

Workforce Flows in the Maine Marine Trades Cluster

MAINE
DEPARTMENT OF
LABOR
*Center for Workforce
Research and Information*



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Workforce Flows in the Maine Marine Trades Cluster:

An analysis of the uses of matched establishment-employee
databases in understanding labor market dynamics

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Preface

The Maine economy is undergoing constant change. The forces of foreign competition, technology innovation and business restructuring contribute to dynamic work environments and changing labor markets. Some industries are declining and shedding jobs while new industries are emerging and creating new employment opportunities. The impacts of these shifts have challenged individuals, families and entire communities. Across the spectrum of Maine workplaces, more is being demanded of workers in terms of knowledge, skills, and abilities required for job performance. Increasingly, Maine's competitiveness is determined by the quality and availability of human capital.

Maine's demographics are also in flux. An aging population and the impending retirements of baby boomers will profoundly impact our labor markets and reshape long standing patterns of demand for goods and services. Understanding these dynamics is fundamental to making effective public policies and developing sound public and private investment strategies. Business, education and training systems and workers must consult economic, demographic and labor market information in making critical choices with limited resources. These choices will have enormous implications for Maine's prospects in the years ahead.

The Maine Department of Labor, Center for Workforce Research and Information, is committed to examining the dynamics of Maine's economy and the associated impacts on the workforce and labor markets in helping to chart a more prosperous future for all Maine citizens.

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Purpose and Scope

Public information systems play an important role in the design and monitoring of effective policy and governance. Effective public policy requires honest, accurate, and timely information, not to mention the commitment of policy makers who are willing to take action based upon the best information available. An effective policy information system also requires active support for the non-partisan public data institutions who not only collect, develop and maintain the necessary information databases, but also supply the skilled analysts who can transform raw data into policy-relevant knowledge and effectively communicate it to a broader audience.

The goal of this study is to demonstrate to analysts and policy makers alike some of the potential creative uses of databases maintained by the Maine Department of Labor, Center for Workforce Research and Information (CWRI), the state's lead agency responsible for collecting and analyzing labor market information. The case of Maine's Marine Trades Cluster is used show how CWRI's confidential employer and establishment data can offer new insights into the labor-market dynamics, while strictly preserving the confidentiality of employers and their workers.

This rare and valuable information has many potential uses. It can help researchers understand the inner-working of regional economies. It can also help policy makers and workforce

Background: WIRED and Maine's North Star Alliance Initiative (NSAI)

This study builds upon work begun by Maine's North Star Alliance Initiative funded under the U.S. Department of Labor Employment and Training Administration's (ETA) Workforce Innovations and Regional Economic Development (WIRED) program. In the early months of 2007, the ETA-designated Coastal Maine as one of seven regional WIRED partnerships, which provided \$13 million over three years to support workforce development and cluster-building activities within the partnership. Soon thereafter, Maine formed the North Star Alliance Initiative with the goal of strengthening the competitiveness of the state's boat builders, boat yards, composite materials fabricators, and supporting industries -- henceforth referred to as the Marine Trades cluster. Under the financial and technical support of WIRED, the NSAI worked with local training providers and industry representatives to establish targeted training for new and incumbent workers to build new skills and introduce workers and employers to cutting-edge production technologies.¹

Acknowledgements:

The Maine Department of Labor, Center for Workforce Research and Information, provided financial support for this research, on-site access to its confidential data files, and technical assistance and expertise. The Maine Department of Labor, Bureau of Employment Services, provided program information and helped conduct the Business Visitation Program employer surveys, which were instrumental in informing this research. The staff and affiliated partners of the North Star Alliance Initiative assisted in building and maintaining the business registry. Graduate research assistant, Sonya Smith, helped identify, classify, and match Marine Trades companies across the different databases.

development professionals monitor program outcomes in an objective fashion and design more effective training programs and economic development incentives. More specifically, employment and wage data collected from individual worksites (i.e. establishments) can be used to:

- Create tailor-made groupings of companies that cross existing industry categories. This is particularly relevant to emerging industries, such as green technologies and advanced composites fabrication, that often include firms that cross traditional industry codes. It is also valuable for initiatives that adopt a cluster-based perspective, whereby the key synergies among firms are likely to be based upon membership in extended buyer-supplier chains, similar technologies used in production, or complementary forms of knowledge.
- Track establishment and employment dynamics, such as job creation due to the births of new firms, layoffs from business closures, and the employment and payroll changes from expanding and contracting businesses.
- Monitor firms that benefit from specific economic/workforce interventions -- such as tax credits and or training subsidies -- and compare their post-treatment employment and wage growth to a control group of similar, but untreated, companies.

Furthermore, by matching the records of individual workers with their employers, it is possible to develop a longitudinal record of worker employment histories. Such employment histories can greatly help us understand how workers acquire experience and skills over the course of their careers as they move between different employers and industries. It can also be used to identify industries with similar or transferable occupational requirements and skills. With this information, workforce development professionals can:

- Target training programs to help workers move up career ladders by examining the employment histories of similar workers.
- Monitor the impacts of layoffs and business cycles on unemployment and rehiring patterns.
- Help dislocated workers find employment opportunities that utilize their existing knowledge -- easing the transition between jobs and reducing the need for extensive re-training.
- Monitor whether training and other career services programs are effective in reducing unemployment and job turnover, and/or raising wages.

This study examines employment and wage trends and workforce flows in the Marine Trades cluster.² This report is divided into four sections. The first provides background information on how the Marine Trades cluster was defined and how its member businesses were identified and matched to CWRI databases. The second section tracks the recent employment and wage history of businesses in the cluster compared to other sectors of the Maine economy. The third section looks at employment and wage trends for subclusters within the Marine Trades cluster. Section four analyzes the career history of workers in the Marine Trades cluster, tracking their movements in order to demonstrate how they acquire and transfer their experience and skill across different employers.³ The concluding section summarizes key results of the study and discusses areas for future investigation.

Defining the Maine Marine Trades Cluster

This study follows a conceptual definition of the Marine Trades cluster that was originally developed by the North Star Alliance Initiative (NSAI). The NSAI identified the key components of the Marine Trades cluster by reviewing recent studies on Maine industry clusters⁴; conducting focus groups with members of the Maine Marine Trades Association, Maine Built Boats, and the Maine Composites Alliance; and consulting with other experts that understand the cluster and its key technologies, markets, and labor force requirements.

As defined by the NSAI, the Marine Trades cluster includes boat builders, composite materials fabricators, marinas and boat yards, sail makers and canvas shops, rigging and cordage manufacturers and wholesalers, marine diesel engine mechanics, naval architects, servicing dealerships, marine supply outfitters, yacht brokerages, and other related businesses. The cluster also includes other regional assets and institutional actors (such as research centers and industry associations) that, while not part of the private sector economy, nonetheless provide important support and service to the cluster.

What is an industry cluster? A Primer

An industry cluster is a constellation of otherwise independent businesses whose collective fortunes are intertwined through the use of common resources (such as natural resources or similar types of workers), similar types of raw materials and intermediate inputs, or similar technologies. Because they draw upon common assets, industry clusters are often concentrated in particular regions. The software industry in Silicon Valley, the automotive complex of Michigan, and the pharmaceuticals industry in the Research Triangle of North Carolina are commonly cited examples of regional industry clusters. Although lesser known, the many boat builders, marinas, boat yards and repair shops, boat haulers, brokerages, canvas shops, and cabinet makers concentrated along the Maine coast also form a regional industry cluster.

The theoretical antecedents of the industrial cluster concept trace back over a hundred years to the writings of Alfred Marshall.⁵ Marshall wanted to understand why small businesses exist, and in some cases thrive, in spite of the considerable advantages of scale and mass production. Marshall discovered

that the concentration of similar business substitute for internal scale advantages, a phenomenon termed 'external' economies of scale. Marshall emphasized three primary advantages to concentration:

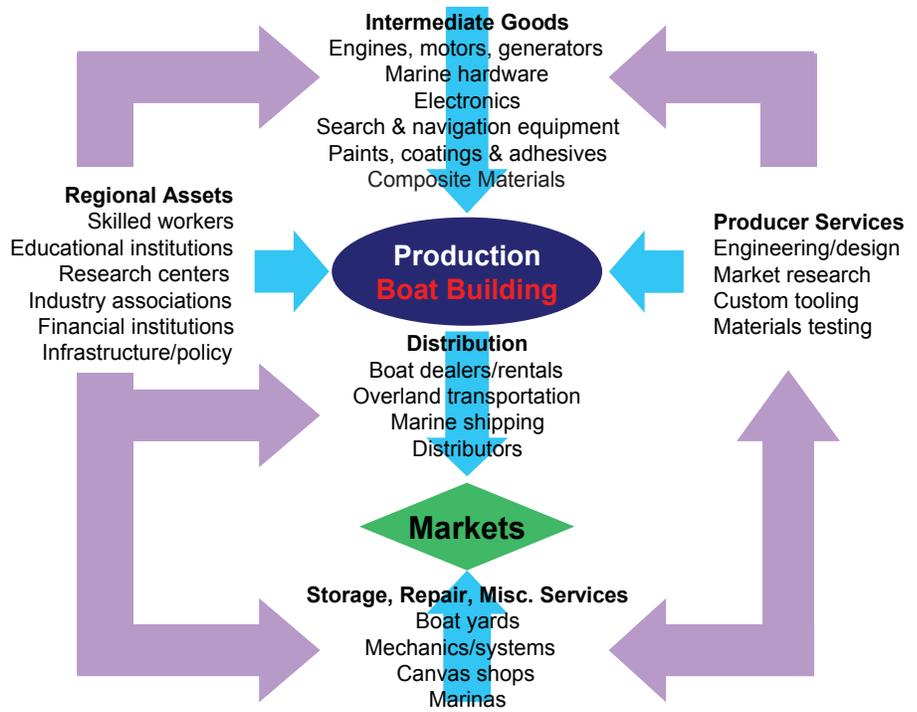
- (1) efficiencies through the specialization of businesses linked by similar intermediate goods suppliers,
- (2) access to deep pools of skilled workers (labor pools), and
- (3) knowledge spillovers, or when co-located firms and workers share information and learn from the successes and failures of their peers.

In the 1990s, Michael Porter⁶ reignited and expanded upon Marshall's concepts, arguing that clusters of interrelated industries and their supporting institutions (i.e. university R&D labs, local lending institutions, industry associations, etc.) were the primary source behind the sustained competitiveness of high-performing regions. Porter's work sparked a renaissance of research into the concentration of inter-related industries and inspired near countless number of cluster policy initiatives aimed at leveraging local assets to strengthen existing and emerging industrial specializations.

Figure 1 summarizes the relationships between the different components of the Marine Trades cluster. Boat builders are at the heart of the cluster. Boat sales are the dominant source of outside money that flows into the state and supports the local market for many of the cluster’s intermediate goods manufacturers (e.g. sail makers and mast builders) and production services (e.g. naval architects). Some of the intermediate goods providers and after-market services (such

Figure 1

The Maine Marine Trades Cluster



as boat yards and servicing dealerships) also export their goods and services to out-of-state clients and serve roles as both supporting and exporting members of the cluster. The cluster also includes manufacturers of products using advanced composite materials. In Figure 1, composite materials appears as an input to the production of boats, because boat builders are increasingly using these materials and methods to make their boats lighter, stronger, and more shock-absorbent. However, composite materials are also used to make wind blades, tidal energy turbines, industrial equipment, decks, artificial limbs, skateboards – any number of products with export potential. These companies are linked to the boat builders and the rest of the cluster through their use of similar inputs and production technologies.

Building upon a firm understanding of the intricate web of inter-dependencies that drive the dynamics of the cluster, the next step is to operationalize these relationships by identifying the specific businesses that are key members of the cluster. Defining an industry cluster involves a mix of art and science. Nonetheless, it is of critical importance. Defining a cluster too narrowly (say by including only a single industry) may exclude key businesses that are important contributors to regional value-chains. Defining a cluster too broadly in order to capture all possible direct and indirect relationships is likely to include many businesses that do not contribute to the collective advantage of the cluster and may diffuse limited policy resources.

The operational definition of the Marine Trades cluster used in this study is rather conservative. It is best thought of as representing the ‘core’ of the Marine Trades cluster, because it only includes private sector businesses that have direct associations with the production, repair, storage and distribution of boats and advanced composites materials. Other industries that utilize the state’s ocean resources and infrastructure (i.e. fishing, marine research, marine commercial and passenger transportation) are not included in the cluster although the state’s commercial boat builders and repair shops are clearly supported by the local fishing and marine transportation industries. Nor does the cluster include the state’s timber harvesters and lumber mills, although wooden boat builders and cabinetmakers often buy hardwoods from local mills. While they might be considered as part of an extended Marine Trades value-chain, including these sectors would produce an extremely broad and diffuse cluster that would obscure key relationships.

The NSAI provided a list of companies belonging to the Marine Trades cluster, was used as a starting point for identifying the membership of the cluster. In 2007, the NSAI began developing a comprehensive registry of Marine Trades and related businesses in order to help inform and monitor their marketing, outreach, and program evaluation efforts. The NSAI registry was populated with the business contact information collected from industry association membership lists, distributor lists, advertisements in trade publications, discussions with knowledgeable industry representatives, and through a survey of owners and managers of Marine Trades companies.⁷ The NSAI registry also includes detailed descriptions of the primary products and services offered by each company.

Information on company employment and payroll comes from the Quarterly Census of Employment and Wages (QCEW). Each company in the NSAI registry was matched to the QCEW by their Employer ID (EIN) numbers. In cases where the EIN was not listed, the match was based on the company’s trade name or legal name. Of the 732 active companies listed in the NSAI database, all but 200 were successfully matched to the QCEW.⁸ The bulk of the unmatched businesses are most likely sole-proprietors, which are not covered by the QCEW.⁹ Using key word and industry codes searches, an

***Data Source:
Quarterly Census of Employment and Wages
(QCEW)***

The QCEW is a confidential database maintained by the Maine Department of Labor, Center for Workforce Research and Information (CWRI). It includes quarterly establishment-level information on the number of payroll employees, payroll earnings, the establishment’s primary industry (i.e. NAICS code), whether it is independent or part of a firm with multiple units or branches, and its physical and mailing addresses. It covers all businesses in the state that are required to report under the Unemployment Insurance program. It does not include sole proprietors and other self-employed persons that have no payroll employees and does not fully cover all agricultural or government employees.

additional 184 cluster companies in the QCEW were identified that were not included in the NSAI registry, but which should be included as part of the Marine Trades cluster. Because the QCEW database goes back to 2000, some of these additional companies may have ceased operations or moved out of state prior to the construction of the NSAI registry in 2007. Others may just have been missed by the NSAI or were included, but listed under a different name.¹⁰

One of the primary benefits of using disaggregate data sources, such as the QCEW, is that they permit the analyst to define cluster membership based upon company-specific characteristics. Typically, clusters are defined by grouping all businesses within relevant industry (i.e. NAICS) codes. However, a NAICS-based cluster classification is limited in several respects. For one, NAICS codes reflect the company's primary product or service and do not account for multi-product businesses. Classifying businesses based purely on NAICS codes may miss relevant companies that happen to be listed under a different code. Likewise, even the most detailed NAICS codes include a variety of businesses, only some of whom may be related to the cluster of interest. Including the entire NAICS code might include many irrelevant companies, while failing to include the NAICS code might exclude relevant companies. NAICS codes may also miss businesses that use complementary technologies and/or labor skills, but serve different product markets. For example, composites fabricators are companies that apply broadly similar materials and production technologies to create a wide range of products, from boat hulls, to decking, to giant wind blades. Under NAICS coding, composites fabricators are classified in different industries with no recognition of their underlying commonalities.

Table 1, on the next page, shows the industrial make-up of companies in the Marine Trades cluster according to their two-digit (i.e. sector-level) NAICS codes. It reports how much of the cluster is comprised of companies in a specific sector (Share of Cluster). It also shows how much of each sector is represented by companies in the cluster (Share of Sector). A geratest share (26%) of companies in the cluster are in the manufacturing sector. However, these manufacturers employ a disproportionately large share of the cluster's workforce (~40%), accounting for just over 8% of the workers in the state's total manufacturing sector workforce. Another quarter of Marine Trades companies are in the arts, entertainment and recreation sector (which includes marinas) although these companies employ disproportionately fewer workers (20%). Together these companies make up roughly 14% of the state's total arts, entertainment and recreational services sector workforce. Another 18% of cluster companies are retailers (e.g. boat dealers and marine equipment suppliers), but these companies account for less than 9% of the cluster's total employment and only a fraction (1.4%) of the state's total retail employment.

Table 1

Major Industry Sectors* in the Maine Marine Trades Cluster, 2007

Sector	Share of Cluster			Share of Sector		
	Estab	Emp	Wages	Estab	Emp	Wages
Manufacturing	25.7%	40.2%	38.0%	10.5%	8.2%	7.3%
Arts, entertainment, and recreation	24.7%	19.7%	17.4%	13.4%	13.6%	25.0%
Retail trade	17.6%	8.6%	6.1%	1.4%	0.7%	0.9%
Wholesale trade	7.7%	3.2%	3.5%	1.2%	1.0%	0.9%
Other services, except public admin	7.3%	1.9%	1.3%	1.0%	0.7%	0.9%
Professional and technical services	5.3%	3.4%	4.9%	0.6%	0.9%	1.1%
Transportation and warehousing	3.6%	2.5%	2.1%	1.0%	0.6%	0.5%
Accommodation and food services	0.8%	0.4%	0.2%	0.1%	0.1%	0.1%
Other	5.5%	19.3%	25.5%	19.1%	11.7%	13.4%

*Activity in the construction sector is grouped into the "other" category to avoid potential disclosure violations.

Table 2 shows the industrial mix of the Marine Trades cluster at a higher level of detail (six-digit NAICS codes). Roughly half of the establishments in the cluster identify themselves either as marinas, boat builders, or boat dealers. The remainder are spread over a wide distribution of industries: other household goods repair & maintenance (which includes diesel engine shops and cabinetmakers), canvas and related product mills (which includes sail makers and canvas shops), and engineering services (which includes naval architects). Many of the non-marine composites fabricators are listed in all other plastics product manufacturing, miscellaneous fabricated metal products manufacturing industries, or "other" industry categories.

Table 2

Key Industries in the Maine Marine Trades Cluster, 2007

NAICS	Industry	Share of Cluster			Share of Industry		
		Estab	Emp	Wages	Estab	Emp	Wages
713930	Marinas	21.6%	16.5%	15.2%	100%	100%	100%
336612	Boat building	15.0%	15.9%	14.1%	100%	100%	100%
441222	Boat dealers	12.8%	5.9%	4.2%	100%	100%	100%
811490	Other household goods repair & maintenance	4.5%	0.9%	0.6%	40%	50%	55%
314912	Canvas and related product mills	2.7%	0.9%	0.6%	45%	27%	20%
541330	Engineering services	2.3%	1.7%	2.9%	3%	5%	5%
326199	All other plastics product manufacturing	2.1%	4.0%	3.6%	33%	21%	20%
423860	Other transport. goods merchant wholesalers	1.9%	0.4%	0.3%	53%	61%	53%
425120	Wholesale trade agents and brokers	1.9%	0.3%	0.5%	1%	1%	1%
237990	Other heavy construction	1.6%	0.9%	1.2%	24%	34%	38%
441229	All other motor vehicle dealers	1.4%	0.3%	0.2%	17%	11%	8%
484220	Other specialized trucking, local	1.4%	0.4%	0.3%	2%	2%	2%
332999	Miscellaneous fabricated metal product mfg.	1.2%	0.7%	0.7%	27%	26%	30%
	Other	29.7%	51.2%	55.5%	1%	3%	5%

Employment and Wage Trends in the Marine Trades Cluster

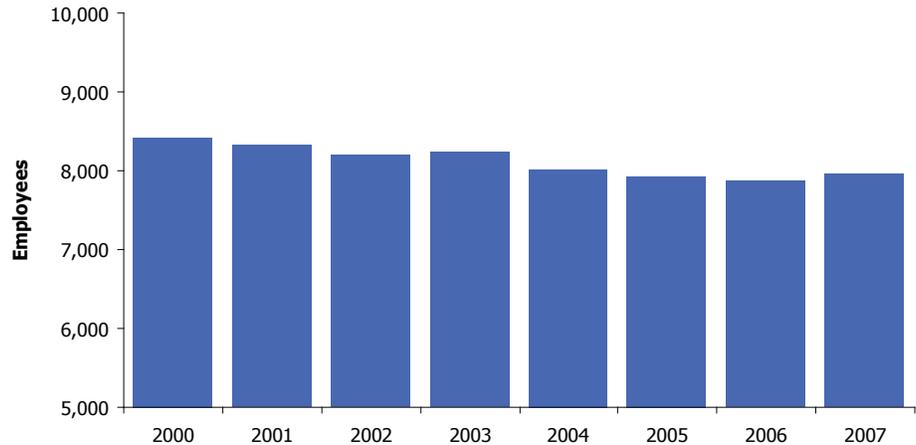
This section describes recent employment, establishment, and wage trends for the Marine Trades cluster as a whole.

Employment

There were just under 8,000 payroll employees in Maine's Marine Trades cluster in 2007 (Figure 2). Although this represents only 1.4% of the state's total payroll employment, the cluster is a core element of several of the state's key economic drivers such as manufacturing and tourism.

Figure 2

Average Annual Payroll Employment in the Marine Trades Cluster, 2000 to 2007

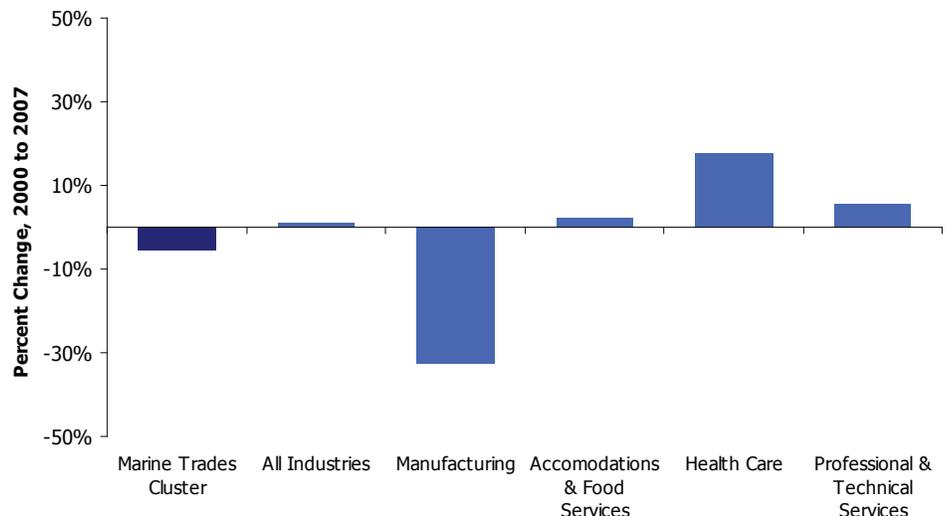


The dominant trend of the past eight years has been one of slight decline in employment, but with some signs of expansion just prior to the current recession. Employment peaked in 2000 at 8,418 employees and bottomed in 2006 at 7,867 workers. The greatest one-year job loss of the past eight years occurred between 2003 and 2004 when the cluster shrank from 8,240 to 8,013 payroll employees. The cluster's employment grew from 2006 to 2007 by roughly 60 workers, but it is uncertain whether this upward trend would have continued had it not been for the weakened economy.

Despite slight job losses, employment in the Marine Trades cluster has actually been rather stable, at least if compared to the performance of the manufacturing sector as a whole. Employment in the Marine Trades cluster has declined by 5.4% from 2000 to 2007 (Figure 3). This is below the statewide employment growth rate

Figure 3

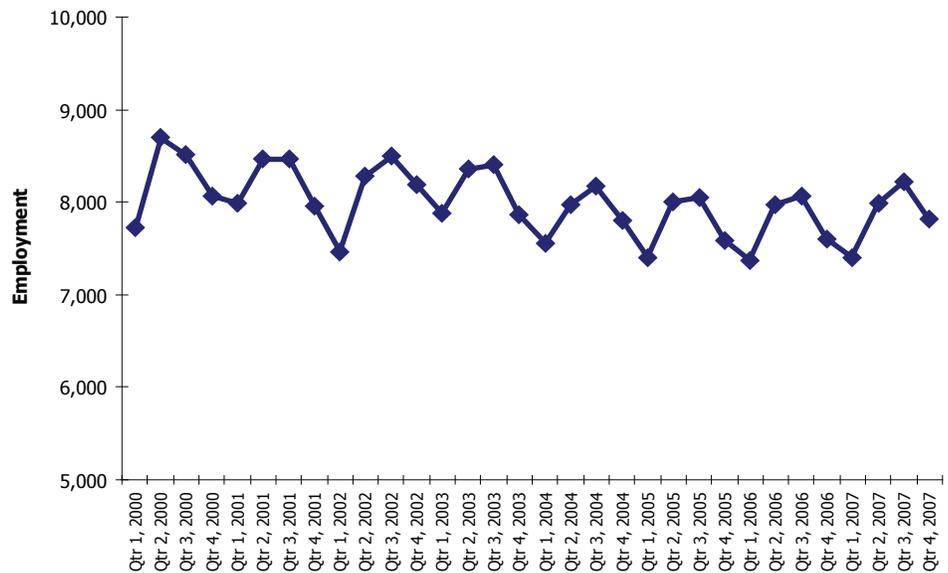
Percent Change in Employment, 2001 to 2007



of 1.2% (driven in large part by the expansion of the health care sector) but considerably higher than the manufacturing sector, which declined by 32.7% over the eight-year period.

The Marine Trades cluster is also subject to considerable seasonal fluctuations, as shown in Figure 4, which plots the quarterly employment in the cluster from 2000 to 2007. Employment in the fourth quarter of 2007 was down by roughly 400 employees from the preceding (third) quarter, but up by 222 employees from the fourth quarter of 2006. Employment typically peaks in the second and third quarters but declines in the cold weather months of the first and fourth quarters. Over the past eight years, there have been about 700 fewer employees in the cluster at the low part of the annual cycle compared to its peak.

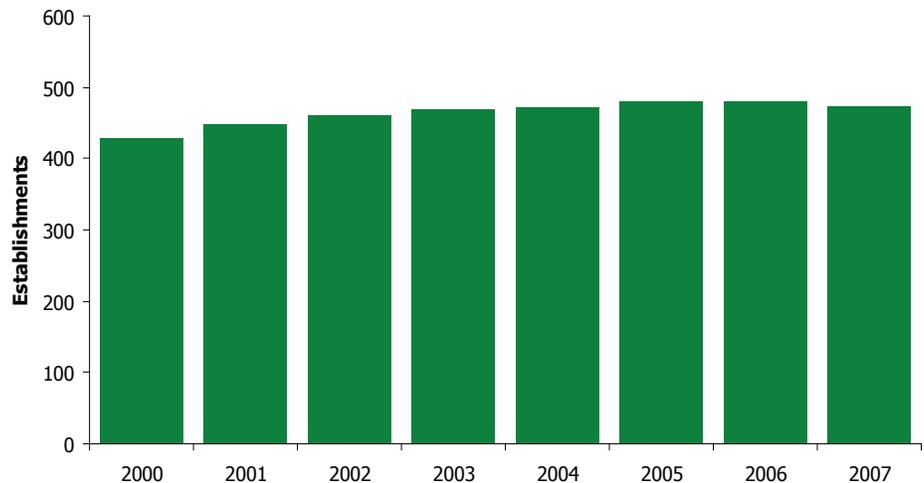
Figure 4
Quarterly Payroll Employment in the Marine Trades Cluster, 2000 to 2007



Establishments and Establishment Size

Although the total number of jobs has declined, the number of establishments in the cluster has increased slightly from the start of the decade. As a result, today’s Marine Trades cluster is comprised of a greater number of slightly smaller companies than at the start of the decade.

Figure 5
Number of Establishments in the Marine Trades Cluster, 2000 to 2007



There were 428 employer establishments in the Marine Trades cluster in 2000 (Figure 5). By 2005, the number of establishments had peaked at 481, only to decline slightly to its most recent value of 474 establishments.

The typical employer in the Marine Trades cluster is very small. Roughly 68% percent of all establishments in the cluster had fewer than five employees in 2007 (Figure 6). Fewer than two percent of establishments have more than 100 workers.¹¹

There has been a slight decline in the size of the typical establishment over the past decade, from 4.25 workers per establishment in 2000 to just over 3.75 workers per establishment in 2007 (Figure 7).¹² Despite this, the size distribution of establishments has remained relatively stable since 2000, as shown in Figure 6. This slight decline in the establishment size may appear odd at first glance, as there are slightly fewer establishments in the smallest employment size class and a slight increase in the number of companies that have 50 or more employees. However, while there may be more companies in the larger size classes, the average size of companies in these classes has declined from 2000 - resulting in the slight drop in the median establishment size.

Figure 6
Distribution of Marine Trades Establishments by Size Class, 2000 and 2007

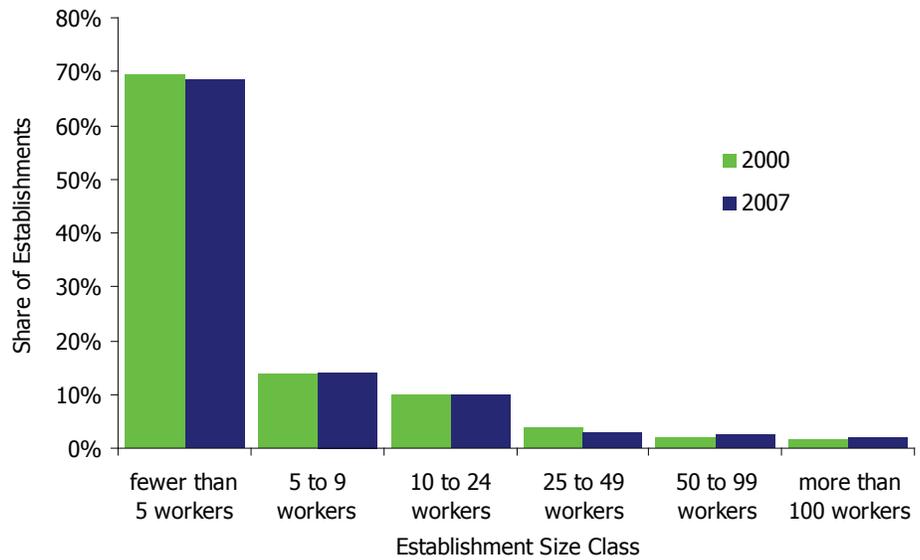
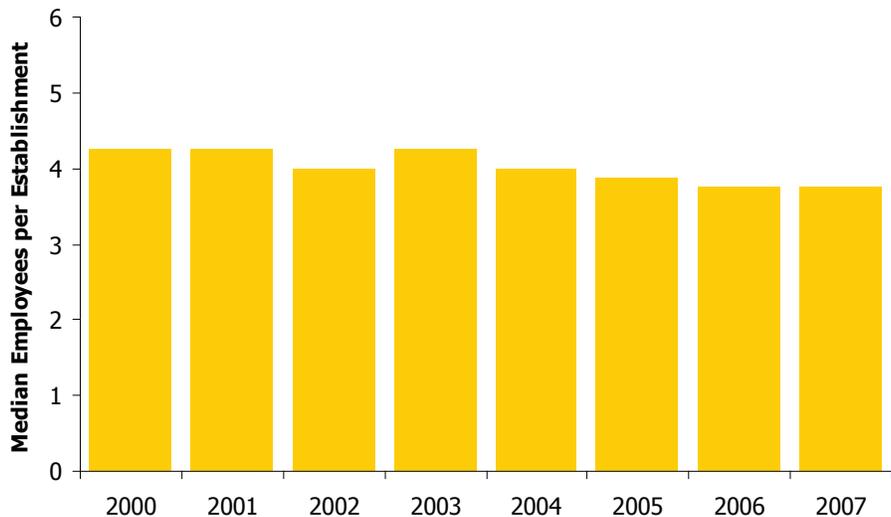


Figure 7
Median Marine Trades Establishment Size (employees per establishment) 2000 to 2007



Wage and Salary Payroll

Employees in the Marine Trades cluster typically earn decent wages relative to other key sectors of the Maine economy. However, wage growth in the cluster has lagged the state in the recent past and may signal increasing difficulty in hiring and retaining top workers in the near future.

In 2007, the average worker in the Marine Trades cluster earned just over \$40,000 per year (Figure 8).¹³ This is slightly above the statewide average and is comparable to the earnings in the manufacturing sector.

Real wage growth in the Marine trades cluster has not kept pace with other key sectors (Figure 9). Between 2000 and 2007, the average real wage per worker in the Marine Trades cluster has grown by 2.9%, considerably lower than the statewide growth rate of 6.3% and far below earnings growth in expanding sectors like health care and professional and technical services.

Figure 8
Average Annual Wage, 2007

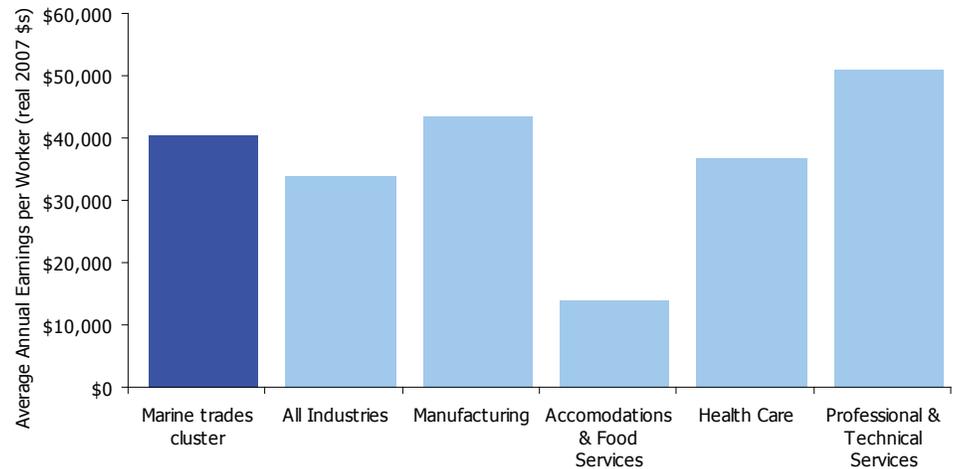
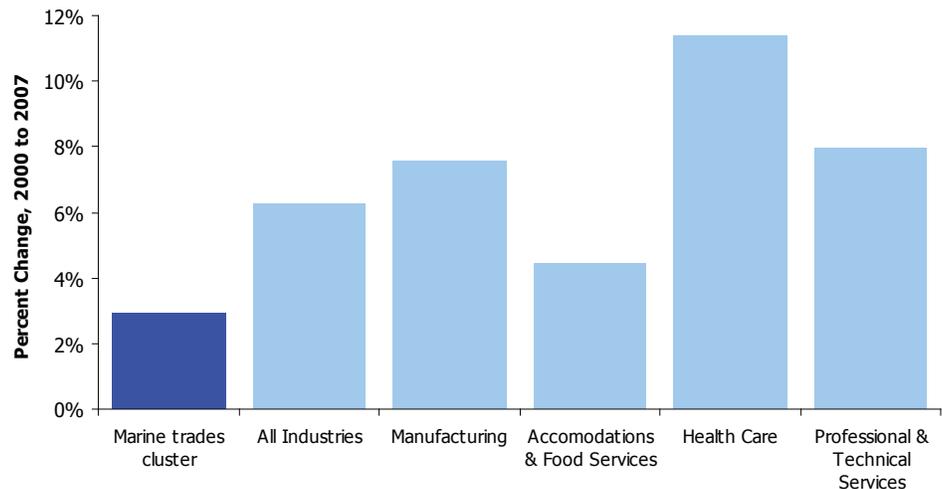


Figure 9
Real Average Annual Wage Growth



Employment and Wage Analysis of Marine Trades Subclusters

The following section conducts an analysis of recent employment and wage trends using more detailed groupings of companies within the Marine Trades cluster.

Defining Marine Trades Subclusters

A combination of NAICS codes, detailed company product and services information provided in the NSAI database, survey responses, and analyst familiarity with the companies was used to classify each Marine Trades establishment into one of ten mutually exclusive subclusters:

1. Boat building
2. Composites (excluding boat builders and composite marine infrastructure)
3. Marinas/boat yards
4. Marine electronics and engines (manufacturing and/or repair/service)
5. Marine infrastructure and construction
6. Servicing dealerships and repair shops
7. Retail and wholesale outlets specializing in maritime products
8. Sailmakers, rigging manufacturers, and joineries
9. Professional services (e.g. naval architects, marine engineers)
10. Businesses not elsewhere classified (NEC)

In most instances, companies were classified according to their primary product or service. The advanced composites subcluster is an exception, which includes companies that use composites technologies, but whose primary product does not fit into one of the other subclusters such as industrial equipment, wind blades, household decking, etc.

Table 3 shows the industrial composition of each subcluster. Some subclusters—boat building, marinas/boat yards, servicing dealers—are dominated by a single NAICS industry. For example, 91% of the establishments in the boat building subcluster are classified under NAICS code 336612 (boat building). Other subclusters—such as composites—are widely spread over many industries reflecting the diversity of their product mix. Many composites companies self-identify as plastics manufacturers or machine shops, however the majority (63%) fall into a large ‘other’ category that is a collection of many industries, each with fewer than three employers in a single NAICS code. The marine electronics and engines used by Maine’s boat builders and yards are largely produced out of state. The within-state portion of this subcluster is largely comprised of fairly small wholesalers and repair shops.

Table 3
Industries in the Subclusters of the Marine Trades Cluster, 2007

Subcluster/NAICS	Share of Subcluster		
	Estab	Emp	Wages
Boat building			
336612 Boat building	91%	86%	84%
Other	9%	14%	16%
Composites			
326199 All other plastics product manufacturing	20%	15%	14%
332710 Machine shops	10%	2%	1%
321999 Miscellaneous wood product manufacturing	6%	3%	2%
Other	63%	80%	83%
Marinas/Boat Yards			
713930 Marinas	81%	84%	75%
811490 Other household goods repair and maintenance	9%	3%	2%
Other	9%	13%	23%
Marine Electronics & Engines			
423860 Other transport. goods merchant wholesalers	20%	6%	4%
811310 Commercial machinery repair and maintenance	20%	9%	7%
811111 General automotive repair	12%	6%	3%
811490 Other household goods repair and maintenance	12%	1%	1%
Other	36%	78%	86%
Infrastructure & Construction			
237990 Other heavy construction	33%	6%	7%
332999 Miscellaneous fabricated metal product mfg.	21%	5%	4%
332510 Hardware manufacturing	13%	2%	1%
Other	33%	88%	89%
Professional & Technical Services			
541330 Engineering services	38%	46%	50%
541380 Testing laboratories	12%	6%	2%
541712 Other physical and biological research	12%	21%	20%
Other	38%	27%	28%
Retail & wholesale			
423860 Other transport. goods merchant wholesalers	13%	5%	6%
423910 Sporting goods merchant wholesalers	13%	15%	13%
425120 Wholesale trade agents and brokers	13%	6%	9%
Other	61%	74%	71%
Sails, Rigging, Joinery			
314912 Canvas and related product mills	61%	34%	32%
314991 Rope, cordage, and twine mills	9%	57%	63%
Other	30%	9%	5%
Servicing dealers			
441222 Boat dealers	77%	84%	84%
441229 All other motor vehicle dealers	8%	5%	4%
811490 Other household goods repair and maintenance	4%	1%	1%
Other	11%	10%	11%
Not elsewhere classified (NEC)			
484220 Other specialized trucking, local	21%	13%	15%
713940 Fitness and recreational sports centers	18%	21%	8%
713990 All other amusement and recreation industries	12%	7%	3%
Other	50%	60%	73%

Employment

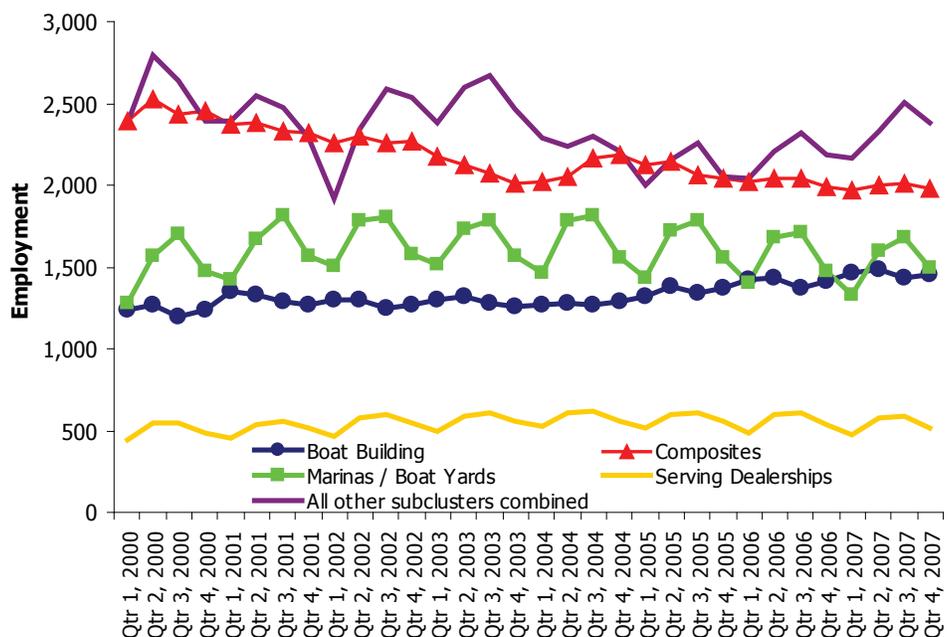
Composites fabrication is the largest subcluster, with just under 2,000 employees in 2007, or 25% of the total employment of the Marine Trades cluster (Table 4). This is followed by marina/boat yards and boat builders who account for 1,559 and 1,473 employees, respectively. Infrastructure and construction also account for a sizable number of the cluster’s employment base (1,216), although many of the companies in the infrastructure and construction subcluster are also involved in non-marine applications. The marinas / boat yards subcluster has the most companies (26%), followed by boat building (20%), and servicing dealerships—many of whom are classified under retail in the NAICS system. Although large in number, servicing dealers make up a only a small share of the cluster’s employment and payroll.

Table 4
Subclusters in the Maine Marine Trades cluster (2007, annual average)

Subcluster	Establishments		Employment		Payroll	
	#	%	#	%	\$ (000's)	%
Boat building	143	20%	1,473	18%	\$54,053	17%
Composites	65	9%	1,997	25%	\$77,651	24%
Marinas / Boat Yards	187	26%	1,559	20%	\$65,328	20%
Electronics & Engines	30	4%	287	4%	\$12,787	4%
Infrastructure & Construction	29	4%	1,216	15%	\$60,027	19%
Professional Services	30	4%	245	3%	\$14,165	4%
Retail & wholesale	38	5%	201	3%	\$9,140	3%
Rigging, Sails, Joinery	33	5%	216	3%	\$6,422	2%
Servicing dealers	116	16%	548	7%	\$15,808	5%
Not elsewhere classified (NEC)	43	6%	222	3%	\$6,608	2%

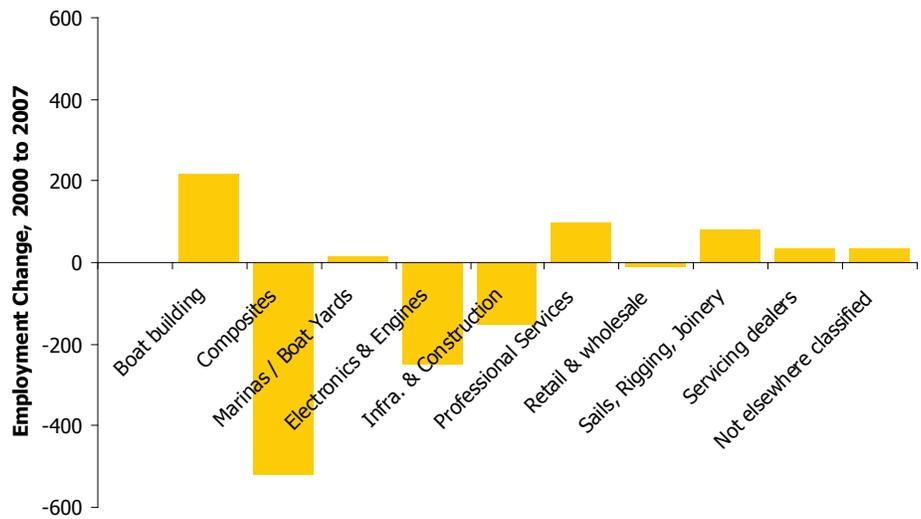
Marinas/boat yards and serving dealerships have the greatest seasonal employment fluctuations (Figure 10). Together these two subclusters drive much of the seasonality observed by the cluster as a whole. Employment among boat builders and composites fabricators is generally less seasonally volatile.

Figure 10
Quarterly Payroll Employment in the Marine Trades Subclusters, 2000 to 2007



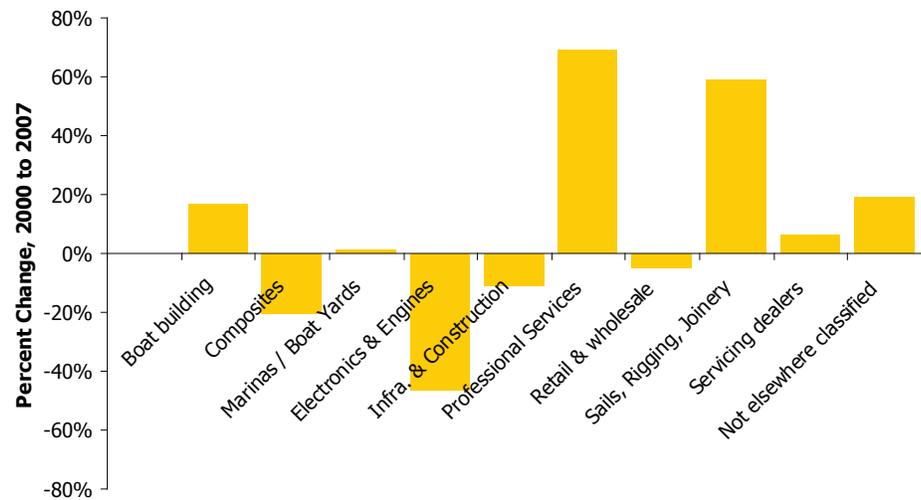
Most of the job losses in the Marine Trades cluster over the past eight years occurred outside of the core 'boat-related' components of the cluster. The composites subcluster lost the most jobs (522) between 2000 and 2007, followed by the electronics and engines and the infrastructure and construction subclusters (Figure 11).

Figure 11
Net Change in Payroll Employment by Subcluster, 2000 to 2007



Due to its relatively small size, electronics and engines saw the fastest relative decline (-46.5%) during the study period (Figure 12). Boat building has performed rather well, with a net gain of 215 jobs (17.1%) between 2000 and 2007. The professional services and the rigging, sails and joinery subclusters have also experienced modest job growth of 100 and 80 employees, respectively. The remaining subclusters have been relatively stable over the past eight years with few dramatic job gains or losses.

Figure 12
Percent Change in Payroll Employment by Subcluster, 2000 to 2007



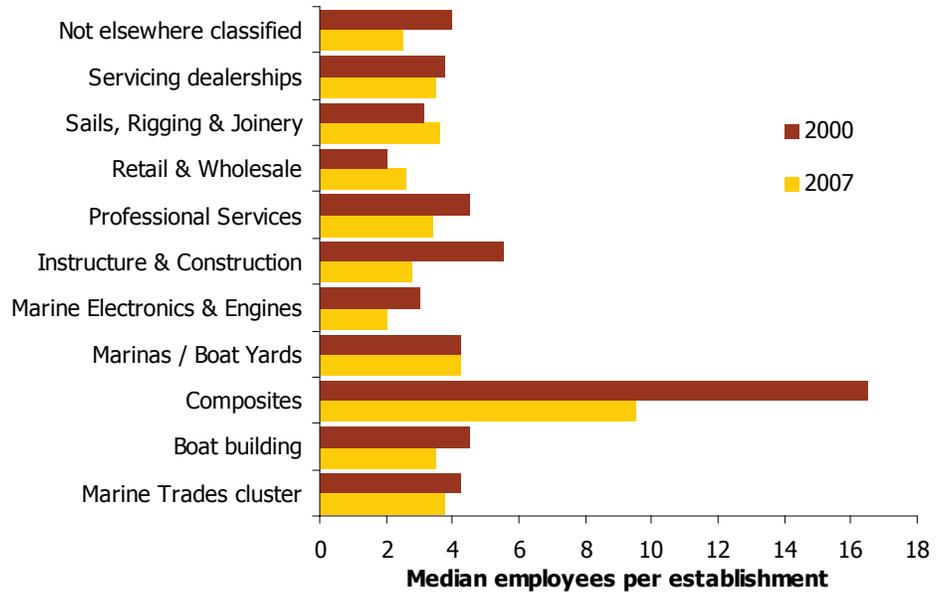
Establishment Size

Establishment size is also fairly consistent across the individual subclusters, with the exception of the considerably larger establishments of the composites subcluster (Figure 13). In 2007, the typical

composites company had 9.6 employees, which is notably higher than the cluster median of 3.8. The other subclusters range in size from a low of 2.0 employees per establishment in the electronics and engines subcluster to 4.3 employees per establishment in the marinas/boat yard subcluster.

Figure 13

Median Establishment Size by Subcluster, 2000 and 2007



Between 2000 and 2007, the size of the typical firm declined in 7 of the 10 subclusters but in most cases these declines were fairly modest or negligible. Only in the cases of the sails, rigging and joinery subcluster and the retail and wholesale subcluster did the median establishment size increase, and then only by fraction of a worker. The most notable declines were in composites, where the median dropped by seven employees per establishment, and in marine infrastructure, where the median dropped by nearly 3 employees per establishment. The professional services, NEC, and boat building subclusters also had declines in their median size by at least one person per establishment.

Wages

Wages are highest in the professional services subcluster with an average annual salary of \$57,815—43% higher than the cluster average and 70% higher than the statewide average (Figure 14). Real wages in the professional services subcluster have also grown faster than the other subclusters over the past eight years (12.5%), far exceeding the statewide growth rate of 7.5% and the cluster average of 2.9% (Figure 15). Marine infrastructure and construction pays the second highest within the cluster at an annual salary of just under \$50,000 per year, down by 7.1% from 2000. Somewhat surprisingly, annual wages in the boat building, composites and marinas subclusters are lower than in the retail and wholesale subcluster, although still higher than the statewide average. The typical worker in the sails/rigging/joinery, servicing dealers, and NEC subclusters earns less than the statewide average. But the wage gap is closing in the

sails/rigging/joinery subcluster with an eight-year real growth rate of 7.6%.

By examining Figure 15, it is clear that the lagging wage growth of the entire Marine Trades cluster (refer to Figure 9, previous section) is due largely to the decline of real wages and the stagnant wage growth in only a few subclusters.

Many subclusters -- composites; marinas/boat yards; professional services; sails, joinery and rigging -- had real wage gains that were either close to or exceeded the state's all-industry rate of 6.9%. The notable exceptions are the sizable declines in the real wages of workers in

the Not Elsewhere Classified (NEC) and the infrastructure and construction subclusters. Wage growth in the electronics and engines subcluster, retail and wholesale, and servicing dealers subclusters were essentially flat or below the statewide average. A deeper investigation is necessary to explain the sources of the decline and stagnation of wages in these industries.

Figure 14
Average Annual Wage by Subcluster, 2007

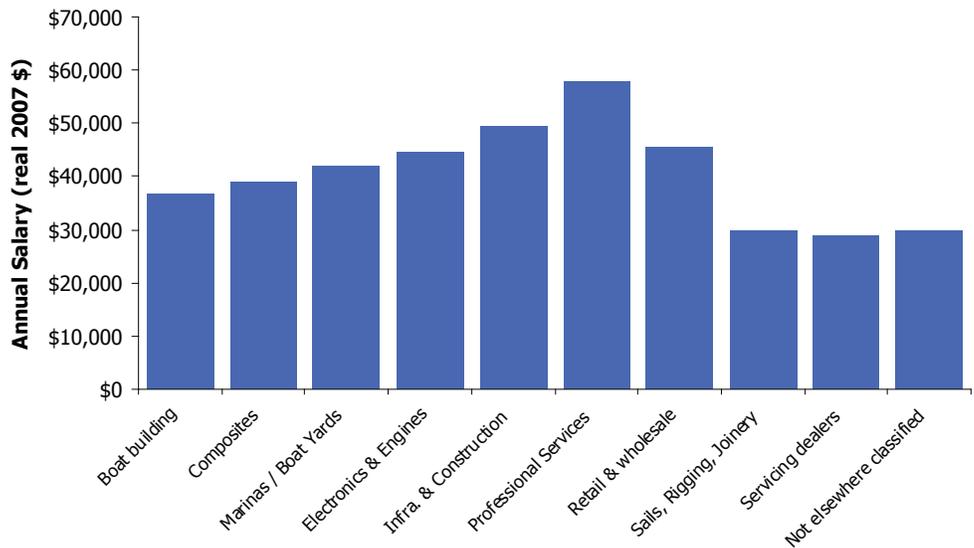
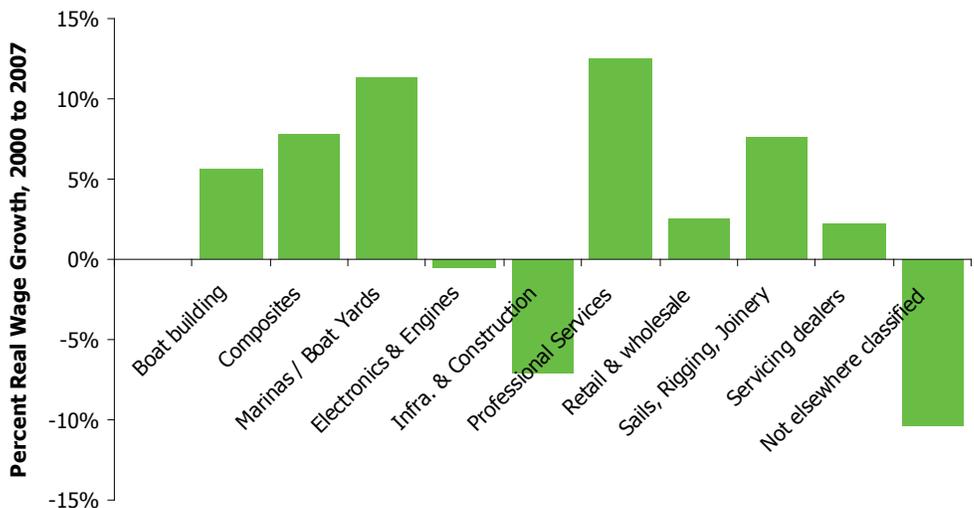


Figure 15
Percent Change in Average Annual Wage by Subcluster, 2000 to 2007



Labor Market Dynamics in the Marine Trades Cluster

The preceding sections examined recent employment and wage trends among businesses in the Marine Trades cluster using establishment-level data from the QCEW. This next section focuses on the workers of the Maine Marine Trades cluster. The Unemployment Insurance (UI) database is used to track the flow of workers in and out of the cluster and its component subclusters from the first quarter of 2000 until the fourth quarter of 2007.

Methodological Note:

Tracking Worker Flows with the Unemployment Insurance (UI) database

The UI database contains a near comprehensive account of all employer paid workers in the state. It does not include self-employed persons and others who are not required to report under the Unemployment Insurance program. Although the QCEW and the UI database cover the same universe, the two databases differ in several key respects. The primary difference is that while the QCEW measures jobs (i.e. employment), the UI database measures workers. The number of workers measured in the UI database uniformly exceeds the number of jobs reported in the QCEW, because during any given quarter a single job may shift between more than one worker.

It is not uncommon for workers to be synonymously registered with more than one employer in the UI database. Because it is reported in quarterly intervals, the UI database will report multiple employers for workers who change employers part-way through the quarter. Some workers may also take on part-time or otherwise supplemental employment, often in seasonal industries. Although supplemental work is an important source of income for many households, it greatly complicates tracking the flow of workers across different employers and industries over time. Including supplementary work can also add unnecessary variation to the measurement of the transferability of accumulated knowledge and skills from industry to industry.

Therefore, it was necessary to assign each worker to a single, dominant, employer for each quarter. In a recent study of worker flows in the IT sector in Georgia, Hotchkiss *et al.*¹⁴ address this issue by assigning each worker to the employer with the highest wages during the quarter. Maine data indicated that temporary or seasonal employment can sometimes surpass the wages from the ongoing employer. Instead of wages, each worker's dominant employer is defined as the employer that has employed the worker the longest. This is more likely to reflect the worker's primary vocation and should provide a more sensitive measure of the transferability of knowledge and skill.

Every worker in the UI database has a unique identification number which is used to track the worker through succeeding quarters. The analysis is limited to workers who were employed by businesses that are members of the Marine Trades/ Composite Materials cluster during the study period. The UI database also includes an employer identification number, which is used to match workers in the UI database to their respective employers in the QCEW. By establishing this link, workers are identified who are employed in the Marine Trades cluster, and their movements are tracked in and out of the cluster and changes measured in their quarterly wages.

Job Tenure

Job tenure is the length of time a worker typically stays with a single employer. It is often used as a measure of the stability of employment within an industry as well as the degree of job satisfaction among its workers. However, this is an imperfect measure of both stability and job satisfaction because job tenure might be lower in growing industries that are hiring new workers. With this caveat in mind, job tenure is measured by the number of years that employees have been with their current employer.¹⁵ This analysis is restricted to only include long-time workers whose work histories can be traced back at least seven years. Including recent entrants into the workforce would likely underestimate average job tenure rates.

Job tenure in the Marine Trades cluster follows a bimodal distribution with many new and long-term employees, but relatively few in between (Figure 16). Forty-five percent of the long-time Marine Trades workforce has been with their current employer for over seven years while 16% has been with their current employer for less than one year. Between these two poles, the percentage of workers declines as the length of tenure increases up to five years. This bimodal pattern is common in many sectors, but particularly those where there is a large share of long-time employees as well as considerable churning among new workers. Tenure in the Marine Trades cluster is generally more stable than the statewide average, where only 35% of long-term workers have remained with their current employer for seven years or more.

Figure 16
Long-Term Workers in 2007 by Tenure at Current Employer, 2000 to 2007

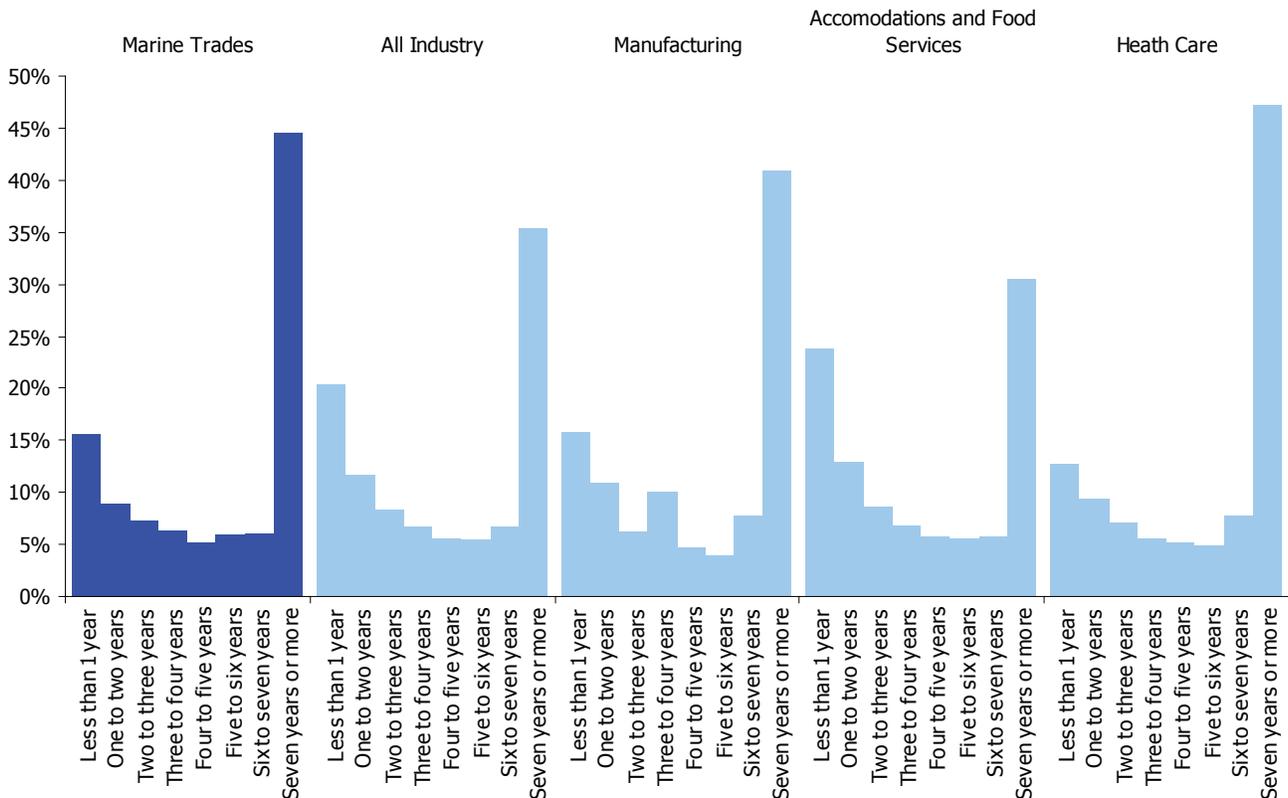
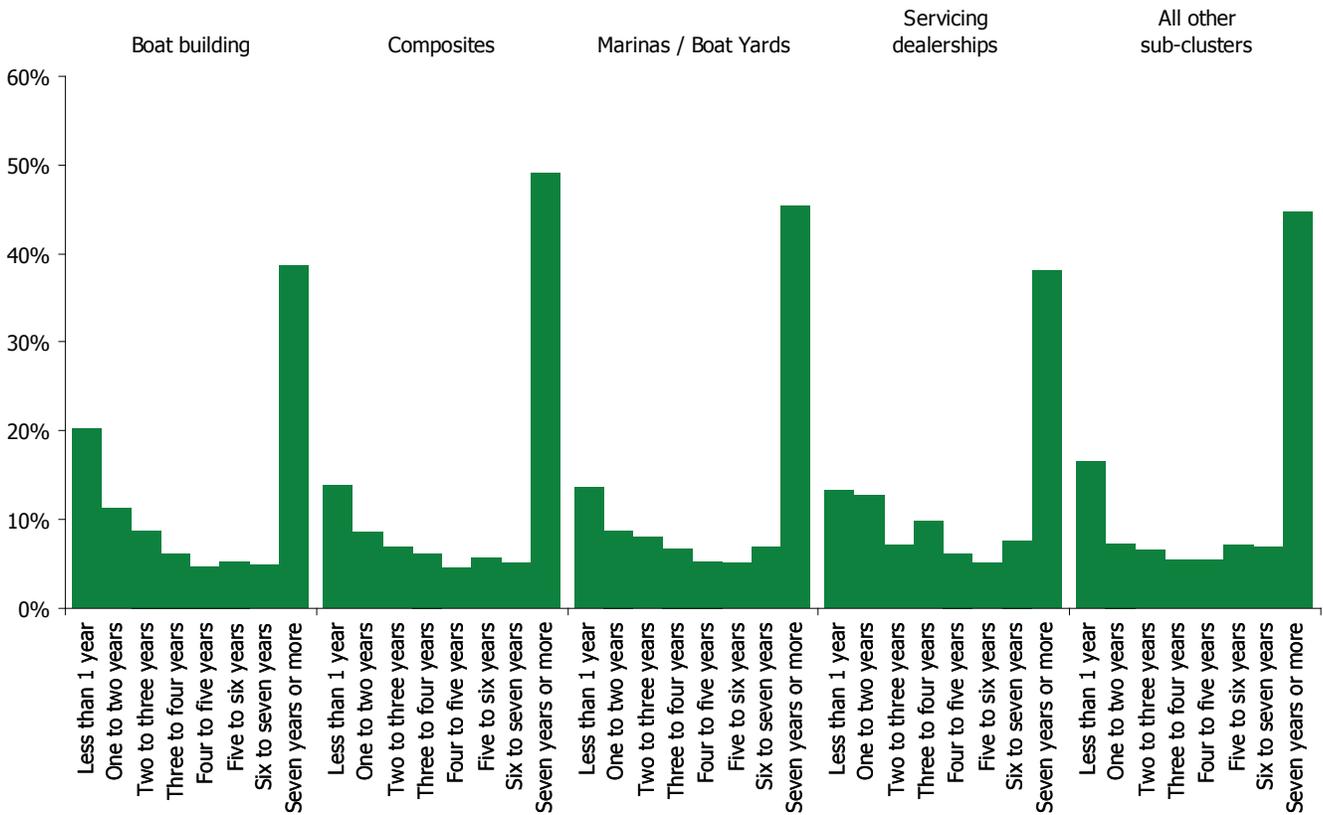


Figure 17 displays job tenure within the Marine Trades cluster for four major subclusters and an aggregate category of all remaining subclusters combined. In every subcluster, the largest share of the 2007 workforce has been with their current employer for at least seven years. Turnover is lowest in the composites subcluster, where nearly 49% of all long-term workers have been with their present employer for seven years or more and only 14% have been with the current employer for less than one year. Servicing dealerships have the fewest long-term employees. Boat building has the highest level of entry-level churning. However, this may not be due to worker dissatisfaction, but rather the addition of 40 new jobs between 2006 and 2007 in the boat building subcluster, while the other subclusters -- composites, marinas / boat yards, and servicing dealerships -- all declined during this period.

Figure 17

Long-Term Workers in 2007 by Tenure at Current Employer and Subcluster, 2000 to 2007



Analysis of Workforce Flows

Next, the movements of workers in, out, and within the Marine Trades cluster¹⁶ are examined. Figure 18 demonstrates how workers move in and out of the cluster using numbers for the first three quarters of 2000. There were 8,720 workers in the Marine Trades cluster during the first quarter of 2000. Of these, 727 left the cluster between the first and second quarters – 343 for employment in an industry outside of the cluster and 384 were not in the UI database during the next quarter. There are several possible reasons for leaving the UI database: they may

have left work temporarily to eventually return to the ranks of the employed; they may have left permanently due to retirement, death, or to tend to family; they may have become self-employed or joined the informal economy; or they may have left the state to seek employment elsewhere. Given the limited information available, there is really no way to tell.

A total of 7,993 workers employed in the cluster in the first quarter 2000 remained employed in the cluster in the second quarter. The vast majority of workers stayed with their existing employer. Less than one percent switched to a different employer within the cluster. In addition, there were 1,634 workers who entered the cluster during the second quarter, but who were not employed in the cluster in the previous quarter. The number of “stayers” combined with the number of “entrants” equals 9,672 – the total number of workers employed in the cluster in the second quarter of 2000. This process is repeated between the second and third quarters, with 1,105 workers exiting the cluster, 896 entering, and 8,522 remaining in the cluster.

Table 5 presents a full analysis of quarterly workforce flows that covers the entire study period. There are several notable trends. First, the vast majority of workers (88% on average over the study period) remain with the same worker from one quarter to

Figure 18
Conceptual Diagram of Worker Flows in the Marine Trades Cluster

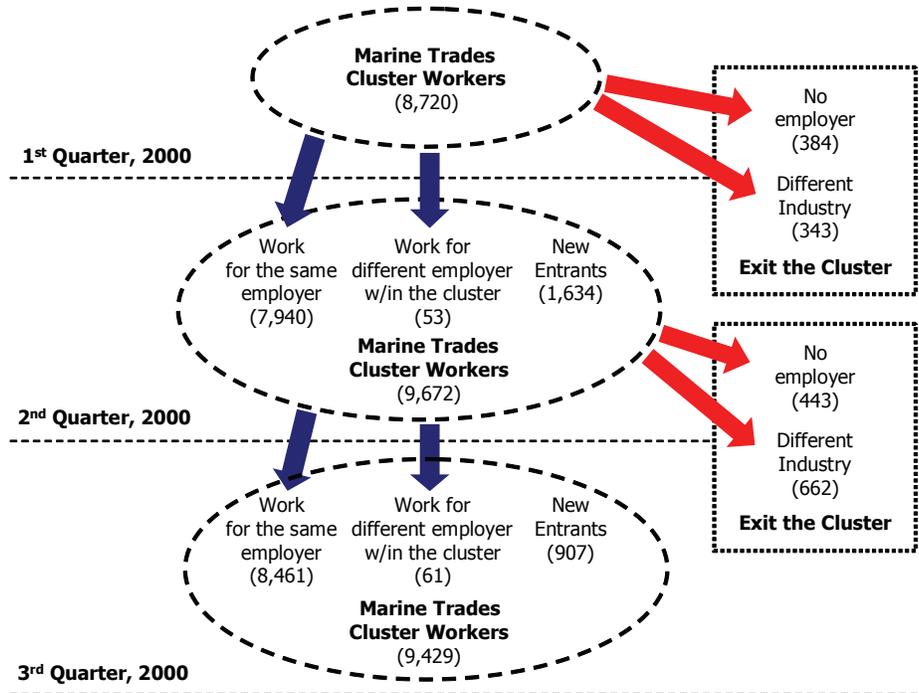
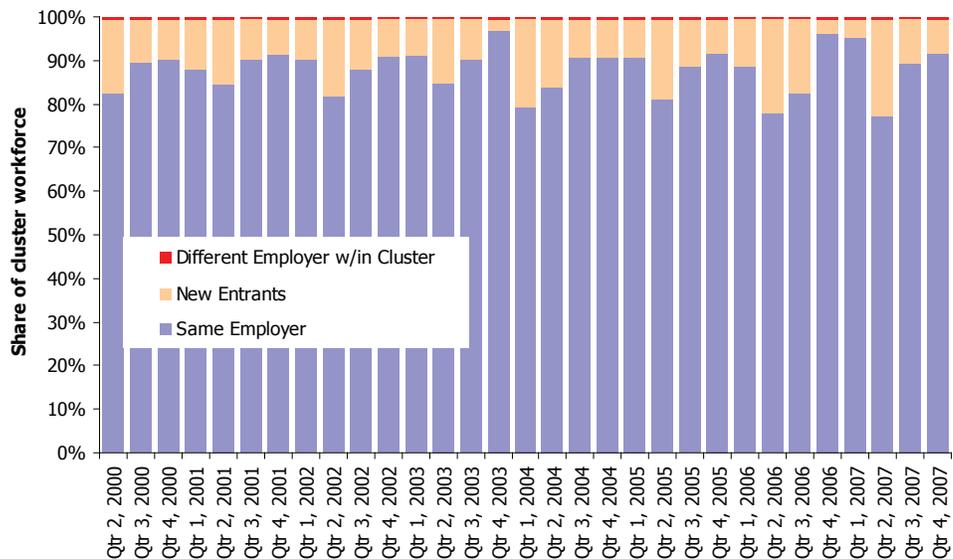


Figure 19
Shares of the Marine Trades Workforce Entering or Remaining Within the Cluster



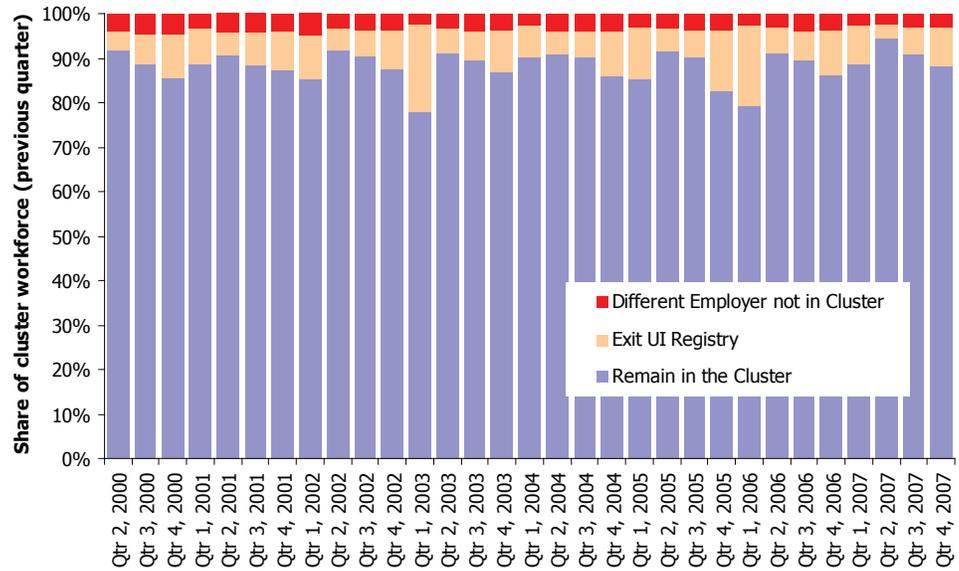
the next. New entrants typically make up approximately 11% of the workforce in any given quarter, as displayed graphically in Figure 19. Fewer than one percent switch employers within the cluster during any given quarter. These respective shares have remained roughly stable over the past eight years, apart from seasonal variation where entry typically slows in third and fourth quarters. There also appears to be an increase in seasonal variation in entry in the most recent years, although a long time period is needed to determine whether this is a long-term trend towards greater seasonality.

Table 5
Workforce Flows in the Marine Trades Cluster, 2000 to 2007

	Entering (remaining in) the cluster							Exiting the cluster			
	Total	Same Employer		Different Employer w/in Cluster		New Entrants		Different Employer not in Cluster		Exit UI Registry	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent (prev qtr)	Number	Percent (prev qtr)
Qtr 1, 2000	8,720										
Qtr 2, 2000	9,627	7,940	82%	53	0.6%	1,634	17%	343	4%	384	4%
Qtr 3, 2000	9,429	8,461	90%	61	0.6%	907	10%	443	5%	662	7%
Qtr 4, 2000	8,860	8,006	90%	49	0.6%	805	9%	431	5%	943	10%
Qtr 1, 2001	8,852	7,780	88%	59	0.7%	1,013	11%	286	3%	735	8%
Qtr 2, 2001	9,460	7,998	85%	52	0.5%	1,410	15%	377	4%	425	5%
Qtr 3, 2001	9,243	8,337	90%	44	0.5%	862	9%	400	4%	679	7%
Qtr 4, 2001	8,797	8,017	91%	48	0.5%	732	8%	362	4%	816	9%
Qtr 1, 2002	8,235	7,434	90%	52	0.6%	749	9%	426	5%	885	10%
Qtr 2, 2002	9,163	7,507	82%	52	0.6%	1,604	18%	281	3%	395	5%
Qtr 3, 2002	9,343	8,232	88%	50	0.5%	1,061	11%	329	4%	552	6%
Qtr 4, 2002	8,979	8,165	91%	24	0.3%	790	9%	336	4%	818	9%
Qtr 1, 2003	7,659	6,981	91%	33	0.4%	645	8%	209	2%	1,756	20%
Qtr 2, 2003	8,210	6,954	85%	30	0.4%	1,226	15%	251	3%	424	6%
Qtr 3, 2003	8,142	7,337	90%	23	0.3%	782	10%	335	4%	515	6%
Qtr 4, 2003	7,272	7,028	97%	37	0.5%	207	3%	300	4%	777	10%
Qtr 1, 2004	8,233	6,527	79%	26	0.3%	1,680	20%	193	3%	526	7%
Qtr 2, 2004	8,868	7,418	84%	52	0.6%	1,398	16%	313	4%	450	5%
Qtr 3, 2004	8,769	7,939	91%	52	0.6%	778	9%	339	4%	538	6%
Qtr 4, 2004	8,266	7,500	91%	47	0.6%	719	9%	356	4%	866	10%
Qtr 1, 2005	7,726	7,002	91%	50	0.6%	674	9%	248	3%	966	12%
Qtr 2, 2005	8,635	7,015	81%	45	0.5%	1,575	18%	256	3%	410	5%
Qtr 3, 2005	8,744	7,745	89%	46	0.5%	953	11%	305	4%	539	6%
Qtr 4, 2005	7,840	7,176	92%	59	0.8%	605	8%	329	4%	1,180	13%
Qtr 1, 2006	6,995	6,200	89%	26	0.4%	769	11%	207	3%	1,407	18%
Qtr 2, 2006	8,127	6,342	78%	34	0.4%	1,751	22%	205	3%	414	6%
Qtr 3, 2006	8,745	7,225	83%	40	0.5%	1,480	17%	322	4%	540	7%
Qtr 4, 2006	7,804	7,490	96%	43	0.6%	271	3%	323	4%	889	10%
Qtr 1, 2007	7,206	6,862	95%	47	0.7%	297	4%	207	3%	688	9%
Qtr 2, 2007	8,754	6,751	77%	44	0.5%	1,959	22%	156	2%	255	4%
Qtr 3, 2007	8,870	7,923	89%	39	0.4%	908	10%	269	3%	523	6%
Qtr 4, 2007	8,499	7,705	91%	45	0.5%	680	8%	276	3%	775	9%

The relative shares of exits have also been fairly stable over the past eight years (Figure 20). On average, roughly four percent of the cluster workforce switches to an employer outside the cluster between one quarter and the next, and another eight percent leaves the UI database altogether.

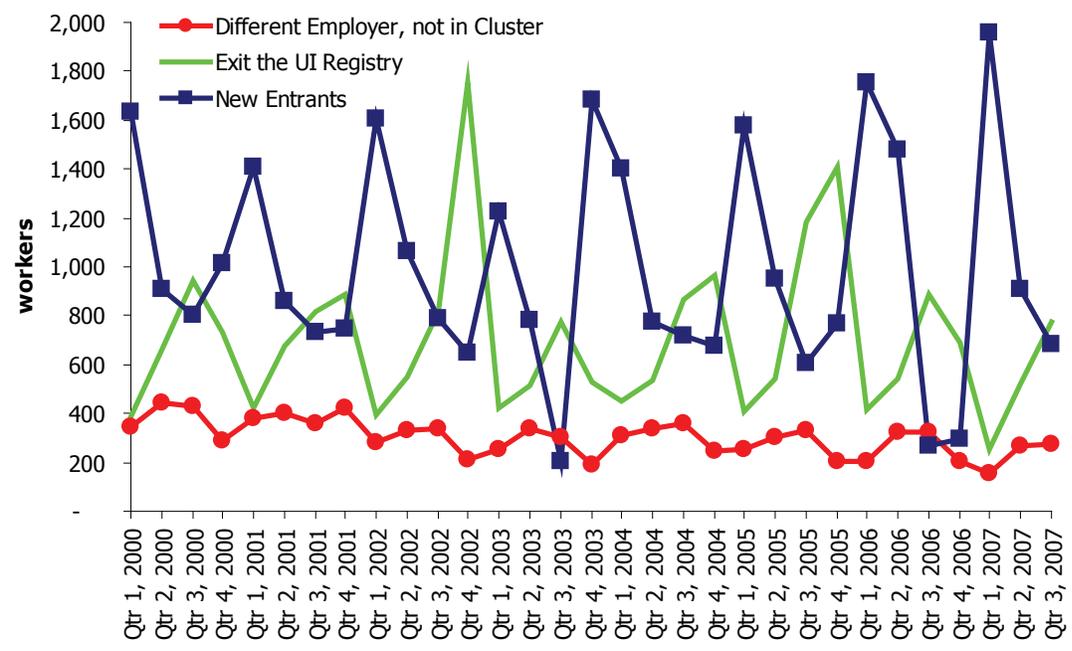
Figure 20
Shares of the Marine Trades Workforce by Destination of Exit



The quarterly movements of entrants are plotted against the two types of exits (Figure 21). Although imperfect, there is a clear negative association between the number of quarterly entrants and those exiting the UI registry. The number of workers leaving the cluster tends to mirror the movements of exits from the registry, albeit with less volatility. In quarters where entry peaks, exits are at their lowest and vice-versa. It makes intuitive sense that entries and exits move in opposite direction, as the former is typically a measure of growth while the latter measures decline. Some of these workers may be regular seasonal hires, who are released

one quarter to resume their job sometime in the next year when work picks up again. A more detailed examination of the UI records could help distinguish whether these releases are temporary or permanent.

Figure 21
Quarterly Worker Entries and Exits in the Marine Trades Cluster, 2000 to 2007



The preceding analysis of workforce flows is replicated for each subcluster and displayed in Appendices A through J. The quarterly shares by each type of flow are summarized in Table 6 by their means and standard deviations over the 2000 to 2007 period. The marine electronics and engines subcluster has the highest share (93%) of workers who remain with the same employer from one quarter to the next, followed by composites (92%) and retail/wholesale (90%). The professional services and NEC subclusters have high shares of new entrants—

commensurate with their low shares of workers who stay with the same employer from one quarter to the next. The boat building subcluster has the highest share of workers who move to a different employer within the subcluster.

Similar to the analysis of workforce flows within the Marine Trades, workers can exit the subcluster either by switching to an employer in a different cluster or by dropping out of the UI registry. At the subcluster level, workers can also exit the subcluster by switching to an employer in a different

subcluster within the Marine Trades cluster. As seen before, the most common form of exit is by leaving the UI registry. The inherently diverse NEC subcluster has the highest mean percentage movement out of the UI registry, followed by servicing dealerships and marinas. These subclusters also experienced high seasonal volatility, suggesting that at least some of these exits are temporary departures. Boat building and marinas/boat yards show the highest

Table 6

Summary of Quarterly Workforce Flows by Subcluster, 2000 to 2007

Share of current year's workforce remaining in/entering the subcluster

Subcluster	Same Employer w/in subcluster		Different Employer w/in subcluster		New Entrants	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Boat building	87.1%	5.3%	0.7%	0.4%	12.1%	5.3%
Composites	92.3%	3.2%	0.1%	0.1%	7.6%	3.2%
Marinas/Boat Yards	83.6%	8.3%	0.3%	0.2%	16.0%	8.3%
Marine Electronics & Engines	93.0%	5.3%	0.0%	0.0%	7.0%	5.3%
Instructure / Construction	87.7%	5.9%	0.0%	0.1%	12.3%	5.9%
Professional Services	75.3%	16.5%	0.0%	0.1%	24.7%	16.5%
Retail / Wholesale	89.9%	5.4%	-0.0%	0.1%	10.2%	5.4%
Sails, Rigging & Joinery	84.9%	8.4%	0.2%	0.3%	14.9%	8.4%
Servicing dealerships	83.9%	10.4%	0.3%	0.4%	15.8%	10.5%
Not Elsewhere Classified (NEC)	79.2%	13.5%	0.2%	0.3%	20.6%	13.6%

Share of the past year's workforce exiting the subcluster

Subcluster	Different Employer w/in cluster		Different Employer not in Cluster		Exit UI Registry	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Boat building	0.6%	0.3%	3.0%	1.0%	8.2%	4.7%
Composites	0.1%	0.1%	3.7%	0.8%	4.6%	2.0%
Marinas/Boat Yards	0.5%	0.2%	3.8%	3.2%	11.5%	5.3%
Marine Electronics & Engines	0.2%	0.3%	3.3%	1.3%	5.8%	3.2%
Instructure / Construction	0.1%	0.1%	4.0%	1.8%	8.5%	3.9%
Professional Services	0.1%	0.2%	17.8%	16.5%	5.6%	3.4%
Retail / Wholesale	0.3%	0.4%	3.8%	1.5%	6.2%	4.3%
Sails, Rigging & Joinery	0.3%	0.5%	4.1%	2.0%	9.5%	6.2%
Servicing dealerships	0.4%	0.3%	4.2%	1.2%	10.9%	8.5%
Not Elsewhere Classified (NEC)	0.3%	0.4%	3.2%	1.5%	15.9%	11.1%

share of switches to employers within a different subcluster of Marine Trades. This is likely due to the similarities between boat builders and boat yards, many of whom are involved in both new boat construction and existing boat rehab and repair. Workers in the professional services subcluster are, by far, the most likely to switch jobs to employers out of the cluster. This is likely because the skills utilized in professional and technical services are both highly transferable across a range of disciplines and in high demand.

Worker Transitions Between Employers and Industries

This final component of the workforce dynamics section examines how workers transfer their knowledge and skills from one employer to another. Analysis of job duration has shown that among the present Marine Trades workforce (both long-term and short-term), approximately 33% have remained with their current employer for seven years or more. The analysis that follows focuses on the other workers in the Marine Trades cluster, those who have changed employers at least once during the past eight years.

Methodological Note:

Measuring Knowledge Flows between Industries

There are several methods proposed for tracking knowledge flows across occupations and industries using secondary and administrative data. State labor analysts and CareerCenter counselors regularly use occupational skills data from the U.S. Department of Labor O*NET database to match dislocated workers to job openings that require similar skills as their previous job. At an aggregate scale, Feser¹⁷ matched occupational data from the U.S. Occupational Employment Survey (OES) to the O*NET database to identify groups of occupations utilizing similar skills (i.e. skill clusters). Koo¹⁸ and Renski, Koo and Feser¹⁹ have also used the national staffing patterns (occupation by industry) matrix to identify groups of industries with common occupational profiles, under the assumption that workers can more readily transfer their knowledge and skills across industries with a similar occupational mix.

While existing databases (such as O*NET and the national staffing patterns) provide invaluable information to help smooth the transition into a new job by building upon a worker's existing skill set and minimizing the need for additional training, they are expensive to collect and are generally only available at the national scale due to the sample size requirements.

The UI database provides an alternative source for studying the transfer of knowledge across employers and industries that can be customized for individual states or sub-state regions. Because it tracks individual workers matched to specific employers, the UI database can also be used to analyze the labor market experience of employees dislocated through the closure of specific businesses or examine the hiring preferences of expanding industries.

The UI database is used to identify all workers who have been employed in the Marine Trades cluster between the beginning of 2000 and the end of 2007. Workers are excluded that have had only a single employer during the study period. For each instance where a worker changed employers, their industry of origin and their industry of destination is measured. Industries are defined according to either the subcluster of the employer within Marine Trades or by the three-digit NAICS code of employers outside of the Marine Trades cluster. For example, if a worker in the boat building subcluster leaves their position to work for a boat yard, the industry of origin is the boat building subcluster and the industry of destination is the marina/boat yard subcluster. This distinguishes bi-directly flows – i.e. where workers entering the subcluster come from and where workers leaving the subcluster go to.

Table 7 summarizes the results of the analysis of worker transitions. It shows the percentage of workers entering and exiting each subcluster coming from (or leaving for) businesses within the same subcluster, other subclusters within Marine trades, or from outside the cluster. The relative shares across subclusters are generally similar whether one looks at entries or exits. Most workers that enter (or exit) businesses in the Marine Trades cluster come from (or go to) employers outside of the cluster. This is not surprising, considering that the Marine Trades is but a small part (1.4%) of the overall state economy. Yet given its size, job transfers within the cluster are generally higher than expected, providing some confirmation for analyzing workforce dynamics using a cluster-based framework.

Table 7

Worker Transitions between Employers by Subcluster, 2000 to 2007
(percentage of workers entering/exiting the subcluster who changed employers)

	Entry into subcluster			Exits from subcluster		
	Same subcluster	Different subcluster	Outside cluster	Same subcluster	Different subcluster	Outside cluster
Boat building	14.2%	12.4%	46.6%	16.2%	12.4%	71.4%
Composites, non-boat	2.1%	1.5%	96.4%	1.9%	1.7%	96.4%
Marine Electronics & Engines	0.0%	4.8%	95.2%	0.0%	4.6%	95.4%
Marine Instructure & Construction	0.6%	2.3%	97.2%	0.5%	2.2%	97.3%
Marinas/Boat Yards	8.4%	10.0%	81.7%	8.4%	11.1%	80.5%
Professional Services	1.5%	5.2%	93.3%	1.4%	5.8%	92.8%
Retail & Wholesale	0.0%	7.9%	92.1%	2.2%	4.9%	92.9%
Sails, Rigging & Joinery	2.0%	6.8%	91.2%	0.0%	7.7%	92.3%
Servicing dealerships	5.3%	8.5%	86.2%	2.8%	6.9%	90.3%

The labor flows summarized in Table 7 also provide a measure of the general transferability of knowledge among the workers of a subcluster. The greater the share of job transfers within the subcluster, or to a lesser extent within the cluster, the greater the specialization of knowledge among the workers of the subcluster. Specialized knowledge sometimes

corresponds with higher earnings, but only in cases where such knowledge is in high demand. Because their knowledge is more specialized, workers in these types of industries often have greater difficulty finding compatible employment in the face of an industry downturns and may require more extensive retraining. Boat building, marinas/boat yards, and servicing dealerships all have strong internal connections (in the form of worker transfers) to other business within their same subcluster. These subclusters also have the strongest connections to other subclusters within Marine Trades -- namely one another, as will be shown later.

By contrast, high transfers outside the cluster indicate more ubiquitous, and more transferable, forms of knowledge among the workers of an industry. In some instances, highly transferable knowledge might be general and basic, such as entry-level positions that require little formal training or on-the-job experience. In other cases, highly transferable forms of knowledge might still require a considerable training or expertise, but are transferable because they have application in many different types of industries. Accounting and management are likely examples of transferable, yet relatively high skilled, forms of knowledge.

Among the ten subclusters, marine infrastructure and construction has the strongest ties to businesses external to the cluster. Construction jobs are highly transferable, and, as mentioned previously, many of the companies in this cluster also have sizable non-marine operations. The composites and marine electronics and engines subclusters also have relatively strong external ties. Job tasks in the composites subcluster may be particularly diverse because of its varied product markets. Marine electronics and engines require skill sets that are compatible with non-marine electronics and mechanics, and are thus also highly transferable.

The results for the individual subclusters are reported in Tables 8 through 17, which show the top 20 industries of origin for workers entering the subcluster (i.e. their previous employer) and the top 20 industries of destination for workers leaving the subcluster.²⁰ These are the industries (and other subclusters) that have job skills that are most compatible with each subcluster. Due to space limitations, only a brief discussion of the results for each subcluster will be provided. However, the information in these tables can be used directly by career services professionals to help them evaluate possible targets for workers that were either dislocated from jobs in the Marine trades or workers from other industries that might be suitable for work in the Marine Trades. The strength of the association between industry pairs is measured as the share of flows (i.e. when a worker changes employers) between the subcluster and the industry of origin (destination), divided by the total flows for the industry of origin (destination) to all other industries.²¹ For example, imagine that there were 1,000 workers in the fin fishing industry (the industry of origin, in this example) who changed employers between 2000 and 2007. Of these 1,000 workers who changed employers, 200 left

fin fishing to work for an employer in the boat building subcluster (the destination industry). In this scenario, the measure of association between industry *i* and subcluster *j* would be 200/1,000, or .2.

As mentioned previously, the flows of workers in and out of the boat building subcluster is heavily concentrated within the cluster. Workers most often switch from one-boat builder to another, reflecting the relatively specialized skills within the industry as well as the availability of employment opportunities with other builders. Boat builders are also closely connected to the Marina/boat yards and Servicing dealerships subclusters, reflecting the similar nature of the work (Table 8). Boat building is also fairly well connected to the other subclusters of the Marine Trades through labor force flows. Nine of the ten Marine Trades subclusters appear among the top twenty industries of origin for workers entering the boat building subcluster (all but marine engines and electronics) while all ten subclusters appear among top twenty destination industries for workers exiting the boat building subcluster. Outside of the cluster, there are fairly strong associations with other transportation sectors (scenic and sightseeing transportation, water transportation, support activities for transportation), other types of durable goods manufacturing (furniture, primary metals, transportation equipment, electrical equipment, machinery, and fabricated metals), fishing, and building construction.

Table 8

Industry Origins/Destination of Workers in the Boat Building Subcluster

Entering workers, industry of previous employer		Exiting workers, industry of next employer			
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Boat building	0.162		Boat building	0.142
	Marinas/Boat Yards	0.077		Marinas/Boat Yards	0.065
	Servicing dealerships	0.023		Other industry within cluster (NEC)	0.024
487	Scenic and sightseeing transportation	0.020	114	Fishing, hunting and trapping	0.022
	Other industry within cluster (NEC)	0.019		Servicing dealerships	0.021
	Professional & Technical Services	0.016		Marine Electronics & Engines	0.019
	Retail & Wholesale	0.016	337	Furniture and related product manufacturing	0.013
	Sails, Rigging & Joinery	0.016	331	Primary metal manufacturing	0.012
114	Fishing, hunting and trapping	0.015		Sails, Rigging & Joinery	0.011
337	Furniture and related product manufacturing	0.013		Professional & Technical Services	0.011
483	Water transportation	0.011		Retail & Wholesale	0.009
	Marine Instructure & Construction	0.010	212	Mining, except oil and gas	0.009
336	Transportation equipment manufacturing	0.010		Marine Instructure & Construction	0.009
335	Electrical equipment and appliance mfg.	0.008	483	Water transportation	0.009
333	Machinery manufacturing	0.007	487	Scenic and sightseeing transportation	0.007
332	Fabricated metal product manufacturing	0.007	333	Machinery manufacturing	0.007
	Composites	0.006	332	Fabricated metal product manufacturing	0.006
236	Construction of buildings	0.006	236	Construction of buildings	0.006
316	Leather and allied product manufacturing	0.006		Composites	0.005
488	Support activities for transportation	0.005	488	Support activities for transportation	0.005

By contrast, the composites subcluster is dominated by flows to businesses outside of the cluster (Table 9). Most workers entering or exiting composites companies come from manufacturers outside the cluster: namely plastics, primary metals, wood products, textiles, furniture, machinery, computers and electronic products, and fabricated metals. Employees of composites companies often transfer to other composites companies (2nd in both entrants and exits), and have moderately strong forward and backward connections within the cluster to the marine electronics and engines, boat building, and sails/rigging/joinery subclusters.

Table 9
Industry Origins/Destination of Workers in the Composites Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
326	Plastics and rubber products manufacturing	0.024	331	Primary metal manufacturing	0.028
	Composites	0.019		Composites	0.021
321	Wood product manufacturing	0.019	321	Wood product manufacturing	0.017
331	Primary metal manufacturing	0.017		Sails, Rigging & Joinery	0.016
314	Textile product mills	0.016		Retail & Wholesale	0.016
337	Furniture and related product manufacturing	0.014	337	Furniture and related product manufacturing	0.013
	Marine Electronics & Engines	0.013	333	Machinery manufacturing	0.013
333	Machinery manufacturing	0.013	326	Plastics and rubber products manufacturing	0.012
335	Electrical equipment & appliance mfg.	0.013	334	Computer & electronic product manufacturing	0.011
	Sails, Rigging & Joinery	0.013	312	Beverage and tobacco product manufacturing	0.010
334	Computer & electronic product manufacturing	0.012		Boat building	0.010
313	Textile mills	0.012	332	Fabricated metal product manufacturing	0.009
312	Beverage and tobacco product manufacturing	0.009	323	Printing and related support activities	0.009
332	Fabricated metal product manufacturing	0.009	314	Textile product mills	0.009
	Boat building	0.008	488	Support activities for transportation	0.009
322	Paper manufacturing	0.008	324	Petroleum and coal products manufacturing	0.009
114	Fishing, hunting and trapping	0.007	112	Animal production	0.008
493	Warehousing and storage	0.007		Marine Electronics & Engines	0.008
444	Building material and garden supply stores	0.007	339	Miscellaneous manufacturing	0.008
316	Leather and allied product manufacturing	0.007	493	Warehousing and storage	0.008

The flows of workers in and out of the marinas/boat yards subcluster are nearly identical to those of the boat builders (Table 10). In fact, workers in the marinas/boat yards subcluster are most likely to come from or take a new job with a boat builder than with another marina or boat yard. Marinas also have strong connections to themselves and to servicing dealerships. As with boat building, we also see strong links to the other subclusters of the marine trades as well as strong external links to transportation services; fishing; construction; and varied types of manufacturing. Unlike boat building, the marina/boat yard subcluster also includes a service component (some marinas include restaurants) that sometimes attracts workers from other service-oriented industries such as private households; amusements, gambling and recreation; repair and maintenance; and motor vehicle and parts dealers.

Table 10

Industry Origins/Destination of Workers in the Marinas/Boat Yards Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Boat building	0.086		Boat building	0.089
	Marinas/Boat Yards	0.084		Marinas/Boat Yards	0.084
	Servicing dealerships	0.051		Servicing dealerships	0.043
487	Scenic and sightseeing transportation	0.034	114	Fishing, hunting and trapping	0.031
	Marine Electronics & Engines	0.018	487	Scenic and sightseeing transportation	0.029
483	Water transportation	0.018		Other industry within cluster (NEC)	0.021
	Other industry within cluster (NEC)	0.017		Sails, Rigging & Joinery	0.020
	Professional & Technical Services	0.016		Retail & Wholesale	0.013
	Retail & Wholesale	0.016		Professional & Technical Services	0.011
	Sails, Rigging & Joinery	0.016	483	Water transportation	0.009
114	Fishing, hunting and trapping	0.007		Marine Electronics & Engines	0.008
236	Construction of buildings	0.006		Marine Instructure & Construction	0.008
337	Furniture and related product manufacturing	0.006	236	Construction of buildings	0.007
814	Private households	0.004	814	Private households	0.006
713	Amusements, gambling, and recreation	0.004	315	Apparel manufacturing	0.005
488	Support activities for transportation	0.004	212	Mining, except oil and gas	0.004
441	Motor vehicle and parts dealers	0.004	921	Executive, legislative and general government	0.004
811	Repair and maintenance	0.004	337	Furniture and related product manufacturing	0.004
325	Chemical manufacturing	0.003	221	Utilities	0.003
	Marine Instructure & Construction	0.003	238	Specialty trade contractors	0.003

Workers in the marine electronics and engines subcluster do not typically transfer within the subcluster to other marine electronics and engines companies (Table 11). There is, however, strong movement to and from other marine retailers and wholesalers. There is also some movement of workers into marine electronics and engines from other subclusters – namely professional services, boat building, marinas, and composites. Otherwise, those entering the marine engines and electronics subcluster generally come from manufacturers or retailers outside the cluster. Those leaving marine electronics and engines often move on to related types of manufacturing (namely transportation equipment, fabricated metals and plastics), or to employers in other areas of the cluster, such as marinas/boat yards, sails/rigging/joinery, composites, or serving dealership subclusters.

Table 11
Industry Origins/Destination of Workers in the Marine Electronics and Engines Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Retail & Wholesale	0.010		Retail & Wholesale	0.013
	Professional & Technical Services	0.005	336	Transportation equipment manufacturing	0.007
336	Transportation equipment manufacturing	0.004	212	Mining, except oil and gas	0.004
	Boat building	0.003	332	Fabricated metal product manufacturing	0.004
334	Computer & electronic product manufacturing	0.002	326	Plastics and rubber products manufacturing	0.003
324	Petroleum and coal products manufacturing	0.002		Marinas/Boat Yards	0.003
335	Electrical equipment and appliance mfg.	0.002	316	Leather and allied product manufacturing	0.003
333	Machinery manufacturing	0.002	324	Petroleum and coal products manufacturing	0.002
423	Merchant wholesalers, durable goods	0.001		Sails, Rigging & Joinery	0.002
314	Textile product mills	0.001		Composites	0.002
332	Fabricated metal product manufacturing	0.001	314	Textile product mills	0.002
313	Textile mills	0.001	312	Beverage & tobacco product manufacturing	0.002
	Marinas/Boat Yards	0.001		Servicing dealerships	0.002
326	Plastics and rubber products manufacturing	0.001	327	Nonmetallic mineral product manufacturing	0.002
425	Electronic markets and agents and brokers	0.001	562	Waste management & remediation services	0.002
712	Museums, historical sites, zoos, and parks	0.001	423	Merchant wholesalers, durable goods	0.001
	Composites	0.001	425	Electronic markets and agents and brokers	0.001
444	Building material and garden supply stores	0.001	532	Rental and leasing services	0.001
325	Chemical manufacturing	0.001	339	Miscellaneous manufacturing	0.001
443	Electronics and appliance stores	0.001	323	Printing and related support activities	0.001

Like composites, marine infrastructure and construction is also characterized by strong external linkages and relatively weak ties to other businesses in the cluster (Table 12). Its closest associations are with other construction sectors (heavy and civil engineering construction, construction of buildings specialty trade contractors) and other manufacturing industries (fabricated metals, machinery primary metals). This may be because some of the larger firms in this sector (like Cianbro) are only partly involved in marine applications and also delve in other construction and manufacturing activity. There are, however, some modest ties to other Marine Trades subcluster, such as boat building, professional services (exits), marine infrastructure/construction, and marinas/boat yards (entry), and sails/rigging/joinery (exits).

Table 12

Industry Origins/Destination of Workers in the Marine Infrastructure and Construction Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
237	Heavy and civil engineering construction	0.013	332	Fabricated metal product manufacturing	0.025
332	Fabricated metal product manufacturing	0.009		Professional & Technical Services	0.015
236	Construction of buildings	0.009	237	Heavy and civil engineering construction	0.012
238	Specialty trade contractors	0.008	236	Construction of buildings	0.012
	Boat building	0.008	114	Fishing, hunting and trapping	0.009
333	Machinery manufacturing	0.007		Boat building	0.008
331	Primary metal manufacturing	0.007	238	Specialty trade contractors	0.008
336	Transportation equipment manufacturing	0.006	221	Utilities	0.006
488	Support activities for transportation	0.006	488	Support activities for transportation	0.006
	Marine Infrastructure & Construction	0.005		Marine Infrastructure & Construction	0.006
112	Animal production	0.005	333	Machinery manufacturing	0.005
	Marinas/Boat Yards	0.005		Sails, Rigging & Joinery	0.005
221	Utilities	0.005	483	Water transportation	0.004
327	Nonmetallic mineral product manufacturing	0.005	325	Chemical manufacturing	0.004
321	Wood product manufacturing	0.004	331	Primary metal manufacturing	0.004
113	Forestry and logging	0.004	336	Transportation equipment manufacturing	0.004
325	Chemical manufacturing	0.003	327	Nonmetallic mineral product manufacturing	0.003
444	Building material and garden supply stores	0.003	113	Forestry and logging	0.003
	Retail & Wholesale	0.003	321	Wood product manufacturing	0.003
928	National security and international affairs	0.003	322	Paper manufacturing	0.003

The professional and technical services subcluster has moderate internal and external linkages (Table 13). Workers in this subcluster are most likely to transfer to and from other businesses within the professional and technical services subcluster. Their external linkages are closest to other transportation services industries (water transportation industries, scenic and sightseeing transportation, and support activities for transportation), administration (environmental, economic, government, human resources), and other advanced services (professional and technical services, waste management and remediation). This is not surprising given the high engineering, legal, and administrative content of many marine professional services firms. Apart from other professional services firms, their closest relatives within the Marine Trades cluster are the NEC subcluster, the sails/rigging/joinery subcluster, the marine electronics subcluster, marine infrastructure and construction, and to a lesser extent boat builders, marinas /boat yards and servicing dealerships.

Table 13

Industry Origins/Destination of Workers in the Professional and Technical Services Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Professional & Technical Services	0.022		Professional & Technical Services	0.015
483	Water transportation	0.007	114	Fishing, hunting and trapping	0.004
	Other industry within cluster (NEC)	0.006	483	Water transportation	0.004
	Sails, Rigging & Joinery	0.003		Marine Electronics & Engines	0.003
487	Scenic and sightseeing transportation	0.003		Sails, Rigging & Joinery	0.002
	Marine Infrastructure & Construction	0.002	924	Administration of environmental programs	0.002
488	Support activities for transportation	0.002	712	Museums, historical sites, zoos, and parks	0.001
924	Administration of environmental programs	0.001		Boat building	0.001
	Boat building	0.001		Marinas/Boat Yards	0.001
926	Administration of economic programs	0.001		Servicing dealerships	0.001
	Marinas/Boat Yards	0.001	221	Utilities	0.001
	Servicing dealerships	0.001	488	Support activities for transportation	0.001
541	Professional and Technical Services	0.001	327	Nonmetallic mineral product manufacturing	0.001
322	Paper manufacturing	0.001	541	Professional and Technical Services	0.001
562	Waste management and remediation services	0.001	562	Waste management & remediation services	0.001
712	Museums, historical sites, zoos, and parks	0.001	711	Performing arts and spectator sports	0.000
325	Chemical manufacturing	0.001	923	Administration of human resource programs	0.000
921	Executive, legislative and general government	0.001	523	Securities, commodity contracts, investments	0.000
524	Insurance carriers and related activities	0.001	922	Justice, public order, and safety activities	0.000
112	Animal production	0.001	425	Electronic markets and agents and brokers	0.000

Similar to marine engines and electronics, the retail/wholesale subcluster has few internal linkages (Table 14). However, it does have fairly strong connections to several subclusters within the Marine trades cluster – namely servicing dealerships, marine electronics and engines, and the NEC subclusters. The common thread of these linkages may be their common sales and customer service orientation. The marinas/boat yards, boat builders, composites, and sails/joinery/rigging subclusters also appear in the top twenty for marine retail and wholesale either for entrants or exits. Otherwise, the external linkages with marine retail/wholesale are scattered across a variety of transportation-related industries, fishing, retailers, and wholesalers.

Table 14
Industry Origins/Destination of Workers in the Retail/Wholesale Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Servicing dealerships	0.008		Marine Electronics & Engines	0.008
114	Fishing, hunting and trapping	0.007		Servicing dealerships	0.006
	Marine Electronics & Engines	0.007	483	Water transportation	0.004
483	Water transportation	0.004		Other industry within cluster (NEC)	0.003
	Other industry within cluster (NEC)	0.003		Sails, Rigging & Joinery	0.002
	Marinas/Boat Yards	0.001	999	Unclassified	0.002
	Boat building	0.001		Boat building	0.002
	Composites	0.001		Marinas/Boat Yards	0.002
333	Machinery manufacturing	0.001	928	National security and international affairs	0.002
493	Warehousing and storage	0.001	425	Electronic markets and agents and brokers	0.002
327	Nonmetallic mineral product manufacturing	0.001	424	Merchant wholesalers, nondurable goods	0.001
423	Merchant wholesalers, durable goods	0.001	336	Transportation equipment manufacturing	0.001
511	Publishing industries, except Internet	0.001	443	Electronics and appliance stores	0.001
485	Transit and ground passenger transportation	0.001	333	Machinery manufacturing	0.001
484	Truck transportation	0.001	312	Beverage and tobacco product manufacturing	0.001
442	Furniture and home furnishings stores	0.001	487	Scenic and sightseeing transportation	0.001
425	Electronic markets and agents and brokers	0.001	441	Motor vehicle and parts dealers	0.001
323	Printing and related support activities	0.001	712	Museums, historical sites, zoos, and parks	0.001
441	Motor vehicle and parts dealers	0.001	423	Merchant wholesalers, durable goods	0.001
325	Chemical manufacturing	0.001	314	Textile product mills	0.001

Workers in the sails, rigging and joinery subcluster are most often switch to different employers within the subcluster (Table 15). It has strong associations with other subclusters, such as servicing dealerships, professional and technical services, boat builders, marinas, and retail & wholesale. It has strong external ties to other types of woven materials manufacturing such as textile product mills, textile mills, leather and allied products manufacturers and apparel. It also has fairly moderate external ties to several transportation services and transportation equipment manufacturing industries, presumably due to the direct relationships between canvas shops and sailmakers and the recreational sailing industry.

Table 15
Industry Origins/Destination of Workers in the Sails, Rigging & Joinery Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Sails, Rigging & Joinery	0.028		Sails, Rigging & Joinery	0.020
314	Textile product mills	0.024		Servicing dealerships	0.007
	Other industry within cluster (NEC)	0.008	114	Fishing, hunting and trapping	0.004
	Professional & Technical Services	0.005		Professional & Technical Services	0.004
313	Textile mills	0.004	487	Scenic and sightseeing transportation	0.003
483	Water transportation	0.004	315	Apparel manufacturing	0.003
	Retail & Wholesale	0.003		Boat building	0.002
	Marinas/Boat Yards	0.003	314	Textile product mills	0.002
487	Scenic and sightseeing transportation	0.003		Marinas/Boat Yards	0.002
	Boat building	0.002	312	Beverage and tobacco product manufacturing	0.001
316	Leather and allied product manufacturing	0.002	337	Furniture and related product manufacturing	0.001
	Composites	0.002	336	Transportation equipment manufacturing	0.001
	Marine Electronics & Engines	0.002	313	Textile mills	0.001
315	Apparel manufacturing	0.002	316	Leather and allied product manufacturing	0.001
336	Transportation equipment manufacturing	0.001		Composites	0.001
326	Plastics and rubber products manufacturing	0.001	924	Administration of environmental programs	0.001
333	Machinery manufacturing	0.001	712	Museums, historical sites, zoos, and parks	0.001
324	Petroleum and coal products manufacturing	0.001	518	Data processing, hosting and related services	0.001
335	Electrical equipment and appliance mfg.	0.001	814	Private households	0.001
	Marine Instructure & Construction	0.001	485	Transit and ground passenger transportation	0.001

The servicing dealership subcluster also has strong ties to many other segments of the Marine Trades cluster (Table 16). Many of the workers entering or exiting servicing dealerships find (or leave) employment in other servicing dealerships, marine retailers/wholesalers, marinas/boat yards, boat building, sails/rigging/joinery, or professional services. Because servicing dealerships typically offer a mix of sales and marine equipment repair services we also see strong external linkages to retailers, transportation services, repair shops, and fishing.

Due to its inherent homogeneity, it is difficult to characterize the worker transition patterns in the NEC subcluster (Table 17).

Table 16

Industry Origins/Destination of Workers in the Servicing Dealership Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Servicing dealerships	0.055		Servicing dealerships	0.053
	Sails, Rigging & Joinery	0.022		Retail & Wholesale	0.025
	Retail & Wholesale	0.019		Marinas/Boat Yards	0.018
	Marinas/Boat Yards	0.016		Boat building	0.010
	Boat building	0.010	487	Scenic and sightseeing transportation	0.008
114	Fishing, hunting and trapping	0.007	483	Water transportation	0.004
483	Water transportation	0.007		Professional & Technical Services	0.004
	Professional & Technical Services	0.005	441	Motor vehicle and parts dealers	0.003
	Marine Electronics & Engines	0.004	444	Building material and garden supply stores	0.003
331	Primary metal manufacturing	0.003		Sails, Rigging & Joinery	0.002
441	Motor vehicle and parts dealers	0.003	999	Unclassified	0.002
	Other industry within cluster (NEC)	0.003	928	National security and international affairs	0.002
444	Building material and garden supply stores	0.002	237	Heavy and civil engineering construction	0.002
339	Miscellaneous manufacturing	0.002	921	Executive, legislative & general government	0.002
443	Electronics and appliance stores	0.002	481	Air transportation	0.001
811	Repair and maintenance	0.002	454	Nonstore retailers	0.001
332	Fabricated metal product manufacturing	0.002	447	Gasoline stations	0.001
921	Executive, legislative & general government	0.001	811	Repair and maintenance	0.001
713	Amusements, gambling, and recreation	0.001	112	Animal production	0.001
326	Plastics and rubber products manufacturing	0.001	511	Publishing industries, except Internet	0.001

Table 17

Industry Origins/Destination of Workers in the Not Elsewhere Classified (NEC) Subcluster

Entering workers, industry of previous employer			Exiting workers, industry of next employer		
NAICS	Subcluster / Industry	Share	NAICS	Subcluster / Industry	Share
	Other industry within cluster (NEC)	0.014		Other industry within cluster (NEC)	0.013
483	Water transportation	0.011	114	Fishing, hunting and trapping	0.009
487	Scenic and sightseeing transportation	0.005		Professional & Technical Services	0.007
562	Waste management & remediation services	0.004		Sails, Rigging & Joinery	0.007
	Boat building	0.004	483	Water transportation	0.004
	Retail & Wholesale	0.003	487	Scenic and sightseeing transportation	0.004
	Marinas/Boat Yards	0.003		Retail & Wholesale	0.003
221	Utilities	0.002		Boat building	0.003
712	Museums, historical sites, zoos, and parks	0.002	712	Museums, historical sites, zoos, and parks	0.002
424	Merchant wholesalers, nondurable goods	0.001		Marinas/Boat Yards	0.002
333	Machinery manufacturing	0.001	562	Waste management & remediation services	0.002
488	Support activities for transportation	0.001	488	Support activities for transportation	0.001
441	Motor vehicle and parts dealers	0.001	814	Private households	0.001
484	Truck transportation	0.001		Servicing dealerships	0.001
323	Printing and related support activities	0.001	327	Nonmetallic mineral product manufacturing	0.001
512	Motion picture & sound recording industries	0.001	711	Performing arts and spectator sports	0.001
325	Chemical manufacturing	0.001	511	Publishing industries, except Internet	0.001
312	Beverage & tobacco product manufacturing	0.001	451	Sporting goods, hobby, book & music stores	0.001
112	Animal production	0.001	314	Textile product mills	0.001
453	Miscellaneous store retailers	0.001	445	Food and beverage stores	0.001

Summary and Conclusions

Confidential employer and employee databases such as the QCEW and UI have considerable value in helping us understand how regional economies and labor markets function, and, by building upon this knowledge, ultimately lead to the design of more effective programs and policies. Because they are comprehensive, covering nearly all businesses and employees, concerns over statistical sampling and validity concerns are largely irrelevant -- even when reported at very fine geographies and/or high-levels of industrial detail. Because they are collected at the most primal economic units (individual workers and business establishments) the datasets are highly flexible and can be organized in any number of different ways for a multitude of purposes.

This study capitalizes upon this flexibility to develop a classification of the Maine Marine Trades cluster that is ultimately more accurate than one developed from aggregate industry groupings. Through the process of defining the Marine Trades cluster and examining its industrial composition, it was determined that:

- The Marine Trades cluster covers a diverse spectrum of industries, from its traditional core in boat building and marinas, to intermediate goods providers and professional services such as sailmakers and naval architects, and to manufacturers using similar technologies to make a variety of different products, such as composites fabricators.
- The Marine Trades cluster is closely intertwined with several of the state's leading export sectors, particularly manufacturing and tourism.

Then the QCEW was used to track employment and wage trends in the Marine Trades cluster over the past eight years. The key findings from this analysis include:

- As of 2007, there were roughly 8,000 employees in the Marine Trades cluster. Its largest sub-cluster components are composites (25% of employment), marinas/boat yards (20%), boat building (18%), and marine infrastructure/construction (15%).
- Some subclusters, namely as marinas and servicing dealerships, are highly seasonal.
- Although employment in the cluster has declined slightly from 2000 to 2007, Marine Trades remains a pillar of stability within the state's goods-producing economy. These job losses were concentrated in the composites, electronics and engines, and marine infrastructure/construction subclusters. Boat building added a net 215 job over the decade.
- The average worker in the cluster earns just over \$40,000 per year, notably higher than the state average of \$34,000. However, real wage growth in the cluster has lagged behind other sectors, namely due to real wage declines in the marine infrastructure and composites sub-clusters.

The final section of the study shifted from employers to employees. By matching the QCEW and the UI databases, workers were identified that are employed by Marine Trades companies to examine labor flows -- where they came from before Marine Trades, how long they stayed

with a particular company, and where they went after changing employers. Measuring the transfer of workers between businesses is particularly valuable for identifying industries that require similar types of skills and knowledge, and thus might serve as target destinations for dislocated workers. The key findings from the analysis of the labor market dynamics of the Marine Trades cluster are:

- Employment within the cluster is fairly stable. Forty five percent of Marine Trades workers that have been in the labor market for at least seven years have worked with the same employer for the entire timespan. This is considerably higher than the statewide rate of 35%. Tenure is highest in the composites subcluster and lowest among servicing dealerships.
- Most Marine Trades workers (88%) remain with their current employer from one quarter to the next. Among the subclusters, marine electronics and engines has the highest quarterly retention rate, followed by composites.
- New entrants to the Maine labor market comprise roughly 11% of the Marine Trades workforce in any given quarter. Quarterly entry rates are highest in the professional services, not elsewhere classified, and marinas/boat yards subclusters.
- Among workers leaving the cluster, the bulk (8% of all the total Marine Trades workforce) leave the Maine payroll labor force, at least temporarily, while another 4% take employment outside the cluster. Workers in the professional services subcluster are, by far, the most likely to transfer to employers outside of the cluster.
- Boat building requires the most specialized skills, as indicated by the share of job transfers between employers within the same subcluster. Boat builders, marinas/boat yards, and servicing dealerships all regularly trade workers with one another, reflecting their relatively similar occupational requirements.
- Job skills in the marine infrastructure and construction subcluster appear to be the most transferable to other industries, as measured by the share of transfers to employers outside of the cluster. Composites and marine electronics and engines also have strong connections outside of the cluster and relatively weak ties to other businesses within.

In addition to their value for informing the creation of effective policies and programs, these databases also have considerable value for policy monitoring and evaluation. A forthcoming companion report will demonstrate some of these uses.

Although valuable, these databases also have their limitations. Both the QCEW and UI databases are extremely large and the potential relationships among and between workers and companies are varied and complex. Processing the raw data into a form that is suitable for analysis requires considerable attention and skill in both database programming and the methods of data analysis (not to mention hours of computer processing). The databases, while comprehensive, are also rather sparse. They contain almost no economic or social characteristics apart from employment, wages, industry codes, and addresses. Lastly, the analyst must also adhere to strict confidentiality requirements regarding the use and reporting of the data so that no personal or company information is revealed. But in the end, these limitations are minor compared to the benefits of gaining access to such rich data sources.

Endnotes and References

1. For more information on WIRED and the North Star Alliance Initiative go to: <http://www.maine.gov/wired/>.
2. In a forthcoming companion report, establishment and worker-level databases will be used to evaluate the outcomes of specific economic and workforce development programs using a quasi-experiments (i.e. case-control) research design.
3. Business owners and managers who were asked to identify key business partners, subcontractors, suppliers, and competitors during a series of regional focus groups and interviews conducted as part of a NSAI sponsored Business Visitation Program (BVP) survey of boat builders and boat yards.
4. For example see: Colgan, C. S. *et al.* (2002). Assessing Maine's Technology Clusters. Hallowell, ME, Maine Science and Technology Foundation: 1-144.; Colgan, C. S., B. H. Andrews *et al.* (2008). Maine's Technology Sectors and Clusters: Status and Strategy. Augusta, ME, Office of Innovation Maine Department of Economic and Community Development.; Feser, E., Renski H.C. and J. Koo (2009) "Regional Cluster Analysis with Interindustry Benchmarks." In Targeting Regional Economic Development (TRED). Goetz S., Deller S., and T. Harris (Eds). Routledge. Planning Decisions, LLC. (2007). Maine's Boat Building Industry: Obstacles & Opportunities. South Portland, ME, report prepared on behalf of Maine Built Boats.
5. Marshall, A. (1920 [1890]). Principles of Economics. London, Macmillan and Co.
6. Porter, M. (1990). The Competitive Advantage of Nations. London, Macmillian.
7. Business owners and managers were asked to identify key business partners, subcontractors, suppliers, and competitors during a series of regional focus groups and interviews conducted as part of a NSAI sponsored Business Visitation Program (BVP) survey of boat builders and boat yards.
8. The QCEW is restricted from being used as source for business contact information. Because the NSAI inventory was developed independent of the QCEW some differences between the two sources are to be expected.
9. Although large in number, sole-proprietors are likely to make up a fairly small share of the total employment of the cluster. For example, if we assume that each of the likely 150 sole proprietors in the NSAI database has one employee (the proprietor), sole proprietors would account for roughly 2 percent of the total payroll employment in the cluster in 2007.
10. Because the primary purpose of the NSAI inventory was for outreach, and not analysis, it was developed to be as broad and inclusive as possible -- including contact information for many companies that were later discovered to have closed or moved out-of-state.
11. If sole proprietors were included the average establishment size would be even smaller still.
12. Medians (rather than means) are used to measure establishment size for the cluster and its subclusters to avoid the distortions due to outliers and possible disclosure violations resulting from the presence of extremely large establishments within a particular subcluster.
13. Because the measure of average annual earnings includes earnings from part-time and seasonal employees, the actual earnings of full-time and permanent employees is likely to be much higher. Industries, such as accommodations and food services, with a higher share of part-time workers will be more affected than others with a higher share of full-time workers.
14. Hotchkiss, J. L., M. M. Pitts and J. C. Robertson (2008). "The Push-Pull Effects of the Information Technology Boom and Bust: Insight From Matched Employer--Employee Data." *Economic Development Quarterly* 22(3): 200-212.

Endnotes and References

15. Job duration is often measured by the average number of years an employee remains with the same employer. Such averages would be downward biased in this case, because much of the current workforce has been with a single employer for longer than the study period.
16. Only transitions between one employer and the next are used. While it would be interesting to profile the entire employment history of workers to see how they incrementally build human capital over time, the complexity of summarizing the near infinite variety of unique work history patterns proved to be overly burdensome and somewhat beyond the scope of the current study. Hopefully this issue will be addressed in future work.
17. Feser, E. J. (2003). "What regions do rather than make: A proposed set of knowledge-based occupation clusters." *Urban Studies* 40(10): 1937-1958.
18. Koo, J. (2005). "How to analyze the regional economy with occupation data." *Economic Development Quarterly* 19(4): 356-372.
19. Renski, H. C., J. Koo and E. J. Feser (2007). "Differences in labor versus value chain industry clusters: An empirical investigation." *Growth and Change* 38(3): 364-395.
20. In the tabulations of the top twenty related industries, origin & destination industries with fewer than 50 total workforce transfers over the combined eight-year study period are excluded. Because they have few transfers, even a very small number of worker transfers to or from these industries can inflate estimated shares and obscure true relationships.
21. The ratio of pairwise industry flows to total flows is a more reliable measure of association than the number of workers who change jobs because it adjusts for the size of the industry of origin or destination and helps account for a higher level of job churning in some industries. For example, food services and drinking places (NAICS 722) is among the top five origins and destination industries for every subcluster when measured by the number of workers. This is because food services is considerably larger than most other industries and has a high volume of turnover – not because there is a high degree of skills transferability between food services and boat building or composites fabrication. If one controls for turnover by dividing the pair-wise flows between boat building and food services by the total number of flows from food services, the food services industry no longer shows up in the top twenty in any of the Marine Trades subclusters.

Table 1

Workforce Flows in the Boatbuilding Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer			New Entrants		Different Employer		Different Employer		Exit	
	Total	#	%	#	%	#	%	#	%	#	%	#	%
								w/in Cluster	not in Cluster	UI Registry			
								prev qtr	prev qtr	prev qtr			
Qtr 1, 2000	1,308												
Qtr 2, 2000	1,331	1,126	85%	23	1.7%	182	14%	6	0%	72	6%	81	6%
Qtr 3, 2000	1,263	1,129	89%	14	1.1%	120	10%	10	1%	64	5%	114	9%
Qtr 4, 2000	1,290	1,095	85%	21	1.6%	174	13%	7	1%	36	3%	104	8%
Qtr 1, 2001	1,386	1,143	82%	22	1.6%	221	16%	5	0%	32	2%	88	7%
Qtr 2, 2001	1,387	1,222	88%	9	0.6%	156	11%	14	1%	66	5%	75	5%
Qtr 3, 2001	1,348	1,185	88%	8	0.6%	155	11%	11	1%	58	4%	125	9%
Qtr 4, 2001	1,310	1,164	89%	11	0.8%	135	10%	11	1%	59	4%	103	8%
Qtr 1, 2002	1,342	1,171	87%	11	0.8%	160	12%	9	1%	42	3%	77	6%
Qtr 2, 2002	1,345	1,206	90%	7	0.5%	132	10%	12	1%	41	3%	76	6%
Qtr 3, 2002	1,294	1,175	91%	9	0.7%	110	9%	12	1%	34	3%	115	9%
Qtr 4, 2002	1,312	1,159	88%	8	0.6%	145	11%	4	0%	32	2%	91	7%
Qtr 1, 2003	1,171	1,021	87%	7	0.6%	143	12%	1	0%	22	2%	261	20%
Qtr 2, 2003	1,199	1,069	89%	5	0.4%	125	10%	9	1%	36	3%	52	4%
Qtr 3, 2003	1,147	1,055	92%	1	0.1%	91	8%	3	0%	42	4%	98	8%
Qtr 4, 2003	1,082	1,023	95%	5	0.5%	54	5%	4	0%	38	3%	77	7%
Qtr 1, 2004	1,316	992	75%	3	0.2%	321	24%	3	0%	22	2%	62	6%
Qtr 2, 2004	1,327	1,171	88%	8	0.6%	148	11%	14	1%	38	3%	85	6%
Qtr 3, 2004	1,309	1,179	90%	11	0.8%	119	9%	8	1%	43	3%	86	6%
Qtr 4, 2004	1,338	1,182	88%	7	0.5%	149	11%	6	0%	36	3%	78	6%
Qtr 1, 2005	1,392	1,201	86%	13	0.9%	178	13%	15	1%	21	2%	88	7%
Qtr 2, 2005	1,399	1,246	89%	12	0.9%	141	10%	11	1%	52	4%	71	5%
Qtr 3, 2005	1,383	1,235	89%	15	1.1%	133	10%	11	1%	41	3%	97	7%
Qtr 4, 2005	1,089	977	90%	12	1.1%	100	9%	12	1%	52	4%	330	24%
Qtr 1, 2006	1,036	817	79%	6	0.6%	213	21%	5	0%	12	1%	249	23%
Qtr 2, 2006	1,373	928	68%	7	0.5%	438	32%	3	0%	28	3%	70	7%
Qtr 3, 2006	1,408	1,204	86%	6	0.4%	198	14%	3	0%	41	3%	119	9%
Qtr 4, 2006	1,361	1,282	94%	5	0.4%	74	5%	6	0%	28	2%	87	6%
Qtr 1, 2007	1,331	1,246	94%	8	0.6%	77	6%	9	1%	22	2%	76	6%
Qtr 2, 2007	1,473	1,211	82%	10	0.7%	252	17%	8	1%	27	2%	75	6%
Qtr 3, 2007	1,480	1,307	88%	7	0.5%	166	11%	9	1%	52	4%	98	7%
Qtr 4, 2007	1,486	1,319	89%	10	0.7%	157	11%	4	0%	44	3%	103	7%

Table 2

Workforce Flows in the Composites Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer			New Entrants		Different Employer		Different Employer		Exit	
	Total	#	%	#	%	#	%	#	%	#	%	#	%
Qtr 1, 2000	2,861												
Qtr 2, 2000	2,921	2,664	91%	0	0.0%	257	9%	3	0%	127	4%	67	2%
Qtr 3, 2000	2,917	2,704	93%	4	0.1%	209	7%	1	0%	127	4%	85	3%
Qtr 4, 2000	2,784	2,612	94%	2	0.1%	170	6%	0	0%	139	5%	164	6%
Qtr 1, 2001	2,734	2,550	93%	2	0.1%	182	7%	4	0%	115	4%	113	4%
Qtr 2, 2001	2,724	2,498	92%	0	0.0%	226	8%	2	0%	136	5%	98	4%
Qtr 3, 2001	2,673	2,512	94%	4	0.1%	157	6%	1	0%	121	4%	86	3%
Qtr 4, 2001	2,612	2,456	94%	0	0.0%	156	6%	1	0%	83	3%	133	5%
Qtr 1, 2002	2,567	2,401	94%	6	0.2%	160	6%	2	0%	84	3%	119	5%
Qtr 2, 2002	2,627	2,398	91%	2	0.1%	227	9%	0	0%	88	3%	79	3%
Qtr 3, 2002	2,600	2,422	93%	3	0.1%	175	7%	3	0%	117	4%	82	3%
Qtr 4, 2002	2,560	2,400	94%	1	0.0%	159	6%	0	0%	96	4%	103	4%
Qtr 1, 2003	2,288	2,160	94%	3	0.1%	125	5%	2	0%	57	2%	338	13%
Qtr 2, 2003	2,235	2,080	93%	1	0.0%	154	7%	0	0%	92	4%	115	5%
Qtr 3, 2003	2,219	2,051	92%	2	0.1%	166	7%	2	0%	84	4%	96	4%
Qtr 4, 2003	2,007	1,984	99%	2	0.1%	21	1%	0	0%	84	4%	149	7%
Qtr 1, 2004	2,216	1,847	83%	2	0.1%	367	17%	0	0%	58	3%	100	5%
Qtr 2, 2004	2,305	2,064	90%	2	0.1%	239	10%	1	0%	88	4%	61	3%
Qtr 3, 2004	2,338	2,131	91%	3	0.1%	204	9%	3	0%	83	4%	85	4%
Qtr 4, 2004	2,271	2,078	92%	5	0.2%	188	8%	1	0%	121	5%	133	6%
Qtr 1, 2005	2,211	2,041	92%	0	0.0%	170	8%	1	0%	65	3%	164	7%
Qtr 2, 2005	2,302	2,037	88%	2	0.1%	263	11%	1	0%	86	4%	85	4%
Qtr 3, 2005	2,282	2,104	92%	2	0.1%	176	8%	1	0%	103	4%	92	4%
Qtr 4, 2005	2,192	2,044	93%	3	0.1%	145	7%	2	0%	104	5%	129	6%
Qtr 1, 2006	2,138	1,987	93%	3	0.1%	148	7%	1	0%	53	2%	148	7%
Qtr 2, 2006	2,137	1,984	93%	2	0.1%	151	7%	2	0%	76	4%	74	3%
Qtr 3, 2006	2,271	1,972	87%	1	0.0%	298	13%	1	0%	83	4%	80	4%
Qtr 4, 2006	2,055	2,032	99%	2	0.1%	21	1%	1	0%	85	4%	151	7%
Qtr 1, 2007	1,993	1,923	96%	1	0.1%	69	3%	2	0%	50	2%	79	4%
Qtr 2, 2007	2,232	1,893	85%	0	0.0%	339	15%	5	0%	53	3%	42	2%
Qtr 3, 2007	2,230	2,078	93%	1	0.0%	151	7%	1	0%	63	3%	89	4%
Qtr 4, 2007	2,179	2,044	94%	0	0.0%	135	6%	0	0%	88	4%	98	4%

Table 3

Workforce Flows in the Marinas/Boat Yards Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer		New Entrants		Different Employer		Different Employer		Exit		
	w/in sub-cluster	w/in sub-cluster	w/in Cluster	not in Cluster			UI Registry						
Total	#	%	#	%	#	%	#	%	#	%	#	%	
Qtr 1, 2000	1,436												
Qtr 2, 2000	1,809	1,287	71%	5	0.3%	517	29%	7	0%	37	3%	100	7%
Qtr 3, 2000	1,797	1,526	85%	12	0.7%	259	14%	10	1%	80	4%	181	10%
Qtr 4, 2000	1,651	1,400	85%	6	0.4%	245	15%	8	0%	91	5%	292	16%
Qtr 1, 2001	1,529	1,339	88%	5	0.3%	185	12%	14	1%	48	3%	245	15%
Qtr 2, 2001	1,863	1,373	74%	3	0.2%	487	26%	11	1%	47	3%	95	6%
Qtr 3, 2001	1,925	1,657	86%	4	0.2%	264	14%	12	1%	66	4%	124	7%
Qtr 4, 2001	1,713	1,551	91%	7	0.4%	155	9%	11	1%	85	4%	271	14%
Qtr 1, 2002	1,606	1,394	87%	6	0.4%	206	13%	7	0%	75	4%	231	13%
Qtr 2, 2002	1,936	1,440	74%	2	0.1%	494	26%	18	1%	46	3%	100	6%
Qtr 3, 2002	1,941	1,694	87%	6	0.3%	241	12%	7	0%	57	3%	172	9%
Qtr 4, 2002	1,768	1,561	88%	2	0.1%	205	12%	8	0%	70	4%	300	15%
Qtr 1, 2003	1,405	1,245	89%	5	0.4%	155	11%	7	0%	33	2%	478	27%
Qtr 2, 2003	1,616	1,238	77%	4	0.2%	374	23%	4	0%	33	2%	126	9%
Qtr 3, 2003	1,603	1,394	87%	1	0.1%	208	13%	8	0%	80	5%	133	8%
Qtr 4, 2003	1,400	1,304	93%	3	0.2%	93	7%	11	1%	60	4%	225	14%
Qtr 1, 2004	1,606	1,199	75%	1	0.1%	406	25%	6	0%	37	3%	157	11%
Qtr 2, 2004	1,977	1,428	72%	7	0.4%	542	27%	5	0%	31	2%	135	8%
Qtr 3, 2004	1,952	1,743	89%	10	0.5%	199	10%	12	1%	64	3%	148	7%
Qtr 4, 2004	1,694	1,550	91%	4	0.2%	140	8%	13	1%	94	5%	291	15%
Qtr 1, 2005	1,444	1,320	91%	2	0.1%	122	8%	8	1%	54	3%	310	18%
Qtr 2, 2005	1,933	1,310	68%	8	0.4%	615	32%	6	0%	25	2%	95	7%
Qtr 3, 2005	1,956	1,722	88%	7	0.4%	227	12%	7	0%	62	3%	135	7%
Qtr 4, 2005	1,689	1,540	91%	11	0.7%	138	8%	10	1%	81	4%	314	16%
Qtr 1, 2006	1,382	1,245	90%	6	0.4%	131	9%	2	0%	53	3%	383	23%
Qtr 2, 2006	1,718	1,276	74%	6	0.3%	436	25%	5	0%	30	2%	65	5%
Qtr 3, 2006	1,914	1,500	78%	10	0.5%	404	21%	7	0%	57	3%	144	8%
Qtr 4, 2006	1,608	1,519	94%	3	0.2%	86	5%	16	1%	80	4%	296	15%
Qtr 1, 2007	1,354	1,274	94%	5	0.4%	75	6%	13	1%	51	3%	265	16%
Qtr 2, 2007	1,826	1,259	69%	2	0.1%	565	31%	8	0%	27	2%	58	4%
Qtr 3, 2007	2,230	1,635	73%	7	0.3%	588	26%	10	0%	48	3%	126	7%
Qtr 4, 2007	1,632	1,510	93%	9	0.6%	113	7%	11	1%	454	20%	246	11%

Table 4

Workforce Flows in the Marine Electronics & Engines Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer		New Entrants			Different Employer		Different Employer		Exit	
	Total	#	%	#	%	#	%	#	%	#	%	#	%
Qtr 1, 2000	550												
Qtr 2, 2000	563	521	93%	0	0.0%	42	7%	0	0%	17	3%	12	2%
Qtr 3, 2000	543	512	94%	0	0.0%	31	6%	1	0%	21	4%	29	5%
Qtr 4, 2000	527	497	94%	0	0.0%	30	6%	0	0%	17	3%	29	5%
Qtr 1, 2001	485	471	97%	0	0.0%	14	3%	0	0%	18	3%	38	7%
Qtr 2, 2001	491	444	90%	0	0.0%	47	10%	0	0%	20	4%	21	4%
Qtr 3, 2001	483	457	95%	0	0.0%	26	5%	1	0%	9	2%	24	5%
Qtr 4, 2001	461	448	97%	0	0.0%	13	3%	0	0%	13	3%	22	5%
Qtr 1, 2002	440	426	97%	0	0.0%	14	3%	0	0%	8	2%	27	6%
Qtr 2, 2002	471	418	89%	0	0.0%	53	11%	0	0%	8	2%	14	3%
Qtr 3, 2002	465	437	94%	0	0.0%	28	6%	0	0%	12	3%	22	5%
Qtr 4, 2002	421	417	99%	0	0.0%	4	1%	0	0%	14	3%	34	7%
Qtr 1, 2003	365	355	97%	0	0.0%	10	3%	0	0%	11	3%	55	13%
Qtr 2, 2003	384	343	89%	0	0.0%	41	11%	0	0%	10	3%	12	3%
Qtr 3, 2003	377	356	94%	0	0.0%	21	6%	0	0%	12	3%	16	4%
Qtr 4, 2003	343	343	100%	0	0.0%	0	0%	0	0%	8	2%	26	7%
Qtr 1, 2004	352	316	90%	0	0.0%	36	10%	0	0%	11	3%	16	5%
Qtr 2, 2004	409	331	81%	0	0.0%	78	19%	1	0%	10	3%	10	3%
Qtr 3, 2004	420	378	90%	0	0.0%	42	10%	0	0%	19	5%	12	3%
Qtr 4, 2004	381	369	97%	0	0.0%	12	3%	1	0%	17	4%	33	8%
Qtr 1, 2005	332	328	99%	0	0.0%	4	1%	2	1%	16	4%	35	9%
Qtr 2, 2005	341	298	87%	0	0.0%	43	13%	0	0%	18	5%	16	5%
Qtr 3, 2005	321	302	94%	0	0.0%	19	6%	0	0%	11	3%	28	8%
Qtr 4, 2005	301	286	95%	0	0.0%	15	5%	1	0%	11	3%	23	7%
Qtr 1, 2006	254	241	95%	0	0.0%	13	5%	1	0%	12	4%	47	16%
Qtr 2, 2006	295	244	83%	0	0.0%	51	17%	1	0%	5	2%	4	2%
Qtr 3, 2006	305	267	88%	0	0.0%	38	12%	0	0%	22	7%	6	2%
Qtr 4, 2006	267	262	98%	0	0.0%	5	2%	3	1%	16	5%	24	8%
Qtr 1, 2007	239	237	99%	0	0.0%	2	1%	2	1%	9	3%	19	7%
Qtr 2, 2007	289	229	79%	0	0.0%	60	21%	2	1%	2	1%	6	3%
Qtr 3, 2007	307	278	91%	0	0.0%	29	9%	0	0%	4	1%	7	2%
Qtr 4, 2007	272	263	97%	0	0.0%	9	3%	0	0%	14	5%	30	10%

Table 5

Workforce Flows in the Marine Infrastructure and Construction Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer			New Entrants		Different Employer		Different Employer		Exit	
	w/in sub-cluster		w/in sub-cluster					w/in Cluster		not in Cluster		UI Registry	
	Total	#	%	#	%	#	%	#	%	#	%	#	%
Qtr 1, 2000	1,467												
Qtr 2, 2000	1,695	1,362	80%	0	0.0%	333	20%	3	0%	33	2%	69	5%
Qtr 3, 2000	1,557	1,453	93%	0	0.0%	104	7%	0	0%	83	5%	159	9%
Qtr 4, 2000	1,423	1,358	95%	0	0.0%	65	5%	0	0%	64	4%	135	9%
Qtr 1, 2001	1,561	1,282	82%	0	0.0%	279	18%	2	0%	32	2%	107	8%
Qtr 2, 2001	1,632	1,426	87%	0	0.0%	206	13%	4	0%	64	4%	67	4%
Qtr 3, 2001	1,438	1,322	92%	0	0.0%	116	8%	0	0%	69	4%	241	15%
Qtr 4, 2001	1,465	1,266	86%	0	0.0%	199	14%	2	0%	65	5%	105	7%
Qtr 1, 2002	1,090	1,010	93%	1	0.1%	79	7%	1	0%	163	11%	290	20%
Qtr 2, 2002	1,325	967	73%	0	0.0%	358	27%	0	0%	54	5%	69	6%
Qtr 3, 2002	1,516	1,198	79%	2	0.1%	316	21%	2	0%	57	4%	66	5%
Qtr 4, 2002	1,556	1,385	89%	0	0.0%	171	11%	0	0%	51	3%	80	5%
Qtr 1, 2003	1,313	1,201	91%	1	0.1%	111	8%	2	0%	55	4%	297	19%
Qtr 2, 2003	1,474	1,196	81%	0	0.0%	278	19%	0	0%	42	3%	75	6%
Qtr 3, 2003	1,473	1,313	89%	0	0.0%	160	11%	0	0%	70	5%	91	6%
Qtr 4, 2003	1,302	1,271	98%	0	0.0%	31	2%	1	0%	46	3%	155	11%
Qtr 1, 2004	1,431	1,180	82%	0	0.0%	251	18%	0	0%	35	3%	87	7%
Qtr 2, 2004	1,334	1,232	92%	0	0.0%	102	8%	3	0%	105	7%	91	6%
Qtr 3, 2004	1,201	1,131	94%	0	0.0%	70	6%	0	0%	67	5%	136	10%
Qtr 4, 2004	1,195	1,063	89%	2	0.2%	130	11%	1	0%	39	3%	96	8%
Qtr 1, 2005	1,113	1,034	93%	0	0.0%	79	7%	0	0%	35	3%	126	11%
Qtr 2, 2005	1,148	991	86%	1	0.1%	156	14%	1	0%	43	4%	77	7%
Qtr 3, 2005	1,198	1,008	84%	0	0.0%	190	16%	0	0%	32	3%	108	9%
Qtr 4, 2005	1,117	1,000	90%	1	0.1%	116	10%	3	0%	33	3%	161	13%
Qtr 1, 2006	1,140	960	84%	0	0.0%	180	16%	0	0%	20	2%	137	12%
Qtr 2, 2006	1,208	1,007	83%	2	0.2%	199	16%	1	0%	30	3%	100	9%
Qtr 3, 2006	1,211	1,053	87%	1	0.1%	157	13%	0	0%	66	5%	88	7%
Qtr 4, 2006	1,122	1,072	96%	1	0.1%	49	4%	1	0%	51	4%	86	7%
Qtr 1, 2007	1,086	1,025	94%	0	0.0%	61	6%	0	0%	31	3%	66	6%
Qtr 2, 2007	1,355	1,035	76%	0	0.0%	320	24%	0	0%	22	2%	29	3%
Qtr 3, 2007	1,372	1,213	88%	0	0.0%	159	12%	1	0%	46	3%	95	7%
Qtr 4, 2007	1,388	1,221	88%	2	0.1%	165	12%	1	0%	68	5%	80	6%

Table 6

Workforce Flows in the Professional and Technical Services Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer			New Entrants		Different Employer		Different Employer		Exit	
	w/in sub-cluster		w/in sub-cluster				w/in Cluster		not in Cluster		UI Registry		
	Total	#	%	#	%	#	%	#	%	#	%	#	%
Qtr 1, 2000	152												
Qtr 2, 2000	213	139	65%	0	0.0%	74	35%	1	0%	5	3%	7	5%
Qtr 3, 2000	253	146	58%	1	0.4%	106	42%	0	0%	59	28%	7	3%
Qtr 4, 2000	179	142	79%	0	0.0%	37	21%	0	0%	91	36%	20	8%
Qtr 1, 2001	136	146	107%	0	0.0%	-10	-7%	1	1%	19	11%	13	7%
Qtr 2, 2001	219	144	66%	1	0.5%	74	34%	0	0%	-21	-15%	12	9%
Qtr 3, 2001	262	151	58%	0	0.0%	111	42%	0	0%	59	27%	9	4%
Qtr 4, 2001	185	137	74%	0	0.0%	48	26%	0	0%	112	43%	13	5%
Qtr 1, 2002	152	141	93%	0	0.0%	11	7%	0	0%	33	18%	11	6%
Qtr 2, 2002	235	150	64%	0	0.0%	85	36%	1	0%	-6	-4%	7	5%
Qtr 3, 2002	285	152	53%	1	0.4%	132	46%	0	0%	73	31%	9	4%
Qtr 4, 2002	212	155	73%	0	0.0%	57	27%	0	0%	115	40%	15	5%
Qtr 1, 2003	151	133	88%	0	0.0%	18	12%	0	0%	44	21%	35	17%
Qtr 2, 2003	215	138	64%	0	0.0%	77	36%	0	0%	12	8%	1	1%
Qtr 3, 2003	234	147	63%	0	0.0%	87	37%	0	0%	62	29%	6	3%
Qtr 4, 2003	176	143	81%	0	0.0%	33	19%	0	0%	82	35%	9	4%
Qtr 1, 2004	172	137	80%	0	0.0%	35	20%	0	0%	33	19%	6	3%
Qtr 2, 2004	265	157	59%	0	0.0%	108	41%	0	0%	4	2%	11	6%
Qtr 3, 2004	293	167	57%	0	0.0%	126	43%	0	0%	92	35%	6	2%
Qtr 4, 2004	216	173	80%	0	0.0%	43	20%	0	0%	108	37%	12	4%
Qtr 1, 2005	179	153	85%	0	0.0%	26	15%	0	0%	35	16%	28	13%
Qtr 2, 2005	240	161	67%	0	0.0%	79	33%	0	0%	13	7%	5	3%
Qtr 3, 2005	329	183	56%	0	0.0%	146	44%	0	0%	49	20%	8	3%
Qtr 4, 2005	252	187	74%	0	0.0%	65	26%	1	0%	131	40%	10	3%
Qtr 1, 2006	164	174	106%	0	0.0%	-10	-6%	0	0%	46	18%	32	13%
Qtr 2, 2006	248	173	70%	0	0.0%	75	30%	0	0%	-17	-10%	8	5%
Qtr 3, 2006	327	199	61%	0	0.0%	128	39%	0	0%	37	15%	12	5%
Qtr 4, 2006	226	215	95%	0	0.0%	11	5%	0	0%	95	29%	17	5%
Qtr 1, 2007	166	202	122%	0	0.0%	-36	-22%	0	0%	12	5%	12	5%
Qtr 2, 2007	269	197	73%	0	0.0%	72	27%	0	0%	-37	-22%	6	4%
Qtr 3, 2007	304	217	71%	0	0.0%	87	29%	0	0%	26	10%	26	10%
Qtr 4, 2007	242	221	91%	0	0.0%	21	9%	0	0%	66	22%	17	6%

Table 7

Workforce Flows in the Retail and Wholesale Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer		New Entrants		Different Employer		Different Employer		Exit		
	w/in sub-cluster	w/in sub-cluster	w/in Cluster	not in Cluster			UI Registry						
Total	#	%	#	%	#	%	#	%	#	%	#	%	
Qtr 1, 2000	195												
Qtr 2, 2000	222	180	81%	0	0.0%	42	19%	0	0%	9	5%	6	3%
Qtr 3, 2000	228	198	87%	0	0.0%	30	13%	0	0%	11	5%	13	6%
Qtr 4, 2000	217	195	90%	0	0.0%	22	10%	1	0%	14	6%	18	8%
Qtr 1, 2001	205	189	92%	0	0.0%	16	8%	1	0%	8	4%	19	9%
Qtr 2, 2001	217	192	88%	0	0.0%	25	12%	0	0%	8	4%	5	2%
Qtr 3, 2001	204	193	95%	0	0.0%	11	5%	2	1%	16	7%	6	3%
Qtr 4, 2001	200	188	94%	0	0.0%	12	6%	0	0%	5	2%	11	5%
Qtr 1, 2002	191	178	93%	0	0.0%	13	7%	0	0%	7	4%	15	8%
Qtr 2, 2002	204	175	86%	0	0.0%	29	14%	0	0%	9	5%	7	4%
Qtr 3, 2002	201	188	94%	0	0.0%	13	6%	0	0%	8	4%	8	4%
Qtr 4, 2002	193	181	94%	0	0.0%	12	6%	0	0%	14	7%	6	3%
Qtr 1, 2003	174	154	89%	0	0.0%	20	11%	1	1%	2	1%	36	19%
Qtr 2, 2003	196	159	81%	0	0.0%	37	19%	2	1%	5	3%	8	5%
Qtr 3, 2003	196	179	91%	0	0.0%	17	9%	0	0%	8	4%	9	5%
Qtr 4, 2003	181	176	97%	0	0.0%	5	3%	1	1%	9	5%	10	5%
Qtr 1, 2004	200	158	79%	0	0.0%	42	21%	2	1%	6	3%	15	8%
Qtr 2, 2004	201	182	91%	0	0.0%	19	9%	0	0%	8	4%	10	5%
Qtr 3, 2004	198	181	91%	0	0.0%	17	9%	1	1%	12	6%	7	3%
Qtr 4, 2004	162	147	91%	-1	-0.6%	16	10%	1	1%	7	4%	44	22%
Qtr 1, 2005	197	146	74%	0	0.0%	51	26%	0	0%	10	6%	6	4%
Qtr 2, 2005	215	184	86%	0	0.0%	31	14%	2	1%	6	3%	5	3%
Qtr 3, 2005	204	191	94%	0	0.0%	13	6%	0	0%	8	4%	16	7%
Qtr 4, 2005	194	185	95%	0	0.0%	9	5%	0	0%	2	1%	17	8%
Qtr 1, 2006	189	172	91%	0	0.0%	17	9%	0	0%	5	3%	17	9%
Qtr 2, 2006	195	176	90%	0	0.0%	19	10%	2	1%	4	2%	7	4%
Qtr 3, 2006	209	182	87%	0	0.0%	27	13%	0	0%	7	4%	6	3%
Qtr 4, 2006	191	185	97%	0	0.0%	6	3%	0	0%	6	3%	18	9%
Qtr 1, 2007	182	173	95%	0	0.0%	9	5%	0	0%	7	4%	11	6%
Qtr 2, 2007	200	172	86%	0	0.0%	28	14%	1	1%	5	3%	4	2%
Qtr 3, 2007	200	187	94%	0	0.0%	13	7%	1	1%	4	2%	8	4%
Qtr 4, 2007	191	180	94%	0	0.0%	11	6%	0	0%	5	3%	15	8%

Table 8

Workforce Flows in the Sails, Rigging and Joinery Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer		New Entrants		Different Employer		Different Employer		Exit		
	Total	#	%	#	%	#	%	#	%	#	%	#	%
								prev qtr	prev qtr	prev qtr	prev qtr	prev qtr	prev qtr
Qtr 1, 2000	147												
Qtr 2, 2000	149	126	85%	1	0.7%	22	15%	0	0%	11	7%	9	6%
Qtr 3, 2000	152	125	82%	1	0.7%	26	17%	0	0%	13	9%	10	7%
Qtr 4, 2000	147	125	85%	1	0.7%	21	14%	1	1%	9	6%	16	11%
Qtr 1, 2001	154	125	81%	1	0.6%	28	18%	1	1%	2	1%	18	12%
Qtr 2, 2001	171	142	83%	1	0.6%	28	16%	0	0%	5	3%	6	4%
Qtr 3, 2001	168	147	88%	0	0.0%	21	13%	0	0%	12	7%	12	7%
Qtr 4, 2001	144	136	94%	1	0.7%	7	5%	1	1%	8	5%	22	13%
Qtr 1, 2002	172	127	74%	1	0.6%	44	26%	0	0%	5	3%	11	8%
Qtr 2, 2002	207	156	75%	0	0.0%	51	25%	2	1%	9	5%	5	3%
Qtr 3, 2002	208	187	90%	0	0.0%	21	10%	0	0%	8	4%	12	6%
Qtr 4, 2002	198	173	87%	0	0.0%	25	13%	0	0%	14	7%	21	10%
Qtr 1, 2003	179	159	89%	0	0.0%	20	11%	0	0%	4	2%	35	18%
Qtr 2, 2003	180	157	87%	0	0.0%	23	13%	2	1%	9	5%	11	6%
Qtr 3, 2003	183	163	89%	0	0.0%	20	11%	1	1%	8	4%	8	4%
Qtr 4, 2003	166	161	97%	0	0.0%	5	3%	0	0%	8	4%	14	8%
Qtr 1, 2004	219	154	70%	0	0.0%	65	30%	1	0%	2	1%	9	5%
Qtr 2, 2004	227	200	88%	0	0.0%	27	12%	1	0%	8	4%	10	5%
Qtr 3, 2004	234	207	88%	0	0.0%	27	12%	0	0%	7	3%	13	6%
Qtr 4, 2004	229	211	92%	1	0.4%	17	7%	0	0%	2	1%	20	9%
Qtr 1, 2005	174	154	89%	0	0.0%	20	11%	3	2%	5	2%	67	29%
Qtr 2, 2005	229	157	69%	0	0.0%	72	31%	0	0%	5	3%	12	7%
Qtr 3, 2005	227	209	92%	0	0.0%	18	8%	0	0%	9	4%	11	5%
Qtr 4, 2005	227	202	89%	0	0.0%	25	11%	0	0%	5	2%	20	9%
Qtr 1, 2006	216	190	88%	0	0.0%	26	12%	0	0%	11	5%	26	11%
Qtr 2, 2006	167	143	86%	0	0.0%	24	14%	0	0%	7	3%	66	31%
Qtr 3, 2006	226	142	63%	0	0.0%	84	37%	0	0%	10	6%	15	9%
Qtr 4, 2006	211	196	93%	0	0.0%	15	7%	0	0%	9	4%	21	9%
Qtr 1, 2007	182	178	98%	0	0.0%	4	2%	0	0%	7	3%	26	12%
Qtr 2, 2007	232	162	70%	0	0.0%	70	30%	3	1%	3	2%	14	8%
Qtr 3, 2007	245	197	80%	0	0.0%	48	20%	0	0%	18	8%	17	7%
Qtr 4, 2007	226	207	92%	1	0.4%	18	8%	0	0%	10	4%	27	11%

Table 9

Workforce Flows in the Servicing Dealership Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer			New Entrants		Different Employer		Different Employer		Exit	
	Total	#	%	#	%	#	%	#	%	#	%	#	%
								prev qtr	prev qtr	prev qtr	prev qtr	prev qtr	prev qtr
Qtr 1, 2000	475												
Qtr 2, 2000	564	415	74%	0	0.0%	149	26%	3	1%	30	6%	27	6%
Qtr 3, 2000	553	483	87%	1	0.2%	69	12%	6	1%	30	5%	44	8%
Qtr 4, 2000	480	421	88%	0	0.0%	59	12%	1	0%	43	8%	88	16%
Qtr 1, 2001	494	411	83%	1	0.2%	82	17%	0	0%	16	3%	52	11%
Qtr 2, 2001	589	431	73%	1	0.2%	157	27%	3	1%	19	4%	40	8%
Qtr 3, 2001	585	509	87%	0	0.0%	76	13%	1	0%	34	6%	45	8%
Qtr 4, 2001	550	495	90%	0	0.0%	55	10%	2	0%	26	4%	62	11%
Qtr 1, 2002	514	453	88%	1	0.2%	60	12%	3	1%	29	5%	64	12%
Qtr 2, 2002	647	457	71%	3	0.5%	187	29%	4	1%	21	4%	29	6%
Qtr 3, 2002	660	566	86%	1	0.2%	93	14%	3	0%	24	4%	53	8%
Qtr 4, 2002	587	541	92%	0	0.0%	46	8%	0	0%	35	5%	84	13%
Qtr 1, 2003	470	419	89%	2	0.4%	49	10%	2	0%	15	3%	149	25%
Qtr 2, 2003	555	434	78%	3	0.5%	118	21%	0	0%	16	3%	17	4%
Qtr 3, 2003	555	488	88%	3	0.5%	64	12%	2	0%	22	4%	40	7%
Qtr 4, 2003	471	456	97%	8	1.7%	7	1%	2	0%	35	6%	54	10%
Qtr 1, 2004	552	409	74%	4	0.7%	139	25%	4	1%	17	4%	37	8%
Qtr 2, 2004	644	490	76%	4	0.6%	150	23%	5	1%	21	4%	32	6%
Qtr 3, 2004	636	579	91%	1	0.2%	56	9%	2	0%	29	5%	33	5%
Qtr 4, 2004	591	525	89%	0	0.0%	66	11%	5	1%	16	3%	90	14%
Qtr 1, 2005	516	467	91%	1	0.2%	48	9%	4	1%	27	5%	92	16%
Qtr 2, 2005	632	480	76%	0	0.0%	152	24%	1	0%	14	3%	21	4%
Qtr 3, 2005	638	568	89%	0	0.0%	70	11%	3	0%	26	4%	35	6%
Qtr 4, 2005	567	530	93%	1	0.2%	36	6%	1	0%	26	4%	80	13%
Qtr 1, 2006	291	256	88%	1	0.3%	34	12%	1	0%	26	5%	283	50%
Qtr 2, 2006	569	259	46%	0	0.0%	310	54%	2	0%	16	5%	14	5%
Qtr 3, 2006	634	489	77%	5	0.8%	140	22%	6	1%	20	4%	49	9%
Qtr 4, 2006	544	508	93%	3	0.6%	33	6%	1	0%	30	5%	92	15%
Qtr 1, 2007	467	449	96%	1	0.2%	17	4%	3	1%	14	3%	77	14%
Qtr 2, 2007	629	434	69%	1	0.2%	194	31%	4	1%	12	3%	16	3%
Qtr 3, 2007	639	564	88%	1	0.2%	74	12%	0	0%	23	4%	41	7%
Qtr 4, 2007	570	530	93%	4	0.7%	36	6%	2	0%	19	3%	84	13%

Table 10

Workforce Flows in the Not Elsewhere Classified Subcluster, 2000 to 2007

	Entering (remaining in) the sub-cluster							Exiting the sub-cluster					
	Same Employer		Different Employer			New Entrants		Different Employer		Different Employer		Exit	
	w/in sub-cluster		w/in sub-cluster				w/in Cluster		not in Cluster		UI Registry		
	Total	#	%	#	%	#	%	#	%	#	%	#	%
Qtr 1, 2000	129												
Qtr 2, 2000	213	120	56%	0	0.0%	93	44%	1	1%	2	2%	6	5%
Qtr 3, 2000	253	185	73%	0	0.0%	68	27%	0	0%	8	4%	20	9%
Qtr 4, 2000	179	161	90%	0	0.0%	18	10%	1	0%	14	6%	77	30%
Qtr 1, 2001	136	124	91%	0	0.0%	12	9%	0	0%	13	7%	42	23%
Qtr 2, 2001	219	126	58%	0	0.0%	93	42%	0	0%	4	3%	6	4%
Qtr 3, 2001	262	204	78%	0	0.0%	58	22%	0	0%	8	4%	7	3%
Qtr 4, 2001	185	176	95%	0	0.0%	9	5%	1	0%	11	4%	74	28%
Qtr 1, 2002	152	133	88%	1	0.7%	18	12%	3	2%	8	4%	40	22%
Qtr 2, 2002	235	140	60%	0	0.0%	95	40%	1	1%	2	1%	9	6%
Qtr 3, 2002	285	213	75%	2	0.7%	70	25%	1	0%	6	3%	13	6%
Qtr 4, 2002	212	193	91%	0	0.0%	19	9%	1	0%	7	2%	84	29%
Qtr 1, 2003	151	134	89%	1	0.7%	16	11%	0	0%	5	2%	72	34%
Qtr 2, 2003	215	140	65%	0	0.0%	75	35%	0	0%	4	3%	7	5%
Qtr 3, 2003	234	191	82%	0	0.0%	43	18%	0	0%	6	3%	18	8%
Qtr 4, 2003	176	167	95%	0	0.0%	9	5%	0	0%	9	4%	58	25%
Qtr 1, 2004	172	135	78%	0	0.0%	37	22%	0	0%	4	2%	37	21%
Qtr 2, 2004	265	163	62%	0	0.0%	102	38%	1	1%	3	2%	5	3%
Qtr 3, 2004	293	243	83%	0	0.0%	50	17%	1	0%	9	3%	12	5%
Qtr 4, 2004	216	202	94%	2	0.9%	12	6%	1	0%	19	6%	69	24%
Qtr 1, 2005	179	158	88%	0	0.0%	21	12%	1	0%	7	3%	50	23%
Qtr 2, 2005	240	151	63%	1	0.4%	88	37%	0	0%	4	2%	23	13%
Qtr 3, 2005	329	223	68%	0	0.0%	106	32%	0	0%	8	3%	9	4%
Qtr 4, 2005	252	225	89%	1	0.4%	26	10%	1	0%	6	2%	96	29%
Qtr 1, 2006	164	158	96%	0	0.0%	6	4%	0	0%	9	4%	85	34%
Qtr 2, 2006	248	152	61%	2	0.8%	94	38%	1	1%	3	2%	6	4%
Qtr 3, 2006	327	217	66%	1	0.3%	109	33%	0	0%	9	4%	21	8%
Qtr 4, 2006	226	219	97%	1	0.4%	6	3%	1	0%	9	3%	97	30%
Qtr 1, 2007	166	155	93%	0	0.0%	11	7%	3	1%	11	5%	57	25%
Qtr 2, 2007	269	159	59%	0	0.0%	110	41%	0	0%	2	1%	5	3%
Qtr 3, 2007	304	247	81%	0	0.0%	57	19%	1	0%	5	2%	16	6%
Qtr 4, 2007	227	210	93%	2	0.9%	15	7%	1	0%	16	5%	75	25%