

Integrating Indigenous and local knowledge in marine spatial planning

Seven messages from the North Atlantic

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Table of contents

EXECUTIVE SUMMARY	3
1. INTRODUCTION	4
2. THE DIGITAL CHALLENGE	7
2.1 What is the purpose of planning?	7
2.2 Who is responsible for integrating the "local"?	9
2.3 Who is "local"?	11
3. A JUST AND EQUITABLE INTEGRATION OF INDIGENOUS AND LOCAL KNOWLEDGE	14
3.1 Implement MSP as a continuous and purpose-driven process for long-term change	14
3.2 Enhance capacity and reflexivity among authorities on how digital tools and data use affect planning processes and outcomes	16
3.3 Establish clear institutional guidelines and roles	17
3.4 Balance local and national interests through multi-level dialogue	18
3.5 Design adaptive processes for engaging evolving Indigenous and local communities	18
3.6 Strengthen local collaboration through peer-learning and data accessibility	19
3.7 Facilitate regular exchanges between countries across the North Atlantic region	20
4. CONCLUDING REMARKS	21
REFERENCES	23
ABOUT THIS PUBLICATION	25

This publication is also available online in a web-accessible version at:
<https://pub.nordregio.org/pb-2026-3-integrating-indigenous-and-local-knowledge-in-marine-spatial-planning>

EXECUTIVE SUMMARY

Across the North Atlantic region, digital tools are reshaping how marine spatial planning is developed and implemented. This offers opportunities for more efficient, adaptive and transparent planning. However, digital tools tend to favour knowledge that can be easily mapped, quantified and standardised, which raises new questions about whose knowledge shapes these processes and whose perspectives risk being overlooked.

This brief argues that the digital transformation of marine spatial planning is primarily a governance challenge rather than a technical one. Whether digital tools and data support or undermine the inclusion of Indigenous and local communities in planning processes depends not on the tools themselves but on the intentions, assumptions and decisions that guide their use.

Drawing on findings from the "Local Knowledge in Marine Spatial Planning, Green Transition and Digital Transformation" project, this brief identifies **seven key messages** aimed at promoting the more just and equitable integration of Indigenous and local knowledge into increasingly digital marine spatial planning processes:

1. Implement MSP as a continuous, purpose-driven process.
2. Enhance capacity and reflexivity among planning authorities.
3. Establish clear institutional guidelines and roles.
4. Balance local and national interests through multi-level dialogue.
5. Design adaptive processes for engaging evolving communities.
6. Strengthen local collaboration through peer learning and data accessibility.
7. Facilitate regular exchanges between countries across the North Atlantic region



Images: Rebecca Eriksson, Nordregio

1. INTRODUCTION

How can marine spatial planning better serve all those who depend on the oceans, and whose knowledge shapes these processes?

Mounting pressures are challenging how we govern and manage our coastal and marine areas. Offshore energy developments compete with traditional fishing grounds (van Hoey et al., 2021), melting Arctic sea ice is opening new shipping routes through already fragile ecosystems (Liu et al., 2024) and deep-sea mining proposals are emerging alongside calls for expanded marine environmental protection (Singh & Jaeckel, 2024). In turn, these converging pressures are creating complex trade-offs and increasing the need for methods and tools that can bring stakeholders and their interests together. To this end, **marine/maritime spatial planning** (hereafter MSP) has become the primary approach in the North Atlantic region. Often defined as a process for *“analysing and allocating parts of three-dimensional marine spaces to specific uses, to achieve ecological, economic and social objectives that are usually specified through the political process”* (Douvere & Ehler, 2009, p.18), it helps governments balance multiple and sometimes competing priorities in increasingly crowded and changing oceans. Yet, for many coastal communities, such as fishers, Indigenous peoples and local residents, the ocean is not an abstract governance challenge. It is a source of livelihoods, cultural identity and knowledge passed down across generations. The processes used to manage and plan marine space often struggle to reflect this reality, and while this challenge is not new, it is becoming increasingly consequential as MSP continues to develop.

As MSP has seen widespread adoption, its implementation is also evolving. Driven by the need for more efficient and adaptive planning, there is a **growing reliance on digital technologies and data** – a shift that has been described in research as the **“digital turn” of MSP** (Davret et al., 2024). This digital turn is evident in the expanding use of new technologies and digital tools, such as Geographic Information Systems (GIS) and other

mapping tools, geospatial platforms, decision-support systems (DSS), digital twin technologies and applications using artificial intelligence (e.g. Miedtank et al., 2024; Pinarbaşı et al., 2017; Schwartz-Belkin & Portman, 2022). These tools provide new ways to collect, analyse and communicate information, supporting more informed and adaptive decision-making and **reshaping how planners work with information and make decisions about marine spaces**.

While creating new opportunities, this digital turn also raises important questions about whose knowledge shapes MSP and how this influences decisions and outcomes. As digitally driven processes tend to favour information that can be easily digitalised, standardised, mapped and quantified, there is growing concern that Indigenous and local knowledge (ILK), often intangible, experiential and place-based in nature (UNESCO-IOC and UNESCO-LINKS, 2024), may be overlooked in MSP processes. This risks losing local perspectives and experiences that scientific data alone cannot capture. Consequently, a key challenge lies in ensuring that digital transformation of MSP processes supports rather than undermines the integration of diverse knowledge systems, which are essential for achieving more **just and equitable**^[1] MSP outcomes.

This policy brief is produced as part of the **“Local Knowledge in Marine Spatial Planning, Green Transition and Digital Transformation”** project and funded by the Working Group for Fisheries (AG-Fisk) under the Nordic Council of Ministers. It examines these dynamics across the North Atlantic region, primarily focusing on Iceland, Greenland, the Faroe Islands, Norway, Denmark, Sweden and Scotland. Drawing on findings from the project, the brief explores the challenges these countries have faced in integrating ILK and local data into MSP and presents seven key messages for improving knowledge integration as digital transformation continues to reshape MSP processes.

Who is this brief for?

This brief is intended for **policymakers, marine governance and planning authorities and professionals** working in and with coastal communities across the North Atlantic region. It also aims to support decision-makers, particularly at the local level, in integrating ILK into MSP in ways that promote meaningful involvement. While not all North Atlantic countries have developed formal MSP, many engage in marine management that addresses similar challenges, making MSP a useful lens for understanding how digital tools, ILK and marine governance intersect in practice. The insights generated are therefore relevant not only to MSP but also to broader marine management approaches both within and beyond the North Atlantic region.

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1. In the context of MSP, just and equitable planning processes commonly refer to approaches that recognise Indigenous and local rights and knowledge, support meaningful participation and representation in decision-making, and consider how the benefits, burdens and risks associated with marine use and planning are distributed and shared. (Flannery et al., 2020; Jentoft, 2017; Saunders et al., 2020; Stalmokaitė et al., 2023).

Research methods

This policy brief builds upon multiple sources:

- A **systematic literature review** synthesised existing research on MSP, ILK and digital transformation. The findings were compiled into the workshop report "[Integrating local knowledge and data in marine spatial planning and management - Challenges and opportunities in the North Atlantic Region](#)".
- A **two-day physical workshop** in Edinburgh, Scotland brought together researchers, practitioners, planners and local community representatives from the North Atlantic region to examine: (1) current MSP approaches; (2) practices of ILK integration into MSP; (3) the influence of digital tools and data use on the integration of ILK into MSP.
- A **one-day digital workshop** with experts from the region focused on presenting the progress made, discussing the direction of the project, future outputs and gathering input to inform the design and content of the final workshop.
- A **two-day hybrid writing workshop** in Tórshavn, Faroe Islands, gathered practitioners and researchers from the region both in person and online to collaboratively produce a workshop report (published in spring 2026) documenting case studies and developing key messages for better integration of ILK into increasingly digital MSP processes. The case examples presented throughout this brief are drawn from this workshop report. Readers wishing to explore individual cases in greater depth are encouraged to consult the full report once available.

This brief draws on extensive collaboration across the North Atlantic region and beyond, with a particular focus on knowledge exchange between researchers, planners and stakeholders. Throughout the project, a **stakeholder advisory board** provided continuous guidance, offering feedback on outputs and shaping the project's direction. As such, this brief represents the input of numerous contributors from the region who helped realise this project.



Images: Rebecca Eriksson, Nordregio

2. THE DIGITAL CHALLENGE

Although the use of digital tools in MSP provides new opportunities for streamlining processes and improving efficiency, this research finds that the shift towards more digital processes simultaneously introduces challenges for integrating the knowledge of Indigenous and local communities.

Our research highlights three of these interrelated challenges, which are presented in the following section as:

1. **The influence of digital tools on the design and structure of MSP processes.**
2. **The lack of clearly assigned responsibilities for collecting and integrating ILK within increasingly digital MSP processes.**
3. **The ways in which digital tools influence how diverse ILK is identified, interpreted and valued.**

2.1 What is the purpose of planning?

MSP serves multiple purposes, from spatial allocation and conflict mediation to fostering environmental protection, social equity and economic growth. These objectives are often combined, interpreted and operationalised in different ways depending on political priorities, legal frameworks and prevailing discourses. They are typically **defined at the national level** in response to international commitments, such as net-zero climate targets or marine conservation provisions. This makes MSP fundamentally a political process rather than a neutral one (Flannery et al., 2018; Flannery et al., 2019), in which national agendas sometimes conflict with local needs and perspectives.

While some processes allow for the tailoring of national and international objectives to local conditions, other rely on more standardised, “one-size-fits-all” approaches, which have historically produced **rigid, pre-defined and exclusive** processes that fail to fully reflect local contexts, creating tensions between governance levels and actors (Jones et al., 2016). Indeed, the consequences of this **top-down approach** are well-documented, ranging from implementation failures and stakeholder exclusion to eroded trust in governance institutions (Domínguez-Tejo et al., 2016; Jones et al., 2016; Pennino et al., 2021).

In turn, these tensions play out differently depending on the **scale of planning**, which varies across countries. For example, Denmark’s nationwide, legally binding MSP contrasts with regional planning in the Shetland Islands, shaping both the role and influence Indigenous and local communities have in decision-making and how MSP processes are designed. Decisions about principles, timelines, responsibilities, methods of data collection and communication strategies determine whether and how local involvement occurs, and ultimately whose knowledge is incorporated.

The “digital turn” of MSP does not resolve these structural challenges – it digitalises them. Because MSP is purpose-driven, the objectives set at the outset **directly shape what information and data are collected and communicated**, as well as which tools are **selected and applied**. This also suggests that **digital tools are only as effective as the intentions and decisions guiding their use**. Depending on how inputs and data are selected and processed and whose knowledge is included in the datasets, these tools can support more balanced planning or reinforce existing inequities, either narrowing or widening the gaps between different governance levels, actors and knowledge systems.

Cases from the region: Marine spatial planning in Iceland

The first MSP processes in Iceland illustrate how national–local tensions arise when there is limited local influence over process design. MSP in Iceland was formally introduced through the adoption of Law 88/2018 (Coastal and Marine Planning Act, 2018), marking a shift towards more integrated governance of coastal and marine areas. The first regional plans were developed for the Westfjords and Eastfjords, regions characterised by ecologically sensitive fjord systems and rapid growth in aquaculture and tourism.

Despite recognising the value of local knowledge, the MSP process reflected a national-level mandate with limited scope for local influence. While scientists contributed data that informed the plans, stakeholder engagement was largely confined to single sector-specific meetings. Following the plan proposals, three public meetings were held per region at different locations and at very short notice, effectively amounting to only one opportunity per area. Rather than contributing to visioning, objective setting, conflict resolution or co-production, participation was oriented towards commenting on already drafted plans. As participation activities were fragmented and primarily focused on data extraction rather than dialogue or iterative participation, many residents were unaware

that MSP was underway, felt excluded or perceived that their concerns, particularly regarding aquaculture expansion, were ignored or dismissed.

This prioritisation of plan production over process design, combined with predetermined procedural structures, meant that participation felt tokenistic or exclusive by many stakeholders. This dynamic was exacerbated by the distance between where planning decisions originated and where the impacts of outcomes were felt.

More detailed descriptions of this case study are available in the forthcoming workshop report, to be published spring 2026.

2.2 Who is responsible for integrating the “local”?

Planners and researchers engaged in this project across the North Atlantic region agree on the importance of integrating ILK into MSP processes. However, a gap exists between this aspiration and the actual capacity to achieve it. On the one hand, there is **ambiguity** regarding **who is responsible** for collecting and integrating this knowledge, at what stage of the planning process and to what extent. On the other hand, even when processes aspire to be locally grounded, efforts to integrate ILK are constrained, particularly by **technical limitations, capacity gaps** and **unclear institutional mandates**.

As MSP has been implemented across the region, planners, researchers and practitioners have frequently expressed frustration over **limited funding, time** and other **resources** to actively engage and build relationships with Indigenous and local communities, particularly when **political support** is lacking. This makes it difficult for planning authorities to meet existing demands on MSP processes, let alone the additional demands that come with the increasing use of digital tools and data. Thus, without clearly defining **who should integrate ILK** and distributing adequate resources for this work, ILK risks continuing to fall through institutional gaps.

Today’s MSP processes commonly utilise digital tools to collect, synthesise, analyse and visualise data. As these tools, including newer AI-powered applications, become more embedded in planning, their **dependence on structured and standardised datasets** can **risk marginalising knowledge that does not easily fit these formats**. At the same time, **digitalisation is not always appropriate or desirable**, as certain forms of ILK are sensitive or fundamentally embedded in place-based traditions and may lose their meaning and integrity in the process. These challenges become more pressing as planning processes increasingly rely on technologies that are designed for Western scientific knowledge and may not align with how ILK is generated, maintained, shared and understood.

Working responsibly with digital tools and data requires **specialised skills, technical expertise** and **awareness** of how choices and biases embedded in tools and data affect

outcomes. It also requires building **transparent, participatory** processes in which communities have **ownership** and agency over how their knowledge is shared and applied. This is particularly important when including Indigenous and local communities, whose knowledge may become **decontextualised** or **misrepresented when translated into digital formats**, or **excluded** entirely if it does not fit these systems. Addressing these challenges requires institutions to build new capacities, often in areas where they lack experience. This means developing not only technical skills, but also critically reflecting on how knowledge is valued, how power dynamics shape processes and what **assumptions** underlie decisions in MSP.

Moreover, these capacity constraints also shape how institutions engage with communities. When resources and time are limited, digital tools are sometimes used as **substitutes for direct interaction** rather than as **supportive instruments**. While these tools are often used to improve communication, this research shows that data, maps and metrics cannot replace the trust and relationship-building needed for meaningful participation.

Cases from the region: Blue justice or just blue? A case study on Greenlandic small-scale fisheries

While Greenland does not currently have MSP in place, recent developments in fisheries management illustrate the challenges that arise when responsible authorities lack the trust, understanding or capacity to work with Indigenous and local communities. The recent expansion of the Individual Transferable Quota system (ITQ), implemented through national policy processes, exemplifies this tension. With the decision to limit inshore catch, many small-scale fishers in remote communities, such as Narsaq in South Greenland, report feeling disconnected from decisions that directly affect their livelihoods, access to fishing grounds and cultural practices.

Despite detailed, place-based knowledge of marine species and seasonal dynamics, local fishers were rarely engaged in decision-making leading up to the expansion of the ITQ system. Instead, their contributions were reduced to logbook data submitted to authorities, with little transparency regarding how this information was used, interpreted or potentially shared back with communities. This one-directional flow of information reinforced perceptions that ILK was collected without clear responsibility for its integration. While concerns have been raised about misinterpretation and the loss of ILK when translated into standardised digital formats, communities also emphasise the potential of digital tools to enhance knowledge inclusion, accessibility and transparency. Fishers in Narsaq emphasise their willingness to share knowledge and collaborate with authorities, provided that their knowledge is respected and integrated.

However, years of extractive data collection, limited communication and top-down decision-making have created mutual mistrust between government institutions and Indigenous and local communities. While government institutions lack trust in Indigenous

and local communities and debate the legitimacy of their knowledge, the communities perceive this distrust as a lack of respect and unwillingness to include them in political decisions, widening the gap between the two sides. This suggests that before digital tools or formal MSP processes can effectively integrate ILK, a first step should be to rebuild relationships and resolve underlying tensions between government institutions and Indigenous and local communities.

More detailed descriptions of this case study are available in the forthcoming workshop report, to be published spring 2026.

2.3 Who is “local”?

The ocean is a common-pool resource, holding diverse cultural, economic and ecological significance for multiple communities, ecosystems and sectors. At the same time, it is governed by overlapping and often misaligned legal regimes and administrative jurisdictions, making it challenging to define who should be involved in decision-making on the use of ocean space. The integration of ILK is typically situated within **public participation** and **stakeholder engagement** procedures (Douvere and Ehler, 2009); however, defining who constitutes the “public” or has a legitimate “stake” in MSP is far from straightforward.

The responsibility for determining this often falls on planning authorities, placing additional tasks on already resource-constrained institutions. Consequently, planning authorities often struggle with inclusive engagement due to **uncertainty about which actors to involve and at which stages, as well as a lack of clear institutional guidance or frameworks**. This challenge is further compounded by shifting governance responsibilities, changing political priorities and institutional ambiguities within MSP development itself.

Indeed, determining where along the MSP development process Indigenous and local communities should be engaged, which sectors they represent and **who qualifies as “local”** quickly becomes a complex task. If marine environments are regarded as common-pool resources, arguably all users and non-users hold some degree of stake in their management. However, this raises questions about the extent to which such stakeholders should have direct influence over decision-making and how this diffuse constituency can be identified and engaged. Moreover, framing ILK integration primarily as a matter of mapping uses for authorities to weigh against other factors overlooks the potential for communities to actively shape implementation, process design and outcomes.

When the question of “who to involve” remains unclear, applying digital tools to support ILK integration becomes difficult. Digital tools rely on **clearly defined user groups** and **structured data inputs**, making it challenging to design appropriate tools and methods without knowing whose knowledge needs to be represented.

Digitalisation further **reinforces assumptions about which types of knowledge are prioritised in planning processes**. Rarely asked is whether ILK *should* be digitalised at all, not just whether it *can* be. Converting ILK into digital formats implies that such knowledge should first be translated, coded and standardised to fit existing systems, rather than designing systems that are compatible with the ways ILK is held and transmitted. This risks privileging knowledge systems that are more easily digitalised, which can reinforce broader **power dynamics** in how legitimacy is attributed to Western scientific knowledge versus ILK.

Cases from the region: Towards stricter marine protection in Raet marine national park, Norway

Norwegian marine national parks (MNPs) have struggled to implement conservation measures to protect the marine ecosystem due to incoherent governance frameworks and local resistance to top-down management. However, after years of local concern over diminishing coastal cod, local municipalities on the southern Norwegian coastline initiated the "Protect Raet" project to increase marine protection in Raet Marine National Park (est. 2016). A key stakeholder working group was established, involving the Institute of Marine Research (IMR), local public sector bodies, an environmental NGO and the local fishing and trawling fleet, to enable co-definition of no-take zones in Raet. With their livelihoods intimately connected to fishing over generations, the fishers resisted.

In 2024, IMR also implemented an online Public Participatory GIS (PPGIS) mapping exercise, in which locals could draw "zones of value" and tag activities associated with them. While the effort to engage stakeholders is promising, it has so far failed to gain the support of the fishers or enable engagement beyond the project group. Key challenges include weak planning, limited attention to power dynamics and poor integration of ILK. Fishers appeared to be framed as "culprits" responsible for declining marine resources rather than as resourceful experts. Other key stakeholders such as tourism operators, recreational users and port authorities were lacking, and no structure for participation in decision-making currently exists. Predefining categories through PPGIS further risks excluding groups, such as elderly residents, and overlooking strong cultural and relational values. More broadly, this case reveals how stakeholder identification and the use of digital tools can limit who is considered "local" and reinforce narrow definitions when participation is structured around pre-determined categories.

More detailed descriptions of this case study are available in the forthcoming workshop report, to be published spring 2026.

Cases from the region: Marine decision-making in Portsmouth, England

While lying outside the primary project region, Portsmouth's Southsea Coastal Management Scheme shows how the temporal dimension of planning adds another layer of complexity to defining who is "local". The scheme was developed following a regional Shoreline Management Plan published in 2010, which determined that coastal defences should "hold the line" against sea-level rise and storm surges in Southsea, a suburb of Portsmouth with a long maritime history and active natural harbours. The project involved constructing a new sea wall to protect the area, with local residents and business owners as the primary stakeholders.

The decision to build a new sea wall had already been made through the regional Shoreline Management Plan, which did not include public consultation. Local engagement was therefore limited to the design stages through multiple non-statutory consultations, providing opportunities for the public to view design options, provide input and give feedback on details rather than on whether the defence was needed or desired. This consultation process took over ten years, during which the local population of Southsea changed. Some early participants who had shaped the initial design options were no longer present for the final decisions, while new residents arrived with no prior involvement. A public-facing website provided access to all previous consultation materials and the development timeline, allowing both longstanding and new residents to review past input. However, this could only partially address deeper questions of legitimacy. As the initial decision had been predetermined, only details remained negotiable and the local constituency itself had shifted over time.

The Southsea case study demonstrates that "local" is defined not only spatially but also temporally. In long-term planning processes, communities are dynamic rather than static, creating participation challenges and raising questions about whose input should carry weight when the people affected by decisions are not necessarily the same as those who shaped them.

More detailed descriptions of this case study are available in the forthcoming workshop report, to be published spring 2026.



Images: Rebecca Eriksson, Nordregio

3. A JUST AND EQUITABLE INTEGRATION OF INDIGENOUS AND LOCAL KNOWLEDGE

Taken together, the preceding sections show that ensuring justice and equity in the digital transformation of MSP depends not on the tools themselves, but on how they are used and for what purposes. Consequently, a common theme throughout this study is that the digital turn of MSP is **seen less as a technical issue and more as a question of justice and equity**, shaped by assumptions, trade-offs and intentions.

Drawing on project findings and case studies, this section outlines **seven key messages** from the North Atlantic region. These messages provide a starting point for policymakers, marine governance authorities and planners to discuss the implications of ILK integration into more digital MSP processes.

3.1 Implement MSP as a continuous and purpose-driven process for long-term change

This research finds that truly just and equitable MSP processes require the establishment of a clear objective and intent to collaborate with Indigenous and local communities from the outset. As one study participant emphasised during a workshop, **"planning follows purpose"**, highlighting the importance of being explicit about **why and for whom** MSP is undertaken. Clarifying objectives in this way also shapes how MSP processes are expected to function over time as conditions change and planning evolves. This study finds that successful MSP requires the framing and implementation of planning as a **continuous, inclusive and adaptive** process that creates space for ongoing negotiation of how different objectives are prioritised and whose knowledge informs decisions.

To enable this, structured but adaptable methods are needed. **Systematic “stepping stones”** or planned stages of consultation that allow a few decisions to be addressed at several points rather than all at once, are identified as a valuable approach. In these stages, agreements, disagreements and the rationale behind decisions are recorded and revisited, creating more predictable and transparent channels for input throughout MSP processes. Because communities are dynamic, such methods should also allow stakeholders to revise plans or withdraw input when circumstances change, ensuring outcomes reflect current knowledge and maintain local ownership of data and input.

This research also highlights the role of digital tools in facilitating such flexibility when designed with equity and justice in mind. Digital platforms and interactive maps can **democratise participation** by enabling stakeholders to propose ideas, co-design plans, track progress and follow how their input shapes outcomes and how different priorities are weighed in decision-making. Additionally, these tools can support continuous, adaptive MSP by maintaining accessible records of decisions, tracking how conditions and priorities evolve and providing platforms for ongoing dialogue. However, physical engagement alongside digital tools remains essential to build trust and relationships, as well as to ensure the accessibility and inclusion of all stakeholders, including those with limited digital access and literacy.

Cases from the region: Sullom Voe Master Plan, Shetland Islands

The Sullom Voe Master Plan demonstrates how structured, iterative engagement supports adaptive planning. When declining tanker movements at Sullom Voe Harbour prompted Shetland Islands Council to reconsider the harbour's future use, they implemented a two-phase public engagement process that allowed decisions to emerge gradually rather than all at once.

The process began with face-to-face meetings and four public community events to gather initial views and map community features. Feedback from this phase indicated widespread support for exploring new uses, shaping the direction of subsequent planning. The team then categorised mapped data based on legal protections, creating Potential Development Zones. These zones were presented during a second round of public engagement, in which further feedback was incorporated into the final version.

This stepping-stone approach made it visible how competing objectives were balanced and created predictable channels for input. Dedicated meetings with fisheries ensured that their knowledge informed decisions, with data ownership residing with fishers themselves. They controlled how data was used, agreed on appropriate levels of detail and could withdraw consent if needed. Different mapping approaches were adapted for each stakeholder segment to reflect their distinct practices.

This case illustrates how accessibility and transparency are maintained through physical engagement alongside digital tools. While digital platforms enabled spatial mapping and visualisation, face-to-face meetings ensured stakeholders could shape outcomes as the plan evolved, rather than simply responding to predetermined proposals.

More detailed descriptions of this case study are available in the forthcoming workshop report, to be published spring 2026.

3.2 Enhance capacity and reflexivity among authorities on how digital tools and data use affect planning processes and outcomes

As MSP processes increasingly rely on digital tools, this research finds that authorities and planners require greater **awareness** of how such tools and data use shape planning processes and outcomes.

A "planning follows purpose" approach recognises that the underlying reasoning for planning shapes the methods and tools applied, as well as the data and knowledge considered relevant and ultimately integrated into MSP. Accordingly, authorities at national, regional and municipal levels would benefit from strengthening two complementary skill sets: first, **soft skills** such as facilitation, negotiation, participatory design and reflexive thinking; second, **technical skills** for ethical use of digital tools and data. Combining these capabilities enables authorities to interpret diverse knowledge, analyse complex data, mediate between stakeholders and ensure that decisions respond to local needs and legal obligations.

In turn, other actors with less formal mandates, such as fishing organisations and local interest groups, may need complementary skills for communicating their knowledge and accessing digital tools. Where gaps exist, authorities and planners can **offer platforms, guidance or training** to reduce participatory disparities.

Cases from the region: Local knowledge in Norwegian Fisheries Management

Norway's experience with integrating fisheries data into fisheries management illustrates both the potential and limitations of combining interviews with digital tracking systems. Since the 1980s, the Directorate of Fisheries has collected spatial data on fishing activities through interviews with fishers, later supplemented by vessel monitoring

systems (VMS), Automatic Identification Systems (AIS) and electronic logbook data. These data are made publicly available through the digital mapping platform "Yggdrasil".

This case demonstrates that who collects and interprets data matters and affects outcomes. Building trust with fishing communities required specialised competence and understanding of local contexts to avoid misinterpretation. Without this, data risks being misused or reinforcing existing biases. For instance, using catch volumes as indicators can favour large vessels over small-scale fishers, who may depend more heavily on specific fishing grounds.

The Directorate's approach, built on sustained trust and long-term engagement with fishers, showed that interview-based fisheries data were comparable to tracking data and often provided more detail than tracking data alone. However, the approach also reveals tensions. Making fisheries data publicly accessible through digital platforms assumes a willingness among fishers to have their knowledge mapped and shared, which is not always the case, particularly when such data may inform decisions that restrict access to fishing grounds. This highlights the need to pair technical capacity with reflexivity about power dynamics and respect for community autonomy in determining how knowledge is integrated.

More detailed descriptions of this case study are available in the forthcoming workshop report, to be published spring 2026.

3.3 Establish clear institutional guidelines and roles

For successful integration of ILK into MSP, planning authorities would benefit from developing **clear guidelines** that **detail responsibilities across all stages** of knowledge integration, from collection and validation to interpretation and application. Without such guidelines and defined roles, it becomes unclear **who is responsible** for engaging communities, validating data and information and integrating insights. This ambiguity creates risks of misinterpreting ILK and eroding community trust.

Establishing clear roles and responsibilities could be combined with **systematic documentation** that links decisions to MSP outcomes. This enables **accountability** and **traceability** throughout the planning process. Digital tools can enhance this transparency by making documentation accessible, but they should be implemented thoughtfully to avoid creating administrative barriers.

This research also highlights that, before integrating ILK, planning authorities should build a shared understanding of what it means in their context and how it can support MSP. This awareness, supported by formal mandates and clear indicators, helps ensure lasting impact and strengthens trust between authorities and Indigenous and local communities.

3.4 Balance local and national interests through multi-level dialogue

The study findings suggest that, by **decentralising responsibilities** where appropriate, planning authorities can support MSP processes by leveraging local expertise and recognising the variation and value of different knowledge across local, regional and national scales.

Supporting this, this research identifies a need for **structured and continuous multi-level dialogue between planning levels** to ensure that international agendas and national objectives are properly localised. It is also important to gain a better understanding of local priorities among authorities. Such alignment can reconcile conflicts between governance levels and create shared MSP visions.

Digital tools can support this by connecting fragmented communication efforts, thereby reducing the duplication of stakeholder input and enhancing transparency. Additionally, institutionalising dialogue through recurring forums, cross-scale advisory groups or digital collaboration platforms makes planning more coherent, transparent and adaptive. Such an approach helps ensure that national objectives are achieved in ways that reflect local conditions, capacities and values, **transforming national goals into meaningful local action.**

3.5 Design adaptive processes for engaging evolving Indigenous and local communities

Identifying who is "local" is complex, as Indigenous and local communities often transcend administrative boundaries and vary across contexts, directly influencing their participation in MSP. Equally important is recognising that **Indigenous and local communities are not static** but rather, they undergo demographic, environmental and social changes over time, and their knowledge, practices and priorities evolve. MSP processes should therefore continuously adapt to engage communities as they change.

To enable this, planning authorities would benefit from establishing **continuous and participatory assessments** alongside regular review processes, with clear responsibilities for updating both how communities are identified and their evolving knowledge and priorities. These processes should use bottom-up approaches that recognise both **use values** (e.g. fisheries, recreational) and **non-use values** (e.g. ecosystem services, cultural values) as evidence alongside scientific data. **Context-specific indicators** that consider social, economic and environmental dynamics can support this work, and digital tools can institutionalise these processes through monitoring, transparent reporting and iterative updates, while accommodating diverse and evolving definitions of "local".

Moreover, the findings suggest that **providing accessible summaries of previous participation rounds** and planning decisions helps **prevent the exclusion of new community members**. It also fosters **transparency** about how communities have been involved over time and builds **continuity** in planning processes, even as communities change. **Scenario planning** was further identified as an enabler for proactive, long-term planning that anticipates how communities and their relationships to marine environments may evolve, shifting MSP **from being reactive to proactive**.

3.6 Strengthen local collaboration through peer-learning and data accessibility

Insights from the study highlight that North Atlantic countries would benefit from facilitating **peer learning between communities with shared characteristics and challenges**. Small and island communities, including those in coastal areas and around fjords in Greenland, Scotland, Iceland and the Faroe Islands, often face similar contexts. This could make targeted exchange more impactful than broad national comparisons. **Structured dialogue forums** could further be established or built upon to enable these communities to share local insights on MSP implementation, communication strategies and the use of inclusive methods for integrating ILK.

Complementing this, ensuring that regional data initiatives follow **open standards** would support community-level and cross-border collaboration by **enhancing accessibility** for local actors, such as municipalities, community groups, NGOs and universities. If locally sourced data are made openly available, these actors can access and **work with information they have provided, supporting data ownership** and ensuring that communities retain control over their contributions. Such accessibility enables local actors to **use data for community-level planning, facilitates knowledge exchange** across borders and could also strengthen their **capacity** and **interest in participating in MSP processes**.

Cases from the region: Integrating local knowledge into Faroese marine governance

The Faroe Islands case highlights how small island communities with similar characteristics could benefit from exchanging knowledge and experiences in marine planning and management, as well as sharing data structures. With 29 municipalities of different sizes and resources, the Faroe Islands currently manage marine space through sectoral regulations without established MSP. While digital tools are emerging that

provide spatial data, such as the Environmental Agency's Føroyakort^[2], experiential and cultural knowledge is not yet systematically incorporated.

The Faroe Islands share characteristics with other North Atlantic communities, such as a dependency on marine resources, coexistence of small-scale and industrial fisheries, strong maritime cultural heritage and emerging pressures from aquaculture and renewable energy. Structured peer learning between communities facing similar contexts could therefore support the Faroe Islands in developing approaches to integrate ILK alongside scientific and sectoral expertise. Given that data gaps at the local level are often highlighted in the Faroese context, shared digital infrastructure following open standards would enable communities to access data and support cross-border knowledge exchange. This accessibility could strengthen capacity and interest in the Faroe Islands in developing inclusive MSP and marine management approaches.

More detailed descriptions of this case study are available in the forthcoming workshop report, to be published spring 2026.

3.7 Facilitate regular exchanges between countries across the North Atlantic region

Study findings show that **regular cross-national forums** and **workshops** among North Atlantic countries can create valuable spaces for **learning and sharing practical approaches**. Since planning decisions sometimes rely on uncertain or incomplete data, these exchanges could focus on **best practices in data transparency, addressing data gaps, updating information systems** and developing **quality assurance indicators** across different knowledge types. In addition, developing **shared cross-border digital infrastructure** would complement these exchanges and support collaboration at all scales.

Building on initiatives like Nordic Spatial^[3], countries can work together to establish **common data standards** and **open-source platforms** that **improve access to harmonised data** across borders. This would strengthen regional MSP capacity for diverse actors at multiple governance levels. Integrating ILK alongside scientific data further ensures that MSP reflects context-specific realities. Knowledge sharing can also support continuous improvement of participation strategies, enabling countries to adapt successful practices while avoiding common pitfalls. These exchanges could complement community-level peer learning by addressing the institutional and policy frameworks that shape MSP implementation.

2. To read more about the Faroe Islands Environmental Agency's mapping application, see kort.foroyakort.fo/kort/

3. To read more about the Nordic spatial mapping tool, see Bergset et al. (2026)



Images: Rebecca Eriksson, Nordregio

4. CONCLUDING REMARKS

There is growing recognition of the opportunities that digital tools offer within MSP, from enhancing data visualisation and stakeholder participation to supporting scenario planning and adaptive management. However, the increasingly data-driven nature of MSP processes also poses new challenges, including questions about what types of knowledge and data are used and whose perspectives are represented and prioritised. Consequently, the “digital turn” of MSP presents challenges that are as much about governance and values as they are about technology.

This brief finds that the inclusion of ILK into MSP depends fundamentally on how MSP processes are designed and managed. Digital tools can either support or undermine inclusive planning, depending on the purposes and intentions that guide their use. When inclusion of ILK is embedded as a core objective from the outset, digitalisation becomes an opportunity to strengthen participation and ground planning in local realities. When it is not, these tools risk reinforcing power imbalances, marginalising knowledge and limiting the capacity of MSP to integrate diverse perspectives.

The path towards more equitable and just MSP processes therefore requires a shift in how MSP is approached. This means recognising that technical solutions alone are insufficient and that the real work lies in building awareness around how tools and data are used. It also means developing institutional capacity, clarifying responsibilities, fostering dialogue across governance levels and strengthening the role of communities in planning processes. These challenges are particularly acute with the rapid development of AI, but they also present opportunities for countries such as Greenland and the Faroe Islands that have yet to develop MSP, allowing them to build inclusive and adaptive approaches from the start rather than retrofitting existing systems.

Beyond these considerations, the key messages of this brief highlight the importance of reflecting on purpose, values and priorities. MSP is ultimately a question of what we aim to achieve and for whom. Decisions made today about the use of digital tools and data, the design of processes and the recognition of knowledge will shape the trajectory of ocean governance for years to come.

Rather than framing the discussion as a set of clear-cut recommendations, these messages serve as starting points for discussion and learning. The central question is not whether digital transformation will reshape MSP, but how that transformation can be guided in ways that respect the knowledge, practices and priorities of all communities that depend on and care for our oceans.

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ABOUT THIS PUBLICATION

Integrating Indigenous and local knowledge in marine spatial planning – Seven essays from the North Atlantic

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This publication forms part of the "Local Knowledge in Marine Spatial Planning, Green Transition and Digital Transformation" project (2024–2026), funded by the Nordic Council of Ministers through the AG-Fisk working group. The project assesses how Indigenous and local knowledge and data are currently included in marine spatial planning and management processes across the North Atlantic region, identifying key challenges and opportunities. It further examines the role of digital tools and data in shaping these processes, including how they influence process design, integration of diverse knowledge and decision-making. Building on this, the project explores how these processes can be developed in more equitable and just ways in the context of increasing digitalisation, while also aiming to strengthen collaboration and knowledge exchange across the region. Link to project: [Local knowledge in Marine Spatial Planning, green transition and digital transformation – Nordregio](#)

Nordregio policy brief 2026:3

ISSN: 2001-3876

DOI: <http://doi.org/10.6027/PB2026:3.2001-3876>

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Layout: Marija Zelenkauskė, Nordregio

Cover photo: Rebecca Eriksson, Nordregio

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