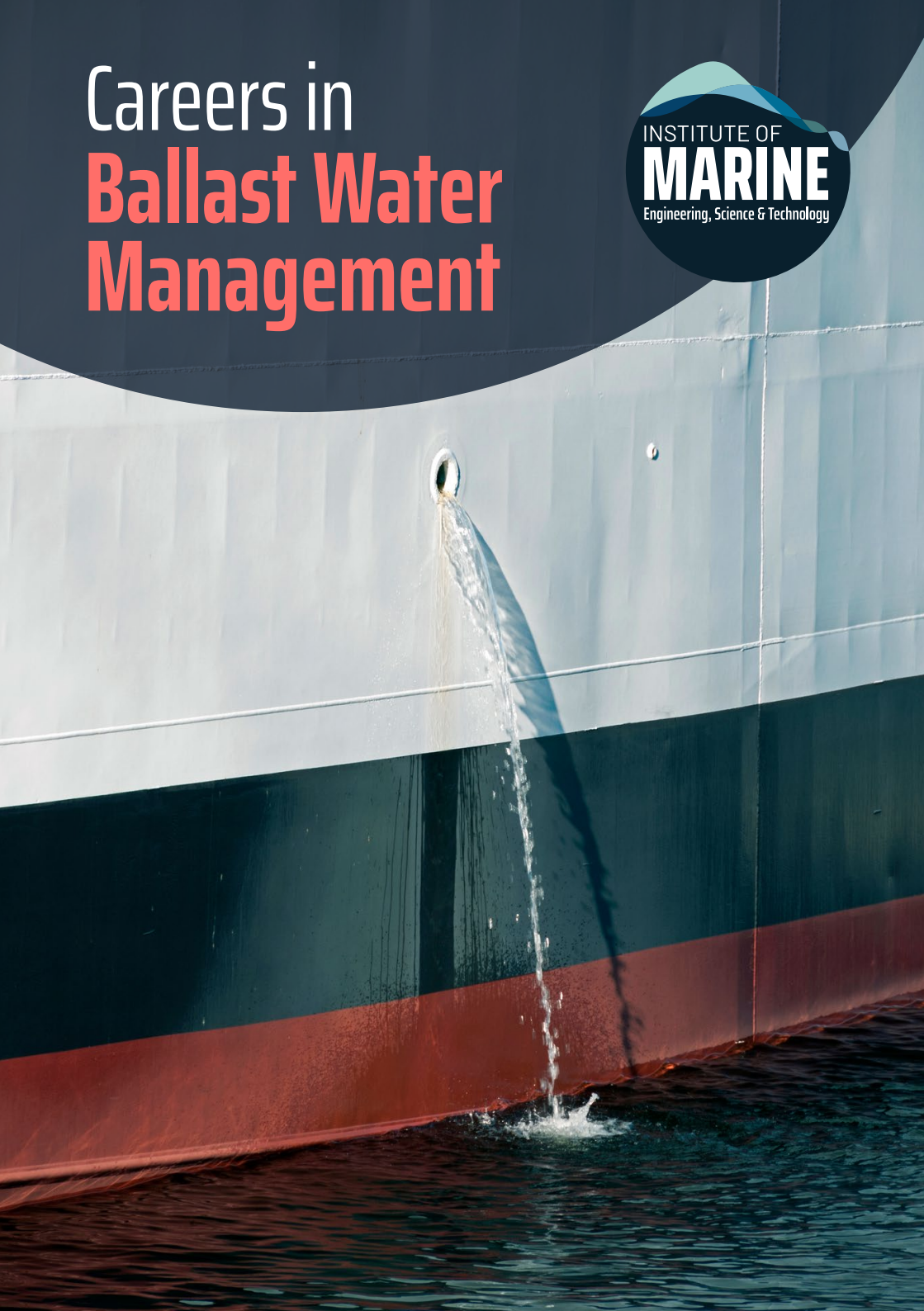
Careers in Ballast Water Management

INSTITUTE OF MARINE
Engineering, Science & Technology



FIELD	ROLE TYPES	EXAMPLE ACTIVITIES	KEY SKILLS AND EXPERIENCE	CAREER PATHWAYS	ROUTES
Ballast Water Management	Environmental Consultant	• Support BWMS manufacturers with scientific aspects of testing and perform environmental, ship safety and human health risk assessments for treated ballast water and equipment installations onboard ships • Support shipowners / crew with understanding/ implementing BW management tasks and regulations • Provide technical input to the global regulatory process • Work with scientific, regulatory and industry stakeholders to facilitate development and implementation of global regulations • Support BWMS makers with obtaining necessary regulatory approvals for their equipment (IMO, USCG, classification societies, Flag administrations) • Provide consulting services to NGO's (industry associations, environmental groups, etc.) • Develop and deliver technical training programs to ship owners/operators/crew and regulatory bodies (intergovernmental organizations, port State control, Flag administrations, etc.)	• Experience with water treatment technologies and their differing industrial applications, and their related effectiveness in ballast water management. • Experience with environmental, human health and ship safety risk assessments. • Knowledge of regulatory processes (i.e., how regulations are developed, brought into force, and implemented) and the regulations associated with the specific industry. • Experience onboard vessels and with field work (i.e., implementing field studies, BWMS equipment familiarity, field data collection). • Understanding of type approval testing (biological efficacy, operational, and laboratory aspects). Experience in working with a wide range of technical specalists and support collaboration. • Project Management skills (project planning, budgets, etc.)	• Academic route (if applicable) Typically 10 + years relevant exerience. Science degree and possibly higher qualification, usually biological / chemical relevant training, eduction or experience • Professional route (if applicable) Tends to be through direct employent or head hunting by relevant industry • Other route(s) (if applicable) Often includes economic / risk specialists	• Usually has had opportunities to manage teams of staff and numerous projects often worldwide. Well aware of project costs and use of environmental data. May include physical, chemical constituents as well as microbial biology & geomorphology
	Environmental or Laboratory Technician	• Perform onboard sampling of BW discharges for laboratory analysis, and field analysis for certain parameters. • Support / perform BWMS bioligical efficacy testing for BWMS approvals and/or ship compliance • Laboratory analysis of water samples (biological and/ chemical constituents)	• Experience onboard vessels and with field work (i.e., implementing field studies, field analytical equipment use, sample and/or data collection). • Understanding of type approval testing (biological efficacy, operational, and laboratory aspects). • Ability to process, understand and effectively communicate test data / results. • Laboratory analytical experience / training. • Strong attention to details.	• Academic route (if applicable) Technical qualifications achieved at college / higher national facility • Professional route (if applicable) - Industry employment • Other route(s) (if applicable) - Initial enthusiasm for sea going, pollution, community interaction through school or hobby opportunities	• Enjoys collecting scientific data and anaysis with colleagues. Often sets up and checks suitability of equipment & may provide training for colleagues. Lab work may involve overseas work in a lab on land or at sea

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Ballast Water Management	Scientist	• Conduct research related to aquatic invasive species (i.e., impacts to habitats, human health, socio-economic impacts, how to prevent / treat, etc.) • Support establishment of testing methods and regulations pertaining to BW management (testing BWMS capabilities) and prevention of aquatic invasive species • Conduct testing of prototype / innovative emerging technologies (BMWS, analytical instruments, etc.) • Act as a resource for training to allow others to understand why managing invasive species is important	• Understanding of type approval testing (biological efficacy, operational, and laboratory aspects). • Ability to process, understand and effectively communicate test data / results. • Experience with environmental and human health risk assessments. • Ability to work with different specialists & understand their contributions • Strong attention to details and critical thinking skills	• Academic route (if applicable) - Science degree usually biological related. Experience of microbiology an asset and understanding of how ballast water treatment technology is employed to minimise environmental impacts • Professional route (if applicable) - Day release from employer to undertake sandwich course that balances industry need and science based approaches. • Other route(s) (if applicable) - School / college schemes linked with scientific organisation such as the Marine Biological Association.	• Ability to communicate scientific data collected by self + from colleagues / team members to show environmental impact and value for money, recognising benefits and short comings of approaches.
	Marine Engineer	• Support BWMS developers with marine engineering for the design, integration and operation of BWMS onboard. • Support shipowners with BWMS system selection, integration engineering, installation, maintenance and troubleshooting. • Provide technical input to support development and implementation of global regulations	• Experience with ship design, safety and operational aspects, and how that relates to ballast water management and installation of a BWMS.	• Academic route (if applicable) - marine academy • Professional route (if applicable) - employment by engineering firms, ship owners, ship yards, classification societies, equipment manufacturers, and more.	
	Service Technician	• Perform onboard service, maintenance, and/or troubleshooting of BWMS • Coordination of logistics for materials and personnel to perform shipboard attendance	• Experience with mechanical / water treatment equipment and principles. Knowledge of shipboard operations, interacting with ships crew and shoreside personnel. • Experience with different BWMS technologies, their operational principles and equipment. • Experience working onboard. • Training in ship safety, and if applicable, chemical safety for BWMS that utilize chemicals in the treatment process		

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Ballast Water Management	Market Manager	• Serve as the company expert in a market segment • Provide forecast models for sales and manufacturing to ensure adequate resources are planned • Coordinate the marketing budget and plans with the marketing department to focus the company's marketing efforts to reach core customers • Interact with key customers and industry stakeholders to build brand presence and value	• Extensive experience in the industry • Ability to self-promote and network effectively • Ability to package technical information in a way that is deliverable to the market and meets the needs of the customer base • Ability to deliver presentations and technical content at industry events. • Excellent written and oral communications skills • Ability to support the sales team and conduct business in a multi-cultural environment.	• Academic route - undergraduate degree in business, engineering, or marketing with post-graduate masters in business administration • Professional route - 10+ years industry knowledge and experience, preferably in sales or product management	• Typical career path would be through work in the industry, leading to increasing responsibity and exposure to sales and marketing. Mentorships are important to bridge the gaps between either technical engineering knowledge or business/marketing knowledge depending on the academic path undertaken. Networking both internally and externally are also important to develop a network and to demonstrate the skills needed in the job.
	Product Manager	• Lead on product design and primary internal champion for the product • Ability to interface with engineering and sales to determine product requirements and customers to determine needs and pain points. • Willingness to interact with external regulatory agencies to gain approvals for the product and establish key regulatory opportunities and markets"	• Excellent written and oral communication skills • Must be able to negotiate various different stakeholder needs, customer expectations, and economic considerations to deliver the best viable product. • Should have good analytical skills and be process-minded with a strong ability to remain accountable to ambiguous targets. • Needs to have strong enough engineering skills to identify potential weaknesses or oversights in the design. • Must have excellent organizational skills.	• Academic route - undergraduate degree in engineering or science, post-graduate degree in business is preferred. • Professional route - 5+ years product knowledge and experience, preferably in engineering, sales, or marketing	• Typical career path would be working through an engineering discapline or market research and development. Mentorship would be prefered to develop the complimentary skills (engineering or marketing) depending on the early career and academic choices of the individual.

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Ballast Water Management	Social Media Coordinator	• Maintain the social media feeds and profile of the company. • Publish internal reports on competitor's moves and tactics to assist with the overall sales and marketing goals of the company • Provide material for sales and marketing teams to amplify the market message of the company • Identifiy and create content to for the company to post to remain relevant in social media and promote the brand and product value.	• Good written communications skills, particularly focused on the particular language of each social media platform • Ability to integrate engineering data and technical specifications into social media posts to create brand value and product recognition • Excellent analytical skills to ensure that the company remains informed of the impacts of competitors in the marketplace • Ability to coordinate with sales, engineering, marketing, product management, and senior leadership to get content and keep all stakeholders satisfied.	• Academic route - undergraduate degree in English, Journalism or Communications • Professional route - building of network through social media connections or through internships • Other route(s) - developing personal content and a personal network and then connecting to business or thought leaders to assist them with their own on-line presence.	
	Classification Surveyor	• Inspect vessels to ensure their safety and seaworthiness • Conduct health, safety, and environmental surveys of vessels on behalf of Flag Administrations to ensure compliance with all applicable regulations. • Inspect equipment at the facilities of the manufacturers for certification • Conduct audits to verify compliance with ISO/ISM policies and procedures"	• Strong analytical skills and ability to carefully and thoroughly conduct complicated and extensive inspections and audits • Excellent written and oral skills to communicate the results of inspections and audits in a clear and concise manner in a multi-cultural environment. • Ability to receive feedback from customers and negotiate the tension between the safety of the vessel and personnel and the financial implications of compliance • Physical endurance and stamina are critical	• Academic route - undergraduate degree in marine engineering or naval architecture • Professional route - time as a licensed officer onboard a commercial vessel or serving is preferred	• Two typical pathways: Graduation from university with a degree in naval architecture or marine engineering followed by an internship or mentorship program at a Classification Society; or 5+ years onboard commercial vessels as a licensed officer followed by an internahip or mentorship program at a Classification Society.

IMarEST ROLE MODELS

The IMarEST features career case studies of inspirational people working across a wide variety of professions in the marine sector. Read about the career experiences of these marine professionals to help you decide on your own career path.

Marcie Merksamer

Vice President / Secretary General

Education:

- Bachelors Degree in Biology with a concentration in Environmental Science and Policy (United States)

Career progression:

- Envionmental Laboratory Technician
- Environmental Field Technician
- Wildlife Biologist
- Shipboard Technician
- Environmental Consultant / Vice President
- Secretary General

Key skills:

- Scientific knowledge of environmental processes and how contaminants behave in the environment (land and water).
- Knowledge of water treatment technologies (chemical and non-chemical) and associated aquatic toxicology of chemically treated water.
- Self-motivated
- Project management
- Critical thinking and problem solving skills
- Technical writing skills
- Oral communication skills
- Desire to work with a variety of professionals and to understand differing perspectives.
- Contract Management
- Monitoring of Quality Control and Quality Assurance internally and with contracted external suppliers.
- Review of laboratory data from environmenal samples and project report preparation.
- Comprehensive knowledge of ballast water and associated regulations within the US and internationally.
- High level of attention to detail.

Role:

- I am currently Vice President of EnviroManagement, Inc., an environmental project management and consulting company that I co-founded in 2002. I am responsible for all aspects of the company including business and financial administration, quality control, client relations, client and supplier contract management, regulatory compliance, project execution and budget management, and maintaining the company's ISO 9001:2015 certification.

  I am also currently the Secretary General of the Ballastwater Equipment Manufacturers'Association (BEMA), a non-profit global industry association dedicated to the effective treatment of ballast water and supporting emerging environmental technologies that reduce the environmental impacts of shipping.

  My work requires regular international travel for meetings with clients, performing quality control audits of contracted laboratories, public speaking engagements, and providing technical input to the work of International Maritime Organization's Marine Environment Protection Committee (MEPC) and Pollution Prevention and Response Subcommittee (PPR).

  I stay abreast of global shipping regulations for ballast water and other discharges from ships, and work with all stakeholders in an effort to develop regulations that are based on science and technology, and that can be practically implemented by industry.

Drivers:

Since I was a small child, I have been interested in all things water and the organisms that live in aquatic environments. I was looking for a career in marine water quality management and when I was introduced to the global issue of the transfer of aquatic invasive species through ship's ballast water, I knew I found the niche that I was meant to work in. My desire is to contribute to maintaining the health of the oceans and freshwater environments by facilitating effective management of ballast water globally. I enjoy working with international scientists, policy makers and industry (ship owners and crew, equipment manufacturers, etc.) to find the balance that accomplishes the goals of each sector while protecting and preserving aquatic environments. My job is never boring and is continually evolving! I feel truly blessed for the professional growth opportunities the field has provided and to have been able to create a career around a topic that I am passionate about.

Mark Riggio

Consultant

Education:

- Bachelors Degree in Marine Engineering Systems
- Masters in Business Administration

Career progression:

- Classification Surveyor
- Port Engineer
- Fleet Manager
- Product Manager
- Global Sales Director
- Consultant

Key skills:

- Ability to understand and analyze complex processes
- Marine engineering knowledge and skills
- Hands-on maintenance and repair skills
- Ability to understand and interpret regulations
- Negotiation skills
- Excellent written and oral communication skills
- Ability to give presentations and provide training in a multi-cultural, multi-lingual environment
- Significant international travel
- Ability to self-start and work with flexibile and maleable deadlines

Role:

I joined the maritime industry when I left University because I was passionate about going to sea. At the time there were few sea-going opportunities in the United States, so I became an apprentice Classification Surveyor to stay closely connected to ships and to learn more about how to keep them safe and seaworthy. After years of inspecting both new construction and in-service vessels, I transitioned to being a port engineer and eventually was promoted to fleet manager. Managing six ships and the crews and support team neeed to operate these vessels gave me unique perspectives into the economics of shipping and helped me to understand the balances between safety, environmental stewardship, and profitability.

My experience both from the regulatory and operational side of shipping caused me to be recruited from my fleet to work as the product manager for a ballast water treatment company. This allowed me to continue to work in my passion for keeping ships safe and environmentally-friendly. This role enabled me to build a global brand, launch multiple product releases, and work closely to develop a product that combined both operational ease with environmental protection so that crews did not have to sacrifice operational ease and performance in order to protect the oceans from the spread of aquatic invasive species.

My unique skill set inspired me to open my own consultancy so that I could help more ships than I would be able to by working with just one company. Giving technology-neutral advice to be able to improve the performance of all ships allows me to have the greatest impact on the environmental performance of shipping. It also allows me to support the multiple NGOs that I work with, including IMarEST and the Ballastwater Equipment Manufacturers' Association (BEMA), much more closely than may be possible while balancing the needs of "a day job..."