



ADVANCING KNOWLEDGE ON FACTORS AFFECTING  
SOCIETALLY-ENDORSED SUSTAINABLE AQUACULTURE

Ramón Filgueira, Lucia M. Fanning, Bertrum MacDonald,  
Patricia Manuel, Charles Mather, and Barbara L. Neis

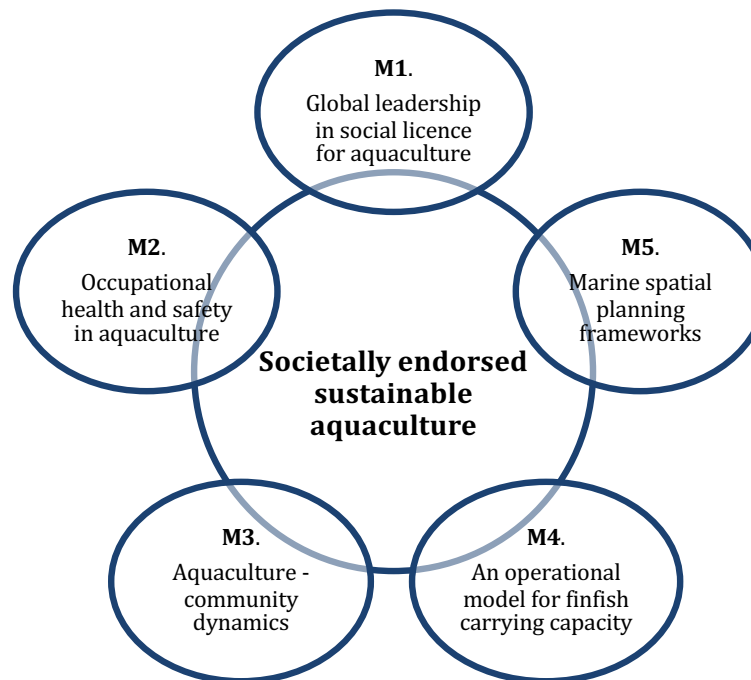
<https://thefishsite.com/articles/what-is-on-salmon-aquacultures-tech-horizon-norway-development-license>

## OVERARCHING GOAL

To advance and share knowledge for bridging the gap in understanding Social Licence to Operate (SLO) for aquaculture

### WHY?

- The challenge of 'social acceptability' in aquaculture
- Need for an innovative approach that tightly couples the technical and technological aspects of fish farming with societal needs

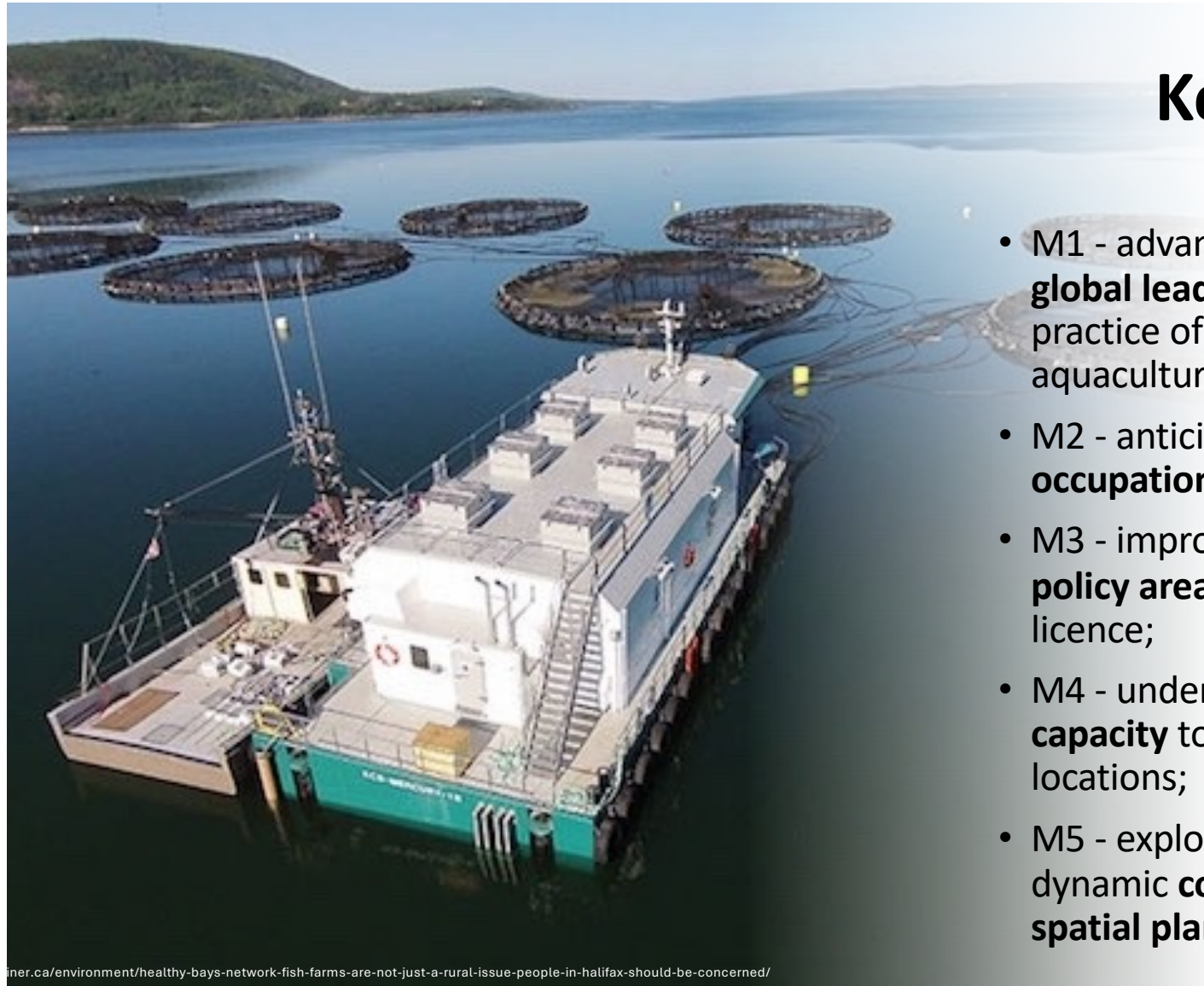


### HOW?

- **understand the full suite of factors affecting SLO**
- 40+ researchers addressing the challenge of social acceptability

# Key Objectives

- M1 - advancing mechanisms to **enhance global leadership** in the theory and practice of societally endorsed sustainable aquaculture;
- M2 - anticipating and addressing **occupational health and safety hazards**;
- M3 - improving understanding of **key policy areas of concern** that affect social licence;
- M4 - understanding **social carrying capacity** to better predict ideal siting locations;
- M5 - exploring tools for adaptive and dynamic **community-based marine spatial planning**.



# Societally Endorsed Sustainable Aquaculture

Can social license be achieved through societally endorsed, sustainable aquaculture?

*enhance global leadership*

**M1 focuses on identifying factors affecting the social acceptability of aquaculture**

- Examining the role of benefits, impacts, risks and uncertainties of aquaculture in social licence;
- Examining the social, legal, political, environmental, economic and institutional factors influencing social licence;
- Identifying and filling knowledge gaps to enhance our understanding of social licence of aquaculture.

# Societally Endorsed Sustainable Aquaculture

Can social license be achieved through societally endorsed, sustainable aquaculture?

## Identifying knowledge gaps



Marine Policy

Volume 99, January 2019, Pages 275-282



## Social licence and aquaculture: Towards a research agenda

[Charles Mather](#)<sup>a</sup> , [Lucia Fanning](#)<sup>b</sup>

## Sharing knowledge among stakeholders



Marine Policy

Volume 113, March 2020, 103800



## Key players in the Grieg NL Placentia Bay Atlantic Salmon Aquaculture Project: A social network analysis

[R.J. Maxwell](#) , [R. Filgueira](#)

## Appropriateness of the concept to aquaculture



COMMENTARY | Full Access

## Is social licence “going rogue”?

[Charles Mather](#) , [Lucia Fanning](#)



Marine Policy

Volume 138, April 2022, 104958



## Transparency and communication in Norwegian and Nova Scotian Atlantic salmon aquaculture industries

[Justin D. Trueman](#)<sup>a</sup> , [Ramón Filgueira](#)<sup>a b</sup>, [Lucia Fanning](#)<sup>a</sup>

# Societally Endorsed Sustainable Aquaculture

Can social license be achieved through societally endorsed, sustainable aquaculture?



WGSEDA

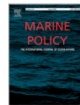
Working Group on Social and Economic Dimensions of Aquaculture

Seeking global leadership towards building a new paradigm



Marine Policy

Volume 118, August 2020, 103985



## Visualizing the social in aquaculture: How social dimension components illustrate the effects of aquaculture across geographic scales

[Gesche Krause](#)<sup>a b c</sup> , [Suzannah-Lynn Billing](#)<sup>d</sup>, [John Dennis](#)<sup>e</sup> , [Jon Grant](#)<sup>f</sup>,  
[Lucia Fanning](#)<sup>g</sup>, [Ramón Filgueira](#)<sup>g</sup>, [Molly Miller](#)<sup>h</sup>, [José Antonio Pérez Agúndez](#)<sup>i</sup> ,  
[Nardine Stybel](#)<sup>j</sup>, [Selina M. Stead](#)<sup>k</sup>, [Wojciech Wawrzynski](#)<sup>l</sup>

REVIEWS IN  
Aquaculture



Review | Open Access |

## Availability and usefulness of economic data on the effects of aquaculture: a North Atlantic comparative assessment

[Eirik Mikkelsen](#) , [Lucia Fanning](#), [Cornelia Kreiss](#), [Suzannah-Lynn Billing](#), [John Dennis](#), [Ramon Filgueira](#),  
[Jon Grant](#), [Gesche Krause](#), [Doug Lipton](#), [Molly Miller](#), [José Perez](#), [Selina Stead](#), [Sebastian Villasante](#)

First published: 02 September 2020 | <https://doi.org/10.1111/raq.12488> | Citations: 7

# Occupational Health & Safety

How can we anticipate and reduce occupation health and safety issues in aquaculture?

## *occupational health and safety hazards*

### **M2 focuses on the role of Aquaculture Occupational Health and Safety (AOHS)**

- AOHS is under-researched globally, including in Canada
- In 2017 there was only one peer-reviewed article on AOHS in Canada, which was co-authored by Barb Neis (lead M2 investigator)
- A key aspect of anticipating and reducing AOHS issues is to **identify hazards, trends and types of injuries/fatalities** in different parts of the sector
- Then carry out **risk assessments and look for ways to reduce risk.**

# Occupational Health & Safety

How can we anticipate and reduce occupation health and safety issues in aquaculture?

## Recognition of need for AOHS

JOURNAL OF AGROMEDICINE  
<https://doi.org/10.1080/1059924X.2019.1655203>



Check for updates

### Scoping Global Aquaculture Occupational Safety and Health

Lissandra Cavalli<sup>a</sup>, Mohamed F. Jeebhay<sup>b</sup>, Flavielle Marques<sup>c</sup>, Rebecca Mitchell<sup>d</sup>, Barbara Neis<sup>e</sup>, Dorothy Ngajillo<sup>b</sup>, and Andrew Watterson<sup>f</sup>

## Characterization of noise exposure



Contents lists available at ScienceDirect  
Aquaculture  
journal homepage: [www.elsevier.com/locate/aquaculture](http://www.elsevier.com/locate/aquaculture)



Occupational noise exposure in Canada's salmonid aquaculture industry

Jonathan K. Stone<sup>a,b</sup>, Lorenzo Moro<sup>a,c,\*</sup>



## Data from injury claims: high hazard but similar to other jurisdictions



Contents lists available at ScienceDirect

Aquaculture

journal homepage: [www.elsevier.com/locate/aquaculture](http://www.elsevier.com/locate/aquaculture)



Occupational safety and health in marine aquaculture in Atlantic Canada: What can be learned from an analysis of provincial occupational injury compensation claims data?

Cory Ochs<sup>a,\*</sup>, Barbara Neis<sup>a</sup>, Kimberley Cullen<sup>b,c,d</sup>, Edgar J. McGuinness<sup>a</sup>



## Specific issues during mass mortality events



Contents lists available at ScienceDirect

Aquaculture

journal homepage: [www.elsevier.com/locate/aquaculture](http://www.elsevier.com/locate/aquaculture)



Mass mortality events in marine salmon aquaculture and their influence on occupational health and safety hazards and risk of injury

Barbara Neis, PhD<sup>a,\*</sup>, Wenzhao Gao, MEng<sup>a</sup>, Lissandra Cavalli, PhD<sup>b</sup>, Trine Thorvaldsen, PhD<sup>c</sup>, Ingunn M. Holmen, PhD<sup>c</sup>, Mohamed F. Jeebhay, MBChBPhD<sup>d</sup>, Maria Andr e L pez G mez, PhD<sup>a</sup>, Cory Ochs, MSc<sup>a</sup>, Andrew Watterson, PhD<sup>a</sup>, Matthias Beck, PhD<sup>f</sup>, Carlos Tapia-Jopla, MSc<sup>g</sup>





# Occupational Health & Safety

How can we anticipate and reduce occupation health and safety issues in aquaculture?

[www.coastalfutures.ca](http://www.coastalfutures.ca)



**OCEAN**  
FRONTIER INSTITUTE

**SINTEF**

Newfoundland  
& Labrador

## Canada-Norway dialogue on marine aquaculture hazards and risk assessment

An online dialogue for researchers and stakeholders starting in January 2024

[+ READ MORE](#)

•

# Community Dynamics

What are the complex and changing relationships between coastal communities and aquaculture production?

*key policy areas of concern*

**M3 focuses on issues and concerns at the community level:**

- The issues of public perception and social licence are crucial to the aquaculture sector, and these issues emerge at the community level
- Community dynamics that are relevant across production regions
- These issues and concerns are also relevant across scales – from local to regional to global

# Community Dynamics

What are the complex and changing relationships between coastal communities and aquaculture production?

## The issue of marine plastics

frontiers  
in Marine Science

SYSTEMATIC REVIEW  
published: 07 July 2021  
doi: 10.3389/fmars.2021.699108

### Critical Gaps in Shoreline Plastics Pollution Research

Jessica Melvin<sup>1\*</sup>, Madeline Bury<sup>1</sup>, Justine Ammendolia<sup>1,2</sup>, Charles Mather<sup>1</sup> and Max Liboiron<sup>1,3</sup>

## The problem of salmon escapes

Science, Technology, & Human Values  
Volume 47, Issue 5, September 2022, Pages 937-959  
© The Author(s) 2021. Article Reuse Guidelines  
<https://doi.org/10.1177/01622439211039013>

SAGE  
journals

Article

### Opening Up Containment

Ignace Schoot and Charles Mather 



## The promise and risks of land-based production



Geoforum  
Volume 123, July 2021, Pages 47-55



### 'Landing' salmon aquaculture: Ecologies, infrastructures and the promise of sustainability

Sarah J. Martin<sup>a</sup> , Charles Mather<sup>b</sup>, Christine Knott<sup>b</sup>, Dean Bavington<sup>b</sup>

## The problem of mass mortalities in aquaculture

### scientific reports



### OPEN Quantitative analysis of mass mortality events in salmon aquaculture shows increasing scale of fish loss events around the world

Gerald G. Singh<sup>1,2,3</sup>, Zaman Sajid<sup>2</sup> & Charles Mather<sup>3</sup>

# Community Dynamics

What are the complex and changing relationships between coastal communities and aquaculture production?

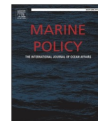
## Developing relevant policy for aquaculture in Canada



Contents lists available at [ScienceDirect](#)

Marine Policy

journal homepage: [www.elsevier.com/locate/marpol](http://www.elsevier.com/locate/marpol)



Short communication

Regulating the Blue Economy? Challenges to an effective Canadian aquaculture act

Melanie G. Wiber<sup>a</sup>, Charles Mather<sup>b</sup>, Christine Knott<sup>b,\*</sup>, María Andrée López Gómez<sup>b</sup>



- Broad governance issues  
Promoter and regulator  
Act that satisfies no one
- Limited scientific capacity  
e.g. ecotoxicology
- Meeting Indigenous Rights  
e.g. B.C.

# Carrying Capacity

Is there a role for social carrying capacity in sustainable aquaculture?

## *social carrying capacity*

### M4 focuses on:


- Operationalize the concept of carrying capacity in support **of holistic management** of aquaculture. Ideal framework as it includes:
  - Ecological
  - Production (economic)
  - Social
- Identify **factors that determine the socially acceptable limits** of salmon aquaculture

# Carrying Capacity

Is there a role for social carrying capacity in sustainable aquaculture?


## Best practices for management

Contents lists available at [ScienceDirect](#)



Journal of Environmental Management

journal homepage: <http://www.elsevier.com/locate/jenvman>



Research article


Development of best practices for more holistic assessments of carrying capacity of aquaculture



Jenny Weitzman <sup>a,\*</sup>, Ramón Filgueira <sup>a</sup>, Jon Grant <sup>b</sup>


## Public consultation and community involvement

Contents lists available at [ScienceDirect](#)



Aquaculture

journal homepage: [www.elsevier.com/locate/aquaculture](http://www.elsevier.com/locate/aquaculture)



Understanding factors influencing social acceptability: Insights from media portrayal of salmon aquaculture in Atlantic Canada

Paul Kraly <sup>a</sup>, Jenny Weitzman, Ramón Filgueira

## Perceptions of risk, individual values, and trust

Contents lists available at [ScienceDirect](#)



Marine Policy

journal homepage: [www.elsevier.com/locate/marpol](http://www.elsevier.com/locate/marpol)




Identifying key factors driving public opinion of salmon aquaculture



Jenny Weitzman <sup>a,\*</sup>, Ramón Filgueira <sup>a</sup>, Jon Grant <sup>b</sup>


## Legitimacy, trust, and local context

Contents lists available at [ScienceDirect](#)



Environmental Science and Policy

journal homepage: [www.elsevier.com/locate/envsci](http://www.elsevier.com/locate/envsci)

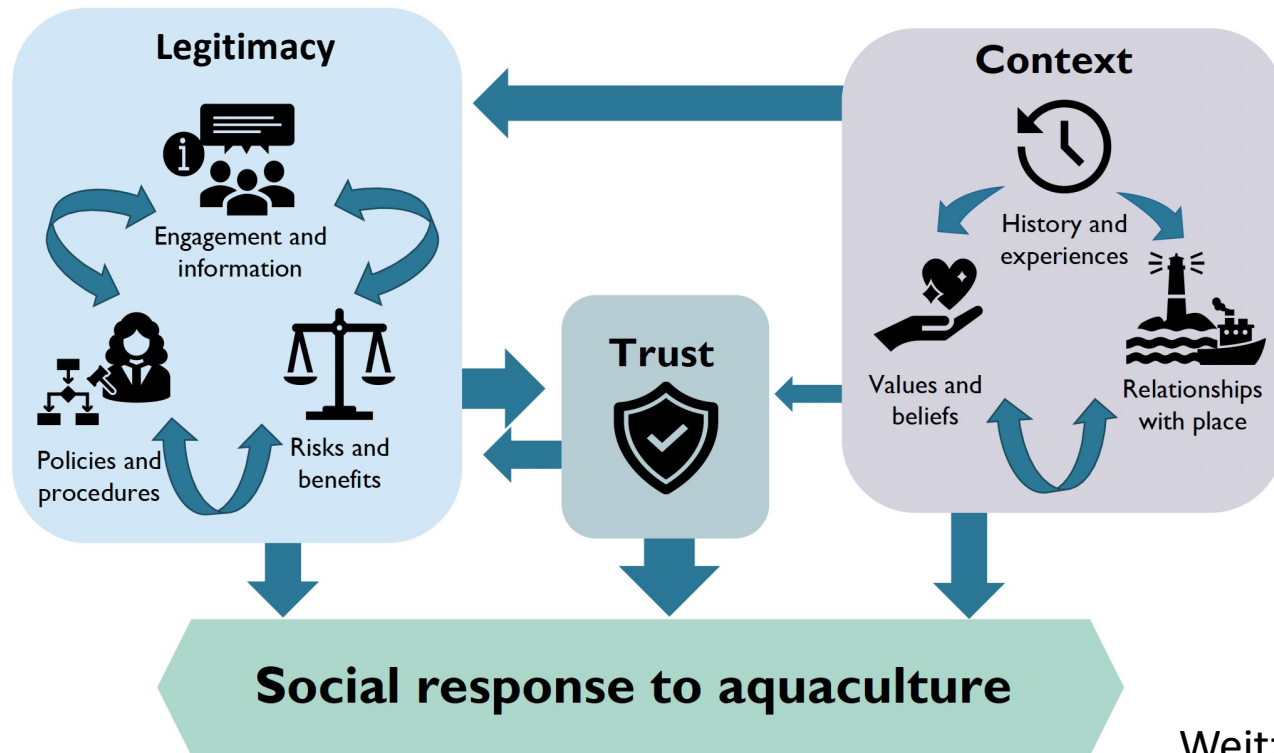


Dimensions of legitimacy and trust in shaping social acceptance of marine aquaculture: An in-depth case study in Nova Scotia, Canada

Jenny Weitzman <sup>a,\*</sup>, Ramón Filgueira <sup>a</sup>, Jon Grant <sup>b</sup>

# Carrying Capacity

Is there a role for social carrying capacity in sustainable aquaculture?



Weitzman 2022

# Marine Spatial Planning

How can marine spatial planning contribute to social license in aquaculture?

## *Community-based MSP*

### **M5 focuses on:**

- MSP has been critiqued for often tokenistic stakeholder engagement in the planning processes.
  - What is the role for coastal communities in MSP?
  - What elements of MSP are important for these communities?
  - How and where do they fit in the MSP processes?
  - What mechanisms enable community participation in MSP?



# Marine Spatial Planning

How can marine spatial planning contribute to social license in aquaculture?

PLANNING PRACTICE & RESEARCH  
2022, VOL. 37, NO. 2, 189–212  
<https://doi.org/10.1080/02697459.2021.2017101>

 **Routledge**  
Taylor & Francis Group

 Check for updates

## Learning from Experience: Lessons from Community-based Engagement for Improving Participatory Marine Spatial Planning

Maggie Yet<sup>a</sup>, Patricia Manuel<sup>a</sup>, Monica DeVidi<sup>id</sup><sup>a</sup> and Bertrum H. MacDonald<sup>id</sup><sup>b</sup>

### Local Governments and Coastal Communities are more than “Stakeholders” in Marine Spatial Planning

by Patricia Manuel and Bertrum H. MacDonald

The Intergovernmental Oceanographic Commission reports that 70 countries are now engaged in marine spatial planning (MSP). As a top-down process, MSP is mostly an activity of national and sub-national governments or international collaborations. Where local governments have jurisdiction in marine waters, community participants in



PETER G. WELLS, HALIFAX, N.S.

## BRIEFING NOTE



### CANADA MARINE PLANNING ATLAS - ATLANTIC: USER PERSPECTIVES FROM COASTAL COMMUNITIES

#### KEY POINTS

- The Atlantic Atlas can be a tool for community education and engagement in MSP.
- The Atlantic Atlas has the potential to be useful for different sectors, e.g., local planning, to support connections with marine interests.
- The Atlantic Atlas can support land and sea interactions and decision-making to manage coastal waters.
- Data from different organizations can improve the applicability of the Atlantic Atlas at the local level.
- A public atlas needs to be accessible for users with diverse interests and needs.



#### BACKGROUND

Marine Spatial Planning (MSP) is a collaborative and practical approach to managing ocean spaces that considers all stakeholders in the marine environment. The Canadian federal government through the Department of Fisheries and Oceans (DFO) has committed to developing MSP in three marine spatial planning areas in Atlantic Canada by 2024. The first product of the planning process is the Canada Marine Planning Atlas - Atlantic, an online, interactive atlas showing marine spaces, resource use, and environmental protection in the Newfoundland and Labrador Shelves, the Estuary and Gulf of Saint Lawrence, and the Scotian Shelf and Bay of Fundy.

A marine atlas is a valuable tool for planning and managing marine activities of relevance to coastal communities. Researchers with the Ocean Frontier Institute (OFI) Social

# Marine Spatial Planning

How can marine spatial planning contribute to social license in aquaculture?

## MSP workshop in Halifax

Over 70 participants including representatives of non-governmental organizations, Mi'kmaw organizations, industry, academia, and government, and interested members of the public spent the day immersed in presentations, a panel session, and breakout discussion groups.

## Where are local communities in Marine Spatial Planning?

March 7, 2024 Admin





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In Coastal Communities

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## About Us

Social licence and planning in coastal communities is an Ocean Frontier Institute ([oceanfrontierinstitute.com](http://oceanfrontierinstitute.com)) funded large research module. The project runs from 2018 to 2022. The focus of our research is in Atlantic Canada and it includes researchers based at Dalhousie University in Halifax and Memorial University in Newfoundland.

[www.coastalfutures.ca](http://www.coastalfutures.ca)