



GROWING CANADA'S  
OCEAN ECONOMY

AMBITION  
**2035**

# THE FUTURE OF OCEAN AI

A STRATEGIC APPROACH AND GLOBAL  
OPPORTUNITY FOR CANADA

**INSIGHTS REPORT**

Developed through leadership and guidance from  
the Ambition 2035 Ocean AI Steering Committee

[WWW.OCEANSUPERCLUSTER.CA](http://WWW.OCEANSUPERCLUSTER.CA)

# INTRODUCTION

Artificial Intelligence (AI) is transforming industries by equipping machines with the capability to think, learn, and process vast amounts of data, automating complex tasks and generating critical insights. AI's potential to address critical challenges, drive economic benefits, and support environmental conservation efforts is at the forefront of ocean AI potential. Recognizing this opportunity, Canada's Ocean Supercluster aims to promote the responsible adoption of AI to grow Canada's ocean sector by demonstrating current AI applications, highlighting industry challenges, and offering future opportunities and recommendations.

## AI IN CANADA: USE CASE EXAMPLES

OSC AI COMMERCIAL 2023 CALL



### Coastal Carbon

#### In-Situ Biomass Sensor for Seaweed Measurement

This project will directly support Canadian seaweed aquaculture at large. The models developed by this project will form the foundation for further leveraging AI for ocean biomass measurement. Beyond the project consortium, access to high quality, inexpensive biomass monitoring has the potential to positively impact all Canadian seaweed farmers. Farmers in remote or small communities with limited measurement ability and resource constraints are positioned to see the most economic benefit. This low-cost, non-intrusive monitoring also provides a pathway for the continued integration of Indigenous-led knowledge in seaweed biomass monitoring, while providing a larger understanding of their own seaweed sites to Indigenous farmers and communities.

CORE PROGRAM



### Global Spatial Technology Solutions

#### Empowering Maritime Collaboration through AI

Low on-time arrival rates at berths is an industry-wide challenge and can be as low as 30-50% at ports around the world. At the same time, vessels often arrive in port to find no berth available. This results in inefficient port resource utilization, excess shipping costs, excess fuel use and excess GHG emissions along trade routes and/or at anchor. The project lead, GSTS, based in Halifax, NS, will work in partnership with Canada Steamship Lines as well as its customers and collaborators, Montreal Port Authority, Laurentian Pilotage Authority, and Clear Seas, to leverage its proprietary platform, OCIANA™ and implement novel AI algorithms to improve the overall efficiency of the maritime supply chain, as well as support Green Digital Shipping Corridors.

OSC AI COMMERCIAL 2023 CALL



### OnDeck Fisheries AI

#### Scalable Fisheries Monitoring

This project will modernize fisheries monitoring with Artificial Intelligence to make electronic monitoring (EM) more affordable for fishers and more effective for fisheries management. Through collaboration, the project will create the necessary AI infrastructure for monitoring programs to seamlessly integrate AI into their workflow. This project will enable monitoring programs to scale their operations without incurring high costs for video review, data processing, and storage. By addressing bottlenecks in data collection and processing, AI-enabled EM can be scaled up to provide key decision-making capabilities for fishers and fisheries management.

Find more Ocean AI projects [here](#).

# CURRENT SITUATION

The ocean sector faces challenges in AI adoption, including upskilling the workforce and hiring the right talent. Large organizations need substantial investment in training, while SMEs need more resources. Attracting AI professionals is challenging because of intense competition from other sectors such as tech and finance. Additionally, a general lack of awareness about AI's value, especially from key stakeholders, creates resistance and slows progress.

## CHALLENGES

### AI Knowledge Gap

- A significant barrier to AI adoption in large organizations is the lack of awareness among key stakeholders about its potential. There is often a limited understanding of AI's capabilities and its strategic advantages in optimizing the marine sector. This knowledge deficit creates resistance to change and a reluctance to invest in AI solutions, slowing technological advancement. SMEs, while more flexible and open to adopting AI technologies, face challenges in educating their clients about AI and convincing them of its value.
- Businesses can be unclear of where to begin when exploring AI, be unsure of opportunities, and lack the internal expertise to create a strategy. For smaller businesses especially, finding the time and resources to explore AI possibilities is a key challenge.
- Continuous professional development, crucial for keeping pace with the rapid evolution of AI technologies, is often hindered by a significant lack of both general and specialized training programs.
- The scarcity of AI experts who can combine domain-specific knowledge in the ocean industry often leads to external talent acquisition. This can disrupt project flows and result in the loss of valuable internal knowledge.
- Visibility and reputation often impede the ocean sector's efforts to attract AI specialists.
- There is often limited recognition and understanding of AI's capabilities and its strategic advantages in optimizing the ocean sector.

### Data Barriers

- Limited digital maturity, characterized by legacy systems and early-stage digital infrastructure, often complicates the integration of advanced AI technologies.
- Challenges in data utilization, including issues related to data collection, cleaning, structuring, and usage, present significant barriers.

### Financial Uncertainty

- The high levels of investment in infrastructure, talent, and iterative testing required to advance AI solutions to operational readiness present a significant challenge to adoption and scalability.
- It is difficult to effectively capture ROI for AI projects. Both SMEs and large enterprises often struggle to focus on critical KPIs, such as cost savings from automation, improved efficiency in resource utilization, reduced operational downtime, and enhanced accuracy in data-driven decision-making, hindering their ability to demonstrate tangible benefits.
- SMEs often require funding to invest in AI, but accessing funding isn't always straightforward; complex and time-consuming approval processes can discourage them from pursuing these opportunities.

# CURRENT SITUATION

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The following recommendations, derived from interviews, surveys, and roundtables, aim to support the ocean sector in increasing AI awareness, understanding, and adoption.

## RECOMMENDATIONS

### Bridge the Skills Gap

- Developing comprehensive educational programs tailored to the ocean sector's unique needs is essential. These programs should focus on AI technologies and their applications in ocean contexts, providing targeted knowledge and skills to bridge the gap.
- Launching campaigns to raise awareness about the importance and potential of AI in the ocean sector can attract more interest and participation. These campaigns can highlight success stories and the transformative impact of AI, encouraging more individuals and organizations to invest in AI training and development.
- By valuing diverse skill sets and focusing on interdisciplinary hiring, organizations can drive more creative and effective problem-solving, enhancing their AI capabilities.

### Foster Industry Collaboration & Standardization

- Enhancing effective collaboration between teams and clients is essential for developing successful AI models and can accelerate AI adoption by facilitating the exchange of best practices and innovative solutions.
- By working together, industries can share knowledge, resources, and best practices, leading to the development of more robust and efficient solutions. In the ocean sector, such collaboration can lead to enhanced data standardization, improved resource management, and innovative solutions for sustainability.

- Standardizing data processes can streamline data preparation, reduce redundancy, and mitigate some of the financial challenges associated with AI development and implementation. This harmonization allows organizations, both large and small, to work together more effectively, leveraging shared resources and insights to drive innovation and progress across the industry.

### Providing Financial Support

- Funding foundational digital and AI capabilities requires a different perspective on success metrics. Unlike typical projects with immediate ROI, these initiatives focus on building essential infrastructure, skills, and readiness, - foundational needs for competitiveness in a digital economy. Success here is measured by companies' enhanced capacity to adopt advanced technologies, participate in digital ecosystems, and grow sustainably, rather than by immediate financial returns. Supporting these fundamentals is an investment in long-term sector resilience and innovation.
- Funding from major tech organizations offers valuable expertise and accelerates the development of data lakes, pipelines, models, and related capabilities.
- Utilize government grants, private investments, and streamlined approval processes to accelerate AI adoption. Specialized funding mechanisms can bridge the gap between development and operationalization, providing tailored support to address the unique challenges of the ocean sector.
- Creating practical tools for AI adoption, focusing on financial ROI, data practices, ethics, and technology standards, will help decision-makers in the ocean industry better understand its value and impact.

# GOALS

## SHORT TERM GOALS

1

Initiate awareness campaigns to build foundational knowledge about AI within the ocean sector.

2

Implement education initiatives, including workshops, webinars, and training sessions, offering practical, hands-on experience with AI tools and technologies. Emphasize the importance of continuous professional development to keep pace with AI advancements.

3

Start forming collaboration networks and partnerships to facilitate data sharing and collective problem-solving.

## LONG TERM GOALS

1

Work towards securing sustained investment from government grants, private investors, and public-private partnerships.

2

Foster a collaborative environment that encourages continuous improvement and innovation in AI adoption.

3

Enhance data access and sharing while providing tangible guidance on data structures and technology adaptation tailored to the ocean sector.



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