

# Portland Harbor Economic Assessment and Data Collection

Prepared for:  
City of Portland, Maine  
City of South Portland, Maine

July 2020



City of  
*South  
Portland*

**AECOM**



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Cover Photo: William Needelman

## Executive Summary

The Cities of Portland and South Portland (the Cities hereafter) developed around the Fore River, and the working waterfront is critical to the region's economy. To estimate its value, an economic assessment of the contribution of the Portland Harbor working waterfront was completed for the Cities. This report presents the result of the assessment.

The working waterfront remains an important contributor to the Cities' economy today. The study estimated that over a billion dollars of total economic output is related directly or indirectly to the Portland Harbor working waterfront via industrial marine, commercial fishing, recreational, and tourism activities. To put this in perspective, the combined Portland-South Portland region generates over \$21 billion dollars in economic output, meaning that the economy related to the working waterfront represents nearly 5 percent of the Cities' overall economic output. Moreover, the marine and non-marine sectors support over 9,000 jobs (approximately 7 percent of the Cities' total employment), about 400 businesses, and diversifies the economy.

The value of the working waterfront is evidenced by the commercial fisheries that rely on the harbor and as an increasingly popular place-based tourist destination. According to the Atlantic Coastal Cooperative Statistics Program, in 2018 the total commercial fishing landings in the Ports of Portland and South Portland amounted to over 48 million pounds, valued at over \$37 million. The data highlights the large number of fishermen (over 500) and dealers (90) who rely on Portland Harbor. In addition, Portland has seen a rapid increase in volume and capacity of cruise ship arrivals between 2015 and 2019, with 107 cruise ships landing in Portland with 158,000 passengers disembarking in 2019 with estimated spending of \$10.9 million.

The basic framework for the study follows the Economics: National Ocean Watch (ENOW) Ocean Economy Framework (NOAA)<sup>1</sup>. In addition, an input-output analysis was completed using the IMPLAN modeling software to measure the interdependencies between various sectors of the economy and the ripples through the economy. The results of the input-output analysis are categorized by labor income, value added, output, and employment. Labor income includes all forms of labor income, including wages, benefits, and proprietor income. Value added is the difference between an industry's total output and the cost of its intermediate inputs (in other words, an industry's contribution to Gross Domestic Product). Output is the value of industry output, measured in purchaser prices. Employment numbers are considered an annual average of employment and includes full-time, part-time, and seasonal employment (i.e., employment data should not be considered full-time equivalent). Results are further broken down into direct, indirect, and induced effects. The direct effects are the direct contribution of the businesses. The indirect effects are a result of supply chain linkages; when a ship building business buys supplies from a local marine hardware store, for example. Finally, induced effects are generated by employees of local industries spending income on consumption goods. The numbers represent a snapshot of the economic contribution of these industries to the combined Portland-South Portland region as they are today. Table 1 provides the results for the marine businesses (those businesses relying on a direct connection to the waterfront, such as repair, berthing, and seafood processing) in Portland and South Portland, whereas Table 2 provides the same results for the marine and non-marine businesses (those businesses benefiting indirectly from the waterfront, such as tourism and recreation-based businesses located within proximity to the Cities' working waterfronts). Since the

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<sup>1</sup> National Oceanic and Atmospheric Administration, The Economic Contribution of Working Waterfronts: Local Estimation and Case Studies.



study focused on the impacts to Portland and South Portland, the values in the tables would be larger if the impacts to neighboring communities or state were included.

Table 1: Marine Businesses Contributions

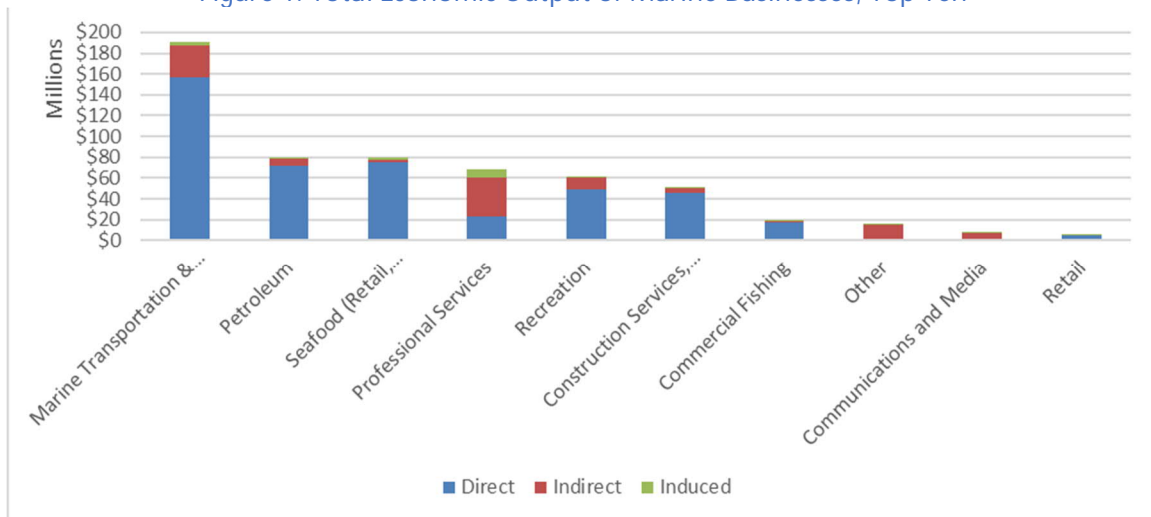
Impact	Labor Income	Value Added	Output	Employment
Direct	\$183,000,000	\$232,000,000	\$445,000,000	2,880
Indirect	\$41,000,000	\$64,000,000	\$129,000,000	760
Induced	\$9000,000	\$14,000,000	\$25,000,000	160
Total	\$233,000,000	\$310,000,000	\$599,000,000	3,800

Table 2: Combined Marine and Non-Marine Business Contributions

Impact	Labor Income	Value Added	Output	Employment
Direct	\$314,000,000	\$440,000,000	\$794,000,000	7,750
Indirect	\$64,000,000	\$102,000,000	\$204,000,000	1,190
Induced	\$14,000,000	\$23,000,000	\$42,000,000	260
Total	\$393,000,000	\$565,000,000	\$1,039,000,000	9,210

Figure 1 displays the total economic output of the direct, indirect, and induced impacts of the marine businesses for the top 10 industry categories.

Figure 1: Total Economic Output of Marine Businesses, Top Ten



This analysis highlights the economic importance of the working waterfront. Much of this economic activity depends on reliable, predictable, and timely access to the waterfront. Interviews and conversations with waterfront users suggest that without this access the cost of doing business in Portland Harbor would increase both monetarily (increased cost of fuel) and in terms of opportunity cost of time. Should vessels be forced to go to other locations because of a decreasing number of berths and slips or have to synchronize their deliveries with high tides (as is already occurring), the health of the marine-related economy may be jeopardized.

## Introduction

The Cities of Portland and South Portland (the Cities hereafter) developed around the Fore River, and the working waterfront is critical to the region's economy. While there are many factors that influence the success of the Cities' waterfront economy, it all begins with the access between sea and land afforded by the harbor's many piers and wharfs. As with all types of infrastructure, regular maintenance is required to keep marine assets operating at full capacity and efficiency; for wharves and piers, this includes dredging to preserve berthing capacity. Recognizing the fundamental importance of berthing capacity (places for vessels to moor or anchor, especially for loading and unloading), the Cities have developed a dredging plan to preserve and reclaim berthing capacity.

To support the dredging plan and to assist in valuing the harbor's contribution to the region's economy, an economic assessment was conducted to estimate the economic contribution of the working waterfront of Portland Harbor. This report summarizes the categories of businesses evaluated, focus areas for businesses, approach and data, and findings of the economic assessment of the contribution of the working waterfront on the Cities.



## Approach

The full economic contribution of the working waterfront is not limited to just the marine jobs reliant on the waterfront. Rather, it includes the non-marine jobs and associated indirect and induced employment and earnings supported by the working waterfront as spending ripples through the economies of Portland, South Portland, and Maine. To capture this range of impacts, a comprehensive approach was followed. The following describes the approach, businesses, and study areas used for the analyses.

## Framework

The basic framework provided in the Economics: National Ocean Watch (ENOW) Ocean Economy Framework (NOAA)<sup>2</sup> (referred to hereafter as ENOW Framework) was followed for the economic assessment. The ENOW Framework provides national-level guidance on assessing the contribution of a working waterfront and a consistent definition of businesses associated with the ocean economy. The ENOW Framework considers the following sectors to be part of the ocean economy:

- Living resources
- Marine construction
- Marine transportation
- Ship and boat building
- Offshore mineral resources
- Tourism and recreation

The ENOW Framework was used as a guide to categorize and classify the businesses that were analyzed through this study. The data collected for the businesses provides a snapshot of the employment and revenue associated with the marine and non-marine businesses in the Cities, indicating the direct impact that these businesses have on the Cities and the region. However, to understand the full contribution of these businesses, a regional input-output analysis was conducted. An input-out analysis is a type of applied economic analysis that tracks the interdependence among various producing and consuming industries of an economy. It measures the relationship between a given set of demands for final goods and services and the inputs required to satisfy those demands. Basically, an input-output analysis estimates the impact or ripple effect of a given economic activity or the contribution of an existing activity within a specific geographic area.

The input-out analysis was completed using the IMPLAN modeling software. IMPLAN measures the total direct, indirect, and induced effects in output, employment, and earnings produced by an industry. The direct effects consist of the output of the firms or industries that are being evaluated; indirect effects consist of the purchases that those firms make from other businesses. Both the direct and indirect output produce household income for their employees; a proportion of this income is re-spent on consumption goods, creating the induced effect. IMPLAN provides the contributions in terms of the dollar value of gross receipts (output), dollar value of wages and salaries (earnings), and number of jobs (employment).

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<sup>2</sup> National Oceanic and Atmospheric Administration, The Economic Contribution of Working Waterfronts: Local Estimation and Case Studies.

The employment and revenue data developed through the ENOW Framework was incorporated into IMPLAN to conduct the input-output analysis.

## Business Categories

While the working waterfront has long sustained businesses adjacent to the Fore River, the economic contribution of the Cities' working waterfront extends beyond the water's edge. The waterfront supports a maritime economy that is comprised of the sites or facilities providing the physical access to the sea (such as piers, wharves, and ramps), the near-shore and offshore complex of facilities and services needed to support commercial uses (such as bait and repair services), and other facilities and services connected to maritime activities through trade and commerce but that do not need to be located at the edge of the sea (such as many of Maine's shippers and consignees located elsewhere in the state). These marine dependent businesses have been categorized in the assessment as "marine businesses".

In addition to direct marine uses, tourism and recreation are also economically productive uses of waterfront development. The viability of tourism and recreation businesses is enhanced by place-based initiatives that capitalize on a local community's assets and pay homage to the region's character defining resources, which is notably the working waterfronts of Portland and South Portland. As a result, the economic assessment also captures the economic contributions of tourism and recreation-based businesses located within proximity to the Cities' working waterfronts. These non-marine dependent businesses have been categorized as "non-marine businesses".

The ENOW Framework was used as a guide to categorize marine and non-marine businesses. Of the ENOW sectors, industries within the tourism and recreation sector were categorized as non-marine businesses, while industries within all other sectors (living resources, marine construction, marine transportation, ship and boat building, and offshore mineral resources) were categorized as marine businesses. However, several industries under the tourism and recreation sector were considered to be more appropriately categorized as marine businesses in the context of this study (e.g. marinas, fishing charters, and boat dealers). For the analysis, the ENOW Framework was also used to develop 11 classifications of marine and non-marine businesses. Nine business classifications were developed for marine businesses while six business classifications were developed for non-marine businesses (Table 3).

Table 3: Summary of Business Classifications

Business Classification	Marine	Non-Marine
Commercial Fishing	√	
Construction Services, Including Shipbuilding	√	
Hotels		√
Marine Transportation & Port Services	√	
Other Retail	√	√
Petroleum	√	
Professional Services	√	√
Recreation Services	√	√
Restaurant/Bar/Brewery		√
Retail - Food & Beverage	√	√
Seafood Manufacturing & Wholesale	√	

Marine businesses classified as “Other Retail” include businesses such as boat, trailer, and marine supply dealers and sporting goods stores, while non-marine businesses classified as “Other Retail” include all other retail establishments that were captured in the working waterfront impact area. Marine businesses classified as “Professional Services” include marine-related architectural, engineering, and consulting services in addition to advocacy organizations that support the working waterfront, while non-marine businesses classified as “Professional Services” include promotional services and professional associations that are largely supported by the region’s tourism industry. Marine businesses classified as “Recreation Services” include businesses such as marinas and water-based organizations, while non-marine businesses classified as “Recreational Services” include land-based sight-seeing businesses. Marine businesses classified as “Retail – Food & Beverage” include fish and seafood markets, while non-marine businesses classified as “Retail – Food & Beverage” include all other food and beverage retail establishments that were captured in the working waterfront impact area.

## Study Focus Areas

The study focused on several areas to capture the impacts of the marine and non-marine businesses. The focus area for marine businesses consisted of the entire geographic area of the Cities. Conversely, the focus area for non-marine businesses was closer to the waters’ edge<sup>3</sup>. In Portland, the focus area for non-marine businesses consisted of the land area bounded by State Street to the west, Congress Street to the north, and the Eastern Promenade and Fore River to the east and south, respectively. The focus area for non-marine businesses in South Portland was bound by Broadway to the south, U.S. Route 1 to the west, and the Fore River to the north (Figure 2). The focus area also includes Peaks, Long, Great Diamond, Chebeague, and Cliff Islands.

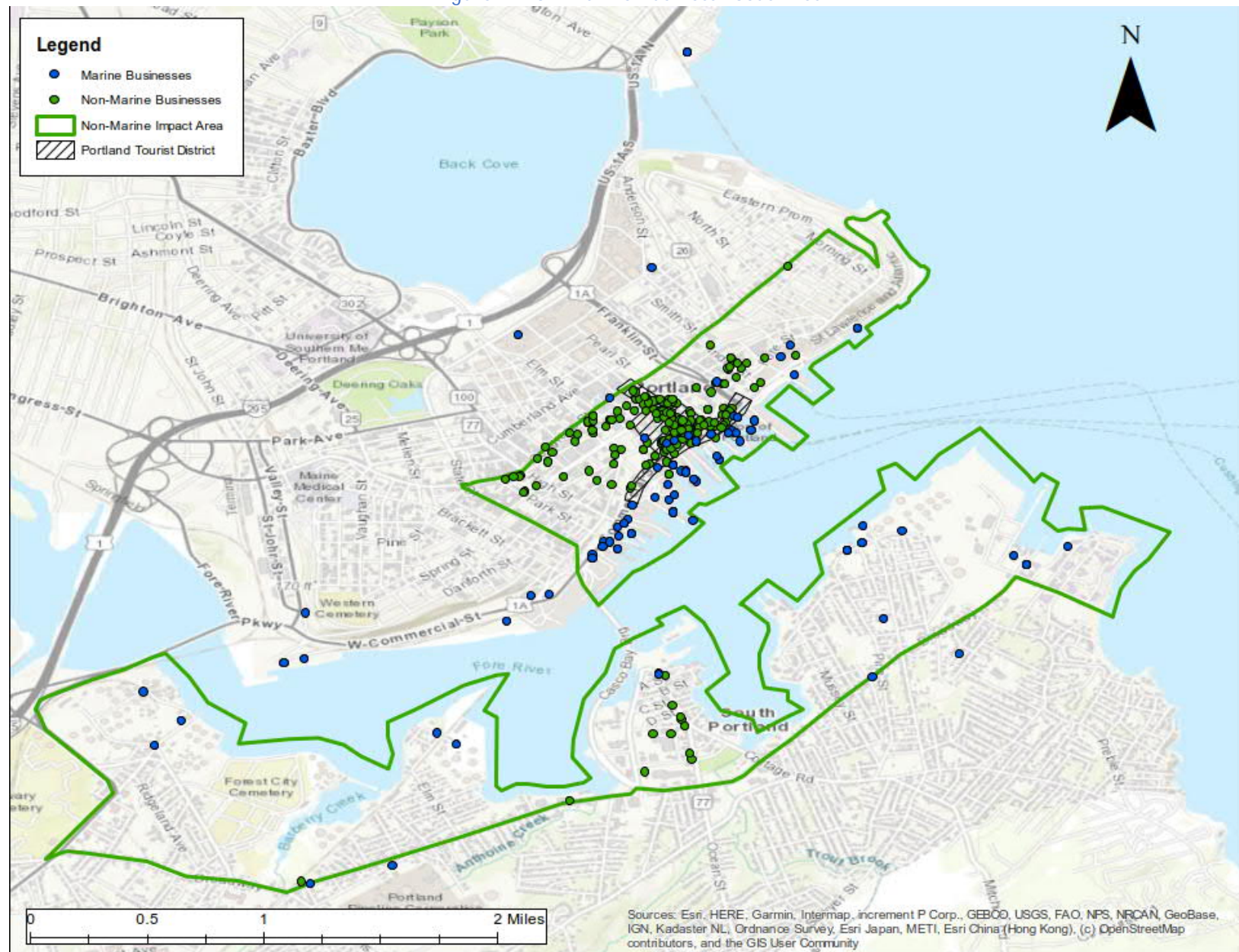
As previously described, tourism is enhanced by place-based businesses that capitalize on a local community’s assets, which include the Cities’ working waterfronts. To better capture this contribution, a tourist area was delineated<sup>4</sup> to capture shops in downtown Portland that are predominantly sustained by the tourists that visit the city. The selected businesses within the tourist area were included with the non-marine businesses.

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<sup>3</sup> The focus area and tourist area for non-marine businesses were delineated based on knowledge and understanding of Portland and South Portland. These areas may not align with other districts and zones that have been developed by the Cities. Therefore, the results of this study should not be used to infer impacts or compared to other districts and zones.



Figure 2: Non-Marine Business Focus Area



## Data

The economic assessment required data collection of marine and non-marine businesses that depend on or benefit from the Cities' working waterfront. The following sections describe the data used for the economic assessment.

### Business Data

The ENOW Framework identified third-party business data as an appropriate source for business related data. Initial data on employment and revenue for marine and non-marine businesses in their respective focus areas was obtained from the AtoZDatabases for Portland and South Portland. AtoZDatabases records include employment and revenue data as well as geographic coordinates of all businesses, allowing them to be georeferenced. AtoZDatabases records are categorized by North American Industry Classification System (NAICS) codes, which were used to categorize and classify the marine and non-marine businesses.

The sectors and NAICS codes identified in the ENOW Framework were used as a guide to identify, categorize, and classify marine and non-marine businesses from the AtoZDatabases. Data from the AtoZDatabases were queried to identify marine businesses located anywhere in either of the Cities, whereas only non-marine businesses located in the non-marine focus area (see Figure 1) were included in the analysis.

Due to the dependence of many businesses on tourists that visit Portland for its working waterfront, a special tourist area was delineated in downtown Portland, which includes portions of Commercial, Fore, Milk, Middle, Exchange, and Market Streets. All businesses in the tourist area were reviewed. Retail and service-based businesses that were considered to be dependent on tourism but were not captured under the ENOW Framework discussed above were added to the list of non-marine businesses.

AtoZDatabases did not provide any information for businesses located on the islands. Businesses located on the islands were reviewed and added to the database as appropriate using other data sources and/or estimates based on other similar businesses.

Several methods were used to validate the data from the AtoZDatabases: data were checked for outliers and reviewed internally by local Team members; Team members walked the Portland waterfront on multiple occasions to record businesses; Team members met with representatives of the Cities to walk through the waterfront or review the waterfront virtually; and data were reviewed by representatives of the Cities. During these reviews, adjustments were made to the data as appropriate.

### Survey Data

A survey was distributed to pier and marina owners within the Cities to supplement and validate the data from the AtoZDatabases. The survey asked owners for information regarding number of tenants/slips, estimated annual revenue, and number of employees. The surveys were distributed on March 25, 2020 to 16 owners. A second email was sent on April 3, 2020 by William Needelman (Portland Waterfront Coordinator) to remind owners to respond.

In April and May 2020, follow-up calls were made to owners and additional surveys were distributed. When an owner was reached during the follow-up calls, he or she was given the opportunity to complete the survey via phone. In all, 25 owners were contacted via email and/or phone. Information was received from 9 owners (see call-out box for impact of the Covid-19 global pandemic). Information provided by the owners is considered confidential; therefore, that data have not been included in this report.

Data from the surveys were compared to the data obtained from AtoZDatabases. Overall, the survey data were found to align well with data from the AtoZDatabases. However, there were some exceptions that could not be explained. The data obtained from the surveys were used to update the business information obtained from the AtoZDatabases.

#### Impact of Covid-19

Because of the Covid-19 global pandemic that coincided with this study, many of the planned meetings with pier and facility owners could not take place and it was often difficult for owners to respond to survey requests in a timely manner. In addition, restrictions during the pandemic limited interactions with representatives of the Cities. As a result, opportunities to refine the existing data and to obtain additional data were limited.

In addition to the pier and marina owners, representatives from the ferry services (managers representing operations from the Casco Bay Ferry Terminal and the commercial landing at East End Beach) were interviewed. The representatives provided insight into their operations and how their operations were impacted by sedimentation.

### Other Data

Other data sources were reviewed and included in the analysis as appropriate. These data sources include:

- 2018 data on commercial landings in the Ports of Portland and South Portland, provided by the Atlantic Coastal Cooperative Statistics Program Fisheries Data by Ports
- 2015-2019 cruise ship data
- Survey of Cruise Visitors to Maine, Behavior, Attitudes, and Spending of Passengers and Crew (2019)
- Data included within IMPLAN, including the total value of the Commercial Fishing industry in the study area

A literature review was also conducted to identify the contribution of working waterfronts on tourism, contribution of working waterfronts on property values, and to identify other studies that valued the economic contribution of working waterfronts.

## Analyses

A total of 398 businesses with 64 unique NAICS codes were categorized and classified during the data collection process. The follow sections summarize the analyses that were conducted for the marine and non-marine businesses and the input-output analysis.

### Marine Business Analysis

Commercial fishing is an important component of the marine businesses associated with Portland Harbor. According to the Atlantic Coastal Cooperative Statistics Program, in 2018 the total commercial fishing landings in the Ports of Portland and South Portland amounted to over 48 million pounds, valued at over \$37 million (Table 4). The data highlights the large number of fishermen (over 500) and dealers (90) who rely on Portland Harbor. Also of interest is the high number of vessels and trips counts (360 and 13,400, respectively), indicating that the port is used by a number of small-sized vessels who take short duration trips (as opposed to larger vessels that take multi-day or week trips).

Table 4: Commercial Landing Summaries for Portland and South Portland

Port	Pounds	Value	Fishing Contributors	Dealer Contributors	Vessel Contributors	Trip Count
Portland	46,436,000	\$36,703,000	500	80	330	13,200
South Portland	1,925,000	\$637,000	40	10	30	200
Total	48,361,000	\$37,340,000				13,400

Source: Atlantic Coastal Cooperative Statistics Program Fisheries Data by Ports

Table 5 provides the breakdown of 2017-2019 top 10 commercial landings by species for Portland Harbor. The data highlight that while herring accounts over 70 percent of the total poundage of commercial landings, lobster accounts for almost half of the total value. Also, of interest is the high number of fishermen, vessels, and trips counts that are involved with harvesting lobster, indicating its importance in the region.

Table 5: Commercial Landing of Species for Portland and South Portland

Common Name	% Total Poundage	% Total Dollars	Known Dealers	Known Fishermen	Known Vessels	Trip Count
Lobster, American	8%	49%	26	294	308	27,832
Herring, Atlantic	72%	26%	44	27	16	1,098
Eel, American	0%	4%	12	281	0	1,887
Pollock	2%	3%	4	36	42	1,311
Tuna, Bluefin	0%	3%	7	120	117	1,149
Flounder, American Plaice	1%	2%	4	25	31	1,038
Goosefish	3%	2%	9	29	40	1,729
Menhaden	7%	2%	12	21	22	192
Haddock	1%	2%	6	38	45	1,232
Hake, White	1%	2%	3	25	31	1,483

Source: Atlantic Coastal Cooperative Statistics Program Fisheries Data by Ports



Commercial fishing directly supports many of the marine businesses related to the working waterfront. The study identified 120 marine businesses (not including individual commercial fishing vessels) in Portland and South Portland. These 120 marine businesses have over a billion dollars in annual revenue and provide employment for approximately 2,270 workers. Commercial fishing adds another \$17 million in revenue and 570 jobs. As can be seen in Table 6, while the petroleum category accounts for a significant portion of the business revenue, the marine transportation & port services category accounts for much of the employment. This indicates the importance of each of these business categories to the region.

Table 6: Marine Businesses by Industry Category

Category	Revenue	Employment
Commercial Fishing <sup>1</sup>	\$17,000,000	570
Construction Services, incl. Shipbuilding	\$59,000,000	100
Hotels	N/A	N/A
Marine Transportation & Port Services	\$167,000,000	610
Other Retail	\$49,000,000	230
Petroleum	\$365,000,000	120
Professional Services	\$22,000,000	240
Recreation Services	\$84,000,000	420
Restaurant/Bar/Brewery	N/A	N/A
Retail - Food & Beverage <sup>2</sup>	\$93,000,000	340
Seafood Manufacturing & Wholesale	\$162,000,000	210
Total	\$1,017,000,000	2,840

Source: AECOM analysis of AtoZDatabases information

N/A – industry category was not included with marine businesses

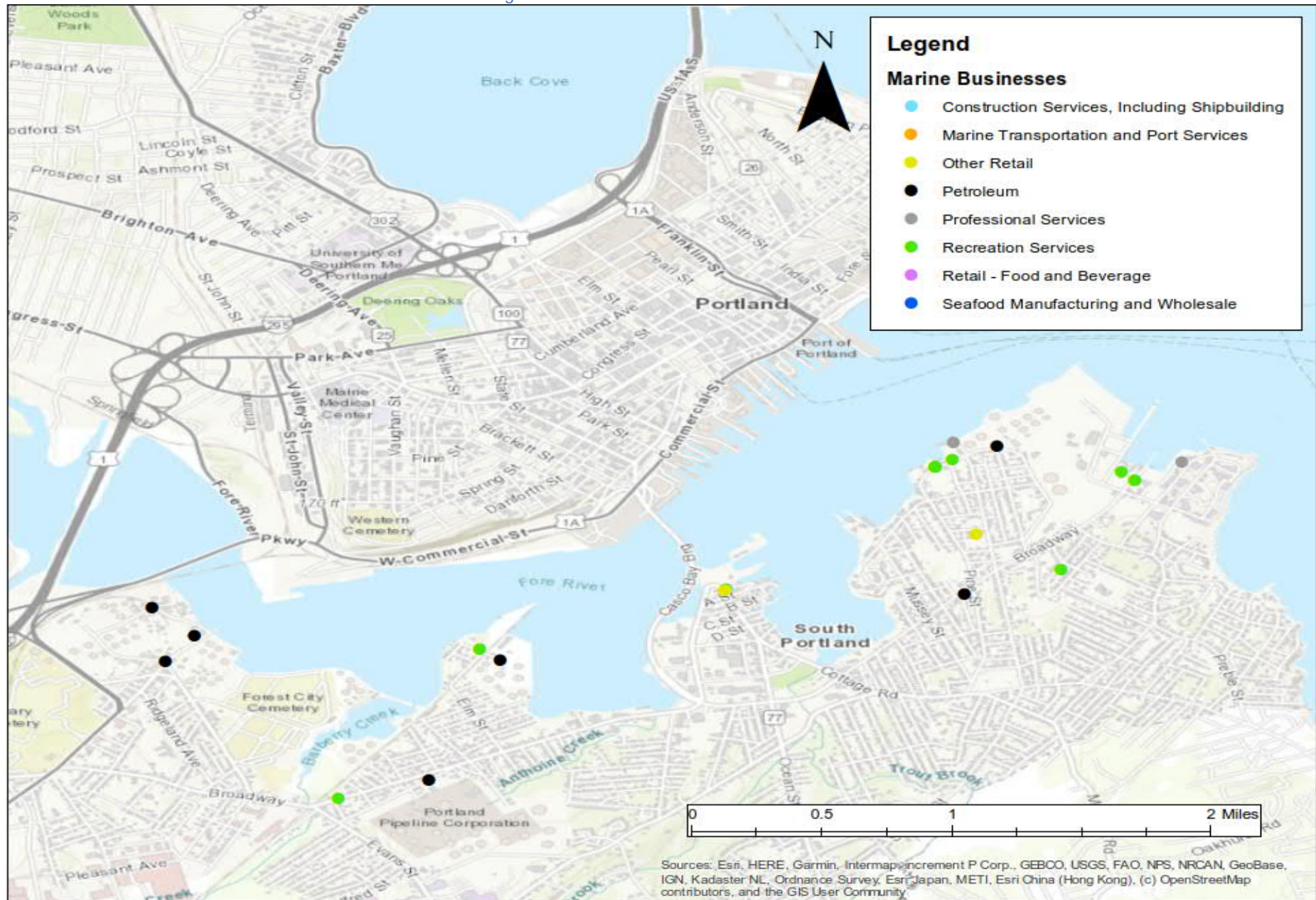
<sup>1</sup> Revenue and employment data for commercial fishing was from Bureau of Labor Statistics and Bureau of Economic Analysis, as reported to IMPLAN

<sup>2</sup> Seafood retail accounted for all the Retail – Food & Beverage category for marine businesses

Figure 3 shows the identified marine businesses in downtown Portland and Figure 4 shows the marine business in South Portland.



Figure 4: Marine Businesses in South Portland





Distribution of marine businesses revenue by category in the Cities is displayed in Figure 5 and employment is displayed in Figure 6.

Figure 5: Distribution of Revenue for Marine Businesses

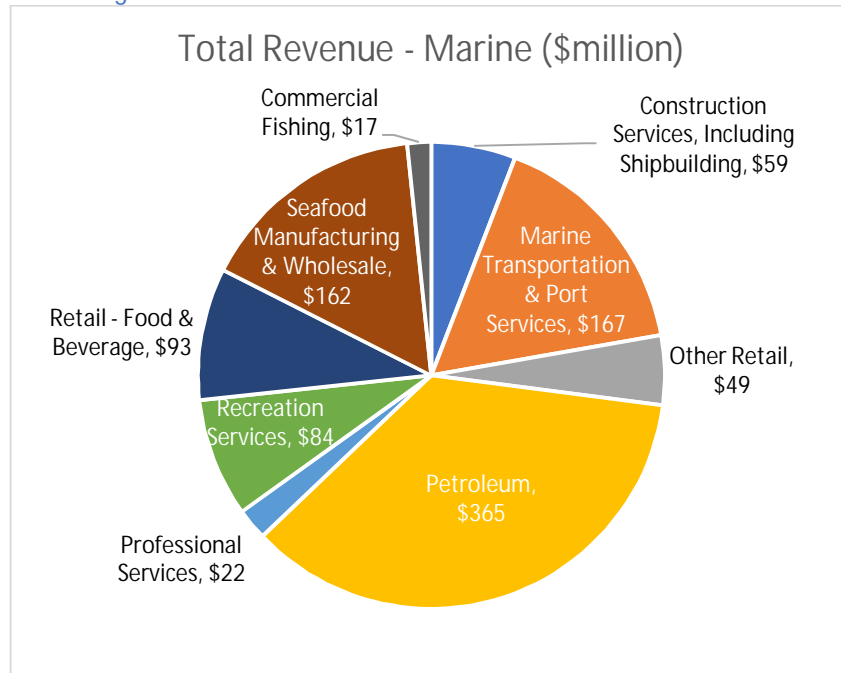
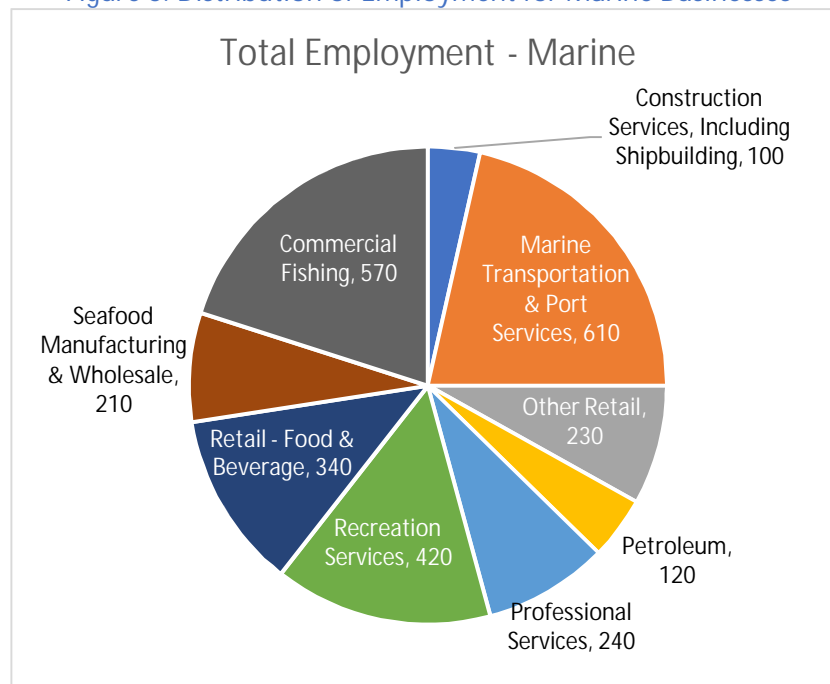


Figure 6: Distribution of Employment for Marine Businesses





## Non-Marine Business Analysis

The Cities' working waterfront supports a host of non-marine businesses. The study identified 278 non-marine businesses in Portland and South Portland (Figure 7 and Figure 8, respectfully). The non-marine businesses have a combined annual revenue of almost \$400 million and provide employment for about 5,000 workers. Table 7 summarizes the economic contributions of non-marine businesses by industry category. While non-marine businesses generate less than half of the revenue as marine businesses, they employ more than double the number of people. Distribution of non-marine businesses revenue in the Cities is displayed in Figure 9 and employment is displayed in Figure 10.

Table 7: Non-Marine Businesses by Industry Category

Category	Revenue	Employment
Commercial Fishing	N/A	N/A
Construction Services, incl. Shipbuilding	N/A	N/A
Hotels	\$84,000,000	780
Marine Transportation & Port Services	N/A	N/A
Other Retail	\$95,000,000	580
Petroleum	N/A	N/A
Professional Services	\$1,000,000	20
Recreation Services	\$3,000,000	30
Restaurant/Bar/Brewery	\$201,000,000	3,440
Retail - Food & Beverage	\$10,000,000	50
Seafood Manufacturing & Wholesale	N/A	N/A
Total	\$394,000,000	4,900

Source: AECOM analysis of AtoZDatabases information.

N/A – industry category was not included with non-marine businesses.

The large percentage of revenue and employment in the Restaurant/Bar/Brewery category indicates the waterfront's importance to tourism. This importance includes the cruise ship industry, which has grown significantly in the last five years in both the number of ships visiting the region and the size of the ships (see call-out box).

Figure 7: Non-Marine Businesses in Portland

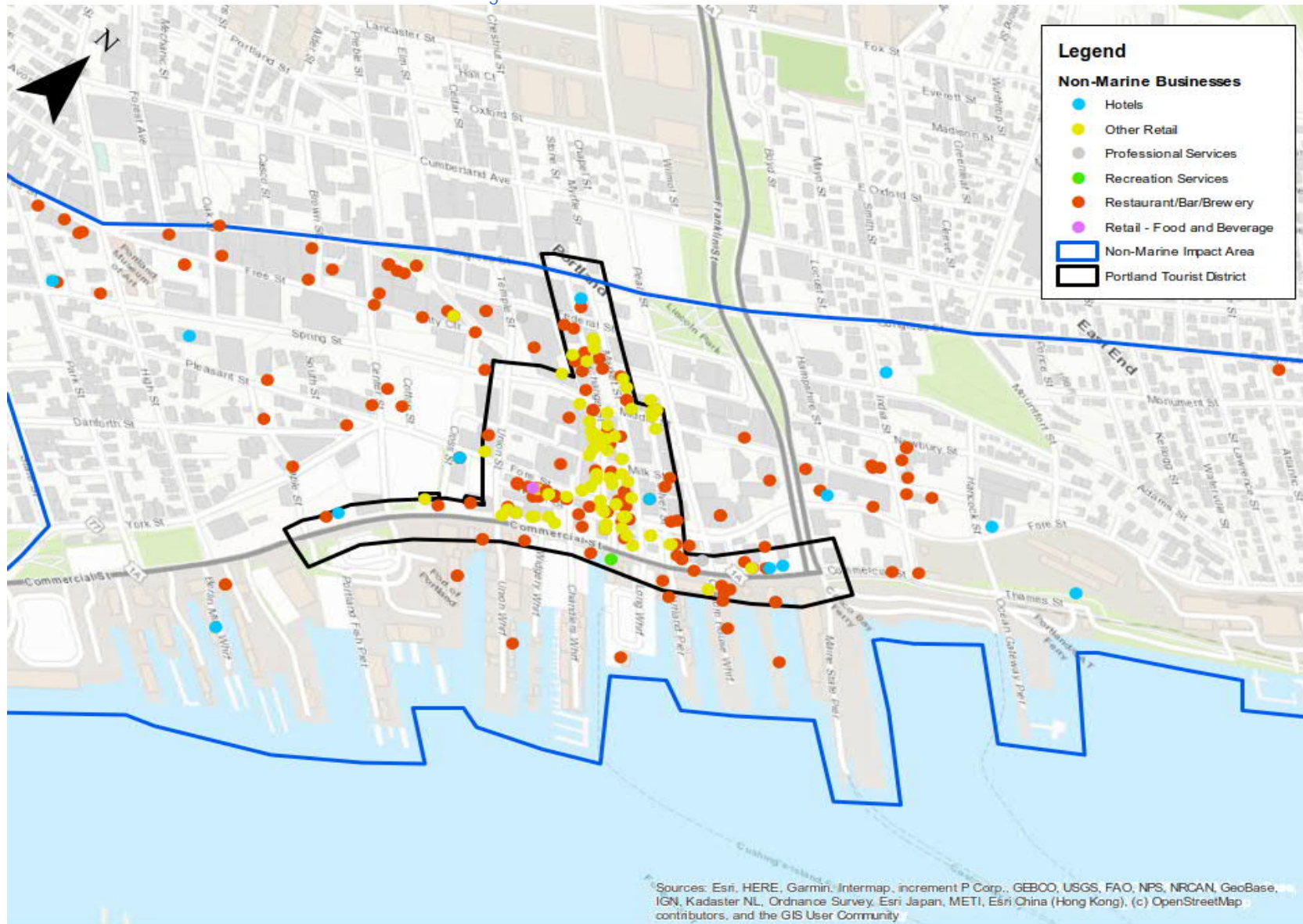


Figure 8: Non-Marine Businesses South Portland

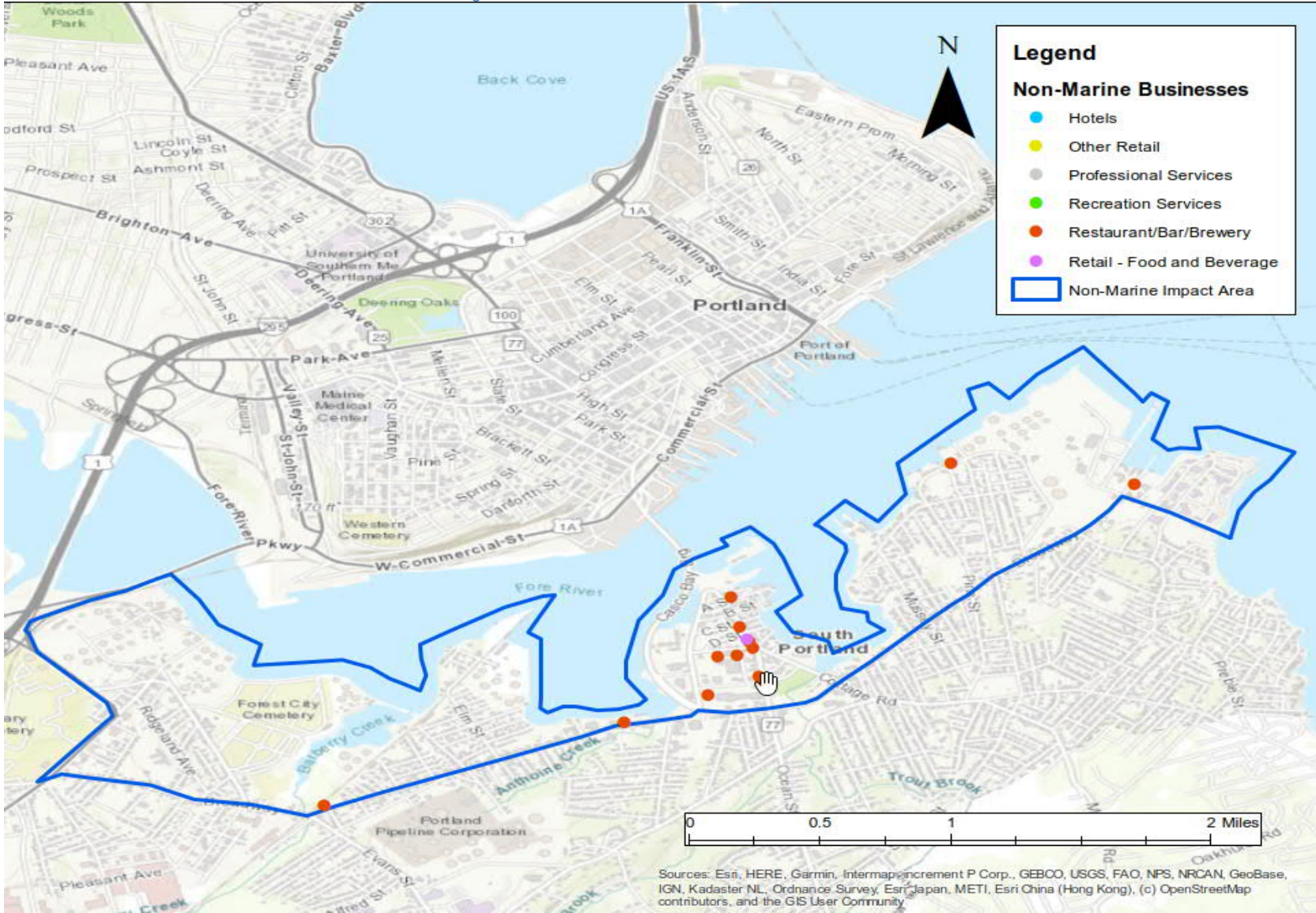


Figure 9: Distribution of Revenue for Non-Marine Businesses

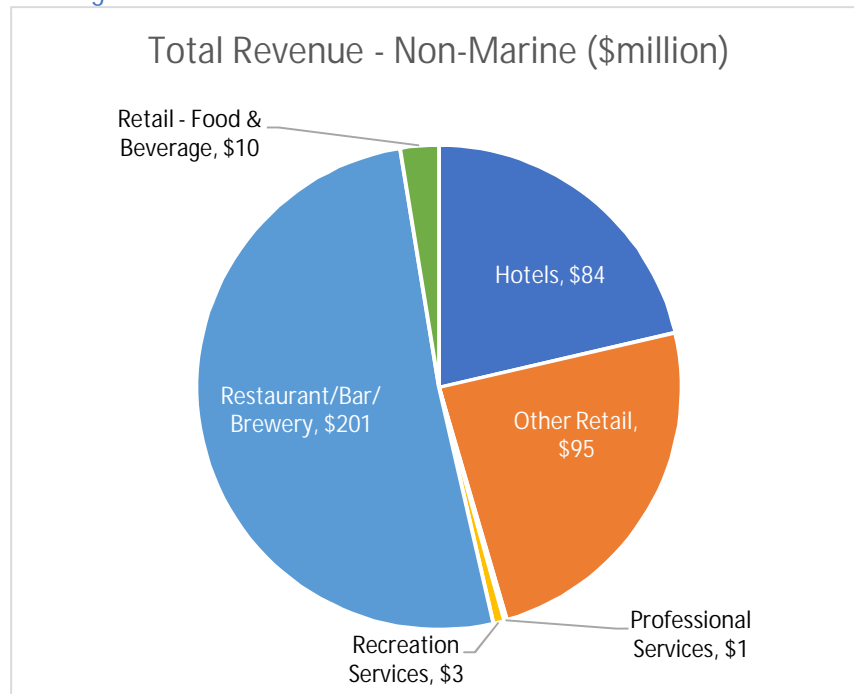
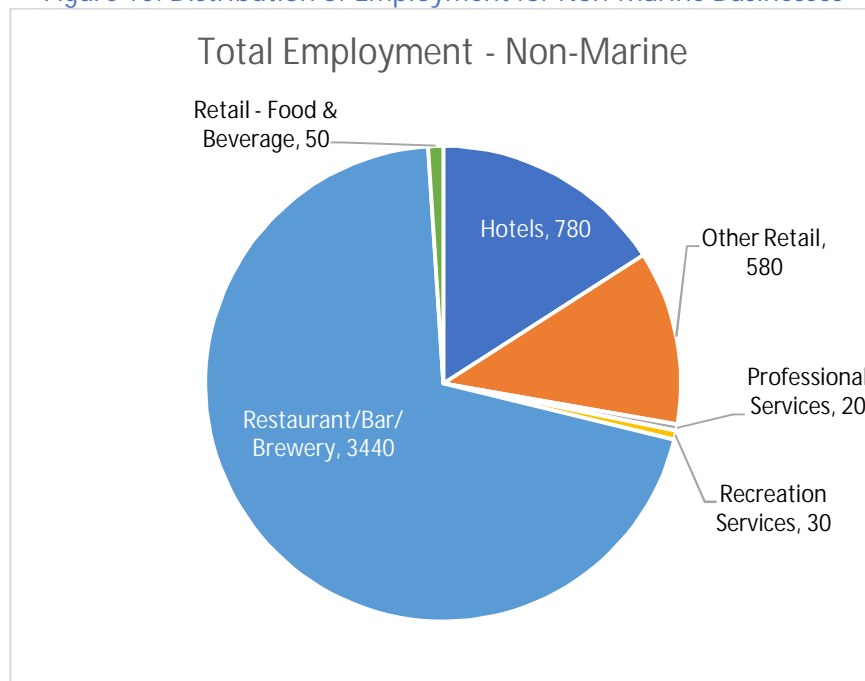


Figure 10: Distribution of Employment for Non-Marine Businesses





## CRUISE SHIPS

Portland has become an increasingly popular tourist destination, as shown by the rapid increase in volume and capacity of cruise ship arrivals between 2015 and 2019. 107 cruise ships landed in Portland and 158,000 passengers disembarked in 2019, compared to 83 cruise ships and 94,000 passengers in 2015. During that time the average number of passengers per ship increased from 1,100 to 1,500.

According to the Survey of Cruise Visitors to Maine, the average visitor on cruise ships spends \$70 on each visit to a port in Maine. As a result, aggregate spending by cruise passengers in Portland increased from \$6.5 million in 2015 to \$10.9 million 2019, an increase of nearly 70 percent.

### Cruise Ship Summary – 2015-2019

Year	Ships	Passengers	Passengers/Ship	Passenger Spending
2015	83	94,000	1,100	\$6,500,000
2016	77	101,000	1,300	\$7,000,000
2017	92	135,000	1,500	\$9,300,000
2018	105	155,000	1,500	\$10,700,000
2019	107	158,000	1,500	\$10,900,000

Source: City of Portland and AECOM Analysis.



Photo: William Needelman

## Regional Input-Output Analysis

The full economic contribution of the working waterfront is not limited to just the revenue and employment of the marine and non-marine businesses discussed above but includes the indirect and induced employment and earnings as spending ripples through the economies. The business data developed through the ENOW Framework were incorporated into the IMPLAN software for the regional input-output analysis. The 64 NAICS codes used to classify the marine and non-marine businesses were also used to determine the appropriate IMPLAN industry code (see Appendix A for the bridge between the NAICS codes and the IMPLAN industry codes). It is important to note that while the businesses were classified into 11 categories for the tables above, the IMPLAN analysis used 35 industry codes; therefore, the results include additional business categories to those presented in Table 3.

The results from IMPLAN are categorized by labor income, value added, output, and employment. Labor income includes all forms of labor income, including wages, benefits, and proprietor income. Value added is the difference between an industry's total output and the cost of its intermediate inputs<sup>4</sup> (in other words, an industry's contribution to Gross Domestic Product). Output is the value of industry output, measured in purchaser prices. Employment numbers are considered an annual average of employment and includes full-time, part-time, and seasonal employment (in other words, employment data should not be considered full-time equivalent).

For many industries, the direct economic output is equal to its sales or revenue. However, many of the businesses included in this analysis are retail and wholesale businesses, which do not produce goods but distribute them as a service. For those businesses, IMPLAN subtracts the cost of goods sold from the total revenue to more accurately capture the businesses' actual economic contribution and avoid double counting the same goods multiple times as they move through the supply chain. This is called gross retail margin or gross wholesale margin, respectively. The value of production for these sectors is the value of services they provide and does not include the value of the items sold at the establishment. Therefore, while a business may seem to have a large economic contribution from a revenue perspective (the wholesale petroleum industry in South Portland, for example), much of that revenue may include the cost of its intermediate goods.

The results are further broken down into direct, indirect, and induced effects. The direct effects are the direct contribution of the businesses developed through the ENOW Framework. The indirect effect is a result of supply chain linkages, such as when a ship building business buys supplies from a local hardware store. Finally, the induced effect is generated by employees of local industries spending income on consumption goods and services. The numbers represent a snapshot of the economic contribution of these industries to the combined Portland-South Portland region as they are today.

Table 8 provides the results for the contribution of the marine businesses in the Cities of Portland and South Portland. As noted above, the direct output of \$445 million shown in the results is less than the \$1 billion of revenue because of the retail and wholesale margins that are applied within IMPLAN to those businesses.

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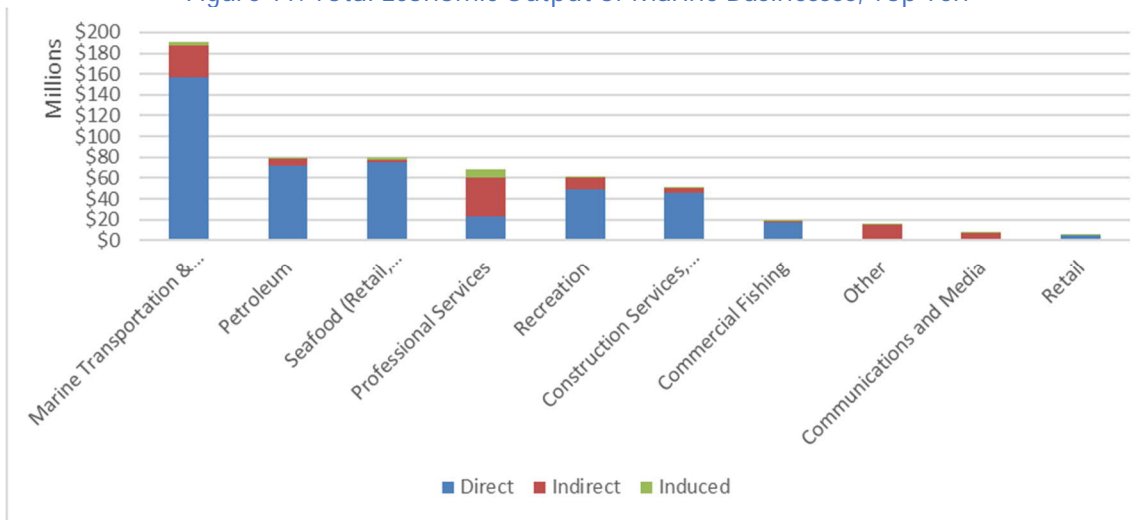
<sup>4</sup> Intermediate inputs are purchases of non-durable goods such as energy, materials, and purchases services that are used in the production of other goods and services, rather than for final consumption.

Table 8: Marine Businesses Contributions

Impact	Labor Income	Value Added	Output	Employment
Direct	\$183,000,000	\$232,000,000	\$445,000,000	2,880
Indirect	\$41,000,000	\$64,000,000	\$129,000,000	760
Induced	\$9,000,000	\$14,000,000	\$25,000,000	160
Total	\$233,000,000	\$310,000,000	\$599,000,000	3,800

Figure 11 displays the total economic output of the direct, indirect, and induced impacts of the marine businesses for the top 10 industry categories<sup>5</sup>. Figure 12 provides direct, indirect, and induced employment figures for the top 10 industry categories. Figure 13 shows the total value added by those industries.

Figure 11: Total Economic Output of Marine Businesses, Top Ten<sup>6</sup>



<sup>5</sup> As noted earlier, the industry categories may not match the business categories identified in Table 3 because of the additional businesses considered through the indirect and induced impacts.

<sup>6</sup> All the marine businesses classified as Retail – Food and Beverage (Table 6) consisted of seafood retail and were categorized as Seafood for the regional input-output analysis. The Retail category in the regional input-output analysis consisted of non-marine businesses.

Figure 12: Total Employment Supported by Marine Businesses, Top Ten

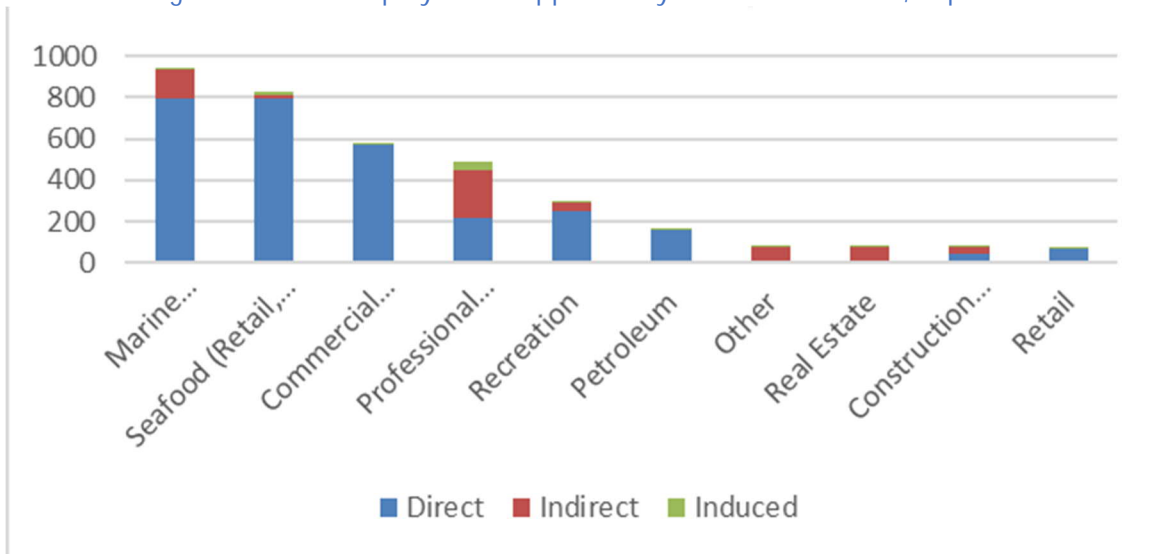


Figure 13: Total Value Added Supported by Marine Businesses, Top Ten

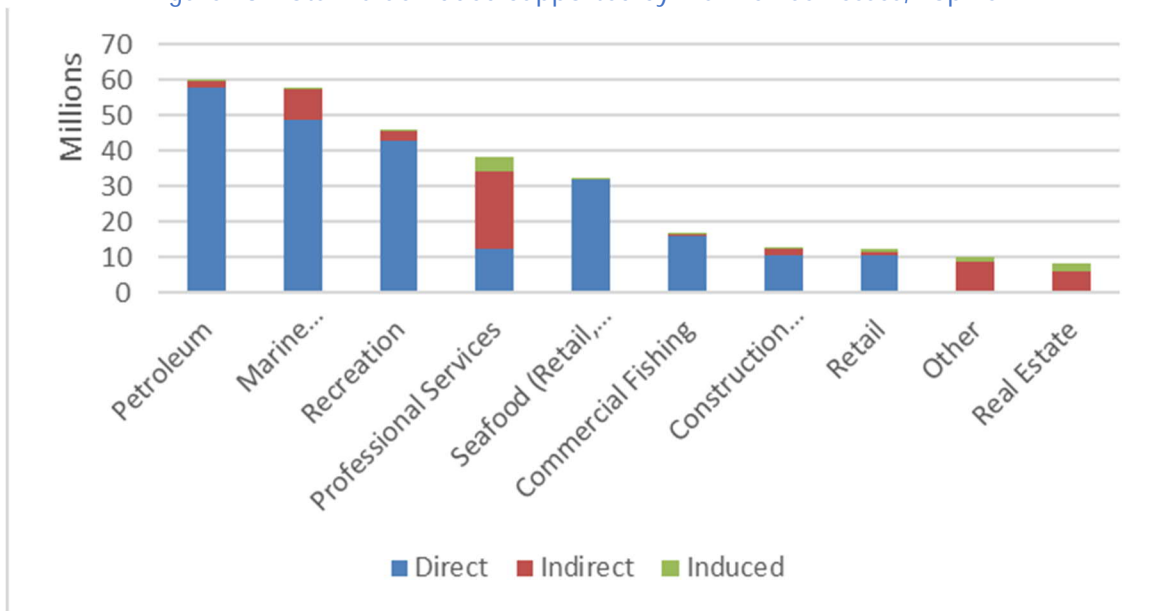


Table 9 shows the economic contribution of the combined marine and non-marine businesses in Portland and South Portland. This shows that Portland Harbor and the working waterfront of the two Cities supports over 9,200 jobs, almost \$400 million in labor income (wages, salaries, benefits, and proprietor income), \$565 million in GDP (value added), and over \$1 billion in total economic output.



Table 9: Combined Marine and Non-Marine Business Contributions

Impact	Labor Income	Value Added	Output	Employment
Direct	\$314,000,000	\$440,000,000	\$794,000,000	7,750
Indirect	\$64,000,000	\$102,000,000	\$204,000,000	1,190
Induced	\$14,000,000	\$23,000,000	\$42,000,000	260
Total	\$393,000,000	\$565,000,000	\$1,039,000,000	9,210

Figure 14 shows the total economic output of those industries, Figure 15 shows the employment supported, and Figure 16 shows the total value added by those industries.

Figure 14: Total Economic Output of Marine and Non-Marine Businesses

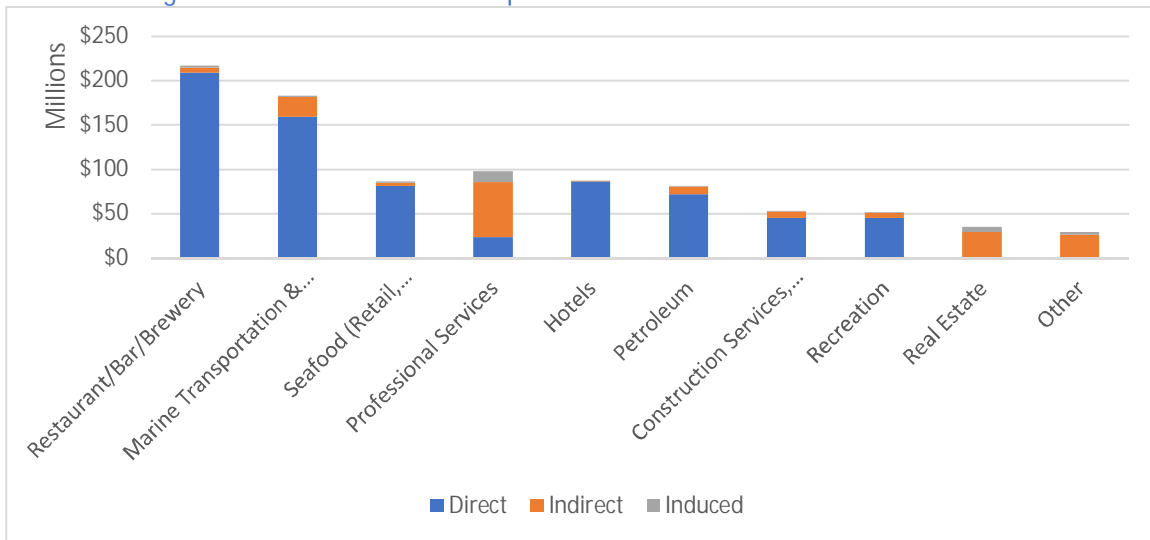


Figure 15: Total Employment Supported by Marine and Non-Marine Businesses

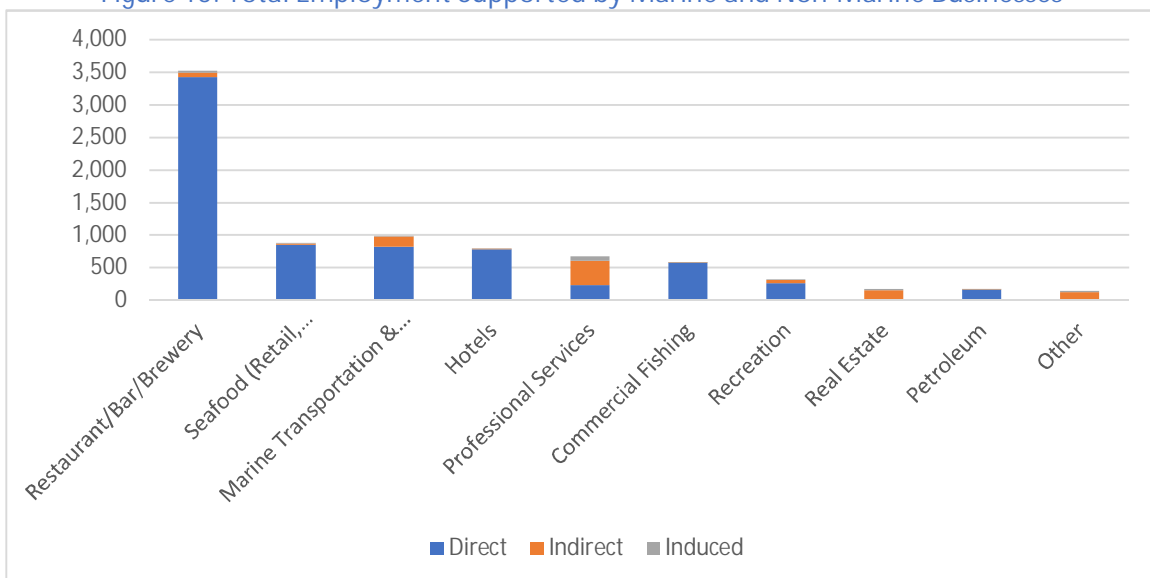
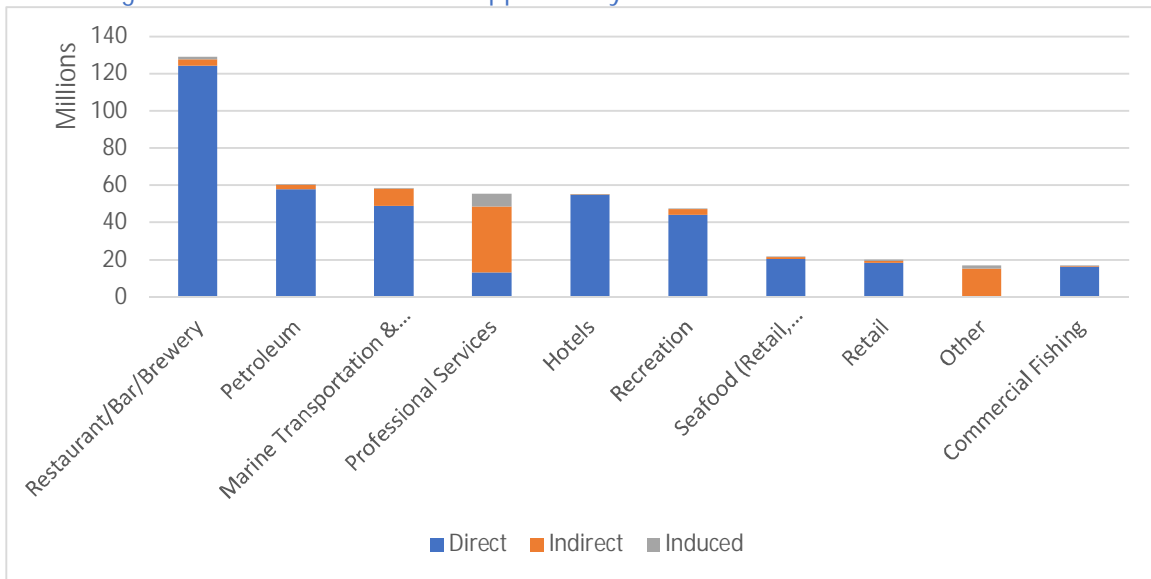


Figure 16: Total Value Added Supported by Marine and Non-Marine Businesses



## Findings

The study measured the economic contribution of the working waterfront in terms of overall output generated, employment supported, and value added to the combined regional economies of Portland and South Portland.

Over a billion dollars of total economic output is related directly or indirectly to the Portland Harbor working waterfront via industrial marine, commercial fishing, recreational, and tourism activities. To put this in perspective, the combined Portland-South Portland region generates over \$21 billion dollars in economic output, meaning that the economy related to the working waterfront represents nearly 5 percent of the Cities' overall economic output. While the output of the working waterfront to the Cities is large, this value does not capture the impacts to neighboring cities, the region, or the state.

Looking at value added, or gross regional product (GRP), the marine and non-marine related sectors contribute five percent of the overall Cities' GRP. In other words, approximately \$1 out of every \$20 generated in the Portland-South Portland economy is connected to the working waterfront as defined in this report. Of course, an argument can be made that without the working waterfront, many of the seemingly unrelated inland businesses would not exist, as the Cities' economies grew around the marine economy (i.e., the economy that has grown as a result of the working waterfront could not be easily recreated).

Moreover, the marine and non-marine sectors support over 9,000 jobs, approximately seven percent of the Cities' total employment. In other words, seven out of every 100 jobs in the Cities are related to the working waterfront. To put this in perspective, this is about 6 times the employment that Wex Inc. has in the Greater Portland area.

For comparison purposes, in 2004, economist Charlie Colgan found that the seafood processing and marinas alone contributed over \$216 million (in 2001 dollars) in gross state product to the State of Maine. In today's dollars, that is over \$312 million. While the seafood processing and marinas are only a small part of the overall marine economy, this study found that the GRP of marine industries in Portland and South Portland alone equaled that amount. While the results cannot be directly compared, due to differences in the industries, data, and method used, the numbers are indicative both of the overall importance of the working waterfront to the Maine economy, and of the importance of this relatively small geographic region to the State.

### ADDITIONAL CONTRIBUTIONS

The analyses took into consideration the contributions of the marine and non-marine businesses that are related to the working waterfront. However, this does not account for all the contributions that can be attributed to the facilities at Portland Harbor. While the multiple terminals within Portland Harbor were included in the analysis, the businesses using these facilities to import or export materials and products may not be captured. For example, the Eimskip containers that pass through the International Terminal go to many businesses throughout the Cities, region, and state. While some of the contributions were captured (such as frozen fish that are processed near the waterfront), the full contribution of the businesses that rely on the working waterfront for aspects of their business could not be captured because no data was available on the extent of the distribution.

More recently, a 2017 study by the Maine Center for Business and Economic Research found that the ocean economy for the entire Casco Bay region contributed over \$704 million in value added in 2017 (which would be \$737 million in 2020 dollars). Although the results cannot be directly compared due to differences in method and data, the results again demonstrate the significance of the economic contributions of the Portland Harbor to the rest of the region.

This analysis highlights the importance of the marine-related economy in the two Cities. Much of this economic activity depends on reliable, predictable, and timely access to the waterfront. Interviews and conversations with waterfront users suggest that without reliable access the cost of doing business in Portland Harbor would increase both monetarily (increased cost of fuel) and in terms of the opportunity cost of time. Should vessels be forced to go to other locations or have to synchronize their deliveries with high tides (as is already occurring), the health of the marine-related economy may be jeopardized.



## Appendix: IMPLAN Data Classifications

The full economic contribution of the working waterfront is not limited to just the marine jobs reliant on the waterfront. Rather, it includes the non-marine businesses as well as the indirect and induced employment and earnings supported by both the marine and non-marine aspects of the working waterfront as spending ripples through the economies of Portland, South Portland, and Maine. IMPLAN was used to capture these indirect and induced contributions.

IMPLAN uses a series of 546 industry classifications, each of which contains multiple NAICS codes. Table 10 shows the NAICS codes included in this analysis and their associated IMPLAN industry codes. Note that these are the 2017 NAICS codes, whereas the ENOW Framework used the 2012 NAICS codes.

Table 10: NAICS to IMPLAN Bridge

NAICS Code	NAICS Description	IMPLAN Code	IMPLAN Description
237990	Other Heavy & Civil Engineering Construction	56	Construction of other new nonresidential structures
311710	Seafood and seafood products manufacturing	92	Seafood product preparation and packaging
312120	Breweries	106	Breweries
713930	Boat Repairs	360	Ship building and repairing
423830	Commercial fishing equipment (except boats) wholesalers	395	Wholesale - Machinery, equipment, and supplies
423990	Importers and Exporters	396	Wholesale - Other durable goods merchant wholesalers
424460	Fish & Seafood Wholesale	398	Wholesale - Grocery and related product wholesalers
424710	Petroleum products bulk stations and terminals, wholesalers	399	Wholesale - Petroleum and petroleum products
424720	Fuel merchant wholesalers		
441222	Boat, Trailer, & Marine Supply Dealers	402	Retail - Motor vehicle and parts dealers
442110	Furniture Stores	403	Retail - Furniture and home furnishings stores
442299	All Other Home Furnishings Stores		
445210	Grocery Stores	406	Retail - Food and beverage stores
445220	Fish & Seafood Markets		
445299	All Other Specialty Food Stores		
445310	Beer, Wine, & Liquor Stores		
446210	Beauty Supply Store	407	Retail – Health and personal care stores
448110	Men's Clothing Stores	409	Retail – Clothing and clothing accessory stores
448120	Women's Clothing Stores		

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NAICS Code	NAICS Description	IMPLAN Code	IMPLAN Description
448140	Family Clothing Stores		
448150	Clothing Accessories Stores		
448310	Jewelry Stores		
448320	Luggage and Leather Goods Stores		
451110	Sporting Goods Stores	410	Retail - Sporting goods, hobby, musical instrument and book stores
451120	Hobby, Toy, and Game Stores		
451130	Sewing, Needlework, and Piece Goods Stores		
451211	Book Stores		
453220	Gift, Novelty, and Souvenir Stores	412	Retail - Miscellaneous store retailers
453310	Used Merchandise & Antique Stores		
453920	Art Dealers		
453991	Tobacco Stores		
483114	Coastal domestic passenger transportation	416	Water transportation
483212	Water taxi services		
486990	All Other Pipeline Transportation	419	Pipeline transportation
487110	Sightseeing	420	Scenic and sightseeing transportation and support activities for transportation
487210	Boat Excursions		
488310	Port facility operation		
488320	Ship hold cleaning services		
488330	Towing & Tugboat Services		
488390	Marine cargo surveyors		
488510	Shipping Agents & Freight Forwarding		
493110	General warehousing	422	Warehousing and storage
493120	Refrigerated warehousing		
541330	Marine engineering services	457	Architectural, engineering, and related services
541360	Geophysical surveying services		
541715	Environmental & Ecological Research & Development	464	Scientific research and development services
561510	Travel Agencies	474	Travel arrangement and reservation services
561591	Tourist information bureaus		
561990	Commercial Divers	478	Other support services
611519	Marine navigational schools	482	Other educational services
624110	Youth Organizations & Centers	493	Individual and family services
711310	Performing arts, concerts, and festival operators	500	Promoters of performing arts and sports and agents for public figures
712110	Marine museums	501	Museums, historical sites, zoos, and parks
713930	Marinas	504	Other amusement and recreation industries

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NAICS Code	NAICS Description	IMPLAN Code	IMPLAN Description
713990	Athletic Clubs		
721110	Hotels	507	Hotels and motels, including casino hotels
722511	Full-Service Restaurants	509	Full-service restaurants
722513	Limited-Service Restaurants	510	Limited-service restaurants
722320	Banquet halls	511	All other food and drinking places
722410	Drinking Places (Alcoholic Beverages)		
722515	Snack and Nonalcoholic Beverage Bars		
811310	Material handling equipment repair and maintenance services	515	Commercial and industrial machinery and equipment repair and maintenance
813312	Environmental advocacy organizations	522	Grantmaking, giving, and social advocacy organizations
813910	Industrial associations	523	Business and professional associations