (6)	-2.1
Industry targeted job recruitment events or services.	14.7 (5)	19.0 (4)	-4.3
Seminars and workshops on commercialization, business development and management.	14.7 (5)	9.1 (2)	5.6
Entrepreneur mentoring for start up companies.	8.6 (3)	18.2 (4)	-9.6
Office/ incubator space with shared facilities and tech support.	8.6 (3)	9.5 (2)	-9

## Years Focused on the Marine Market (under 20 years vs. 20 years and older)

### Revenue

There are no strong differences in terms of revenue from established companies versus newer companies in our survey results. There is an balanced revenue portfolio for both established firms and newer firms.

Revenue Categories	20+ years (%)	N 20+ yrs	Under 20 years (%)	N < 20 yrs	Difference
up to 200k	12.0	4	15.4	4	-3.4
200k to 500k	20.0	5	23.1	5	3.1
500k to 1.5m	24.0	6	23.1	6	.9
1.5m to 5m	24.0	6	26.9	6	-2.9
over 5m	20.0	5	11.5	5	8.5

### Products and Services

Established companies were more likely to report marine science equipment, oceanography, and offshore/ coastal engineering, while younger companies were more likely to report defense related marine equipment, consulting, and underwater vehicles. The largest area of difference is in oceanography (over 41% of the established firms report this service while only 17% of the newer companies report this service).

Products and Services	20+ Yrs (%)	# 20+ Yrs	>20 Yrs (%)	# >20 Yrs	Difference (%)
Marine science equipment	41.4	12	31.0	9	10.4
Oceanography	41.4	12	17.2	5	24.2
Ocean/ environmental monitoring and surveying	37.9	11	37.9	10	0
Defense related marine equipment	34.5	10	44.8	13	-10.3
Communications equipment	20.7	6	17.2	5	3.5
Underwater vehicles	17.2	5	31.0	9	-13.8
Offshore/ coastal engineering	17.2	5	0	0	17.2
Underwater photography/ imaging	13.8	4	17.2	5	-3.4
Consulting	13.8	4	34.5	9	-20.7
Computer modeling	13.8	4	3.4	1	10.4
Shipbuilding/ design	13.8	4	6.9	2	6.9
Navigation equipment	10.3	3	6.9	2	3.4
Marine specific materials	10.3	3	6.9	2	3.4
Marine education	3.4	1	0	0	3.4
Offshore construction	3.4	1	0	0	3.4

### *Business Relationships*

Established firms collaborate with many different institutions are fairly evenly distributed in the amount of collaboration across institutions. Younger firms (under 20 years) are more likely to collaborate with colleges/ universities and government agencies and are less likely to collaborate with oceanographic research institutions.

Collaboration with...	No Collaboration (%)		Yes, on Research and Development (%)		Yes, on Testing and/or Demonstration (%)		Yes, on other activities	
	20+ yrs	>20 yrs	20+ yrs	>20 yrs	20+ yrs	>20 yrs	20+ yrs	>20 yrs
Oceanographic research institutions	37.9 (11)	28.6 (8)	37.9 (11)	39.3 (11)	31.0 (9)	42.9 (12)	24.1 (7)	10.7 (3)
Colleges/ Universities	31.0 (9)	3.6 (1)	34.5 (10)	57.1 (16)	37.9 (11)	35.7 (10)	27.6 (8)	17.9 (5)
Other firms	27.6 (8)	10.7 (3)	17.2 (5)	28.6 (8)	20.7 (6)	10.7 (3)	20.7 (6)	7.1 (2)
Government agencies/ departments	27.6 (8)	3.6 (1)	34.5 (10)	50.0 (14)	37.9 (11)	42.9 (12)	34.5 (10)	17.9 (5)
Marine technology firms	17.2 (5)	21.4 (6)	44.8 (13)	32.1 (9)	41.4 (12)	17.9 (5)	24.1 (7)	17.9 (5)

### *Business Environment*

Older firms are reporting significant or modest advantages in regards to access to research institutions and proximity to others in the industry. There does not appear to be major differences between newer and older companies in terms of the relative advantages and disadvantages of being based in New England.

New England Advantage/ Disadvantage Factors...	Significant or Modest Advantage (%)		Significant or Modest Disadvantage (%)	
	20+ yrs	>20 yrs	20+ yrs	>20 yrs
<i>Business and Industry Factors</i>				
Access to research institutions	73.1 (19)	57.7 (15)	3.8 (1)	0 (0)
Proximity to others in your industry	57.1 (16)	66.7 (16)	14.2 (4)	2 (8.4)
Access to labor w/ technical skills	55.2 (16)	61.5 (16)	10.1 (3)	7.7 (2)
Proximity to testing facilities and sites	48.1 (13)	68.0 (17)	1 (3.7)	16.0 (4)
Proximity to suppliers	51.9 (14)	36.0 (9)	7.4 (2)	7.4 (2)
Proximity to markets	50.0 (14)	30.8 (6)	17.9 (5)	19.2 (5)
Proximity to deep water shelf	36.0 (9)	8.4 (2)	0 (0)	20.8 (5)
Access to capital	14.2 (4)	7.7 (2)	14.2 (4)	15.3 (2)
Access to labor for factory floor	20.8 (5)	8.4 (2)	29.2 (7)	12.5 (3)
Overall cost of doing business	0 (0)	7.7 (2)	70.3 (19)	73.1 (19)
<i>Infrastructure Factors</i>				
Physical infrastructure (roads, ports, etc.)	40.7 (11)	57.7 (15)	14.8 (4)	7.6 (2)
High speed data transmission (broadband)	51.9 (14)	56.0 (14)	7.4 (2)	3.6 (1)
State regulatory policy	7.4 (2)	8.3 (2)	40.7 (11)	4.2 (1)
<i>Quality of Life Factors</i>				
Quality of life	85.7 (24)	62.9 (17)	3.6 (1)	3.7 (1)
Cost of housing	11.1 (3)	12.5 (3)	77.7 (21)	58.3 (14)

### Potential Business Assistance

In general, younger companies were more likely to report almost all kinds of potential assistance as highly beneficial than older companies. The greatest difference appears in the “a forum to introduce commercialization technologies to potential investors and corporate collaborators”. For this type of assistance, 40% of the younger companies viewed this as highly beneficial compared to only 11% of older companies.

How would each of the following types of assistance be to your company?	Highly Beneficial 20 years and older	Highly Beneficial Under 20 years	Difference
Grants to support “proof of concept” research.	37.0 (10)	53.6 (15)	-16.6
A forum for strategic alliances to secure funds for large scale research, development and demonstration projects.	25.9 (7)	37.0 (10)	-11.1
Office/ incubator space with shared facilities and tech support.	25.0 (7)	18.5 (5)	6.5
Market research studies for new products.	22.2 (6)	33.3 (9)	-11.1
A center for product development, testing, and demonstration.	18.5 (5)	39.3 (11)	-20.8
Industry targeted job recruitment events or services.	15.4 (4)	17.9 (5)	-2.5
Assistance commercializing SBIR Phase II projects.	11.1 (3)	37.0 (10)	-25.9
A forum to introduce commercialization technologies to potential investors and corporate collaborators.	10.7 (3)	40.0 (10)	-29.3
Entrepreneur mentoring for start up companies.	7.1 (2)	17.9 (5)	-10.8
Seminars and workshops on commercialization, business development and management.	3.6(1)	22.2 (6)	-18.6

### Company Size

#### Revenue

Companies with 16 or more employees were more likely to fall into the \$1.5 million to \$5 million category. Companies that had 16 or more employees were also less likely to have revenues in the \$200,000 to \$500,000 range. There were no firms that had under 16 employees who fall into the lowest revenue category as well as there being no firms who had under 16 employees who are in the highest revenue category.

Revenue Categories	16+ Employ (%)	N 16 + Empl	Under 16 Employ (%)	N < 16 Empl	Difference
up to 200k	0	0	20.6	7	-20.6
200k to 500k	11.8	2	26.5	9	-14.7
500k to 1.5m	5.9	1	32.4	11	-26.5
1.5m to 5m	35.3	6	20.6	7	14.7
over 5m	47.1	8	0	0	47.1

### Products and Services

Larger companies had a greater diversity of the number of products and services reported and their percentages are higher for almost all categories. The greatest difference is in the area of ocean/environmental monitoring and surveying (Over half of larger companies report this service and only 29% of smaller companies).

Products and Services	16+ Empl (%)	>16 Empl (%)	Difference
Ocean/ environmental monitoring and surveying	52.4 (11)	28.9 (11)	23.5
Defense related marine equipment	42.9 (9)	36.8 (14)	6.1
Marine science equipment	38.1 (8)	34.2 (13)	3.9
Oceanography	33.3 (7)	26.3 (10)	7.0
Communications equipment	28.6 (6)	13.2 (5)	15.4
Underwater vehicles	28.6 (6)	21.1 (8)	7.5
Consulting	28.6 (6)	21.1 (8)	7.5
Offshore/ coastal engineering	19.0 (4)	2.6 (1)	16.4
Underwater photography/ imaging	19.0 (4)	13.2 (5)	5.8
Computer modeling	19.0 (4)	2.6 (1)	16.4
Navigation equipment	19.0 (4)	2.6 (1)	16.4
Marine specific materials	14.3 (3)	5.3 (2)	9.0
Shipbuilding/ design	4.8 (1)	13.2 (5)	-8.4
Marine education	4.8 (1)	0 (0)	4.8
Offshore construction	0 (0)	2.6 (1)	-2.6

### *Business Relationships*

Larger companies are more likely to collaborate with government agencies/ departments and are less likely to collaborate with oceanographic research institutions. Smaller companies are less likely to collaborate with oceanographic research firms and are more likely to collaborate with marine technology firms.

Collaboration with...	No Collaboration (%)		Yes, on Research and Development (%)		Yes, on Testing and/or Demonstration (%)		Yes, on other activities	
	16+ Em	>16 Em	20+ Em	>16 Em	16+ Em	>16 Em	16+ Em	>16 Em
Oceanographic research institutions	38.1 (8)	29.7 (11)	33.3 (7)	40.5 (15)	42.9 (9)	35.1 (13)	9.5 (2)	21.6 (8)
Marine technology firms	23.8 (5)	16.2 (6)	47.6 (10)	40.5 (15)	47.6 (10)	29.7 (11)	9.5 (2)	27.0 (10)
Colleges/ Universities	14.3 (3)	18.9 (7)	52.4 (11)	40.5 (15)	42.9 (9)	35.1 (13)	23.8 (5)	21.6 (8)
Other firms	14.3 (3)	21.6 (8)	23.8 (5)	21.6 (8)	14.3 (3)	16.2 (6)	9.5 (2)	16.2 (6)
Government agencies/ departments	9.5 (2)	18.9 (7)	57.1 (12)	35.1 (13)	38.1 (8)	40.5 (15)	19.0 (6)	29.7 (11)

### *Business Environment*

Larger firms are reporting access to research institutions and access to labor with technical skills as the top two advantages to a New England location. Smaller companies feel that proximity to others is also a highly advantageous business factor.

<b>New England Advantage/ Disadvantage Factors...</b>	<b>Significant or Modest Advantage (%)</b>		<b>Significant or Modest Disadvantage (%)</b>	
	<b>16+ Emp</b>	<b>&gt;16 Emp</b>	<b>16+ Emp</b>	<b>&gt;16 Emp</b>
<i>Business and Industry Factors</i>				
Access to research institutions	76.5 (13)	77.8 (28)	0 (0)	2.8 (1)
Access to labor w/ technical skills	57.9 (11)	59.5 (22)	21.1 (4)	2.7 (1)
Proximity to others in your industry	55.6 (10)	62.9 (22)	16.7 (3)	8.7 (3)
Proximity to testing facilities and sites	52.9 (9)	20.6 (7)	5.9 (1)	8.8 (3)
Proximity to suppliers	35.3 (6)	47.2 (17)	17.7 (3)	2.7 (1)
Proximity to markets	33.3 (6)	13.5 (5)	16.7 (3)	18.9 (7)
Proximity to deep water shelf	25.0 (4)	20.6 (7)	12.6 (2)	8.8 (3)
Access to labor for factory floor	20.0 (3)	11.8 (4)	33.3 (6)	14.7 (5)
Access to capital	11.1 (2)	10.8 (4)	11.1 (2)	16.2 (6)
Overall cost of doing business	0 (0)	5.6 (2)	77.8 (14)	67.7 (24)
<i>Infrastructure Factors</i>				
High speed data transmission (broadband)	47.1 (8)	58.3 (22)	5.9 (1)	5.6 (2)
Physical infrastructure (roads, ports, etc.)	27.8 (5)	58.3 (22)	16.7 (3)	8.4 (3)
State regulatory policy	10.0 (2)	6.3 (2)	35.0 (7)	31.2 (10)
<i>Quality of Life Factors</i>				
Quality of life	78.9 (15)	73.0 (27)	5.3 (1)	2.7 (1)
Cost of housing	29.4 (5)	5.7 (2)	70.6 (12)	65.7 (23)

### *Potential Business Assistance*

Larger companies viewed market research studies and job recruitment as beneficial more than smaller companies. Smaller companies viewed a forum to introduce commercialization technologies more favorable than larger companies.

How would each of the following types of assistance be to your company?	Highly Beneficial (16 or more employ)	Highly Beneficial (Under 16 employ)	Difference
A forum for strategic alliances to secure funds for large scale research, development and demonstration projects.	40.0 (8)	28.6 (10)	11.4
Market research studies for new products.	35.0 (7)	22.9 (8)	12.1
Grants to support “proof of concept” research.	33.3 (7)	51.4 (18)	-18.1
A center for product development, testing, and demonstration.	25.0 (5)	30.6 (11)	-5.6
Assistance commercializing SBIR Phase II projects.	25.0 (5)	22.9 (8)	2.1
Industry targeted job recruitment events or services.	23.8 (5)	11.8 (4)	12.0
A forum to introduce commercialization technologies to potential investors and corporate collaborators.	10.0 (2)	32.4 (11)	-22.4
Seminars and workshops on commercialization, business development and management.	5.0 (1)	16.7 (6)	-11.7
Office/ incubator space with shared facilities and tech support.	0 (0)	13.9 (5)	-13.9
Entrepreneur mentoring for start up companies.	0 (0)	19.4 (7)	-19.4