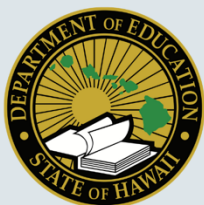




HAWAI'I MARINE ECONOMY WORKFORCE ANALYSIS

OCTOBER 2024



Chamber of Commerce
HAWAII
The Voice of Business


AE Consulting
INSIGHTS FOR IMPACT

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EXECUTIVE SUMMARY

Hawai'i's marine economy is valued at \$1.5 billion and employs at least 20,430 individuals across diverse industry sectors, including marine transportation, ship & boat building,¹ tourism & recreation, living resources, and marine research & conservation. Historical trends suggest that marine economy jobs in Hawai'i will continue to grow, as statewide employment increased by 13% from 2011 to 2021. The marine economy sub-sectors represent many exciting opportunities for local students and job seekers to pursue in-demand, living wage careers that will allow them to live and thrive in Hawai'i.

The majority of Hawai'i's current marine economy workforce is found in ship & boat building (35%), tourism & recreation (30%), and marine transportation (16%). Ship & boat building and marine transportation generally offer the highest wages, and many positions are union jobs with competitive benefits. In terms of anticipated job growth, ship & boat building, tourism and recreation, and living resources added the most jobs in Hawai'i over the last decade, and these trends are expected to continue. Marine transportation is another high-growth marine economy sub-sector, with occupations such as captains, mates, & pilots, and passenger attendants having some of the highest projected growth rates among all marine economy occupations.

Career opportunities vary widely across the marine economy sub-sectors. In marine transportation, there are clearly defined career tracks in different ship departments that have advancement opportunities to high-paying roles like captains and chief engineers with the proper training and licensure. In ship & boat building, engineering and skilled trades workers are in demand. The tourism & recreation sub-sector offers various jobs in ocean safety and on tour boats, while living resources has a growing demand for aquaculture technicians, processing, and maintenance staff, and marine research & conservation includes roles such as grants managers, natural resources managers, and field technicians.

Employers in Hawai'i's marine economy are facing major workforce challenges, including a limited local talent pool, in some cases due to a lack of local training availability for specialized roles. Lack of career awareness among Hawai'i students is also a concern for employers in many sub-sectors. Engaging K-12 students in marine-related careers through work-based learning (WBL) experiences, as well as Career & Technical Education (CTE) programs at the secondary level, are key to preparing students for success in the field. Incorporating Polynesian voyaging in marine-related education programs could help to engage students in experiential learning and foster their passion for the ocean, as well as develop transferable technical and professional skills.

¹ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

Additionally, expanding the availability of local training for in-demand, high-paying roles in sectors like marine transportation and ship & boat building, and addressing barriers to access for students and job seekers will be critical to increasing Hawai'i's skilled, local talent pipeline. Close partnerships and collaboration among secondary and post-secondary education, industry, and community partners are fundamental to these efforts.

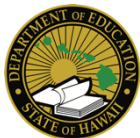
INTRODUCTION

Ensuring local students and job seekers can pursue careers that allow them to live and work in Hawai'i is top of mind for many in the state. Getting students aware of and engaged in career paths that excite and interest them is essential to setting them up for success in the workforce. As a result of our geography and culture, many local students are already passionate about the ocean and have related hobbies and skill sets that make them ideal candidates to pursue successful and sustainable careers within Hawai'i's thriving and diverse marine economy.

This Hawai'i Marine Economy Workforce Analysis aims to provide insight into the workforce needs and opportunities in various marine economy sub-sectors, including marine transportation, ship & boat building,² tourism & recreation, living resources, and marine research & conservation.

PROJECT TEAM

The Hawai'i Marine Economy Workforce Analysis was funded by the Hawai'i Department of Education. The project team was led by Chamber of Commerce Hawaii with support from Pewa Project, LLC. AE Consulting was contracted to manage the data collection, analysis, stakeholder outreach, and reporting.



² The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

HAWAI'I MARINE ECONOMY & EMPLOYMENT

MARINE ECONOMY OVERVIEW

Hawai'i's marine economy is valued at more than \$1.5 billion and employs at least 20,430 individuals across diverse industry sectors. These estimates are derived from the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management Economics: National Ocean Watch data set. This data set defines the marine economy as those businesses whose existence depends on the oceans or Great Lakes, and includes six sub-sectors: marine construction, offshore mineral resources, tourism & recreation, living resources, ship & boat building,³ and marine transportation (see Table 1 below).

Employment in these six sub-sectors represents at least 18,865 jobs in Hawai'i.⁴ Additionally, an estimated 1,565 individuals in Hawai'i are employed in marine research & conservation.⁵ When employment in the six marine economy sub-sectors is combined with marine research & conservation employment, Hawai'i's total marine economy represents more than 20,000 jobs in the state.

Hawai'i's Marine Economy



As shown in Table 1 below, each of the six marine economy sub-sectors identified by NOAA is comprised of several industry codes. It should be noted that the tourism & recreation sub-sector as defined by NOAA initially included eating and drinking establishments, hotels, campsites, and RV parks, and manufacturing of sporting goods. However, jobs associated with these industries were removed from the employment data, as these employment opportunities are less relevant for the scope of this analysis.

³ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

⁴ National Oceanic and Atmospheric Administration (NOAA). [Economics: National Ocean Watch \(ENOW\) Data](#). Based on data from the Bureau of Labor Statistics and the Bureau of Economic Analysis. Charleston, SC: NOAA Office for Coastal Management.

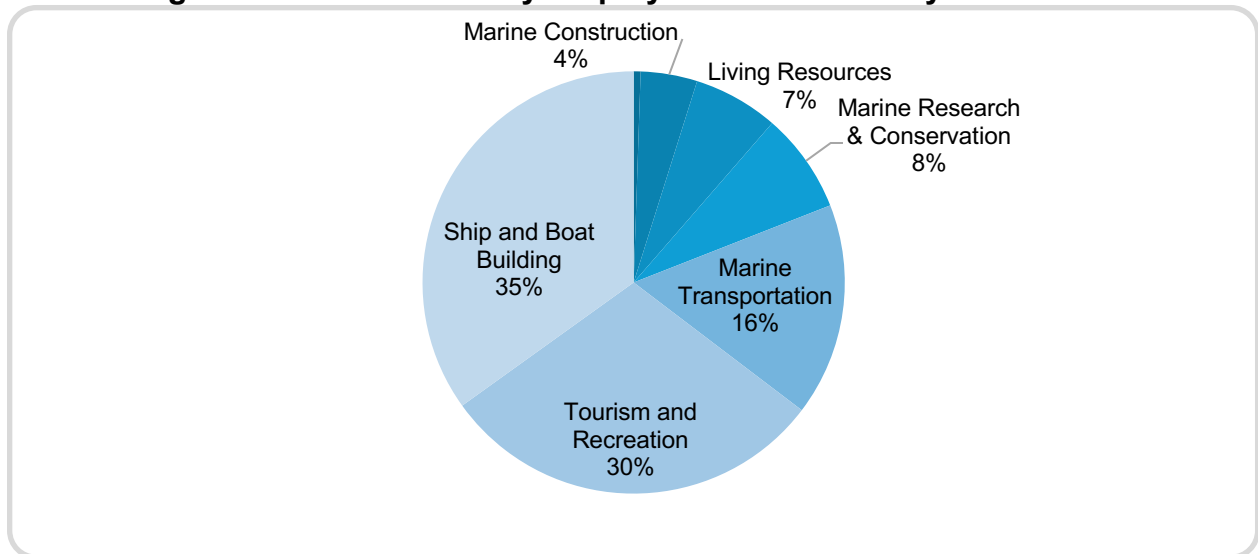
⁵ An estimate of marine research & conservation employment in Hawai'i was derived from the 2023 Natural Resources Management Sector Survey data, which was administered by SMS Research and Hau'oli Mau Loa Foundation for the [2024 Green Jobs Report](#).

Table 1: NOAA Marine Economy Sub-Sectors

Marine Economy Sub-Sector	NOAA Sub-Sector Description
Marine Construction	Beach Nourishment and Harbor Dredging
Offshore Mineral Resources	Oil and Gas Exploration and Production, Sand and Gravel Mining
Tourism and Recreation	Marinas, Boat Dealers and Charters, Scenic Water Tours, Amusement & Recreation Services, Recreational Fishing, Zoos and Aquariums
Living Resources	Commercial Fishing, Fish Hatcheries, Aquaculture, Seafood Processing, Seafood Markets
Ship and Boat Building	Ship and Boat Building & Repairs
Marine Transportation	Deep Sea Freight, Marine Passenger Transportation, Pipeline Transportation, Marine Transportation Services, Search & Rescue Navigation Equipment, Warehousing

Within Hawai'i's marine economy, the majority of jobs are found in ship & boat building (35%),⁶ tourism & recreation (30%), and marine transportation (16%), as shown in Figure 1 and Table 2 below. Combined, marine research & conservation and living resources account for 15% of marine economy jobs in Hawai'i. Marine construction represents 4% and offshore mineral resources represents less than 1% of employment in Hawai'i's marine economy.

Figure 1: Marine Economy Employment in Hawai'i by Sub-Sector



Source: Economics: National Data Watch (ENOW), NOAA (2021)

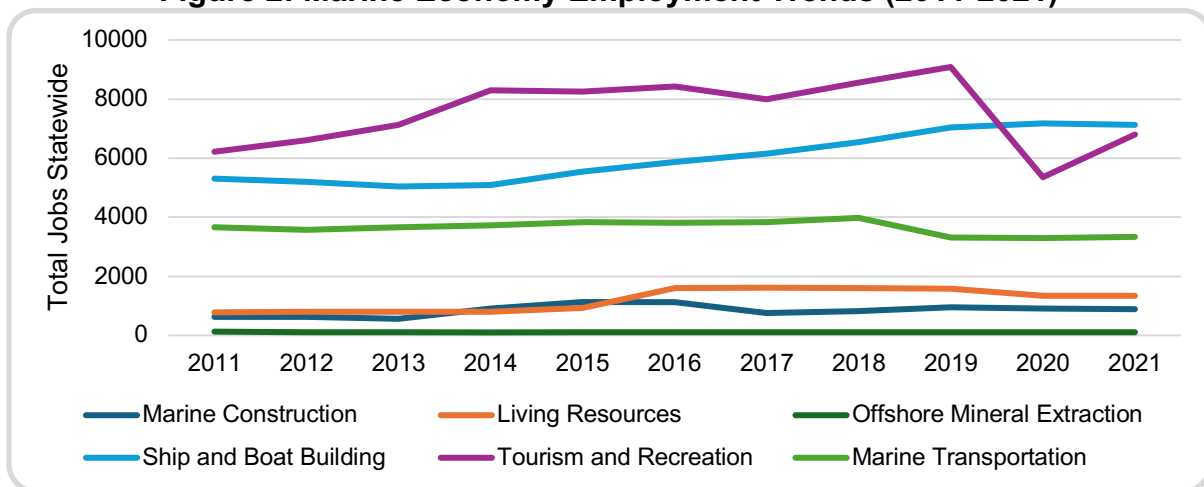
⁶ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

Table 2: Marine Economy Employment in Hawai'i by Sub-Sector

Marine Economy Sub-Sector	Employment
Total Ship & Boat Building⁷	7,133
Total Tourism & Recreation	6,077
Amusement and Recreation Services	4,392
Scenic Water Tours	1,596
Boat Dealers	89
Total Marine Transportation	3,328
Marine Transportation Services	1,413
Warehousing	875
Marine Freight	639
Total Marine Research & Conservation	1,565
Total Living Resources	1,334
Seafood Markets	803
Fish Hatcheries and Aquaculture	396
Total Marine Construction	885
Total Offshore Mineral Resources	108
TOTAL	20,430

Source: Economics: National Data Watch (ENOW), NOAA (2021)

Trends in marine economy sub-sector employment have varied widely over the last decade, as shown in Figure 2. Overall, marine economy employment has grown by approximately 13% from 2011 to 2021. During this period, the most jobs were added in ship & boat building (1,835 jobs), tourism & recreation (591 jobs), and living resources (556 jobs). Several sub-sectors saw a decline in employment in 2020, particularly tourism & recreation, likely due to the COVID-19 pandemic. However, the job growth over the last decade is a positive sign for Hawai'i's marine economy.

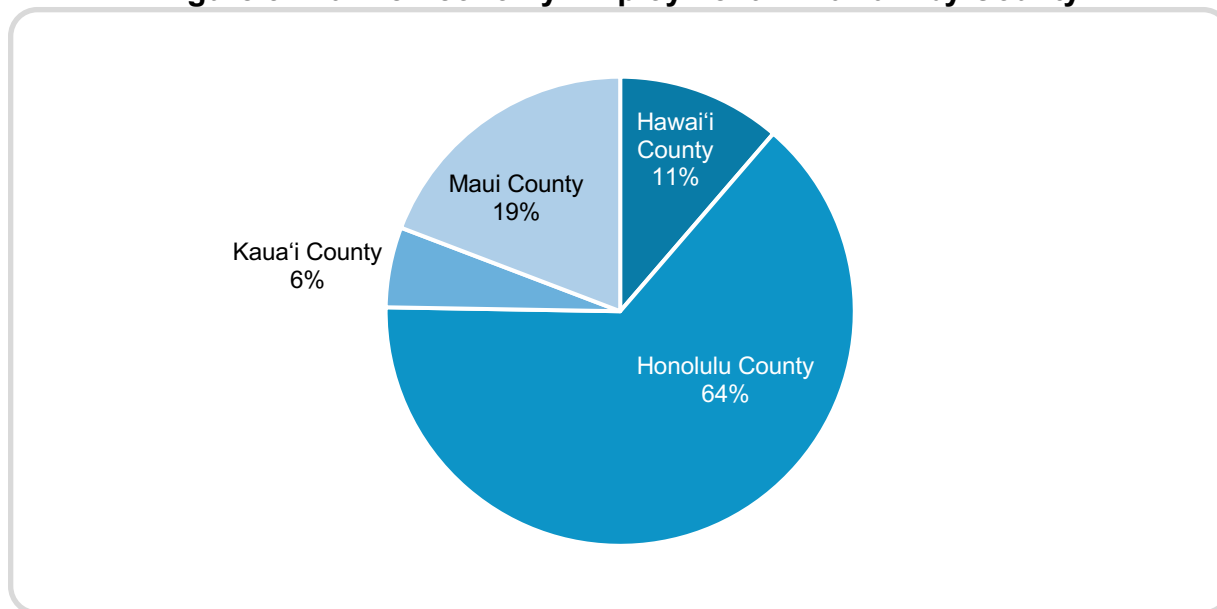
Figure 2: Marine Economy Employment Trends (2011-2021)

Source: Economics: National Data Watch (ENOW), NOAA (2021)

⁷ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

As shown in Figure 3 below, the majority of Hawai'i's marine economy workforce is concentrated in Honolulu County (64%), followed by 19% in Maui County, 11% in Hawai'i County, and 6% in Kaua'i County.

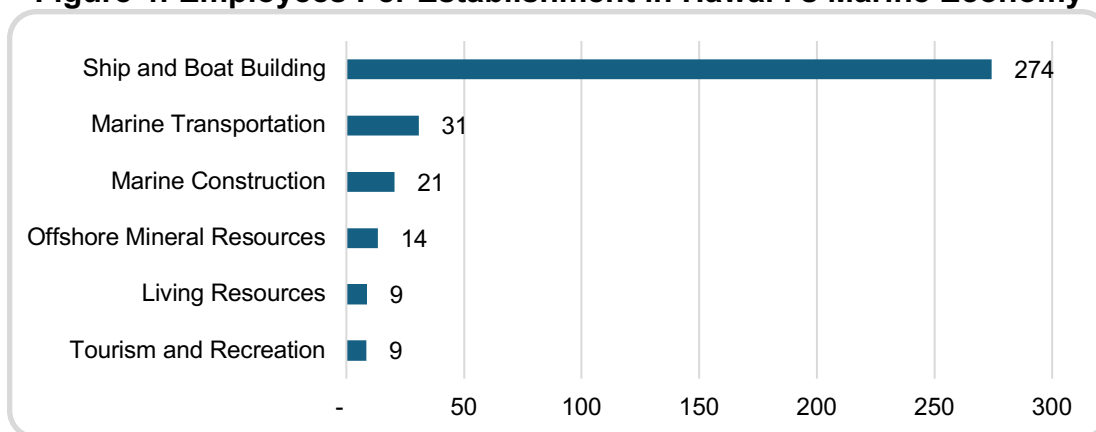
Figure 3: Marine Economy Employment in Hawai'i by County



Source: Economics: National Data Watch (ENOW), NOAA (2021)

In terms of the number of business establishments, the tourism & recreation sub-sector accounts for the most establishments in Hawai'i's marine economy (706), followed by living resources (152), and marine transportation (108). Ship & boat building⁸ has the most employees per establishment (274), suggesting much larger companies in this sub-sector, as seen in Figure 4.

Figure 4: Employees Per Establishment in Hawai'i's Marine Economy

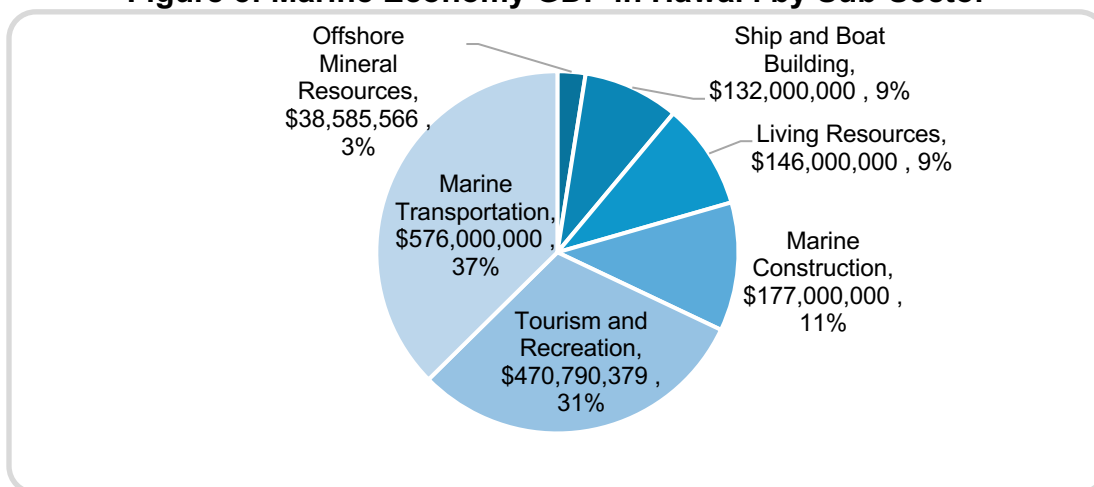


Source: Economics: National Data Watch (ENOW), NOAA (2021)

⁸ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

In terms of GDP, the highest value marine economy sub-sectors in Hawai'i are marine transportation (\$576M), tourism & recreation (\$471M),⁹ and marine construction (\$177M).

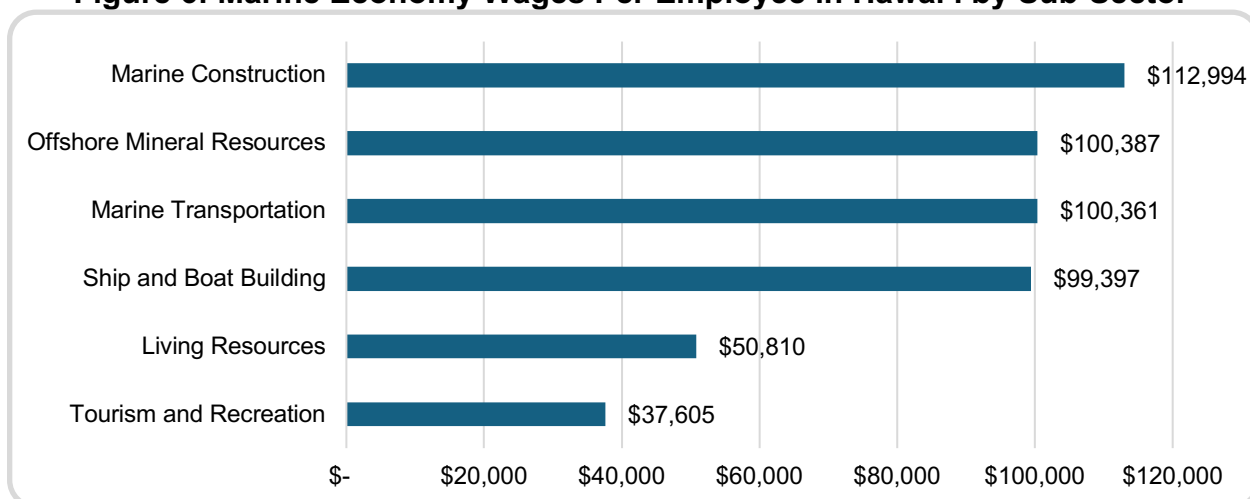
Figure 5: Marine Economy GDP in Hawai'i by Sub-Sector



Source: Economics: National Data Watch (ENOW), NOAA (2021)

Data on wages per employee can serve as an indicator of earnings in these sub-sectors. Marine construction has the highest wages per employee, at \$112,994, as shown in Figure 6 below. Wages per employee in offshore mineral resources, marine transportation, and ship & boat building¹⁰ all hover around \$100,000 per year. Wages per employee are significantly lower in living resources and tourism & recreation.

Figure 6: Marine Economy Wages Per Employee in Hawai'i by Sub-Sector



Source: Economics: National Data Watch (ENOW), NOAA (2021)

⁹ Eating and drinking establishments, hotels, campsites and RV parks, and manufacturing of sporting goods are not included in the GDP estimate for tourism & recreation.

¹⁰ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

RELEVANT OCCUPATIONS

Hawai'i's marine economy workforce is comprised of diverse occupation types, including laborers, skilled trades, and STEM professionals who work across sectors. Based on industry data and similar maritime/marine economy reports conducted elsewhere, there are 35 occupations that directly correspond to the marine economy sub-sectors, can require ocean-specific skill sets or knowledge, and have a median salary above the ALICE survival budget for a single adult in Hawai'i (\$39,384).¹¹ The full list of relevant occupations can be found in Appendix A.

It should be noted that the data accounts for employment in those occupations across all sectors, not just the marine economy sectors. Certain occupations are predominantly found in marine economy sub-sectors, such as Captains, Mates, and Pilots of Water Vessels. However, many occupations are spread broadly across various industry sectors. For example, a marine biologist would be classified under the Standard Occupational Classification (SOC) code for Biological Scientists, but that SOC code also includes biologists who work in various fields unrelated to the ocean. Even though occupation data includes employment in all industries, not just the marine economy sectors, it provides general insight into the top, in-demand employment opportunities.

Occupations were sorted according to four key indicators:

- Employment Volume Statewide (2023)
- Projected Job Growth (2020-2030)
- Average Annual Openings (2020-2030)
- Median Annual Wage (2023)

Table 3 below shows the relevant occupations with the highest employment volume statewide. The top five highest volume occupations are primarily in physical labor, skilled trades, and engineering.

Table 3: Top Occupations by Employment Volume

Occupation Title	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)
Laborers and Freight, Stock, and Material Movers, Hand	9,180	\$40,250	8,000	960	13.60%
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	3,230	\$59,500	2,890	420	17.00%

¹¹ ALICE in the Crosscurrents, Aloha United Way (2024). <https://www.auw.org/about/alice-initiative/>

First-Line Supervisors of Mechanics, Installers, and Repairers	2,760	\$85,750	3,020	300	11.00%
Civil Engineers	2,380	\$84,500	2,490	160	6.8%
Electrical Engineers	860	\$110,490	1,060	30	3.2%

Sources: Long-Term Occupational Projections to 2030, HireNet Hawaii (DLIR)
Occupational Employment & Wage Statistics (OEWS), Bureau of Labor Statistics

In terms of projected job growth, the fastest growing occupation is Captains, Mates, and Pilots of Water Vessels, with 52% projected job growth from 2020-2030. Passenger Attendants and Motorboat Operators also have high growth rates, with 50% and 24% respectively.

Table 4: Top Occupations by Projected Growth

Occupation Title	Percent Job Growth (2020-30)	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Average Annual Openings
Captains, Mates, and Pilots of Water Vessels	52.10%	570	\$71,820	680	230	80
Passenger Attendants	50.40%	830	\$43,950	1,380	460	210
Motorboat Operators	23.80%	380	\$60,160	340	70	40
Farmworkers, Farm, Ranch, and Aquacultural Animals	19.40%	150	\$47,110	760	120	120
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	17.00%	3,230	\$59,500	2,890	420	330

Sources: Long-Term Occupational Projections to 2030, HireNet Hawaii (DLIR)
Occupational Employment & Wage Statistics (OEWS), Bureau of Labor Statistics

As shown in Table 5, the occupations with the most average annual openings are similar to those with the highest employment volume, with the exception of Lifeguards, Ski Patrol, and Other Recreational Service Workers, and Passenger Attendants.

Table 5: Top Occupations by Average Annual Openings

Occupation Title	Average Annual Openings	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)
Laborers and Freight, Stock, and Material Movers, Hand	1,080	9,180	\$40,250	8,000	960	13.60%
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	330	3,230	\$59,500	2,890	420	17.00%
First-Line Supervisors of Mechanics, Installers, and Repairers	280	2,760	\$85,750	3,020	300	11.00%
Passenger Attendants	210	830	\$43,950	1,380	460	50.40%
Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	180	700	\$53,330	740	80	12.60%
Civil Engineers	180	2,380	\$84,500	2,490	160	6.8%

Sources: Long-Term Occupational Projections to 2030, HireNet Hawaii (DLIR)
Occupational Employment & Wage Statistics (OEWS), Bureau of Labor Statistics

The highest paying occupations are dominated by skilled trades and STEM occupations, including crane and tower operators (\$113,500), natural sciences managers (\$112,670), electrical engineers (\$110,490), hoist and winch operators (\$98,580), and mechanical engineers (\$97,140).

Table 6: Top Occupations by Median Wage

Occupation Title	Median Annual Wage (2023)	Employment Statewide (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)	Average Annual Openings
Crane and Tower Operators	\$113,500	260	90	10	5.80%	10
Natural Sciences Managers	\$112,670	330	350	20	6.00%	30
Electrical Engineers	\$110,490	860	1,060	30	3.2%	70

Hoist and Winch Operators	\$98,580	170	-	-	-	-
Mechanical Engineers	\$97,140	530	780	0	-0.1%	50

Sources: Long-Term Occupational Projections to 2030, HireNet Hawaii (DLIR)
Occupational Employment & Wage Statistics (OEWS), Bureau of Labor Statistics

HAWAI'I MARINE ECONOMY JOB OPPORTUNITIES BY SUB-SECTOR

AE Consulting spoke with several community partners and practitioners in voyaging. AE also interviewed 19 employers across the top 5 sub-sectors of Hawai'i's marine economy (ship & boat building,¹² tourism & recreation, marine transportation, living resources, and marine research & conservation) to identify the top employment opportunities in Hawai'i, including entry-level roles and opportunities for career advancement.

VOYAGING



Image Credit: [Polynesian Voyaging Society](#)

Voyaging is integral to the history of Hawai'i and Hawaiian culture. More than a thousand years ago, Polynesian voyagers sailed to Hawai'i on wa'a, double-hulled canoes, guided by the stars. In the 1970s, the Polynesian Voyaging Society was founded, spurring a modern renaissance of voyaging in Hawai'i.

While it is a challenge to quantify employment opportunities in Hawai'i that are specific to voyaging, there are careers within organizations like the Polynesian Voyaging Society, as well as jobs in Hawaiian cultural education, and skilled trades jobs related to canoe craftsmanship and maintenance (e.g., carvers and fiberglass workers) with organizations like the Polynesian Cultural Center.

Beyond career opportunities specific to the traditional practice of voyaging, the foundational knowledge and skills associated with voyaging translate to a variety of maritime or ocean-related occupations in Hawai'i. Voyaging can serve as an introduction to various marine careers for local students who are passionate about the ocean, bridging the gap between Hawaiian cultural knowledge and scientific knowledge.

Employers and community stakeholders identified the following technical skills that translate from voyaging to other careers, particularly in the maritime sector:

- Observing weather and ocean conditions

¹² The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

- Ocean safety
- Vessel operations and terminology
- Line handling
- Navigation

In addition to these technical skills, voyaging fosters the development of professional skills, such as teamwork, communication, leadership, and planning/logistics.

SHIP & BOAT BUILDING



7,133
Jobs Statewide

35%
of Hawai'i Marine
Economy Employment



\$99,397
Average Wages
Per Employee

Ship & boat building¹³ is the largest sub-sector in Hawai'i's marine economy, representing 35% of marine economy employment and 7,133 workers. Many workers in this sub-sector are civilians employed by the U.S. Department of Defense. Additionally, some workers are employed by special defense contractors, such as Hawaiian Dredging & Construction Company. Pearl Harbor Naval Shipyard is a significant source of local employment in this sub-sector.

The two main departments in a shipyard are engineering and production.

Engineering: The engineering side of a shipyard includes mechanical, electrical, civil, nuclear, and ocean engineers, as well as naval architects.

Production: The majority of shipyard jobs are on the production side, which includes various skilled trades workers such as welders, machinists, mechanics, and riggers. Apprenticeships are a common entry point for local candidates into skilled trades careers with the shipyard. Apprentices typically advance to Journeyman or Journey Worker status after completing their apprenticeship program, which comes with higher earnings.

Median wages for occupations related to ship & boat building engineering and production in Hawai'i are shown in Table 7 below.

¹³ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

Table 7: Median Wages – Ship & Boat Building Occupations¹⁴

Occupation	Median Wage Statewide
Electrical Engineers	\$110,490
Mechanical Engineers	\$97,140
Marine Engineers and Naval Architects	\$89,360
Civil Engineers	\$84,500
Machinists	\$76,540
Welders, Cutters, Solderers, and Brazers	\$76,540
Riggers	\$76,540

Source: Occupational Employment & Wage Statistics, U.S. Bureau of Labor Statistics (2023)

MARINE TRANSPORTATION



3,328
Jobs Statewide

16%

of Hawai'i Marine
Economy Employment



\$100,361

Average Wages
Per Employee

Hawai'i's marine transportation sub-sector represents 16% of the state's marine economy, employing an estimated 3,328 workers, including on ships and shoreside. On a ship, the main departments typically include the Deck Department, the Engine Department, and the Steward's Department. Job opportunities in each department, career pathways, pay, and qualifications are outlined in this section.

Deck Department

The Deck Department is led by the Captain and includes positions such as First Mate and Second Mate. The Deck Department handles navigation, cargo operations, and safety procedures. Captains, Mates, and Pilots of Water Vessels are in high demand in Hawai'i, and these positions are expected to grow by 52% from 2020-2030, with an average of 80 annual openings.

Entry-level jobs in the deck department include:

- **Ordinary Seaman (OS):** The Ordinary Seaman position is an entry-level position supporting deck operations, including maintenance tasks, watchkeeping, and assisting more experienced crew members. OS positions are typically filled by those starting their maritime careers.
- **Able Seaman (AB):** Able Seamen are experienced deckhands responsible for performing general deck work such as mooring, maintenance, and watchkeeping. The AB assists officers with navigation duties and ensures the ship's safety and cleanliness.

¹⁴ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

Advancement Opportunities: Those in entry-level positions can pursue licenses and training to advance to higher positions. The typical advancement path is:



Pay: Sailors and Marine Oilers in Hawai'i (including Ordinary Seamen and Able Seamen) have median earnings of \$64,600, while Captains, Mates, and Pilots of Water Vessels have median earnings of \$71,820. Earnings for unionized deck workers increase significantly with training and licensure, up to the \$80-160k range.

Qualifications: Many positions in marine transportation require licensure from the [United States Coast Guard](#). Entry-level roles on a ship typically require at least an entry-level [Merchant Mariner Credential](#) (MMC). To obtain an MMC, candidates must first get their [Transportation Worker Identification Credential](#) (TWIC) through the Transportation Security Administration (TSA). To obtain a TWIC, you must be a U.S. citizen, lawful permanent resident, naturalized citizen, or a nonimmigrant alien or refugee, and pass a background check. In addition to holding a TWIC, candidates must be at least 18 years old (or 16 years old with parental/guardian consent), fluent in English, hold a valid medical certificate, pass drug testing, and complete basic training to obtain an entry-level Merchant Mariner's Credential.

To advance beyond entry-level roles, higher-level licenses from the U.S. Coast Guard are required. Requirements for licensure are typically based on days of sea service and completion of training or exams. Required licenses for positions in the deck department are outlined below.

Table 8: Deck Department Qualifications		
Position	Certification or License	Sea Service Requirements
Ordinary Seaman	Valid Entry-Level Merchant Mariner Credential (MMC)	N/A
Able Seaman (AB)	Able Seaman (AB) endorsement	At least 180 days of sea service. Up to 540 days of sea service required for AB Unlimited rating.
Third Mate/Officer	National 3rd Mate endorsement	1,080 days of sea service, graduation from a maritime academy, or equivalent.
Second Mate/Officer	National 2nd Mate endorsement	360 days of service as an officer in charge of a navigational watch.
Chief Mate/Officer	National Chief Mate endorsement	360 days of service as a OICNW while holding an endorsement as 2 nd Mate

Captain	National master endorsement requirement varies by tonnage: - Master less than 100 - Master less than 200 - Master less than 1600	Service requirements vary by tonnage
Harbor Pilot	Meet U.S. Coast Guard licensure and experience requirements specified by the Hawaii Department of Commerce and Consumer Affairs	

Engine Department

The Engine Department, overseen by the Chief Engineer, is responsible for maintaining and operating the ship's machinery and propulsion systems. This team includes engineers and technicians who ensure the vessel's technical operations run smoothly.

Entry-level jobs in the engine department include:

- **Wiper:** The Wiper position is an entry-level role that involves basic maintenance and cleaning of engine room equipment. Wipers assist with oiling, greasing, and keeping the engine room tidy.
- **Oiler:** Oilers are junior engineers responsible for routine maintenance tasks, including lubricating machinery, monitoring equipment, and assisting with engine operations. The oiler helps ensure the smooth running of the ship's machinery.

Advancement Opportunities: Additional certification and experience can provide career advancement opportunities. The typical advancement path is:



Pay: Sailors and Marine Oilers in Hawai'i have median annual earnings of \$64,600, while Ship Engineers have median annual earnings of \$97,070.

Qualifications: Required licenses for positions in the engine department are outlined below.

Table 9: Engine Department Qualifications		
Position	Certification or License	Sea Service Requirements
Wipers	Valid Entry-Level Merchant Mariner Credential (MMC)	N/A
Oilers	National Qualified Member of the Engine Department (QMED) endorsement	180 days of service in a rating at least equal to that of a wiper.

Third Engineers	<u>National 3rd Assistant Engineer endorsement</u>	1,080 days of service in the engine room, graduation from a maritime academy, or equivalent. Valid STCW BT and Advanced Firefighting.
Second Engineers	<u>National 2nd Assistant Engineer endorsement</u>	360 days of service as an assistant engineer while holding MMC as 3 rd A/E. Valid STCW BT and Advanced Firefighting.
Chief Engineers	<u>National Chief Engineer endorsement</u>	360 days of service while holding MMC as 1 st A/E. Valid STCW BT and Advanced Firefighting.

Steward Department

The Steward Department on a ship is responsible for preparing and serving meals on a ship for the crew and conducting general housekeeping aboard the ship.

Entry-Level Jobs: Steward Assistants are an entry-level position and help in various hospitality tasks such as serving meals, cleaning accommodation areas, and providing general support to the steward's team. They help maintain the comfort and hygiene of passenger and crew areas.

Advancement Opportunities: Steward Assistants can advance to become Chief Stewards and Chief Cooks, who are senior members of the steward department that oversee food services and cleaning.

Qualifications: Steward Department positions typically require a [Valid Entry-Level Merchant Mariner Credential](#) with a steward's department endorsement.

Shoreside Employment Opportunities

In addition to employment on ships, there are shoreside job opportunities available in marine transportation. In-demand shoreside jobs in marine transportation include:

- Warehouse laborers
- Stevedores
- Mechanics

For warehouse laborers, forklift operator certification is desired. Mechanics who have welding skill sets are also highly desirable. Many of these jobs are unionized positions that offer competitive pay and benefits.

TOURISM & RECREATION



6,077
Jobs Statewide

30%
of Hawai'i Marine
Economy Employment



\$37,605
Average Wages
Per Employee

In Hawai'i's marine economy, the tourism & recreation sub-sector includes marine amusement and recreation services, scenic water tours, and boat dealers. This sub-sector represents 30% of Hawai'i's marine economy, with an estimated 6,077 workers employed.¹⁵

Entry-Level Jobs: In-demand, entry-level job opportunities in the marine tourism & recreation sub-sector include:

- **Boat Crew:** Boat crew members are commonly employed on vessels for scenic water tours, including charters and catamarans. Their job duties typically pertain to customer service and ocean safety.
- **Beach/Recreation Attendants:** Hotels and resorts commonly employ beach or recreation attendants responsible for guest experience and safety.
- **Lifeguards:** Lifeguards are commonly employed at hotels and resorts and are also employed by the City & County of Honolulu. The City & County of Honolulu [Ocean Safety Department](#) has 42 lifeguard towers on O'ahu and employs 271 water safety officers.¹⁶

Advancement Opportunities: Candidates working in scenic water tours can become boat captains if they obtain their U.S. Coast Guard captain's license. Those employed by hotels and resorts may have opportunities to advance to supervisory and managerial roles.

Pay: Lifeguards and Other Recreational Protective Service Workers in Hawai'i earn median wages of \$53,330, while Passenger Attendants earn median wages of \$43,950.

Qualifications: For crew member and attendant roles, First Aid and CPR certification are commonly required. Lifeguards typically need Red Cross Lifeguard Certification. Tour boat captains are required to be licensed by the U.S. Coast Guard, with the type of license depending on the size of the vessel. A 25-ton [captain's license](#) is typical for whale watching or dolphin tour boats.

¹⁵ The tourism & recreation sub-sector as defined by the National Oceanic & Atmospheric Administration (NOAA) initially included eating and drinking establishments, hotels, campsites and RV parks, and manufacturing of sporting goods. However, jobs associated with these industries were removed from the employment data, as these employment opportunities are less relevant for the scope of this analysis.

¹⁶ <https://www8.honolulu.gov/mayor/mayor-signs-resolution-to-create-standalone-ocean-safety-department/>

LIVING RESOURCES



1,334

Jobs Statewide

7%

of Hawai'i Marine
Economy Employment



\$50,810

Average Wages
Per Employee

The living resources sub-sector of Hawai'i's marine economy includes seafood markets, fish hatcheries, and aquaculture. This sub-sector represents 7% of Hawai'i's marine economy, with 1,334 workers. This number has likely increased since 2021, given the growing prevalence of aquaculture in Hawai'i. In 2022, an estimated 416 workers were employed in aquaculture in Hawai'i.¹⁷ Algae cultivation is a particularly fast-growing segment of Hawai'i's aquaculture market in Hawai'i. In 2022, algae was Hawai'i's fourth most valuable agricultural commodity.¹⁸

The [Natural Energy Laboratory of Hawai'i Authority](#) (NELHA) on Hawai'i Island is a hub for aquaculture projects in the state. [HATCH](#) offers a business accelerator program to encourage the development of new aquaculture ventures in Hawai'i.

Entry-Level Jobs: According to local employers, common entry- to mid-level roles in aquaculture include:

- **Technicians:** Technicians for aquaculture labs and hatcheries maintain systems and monitor water quality.
- **Maintenance Staff:** Maintenance staff are needed in aquaculture operations to clean systems.
- **Processing Staff:** Aquaculture operations often employ staff to process their products, such as cutting and packing fish and other products.

Pay: Pay in aquaculture depends on the job role. Based on current job postings, pay ranges from \$21-\$31 per hour for technicians and research specialists.

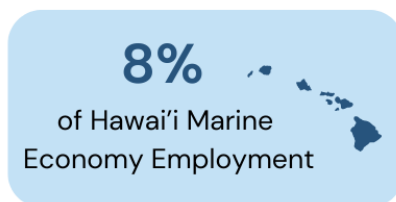
Qualifications: A college degree is not necessarily required for aquaculture technician roles, but candidates typically have some training and experience in marine biology, animal husbandry, algae and seaweed, or related fields.

Maintenance and processing staff are entry-level roles that have minimal qualifications, and many of the knowledge and skills required can be learned on the job. There are opportunities for maintenance staff to advance to technician roles with experience.

¹⁷ United States Department of Agriculture, National Agriculture Statistics Service [https://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Livestock, Poultry, and Dairy/Aquaculture/2023/AQUAHI_0923.pdf](https://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Livestock,_Poultry,_and_Dairy/Aquaculture/2023/AQUAHI_0923.pdf)

¹⁸ State of Hawaii Department of Agriculture https://hdoa.hawaii.gov/add/files/2023/12/Top-20-Commodities-2022_SOH_12.15.2023.pdf

MARINE RESEARCH & CONSERVATION



Marine research & conservation, although not included as a sub-sector in the NOAA Office for Coastal Management Economics: National Ocean Watch data set, is vital to Hawai'i's marine ecosystem. An estimated 1,565 workers are employed in marine research and conservation in Hawai'i, which accounts for 8% of Hawai'i's marine economy when incorporated with the NOAA data.

The estimated number of workers employed in marine research & conservation in Hawai'i was derived from the 2023 Natural Resources Management Sector Survey.¹⁹ Among the marine research and conservation-related organizations that responded to the survey, the top occupations were administrative support, grants management, educators, natural resources managers, field technicians, and communications & outreach.

Pay: Salary ranges in marine research & conservation vary by the position type. Salaries for administrative professionals and field technicians tend to start in the \$41–50K range, while professional or managerial employees start at \$61–80K, and executives have starting salaries of at least \$80K.

Qualifications: Most employees in this sub-sector have a bachelor's degree across occupation types. The top five college majors desired by marine research and conservation employers were environmental studies, natural resource management, biology, ecology, and marine biology.

In addition to a college degree, employment in marine research and conservation commonly requires field experience and skill sets such as collection and analysis, and report writing.

¹⁹ The 2023 Natural Resources Management Sector Survey was administered by SMS Research and Hau'oli Mau Loa Foundation for the [2024 Green Jobs Report](#).

EDUCATION & TRAINING LANDSCAPE

The types of education and training required vary widely across the various marine economy sub-sectors in Hawai'i. Many education and training programs are available, both in Hawai'i and on the U.S. continent, to prepare local candidates for marine economy careers.

VOYAGING

Education and training in Polynesian voyaging is offered by several community organizations, including:

- [Polynesian Voyaging Society](#): Polynesian Voyaging Society (PVS) engages with school groups and the public through their Hōkūle'a Statewide Pae 'Āina Sails. They have also offered voyaging training programs with schools such as Wai'anae High School in the past.
- [Kānehūnāmoku Voyaging Academy](#): Kānehūnāmoku is based in Kāne'ohe on O'ahu. Their mission is *To Perpetuate the Knowledge of Traditional Hawaiian Navigation and Provide Opportunities to Native Hawaiian Students to Advance in Contemporary Ocean Based Careers Through Academic, College, and Career Support*. They offer a program with K-12 public and charter schools to provide maritime skills training and exposure to maritime careers, as well as a training program for adults to learn about wa'a and community teaching skills.
- [Nā Kama Kai](#): Nā Kama Kai is based in Wai'anae on O'ahu. They offer various ocean clinics and camps for youth throughout the year. Many of their volunteers/mentors work in various ocean-related careers and help to provide career awareness and exposure to students.
- [Hui O Wa'a Kaulua](#): Based on Maui, Hui O Wa'a Kaulua works with several Hawai'i Department of Education (HIDOE) schools to provide voyaging education that emphasizes the history and modern renaissance of voyaging, water safety, seamanship skills, navigation, and natural resource management.

SHIP & BOAT BUILDING

Local education and training programs relevant to ship & boat building and repairs include:

- [Pearl Harbor Naval Shipyard Apprenticeship Program](#): Honolulu Community College offers an apprenticeship program in partnership with the Pearl Harbor Naval Shipyard. Apprentices earn an Associate Degree in Applied Trades upon program completion.
- Honolulu Community College previously offered a small boat and vessel repair program through the Marine Education & Training Center (METC). However, this program is no longer being offered.
- [University of Hawai'i at Mānoa College of Engineering](#): The UH Mānoa College of Engineering offers bachelor's and master's degrees in a variety of engineering

disciplines relevant to the ship and boat building sub-sector, including mechanical, electrical, and civil engineering.

MARINE TRANSPORTATION

Local Training Programs: Local training programs in marine transportation include:

- [The Maritime Institute](#): The Maritime Institute has a satellite training location in Honolulu. The Honolulu location offers various courses, including basic training and Able Seaman. However, it does not offer additional training requirements for an Able Seaman rating, such as Lifeboatman/Proficiency in Survival Craft.
- [Marimed Foundation](#): Marimed Foundation is a nonprofit organization based in Kāneʻohe and Kāhalaʻu on Oʻahu. They offer a variety of training for students aimed at preparing local students and job seekers to enter the maritime industry.

National Training Programs: A wider variety of maritime training opportunities are available out of state, including apprenticeship programs sponsored by maritime unions.

- [Seafarers International Union Apprenticeship](#): The Seafarer's International Union (SIU) offers an Unlicensed Apprenticeship (UA) Program located in Maryland. The program includes 4 months of classroom instruction and 7 months of paid on-the-job training. The Union helps to cover associated costs for students.
- [Seamanship Training Program at Tongue Point](#): The Inlandboatmen's Union of the Pacific (IBU) offers a 2-year Seamanship Training Program at Tongue Point in Oregon. Students' expenses can be covered by the IBU. Students earn entry-level licenses upon completion of the program.
- [Cal Maritime](#): Cal Maritime is a 4-year maritime academy that provides a fast track into the maritime industry. Their degree programs include marine transportation and marine engineering technology.

TOURISM & RECREATION

Common trainings and certifications needed for tourism & recreation jobs related to the ocean include:

- [American Red Cross](#): CPR and First Aid certifications are commonly required for lifeguards and various roles in the tourism industry that involve taking passengers on the water.
- [YMCA](#): Lifeguards are typically required to have a lifeguard certification, such as from the YMCA.
- [Ocean Safety](#): Windward Community College Continuing Education offers ocean safety courses.

LIVING RESOURCES

Several University of Hawai'i System campuses offer programs that relate to aquaculture, including:

- [Windward Community College](#): Windward CC's Agripharmtech Certificate of Achievement (CA) includes an option to specialize in Limu Culture.
- [Leeward Community College](#): Leeward CC's Sustainable Agriculture program includes an Aquaponics Technician Certificate of Competence (CO) option.
- [University of Hawai'i at Hilo](#): UH Hilo offers a Bachelor of Science Degree in Agriculture with an Aquaculture specialization.
- UH Mānoa recently opened the [Tuahine Aquaculture Research and Education Center](#), a partnership between the College of Tropical Agriculture and Human Resources and UH Sea Grant. The Center will offer experiential aquaculture learning opportunities for students and the community.
- [University of Hawai'i Sea Grant College Program](#): The UH Sea Grant College Program is highly engaged in education and workforce development programs related to marine resource management, including through the [Hawai'i Aquaculture Collaborative](#).
- [Ocean Institute of Hawai'i Pacific University](#): One of the Ocean Institute's goals is to participate in workforce development and education using aquaculture as a platform for STEM disciplines.

MARINE RESEARCH & CONSERVATION

There are various certificate and degree programs in the University of Hawai'i system related to marine research & conservation, including:

- [Marine Option Program](#): The Marine Option Program is a UH system-wide certificate program.
- [University of Hawai'i at Mānoa](#): UH Mānoa offers degrees in Marine Biology (BA, BS, MS, PhD) and Oceanography (PhD, MS).
- [University of Hawai'i at Hilo](#): UH Hilo offers degrees in Marine Science (BS, BA).
- See Hawai'i P-20's [Natural Resources Management Pathway Map](#) for additional education and training programs related to natural resources and conservation careers in Hawai'i.

STAKEHOLDER FEEDBACK

Through in-depth interviews with 19 Hawai'i employers and community partners across various marine economy sub-sectors, the following emerged as common workforce development challenges and strategies.

Challenges:

- **Limited Local Talent Pool:** Across sub-sectors, employers are having challenges recruiting and retaining qualified local talent. In the maritime industry, hard-to-fill positions include Able-Bodied Seamen, Stewards, Mates, and Captains, particularly captains with higher-level licenses needed for larger ships. In aquaculture, technician roles can be challenging to fill.
- **Career Awareness:** Many employers, particularly in the maritime industry, believe that local students are unaware of the variety of career opportunities in their industries and the associated pay and benefits.
- **Limited Local Training Availability:** In the maritime industry, there are limited training opportunities available in Hawai'i, and Hawai'i does not have a maritime trade school like Tongue Point or Cal Maritime.
- **Need for Improved Coordination:** Many workforce development efforts in maritime and other marine sub-sectors are happening in silos, which creates confusion for industry partners.
- **Low Math Competency:** Math competency can be a barrier for students to pursue careers related to STEM, as STEM degrees often require advanced courses in math and physics.

Strategies:

- **Promoting Careers to Students:** Many employers are holding information sessions, sharing resources (e.g., flyers), and attending career fairs to spread awareness of careers in their sector.
- **Work-Based Learning:** Employers are creating work-based learning (WBL) opportunities for students to gain experience in their fields, including job shadowing and internships.
- **Engaging Students through Voyaging:** Community partners shared that voyaging can serve as a “hook” to get students to learn foundational knowledge and skills related to careers in maritime and natural resources/mālama 'āina.
- **Subsidized Training Programs:** The SIU and IBU both offer apprenticeship programs with financial assistance that reduce barriers to student participation.

RECOMMENDATIONS

Career Awareness: Ensure Hawai'i students and job seekers are aware of the diverse career paths in the state's marine economy, particularly in high-demand sub-sectors like marine transportation and ship & boat building²⁰ that offer competitive salaries but don't require a 4-year college degree. Common entry points in marine transportation include Ordinary Seamen, wipers, and steward assistants, while in ship & boat building, apprenticeships offer entry to the field. Hands-on work-based learning (WBL) activities are key to enabling students to experience these different careers.

Engage Students Through Voyaging: Education and training in Polynesian voyaging can engage students in maritime careers and equip them with valuable cultural knowledge, technical skills, and soft skills that are highly transferable to the maritime industry and other marine-related careers in Hawai'i.

Expand Local Training Programs: To increase the local talent pipeline, there is a need to expand local workforce training programs in marine transportation to fill the shortage of Able-Bodied Seamen and more advanced roles like mates and captains. If students and job seekers need to leave Hawai'i to get the maritime training they need, many may be unable to go or may not return to the state for work post-graduation.

Address Barriers to Access: Financial support and wraparound services in subsidized apprenticeships or training programs are key to ensuring education, training, and employment are accessible to Hawai'i students and job seekers. Students would likely benefit from industry guidance on navigating the requirements and credentials needed to enter the maritime industry.

Education Alignment for Improved Workforce Preparedness: Leverage Hawai'i Department of Education (HIDOE) Career & Technical Education (CTE) Programs to prepare students with foundational knowledge, technical and professional skills, and appropriate industry-recognized certifications, to set them up for entry-level employment or post-secondary education after graduation. Skills in basic vessel operations and ocean safety, as well as certifications such as Basic Life Support, are broadly applicable across many marine economy sub-sectors.

Foster Entrepreneurship: There are significant opportunities for Hawai'i students and residents to start up small businesses that create local jobs in some marine sub-sectors, such as aquaculture.

Industry-Education Collaboration: Collaboration among industry, secondary, and post-secondary education is essential to align curriculum and policies with current industry standards and develop new training programs as industry needs continually evolve.

²⁰ The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

APPENDIX A: TABLES

Table 10 below lists 35 occupations that correspond to the marine economy sub-sectors, can require ocean-specific knowledge or skill sets, and have a median salary above the ALICE survival budget for a single adult in Hawai'i (\$39,384).²¹ It should be noted that the labor market data associated with these occupations reflects statewide employment in all industries in Hawai'i, not just Hawai'i's marine economy.

Table 10: Relevant Marine Economy Occupations

SOC Code	Occupation Title	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)	Average Annual Openings
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	9,180	\$40,250	8,000	960	13.60%	1,080
53-1047	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	3,230	\$59,500	2,890	420	17.00%	330
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	2,760	\$85,750	3,020	300	11.00%	280
17-2051	Civil Engineers	2,380	\$84,500	2,490	160	6.8%	180
17-2071	Electrical Engineers	860	\$110,490	1,060	30	3.2%	70
53-6061	Passenger Attendants	830	\$43,950	1,380	460	50.40%	210
53-7051	Industrial Truck and Tractor Operators	790	\$60,940				
33-9092	Lifeguards, Ski Patrol, and Other	700	\$53,330	740	80	12.60%	180

²¹ ALICE in the Crosscurrents, Aloha United Way (2024). <https://www.auw.org/about/alice-initiative/>

	Recreational Protective Service Workers						
SOC Code	Occupation Title	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)	Average Annual Openings
53-5021	Captains, Mates, and Pilots of Water Vessels	570	\$71,820	680	230	52.10%	80
51-4121	Welders, Cutters, Solderers, and Brazers	550	\$76,540	640	-	0.00%	70
19-2041	Environmental Scientists and Specialists, Including Health	540	\$71,280	600	40	7.10%	60
17-2141	Mechanical Engineers	530	\$97,140	780	0	-0.1%	50
53-5022	Motorboat Operators	380	\$60,160	340	70	23.80%	40
19-1029	Biological Scientists, All Other	340	\$91,020	380	(10)	-1.80%	30
11-19121	Natural Sciences Managers	330	\$112,670	350	20	6.00%	30
51-9124	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	300	\$48,590	160	-	1.90%	20
19-1023	Zoologists and Wildlife Biologists	270	\$71,620	310	20	5.80%	30
53-7021	Crane and Tower Operators	260	\$113,500	90	10	5.80%	10
51-4041	Machinists	260	\$76,540	300	0	-0.7%	30

SOC Code	Occupation Title	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)	Average Annual Openings
53-5011	Sailors and Marine Oilers	250	\$64,600	110	-	-3.40%	10
53-6031	Automotive and Watercraft Service Attendants	210	\$44,240				
19-4042	Environmental Science and Protection Technicians, Including Health	180	\$48,220	160	10	7.40%	20
49-9096	Riggers	170	\$76,540	200	-	-1.00%	20
53-7041	Hoist and Winch Operators	170	\$98,580				
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	160	\$57,140	430	30	8%	60
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	150	\$47,110	760	120	19.40%	120
19-1031	Conservation Scientists	120	\$87,500	220	30	13.50%	20
49-3051	Motorboat Mechanics and Service Technicians	110	\$64,480	70	10	15.90%	10
33-3031	Fish and Game Wardens	100	\$68,660				
53-5031	Ship Engineers	70	\$97,070	40	-	11.10%	*

SOC Code	Occupation Title	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)	Average Annual Openings
45-2011	Agricultural Inspectors	70	\$58,550	140	10	9.30%	20
19-4012	Agricultural Technicians	70	\$42,000				
19-1022	Microbiologists	60	\$60,900	80	-	4.10%	10
49-9092	Commercial Divers	50	\$89,760				
17-2121	Marine Engineers and Naval Architects	N/A	\$89,360	110	0	0.0%	10

The three occupations listed in Table 11 below correspond to the marine economy sub-sectors and can require ocean-specific knowledge or skill sets, but have a median salary lower than the ALICE survival budget for a single adult in Hawai'i (\$39,384).

Table 11: Relevant Marine Economy Occupations Below ALICE Survival Budget

SOC Code	Occupation Title	Employment Statewide (2023)	Median Annual Wage (2023)	Projected Employment (2030)	Long-Term Job Growth (2020-30)	Percent Job Growth (2020-30)	Average Annual Openings
43-4181	Reservation and Transportation Ticket Agents and Travel Clerks	2,120	\$37,640	1,660	490	41.80%	200
43-5011	Cargo and Freight Agents	1,980	\$37,680	1,400	300	26.90%	150
19-4021	Biological Technicians	750	\$38,540	920	10	0.80%	120

APPENDIX B: METHODOLOGY

Quantitative Data

AE Consulting sourced data on marine economy employment in Hawai'i from the NOAA Office for Coastal Management [Economics: National Ocean Watch](#) (ENOW) dataset. ENOW includes data on employment in six sectors: Marine transportation, marine construction, living resources, offshore mineral resources, tourism & recreation, and ship & boat building.²²

The tourism & recreation sub-sector as defined in the ENOW data initially included eating and drinking establishments, hotels, campsites & RV parks, and manufacturing of sporting goods. However, jobs associated with these industries were removed from the employment data, as these industries are less relevant for the scope of this analysis, which is focused on occupations that can require ocean-specific skill sets or knowledge.

Marine research & conservation was not initially included in the ENOW data as a marine economy sector. AE Consulting derived an estimate of marine research & conservation employment in Hawai'i from the 2023 Natural Resources Management Sector Survey data, based on survey responses from organizations engaged in some form of marine research and/or conservation. The 2023 Natural Resources Management Sector Survey was administered by SMS Research and Hau'oli Mau Loa Foundation for the [2024 Green Jobs Report](#).

Data on relevant occupations was sourced from [HireNet Hawaii](#) (State of Hawai'i Department of Labor & Industrial Relations) and the [U.S. Bureau of Labor Statistics](#). AE Consulting identified 35 occupations that correspond to the marine economy sub-sectors, can require ocean-specific skill sets or knowledge, and have a median salary above the ALICE survival budget for a single adult in Hawai'i (\$39,384). Three occupations were identified that correspond to the marine economy sub-sectors and can require ocean-specific skill sets or knowledge but have a median salary lower than the ALICE survival budget for a single adult in Hawai'i.

Stakeholder Outreach

AE Consulting developed a stakeholder outreach strategy and contact list in collaboration with the project team to ensure representation from key employers in the major marine economy sectors in Hawai'i. AE Consulting interviewed a total of 19 employers and community partners for this analysis. Interviews focused on employers' top workforce needs, including entry- and mid-level roles, training and skills needed for those in-demand roles, workforce challenges, and strategies/recommendations for workforce development.

²² The National Oceanic and Atmospheric Administration (NOAA) defines the ship & boat building sub-sector as ship and boat building and repairs.

APPENDIX C: PRIMARY DATA SOURCES

NOAA Economics: National Ocean Watch (ENOW) Data

[Economics: National Ocean Watch](#) (ENOW) data from the National Oceanic and Atmospheric Administration (NOAA) was used to report on employment volume, GDP, and wages in six marine economy sub-sectors in Hawai'i.

HireNet Hawaii

Long-term Occupational Projections to 2030 for the State of Hawai'i were sourced from Hawaii Workforce Infonet on [HireNet Hawaii](#).

U.S. Bureau of Labor Statistics

[Occupational Employment & Wage Statistics](#) for Hawai'i in 2023 were sourced from the U.S. Bureau of Labor Statistics.