



TRACKING NETWORK



STRATEGIC PLAN 2024-2029



COVER: Atlantic tomcod in the Shubenacadie River in Nova Scotia. Nicolas Winkler Photography

THIS PAGE: Glider staff recovering an OTN Teledyne Webb Research Slocum glider. Nicolas Winkler Photography

# foreword

Since 2008, the Ocean Tracking Network (OTN) has been advancing our collective understanding of aquatic animal movements around the world. OTN has established a globally connected infrastructure to generate critical data on species movements and survival in the context of changing marine and freshwater environments. Currently composed of ten regional nodes and compatible partner networks, with additional nodes in development, OTN has established itself as the world's leading aquatic animal tracking network.

Animal movements are changing at an unprecedented rate due to anthropogenic and natural stressors—never has it been so critical to adopt multi- and interdisciplinary approaches to aquatic telemetry research to generate the knowledge required to inform the conservation and management of aquatic species and ecosystems. Over the past fifteen years, OTN has established itself as a leading Canadian research facility with a transformative global impact. Looking ahead, OTN will continue to provide innovative and agile infrastructure and data management services that enable research excellence and develop partnerships to answer key questions of priority and relevance on local, national, and global scales.



A bottom-moored OTN Innovasea receiver.  
Nicolas Winkler Photography

# about this plan

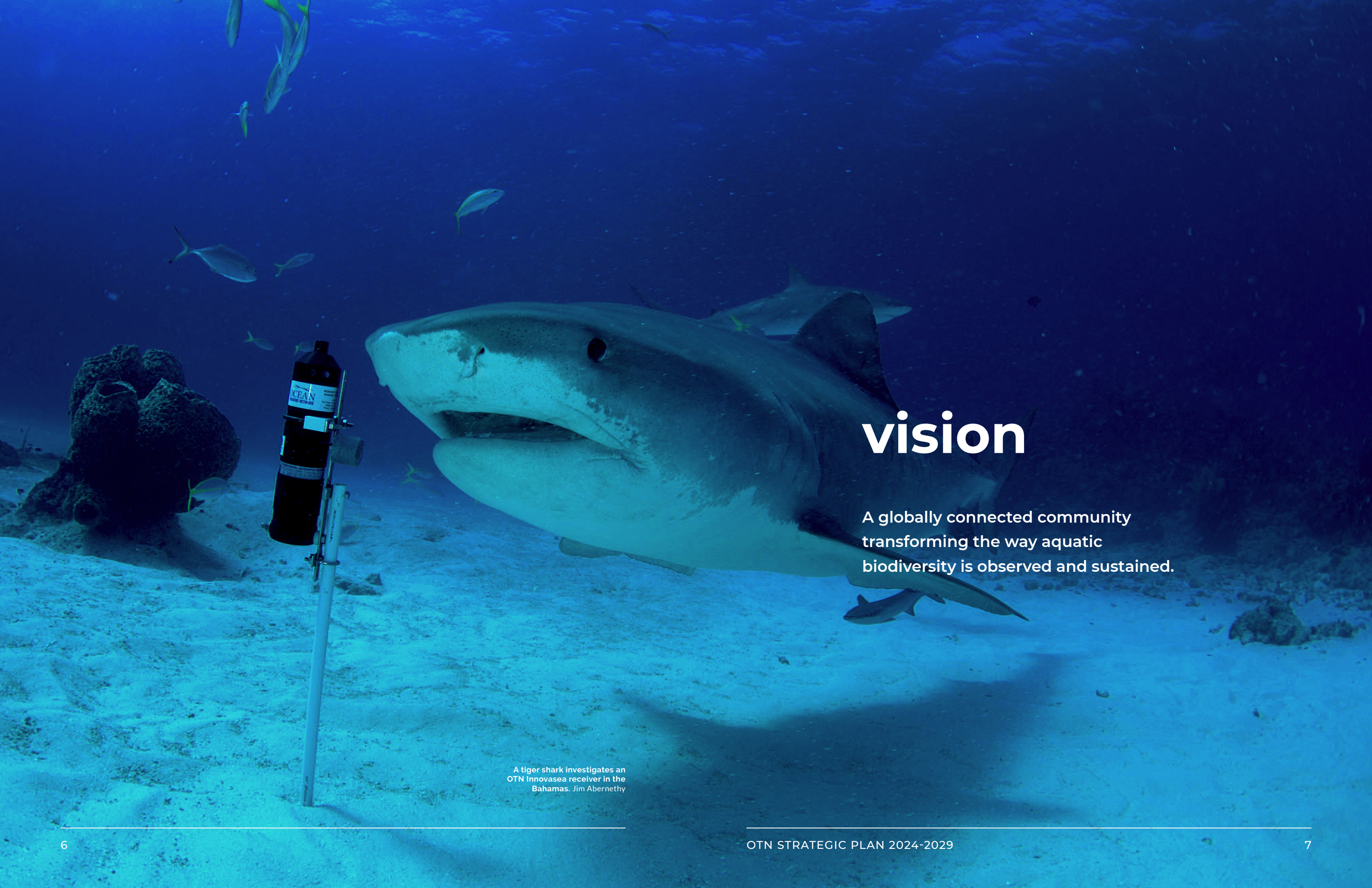
This plan is laid out to document OTN’s vision, mission, guiding principles, and key goals and objectives for 2024-2029, with each layer providing a finer level of detail.

Over the next five years, OTN will:

- Strengthen our relationships with Indigenous and other underserved communities to support research in places and led by people most impacted by climate change.
- Expand the use of real-time data collection, and other complementary data streams, to enable responsive decision making for the health and safety of people and the planet.
- Increase the amount of data available in open data repositories and link these data for secondary users who are modelling key changes in our ocean regions and waterways.
- Leverage resources and funding to help deliver *the science we need for the ocean we want*, in support of Canada’s commitment to the UN Decade of Ocean Science for Sustainable Development.
- Advance partnerships with Canada’s ocean technology sector and inform the development of new products for global markets.
- Respond to immediate threats and adapt to unforeseen challenges facing aquatic ecosystems around the globe.

Goals and objectives are grouped into one of three core aspects of OTN’s work: track, connect, and transform. Under each of these, we have included a ‘What does this look like in practice’ section, to highlight for the reader the associated key actions and impacts at national and global scales.

This plan was developed by OTN’s senior management team, in close collaboration with core team leads. Guidance was provided by OTN’s Council, International Scientific Advisory Committee, and International Data Management Committee. Input was also generously provided by OTN’s staff and network of researchers from around the world.



# vision

A globally connected community transforming the way aquatic biodiversity is observed and sustained.

A tiger shark investigates an OTN Innovasea receiver in the Bahamas. Jim Abernethy

# mission

Tracking the distribution, movement, and survival of aquatic species to inform their conservation and management around the world.



A grey seal outfitted with tracking equipment and a camera. Damian Lidgard



Field technician  
Iago Gradin uses a  
grappling hook—or  
gaff—to recover an OTN  
Innovasea acoustic  
receiver after releasing it  
from its mooring.  
Nicolas Winkler  
Photography

# value proposition

**OTN is uniquely positioned to provide global scientific leadership in aquatic animal tracking.**

OTN pairs contributions from partners around the world to match Canadian investments in a distributed, world class scientific infrastructure. This infrastructure yields unprecedented and unmatched visibility to the environmentally and ecologically important processes unfolding underwater. By leveraging equipment, data services and partnerships, OTN is connecting researchers across disciplines and sectors to answer questions of relevance and priority in Canada and around the world. Through the management and expansion of key tracking infrastructure, data best practices, and supporting technological innovation, OTN advances the science required to inform conservation and management decisions. As we confront the biodiversity and climate crises, and their impacts on aquatic animal populations, decision-makers around the globe can depend on OTN for historic and real-time records about where, when, and why animals are using the ocean and its connected inland waters. OTN enables the research needed to inform policy and management frameworks that affect the socio-economic wellbeing of communities on local, national, and international scales. OTN is an international ambassador for Canadian science, expertise, and values.

# core principles



## RESEARCH EXCELLENCE

We provide the equipment, technology, digital infrastructure, analytical tools, and training necessary to track animals and develop the next generation of highly qualified personnel.



## DIVERSITY AND INCLUSION

We champion a diverse and inclusive network, where barriers to participation are addressed and removed. We build partnerships based on trust and respect with equity-deserving groups, and actively work to listen to and learn from diverse knowledge and value systems.



## ACCESS TO INFORMATION

We promote credible stewardship of data by implementing data and information systems based on globally established guidelines, open-access software and hardware, and making data available in an ethical and responsible manner.



## PEOPLE-FIRST

We value our staff as individuals and provide a flexible and supportive environment for all employees. We provide meaningful work, opportunities for professional growth, and empower staff to participate in organizational decision making.



## INNOVATION

We support the development of new technologies and the innovative use of existing ones. We assist developers in the creation of new capabilities, provide testing platforms and product trials, and combine technologies in novel ways to enhance tracking programs.



## ADAPTABILITY

We are agile and respond to a rapidly changing world with strategic equipment deployments, the adoption of new best practices and standards, and by addressing pressing scientific questions.



## LEADERSHIP

We are a trusted partner and credible voice for the national and international aquatic tracking community. We serve our global network by providing infrastructure and leveraging resources and knowledge to address key questions of societal and scientific relevance.



An OTN Innovasea receiver encased in a custom float collar. Nicolas Winkler Photography



Atlantic sturgeon being tagged in the Minas Basin. Nicolas Winkler Photography, courtesy of FORCE.

# goals and objectives

**TRACK** aquatic animals across the globe in support of conservation and management by maintaining a world class facility and enabling critical research on a scale that would not be possible otherwise.

**Goal:** Foster and promote excellence in animal tracking by elevating high quality and impactful science.

- Identify and investigate ecological hotspots, movement pathways, conservation areas, and other biologically significant areas.
- Prioritize support for research and conservation initiatives led by Indigenous and other historically underrepresented groups in science.
- Deploy infrastructure to support ecosystem-based management and sustainable fisheries.



**Goal:** Optimize the performance of OTN platforms and promote their compatibility with established and novel technologies.

- Expand and align geographic coverage to detect observed and anticipated changes to animal distribution.
- Expand the scientific capabilities of OTN platforms by increasing the use of cost-effective and complementary technologies, such as gliders and remotely operated vehicles, and introducing new sensors for aquatic observation.
- Test and integrate technology and inform novel features that bring new capabilities to market.

**What does this look like in practice?**

**Within Canada:**

- OTN is supporting Indigenous-led research with infrastructure and knowledge sharing, and partnering on collaborative research projects.
- OTN is supporting Canada’s commitment to protect 30% of its ocean area by 2030 by providing equipment, data infrastructure, and expertise that are essential to the establishment and monitoring of Indigenous-led conservation areas, federal marine protected areas, and other effective conservation measures.
- Tracking studies are being conducted to advance the sustainability of commercial fisheries and support the livelihoods of coastal communities.
- Data collected by OTN is informing safety measures for species of public concern.
- OTN is continuing to partner with the ocean technology sector to drive the innovation of new products.



**Across the globe:**

- Equipment loans are supporting research conducted by communities and in regions that are historically underrepresented in science.
- Telemetry data generated by OTN are helping to fill critical gaps in fisheries management models and methodologies.
- OTN is facilitating cutting-edge research that is helping achieve the UN goals for the Decade of Ocean Science for Sustainable Development and the Sustainable Development Goals.

## CONNECT researchers across the globe to answer pressing questions in aquatic science through partnership building, knowledge exchange, capacity building, and an internationally certified data management centre.

**Goal:** Expand the global network of individuals working in synergy to advance our collective understanding of aquatic ecosystems.

- Establish and maintain collaborative relationships with Indigenous peoples based on capacity sharing, knowledge exchange, and respect.
- Lead and support high impact collaborations that leverage OTN's equipment, data products, and expertise.
- Maintain and strengthen connections to affiliate networks and promote the creation of new regional data nodes and partnerships.
- Foster the training and development of highly qualified personnel, and support early- and mid-career researchers in establishing themselves in aquatic sciences.

**Goal:** Maintain and advance OTN's data repository as a sustainable and trustworthy data infrastructure.

- Adopt new data streams, such as satellite telemetry, to meet the needs of current and potential users.
- Enhance the findability and accessibility of data housed within the OTN data system.
- Expand the use of complementary data sets through shared standards, collaboration, and innovation.



Caliyena Brown, a summer communications intern, at an outreach event.

## What does this look like in practice?

### Within Canada:

- More opportunities are created for capacity sharing and co-production of knowledge by fostering relationships with Indigenous communities, organizations, and governments, and continuing to build diverse partnerships to address shared interests through initiatives like *Apoqnmulti'k*, a collaborative research program with Mi'kmaw, local, and western knowledge holders in Nova Scotia.
- A large-scale research program is supporting a network of Canadian scientists and highly qualified personnel who work in synergy with OTN's infrastructure.
- A satellite telemetry data assembly centre is established by OTN as Canada's contribution to the Global Ocean Observing System's Animal Borne Ocean Sensors (AniBOS) program.
- Highly qualified personnel are trained by OTN to be experts in telemetry research and are equipped and guided to take on full-time opportunities in ocean sciences in Canada and around the world.



An OTN Liquid Robotics Wave Glider.  
Nicolas Winkler Photography

### Across the globe:

- OTN's data publication processes are aligned with FAIR (Findable, Accessible, Interoperable, Reusable), CARE (Collective benefit, Authority to control, Responsibility, Ethics), and OCAP (Ownership, Control, Access, Possession) principles and reflect UNESCO's open science recommendations.
- Secondary usership of OTN data is increased with a goal of maximizing its research and societal impact.
- OTN is fulfilling and upholding its certification as an Associate Data Unit of the International Oceanographic Data and Information Exchange and a CoreTrustSeal trustworthy repository.
- OTN is adopting and co-authoring emergent protocols and data formats with an aim to optimize secondary use of OTN-held data.
- OTN is supporting the development of interoperable data visualization and analysis tools and facilitating their coordination.



Data team member Caitlin Bate presenting to the Terranaut Club in Dartmouth, Nova Scotia.

## **TRANSFORM** the way oceans and connected inland waters are understood to help guide better stewardship and sustainability of aquatic species and resources.

### **Goal:** Fulfill information needed for science-based decision-making in the face of unprecedented environmental change.

- Partner with Indigenous communities and organizations to co-develop and execute research to generate knowledge to inform co-management and governance of fisheries and aquatic ecosystems.
- Increase the amount of telemetry and associated environmental data available in open data repositories and federated data systems, such as the Ocean Biodiversity Information System and the Canadian Integrated Ocean Observing System.
- Inform national and global conservation initiatives by flowing OTN data and expertise into management and decision-making processes.
- Partner with government, industry, and regulators to better understand the potential environmental impacts of aquatic resource development projects.

### **Goal:** Expand the OTN platform to include new technologies that advance how we study marine and freshwater environments.

- Inform and enable development of new technologies through innovative partnerships with industry.
- Integrate additional and novel real-time capabilities and facilitate their widespread implementation.

- Position OTN to adapt to anticipated advancements in artificial intelligence and the ways it can be positively implemented to explore and understand aquatic ecosystems.

## **What does this look like in practice?**

### **Within Canada:**

- OTN is supporting Indigenous communities and organizations to transform aquatic stewardship and serve as a model for cooperation between western and Indigenous knowledge systems.
- OTN data and equipment are helping inform storm tracks and responses, the development of offshore wind and tidal energy to promote net zero energy security, and the production of sustainable aquaculture.
- OTN is a world class national research facility and trusted partner in scientific research that addresses the biodiversity and climate crises.
- OTN is supporting Canadian leadership in developing new capabilities to advance aquatic animal tracking, and leveraging Nova Scotia's expertise in ocean technology.
- OTN data are consistently flowing into science advisory bodies, such as the Canadian Science Advisory Secretariat, and informing policy.

### **Across the globe:**

- OTN is a global and trusted leader in providing and deploying state-of-the-art technologies that enable the research needed to address the challenges identified by the UN Decade of Ocean Science for Sustainable Development.
- An increased amount of telemetry and associated environmental data is available in open data repositories and federated data systems, such as the Ocean Biodiversity Information System and Canadian Integrated Ocean Observing System.

A tagged European lobster  
in Bergen, Norway.

