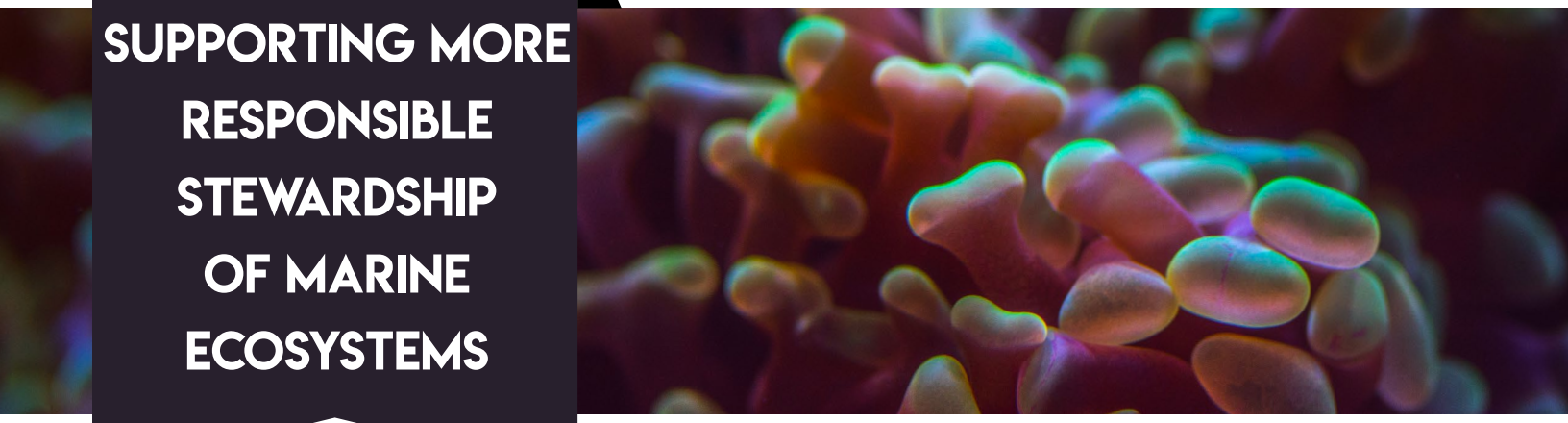
SUPPORTING MORE RESPONSIBLE STEWARDSHIP OF MARINE ECOSYSTEMS



Despite the vital importance of aquatic species to the global economy, food security, and the subsistence and cultures of indigenous peoples, significant gaps in our understanding about their movements and habitat use exist. To date, tracking data on valued animals has been regional in nature, done for a limited number of species, and often entirely absent for many important species that are key parts of the food web. In order to provide responsible stewardship of marine ecosystems, industry, policy makers, and cultural groups require a more accurate picture of the survival, movements, habitat use, and response to the changing ocean climate of many species.

TRACKING SPECIES WORLDWIDE

Canada's Ocean Tracking Network (OTN), based at Dalhousie University in Halifax, has created a global monitoring network to comprehensively examine the local-to-global movements of aquatic species in all of the world's five oceans. It unites scientists from around the world in a revolutionary examination of marine life and ocean conditions, uniquely providing a scientific foundation for sustainable oceans management.

The OTN uses electronic telemetry to track aquatic animals and environmental conditions such as water oxygen, temperature and salinity. Its bowling-pin-sized mooring units detect sonar pings from tagged animals passing within 800-metres. Data from 2,000 of these moorings, as well as from almost 30,000 independent, compatible moorings worldwide, allow the OTN to exchange information worldwide, and scale up its tracking capabilities globally. The network also uses two models of remotely piloted marine autonomous vehicles and satellite-linked receivers to retrieve data from moorings and in some cases provide information in near-real time.

OTN research has already yielded important insights into the often-mysterious migrations of endangered marine animals like leatherback turtles, basking sharks, American eels, and Bluefin tuna, and have generated critical knowledge towards conservation recommendations.

Tracking studies have also highlighted the limitations of current management plans. For example, acoustically tagged reef fish were shown to regularly move outside their marine protected area, putting them at risk.

ACCESS TO OCEANOGRAPHIC DATA

The OTN collects, stores and shares its extensive data holdings through Canada's National Research and Education Network (NREN). CANARIE and its 12

WHAT IS THE NREN?

The National Research and Education Network (NREN) is an essential collective of infrastructure, tools and people that bolsters Canadian leadership in research, education, and innovation. CANARIE and its twelve provincial and territorial partners form Canada's NREN. We connect Canada's researchers, educators, and innovators to each other and to data, technology, and colleagues around the world.

provincial and territorial partners form Canada's NREN, an essential collective of infrastructure, tools, and people that bolsters Canadian leadership in research, education, and innovation. The OTN's researchers at Dalhousie University connect to the NREN through ACORN-NS (Atlantic Canada Organization of Research Networks – Nova Scotia).

The OTN carries out quality assurance and verification on all the data it collects. That data is then stored and aggregated at Dalhousie, and shared both nationally and globally through the ACORN-NS and CANARIE networks. It makes its oceanographic data immediately available through the Global Telecommunications System where it is used by the Canadian navy for fleet forecasts, and by Environment Canada for weather forecasting. The OTN is working with Canada's Department of Fisheries and Oceans (DFO) to create the Canadian Integrated Ocean Observing System (CIOOS) to store all oceanographic data collected by the OTN, DFO, and other academics and NGOs.

LEADING GLOBAL COOPERATION

OTN research is informing Canadian marine policy, environmental impact assessments for sustainable marine sector growth, the design of marine protected areas, and management strategies for commercially harvested, endangered, or threatened species. Given that aquatic animals migrate beyond international borders, sharing information globally is imperative, and the OTN is leading the international scientific community to coordinate research in areas beyond national jurisdiction.

Armed with this important data, the OTN is also taking leadership in the global effort to develop strategies on adapting to climate change. OTN scientists have led discussions about animal movements with the UN, in support of the UN's Sustainable Development Goal 14. That involvement is expected to grow leading up to the international Decade of Ocean Science, which begins in 2020.

For more information, visit:

ACORN-NS.CA