

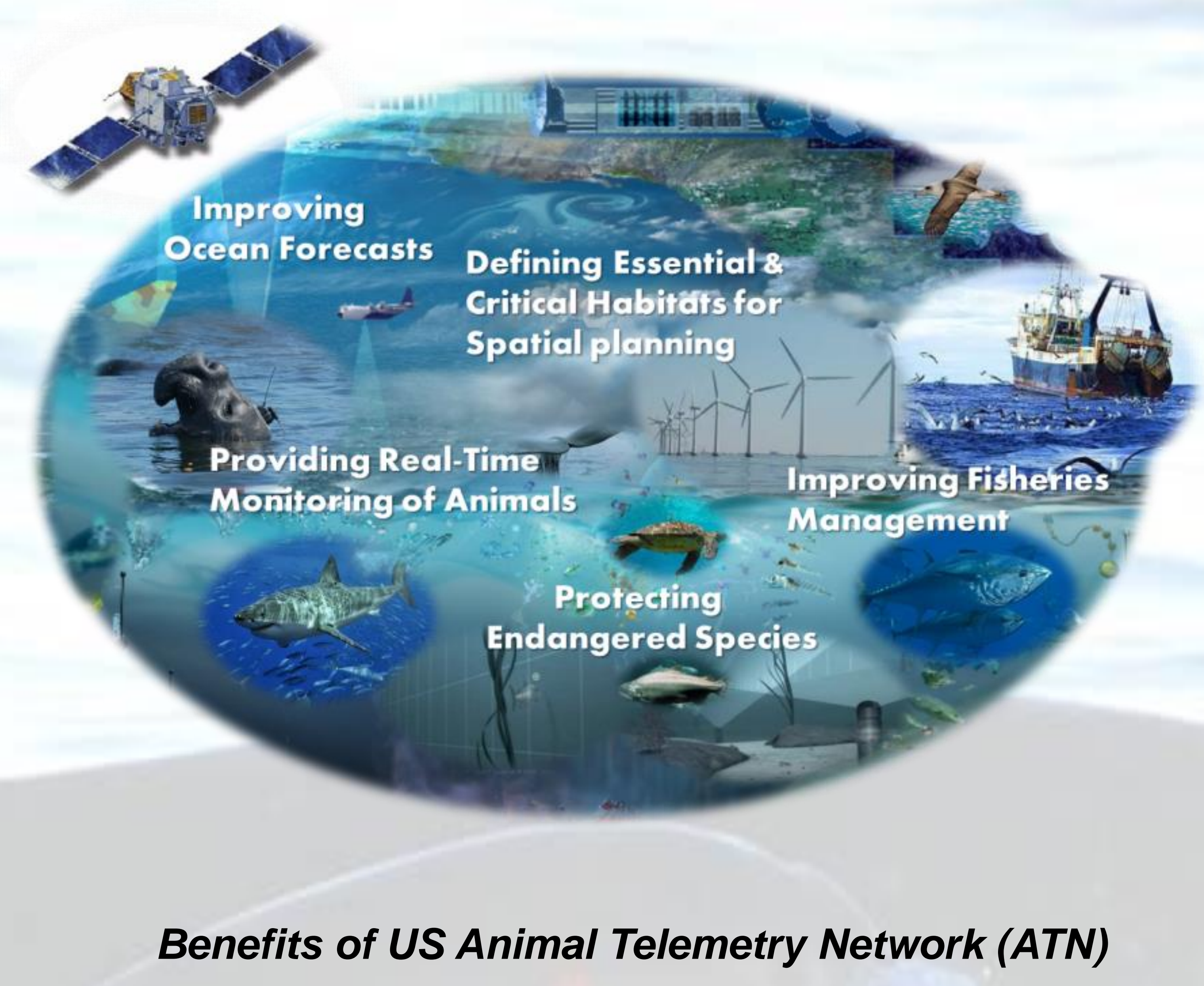


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Abstract

Aquatic animal telemetry and tracking is the science of elucidating the behavior of animals as they move through the world's oceans and lakes. Telemetry and tracking devices yield detailed data regarding the physical environment through which the animals are moving. Sometimes this can be done in near-real time - true telemetry - and in other tags the data are stored for later acquisition. Animal species tagged range from 20-gram salmon smolts to 150-ton whales. Detailed observations of animal movements and their aquatic environment, have significantly improved our understanding of ecosystem function and the evolutionary constraints of species. These data are critical for preventing extinctions, preserving biodiversity and implementing ecosystem-based management of living resources. Animal-borne sensors have come of age and deliver high resolution physical oceanographic data at a relatively low cost. A U.S. national Animal Telemetry Network (ATN) through the U.S. Integrated Ocean Observing System (U.S. IOOS) will implement a range of operational telemetry technologies that enable monitoring of a host of aquatic life over multiple temporal and spatial scales. This work focuses on how to integrate an ATN into the U.S. IOOS program and what benefits this will have for U.S. oceans, coasts and great lakes.



Recommendations

In the ATN Strategic Plan & Recommendations the following recommendations were proposed for how U.S. IOOS can integrate ATN efforts into a national, and ultimately international system:

- Invest in, deploy and maintain a combination of key assets through the U.S. IOOS Regional Associations
- Develop and maintain a national data management capacity by establishing common data standards and infrastructure
- Develop a plan for sustained long-term support for a) maintenance of infrastructure for receiving data, b) tag deployment through the U.S. IOOS Regional Associations, c) data management system and capacity, and d) advancement of tagging and observing technology
- Synthesize animal telemetry products
- Advance the national capacity for assimilation animal oceanographic telemetry data into ocean models.

Approach

An ATN task team under the U.S. Integrated Ocean Observing Committee (IOOC) was established to facilitate the development and implementation of a national ATN through the U.S. IOOS Program. The approach to developing an ATN includes:

- Develop, distribute and socialize the 'Strategic Plan and Recommendations for a National Animal Telemetry Network (ATN) through U.S. IOOS'.
 - Publish Strategic Plan and Recommendations
 - Identify and prioritize the target audience
 - Develop a marketing plan
 - Identify potential strategic partners
- Develop an **ATN Design & Implementation Plan**, including:
 - Inventory existing infrastructure/activities
 - Identify time horizon and develop budget or Implementation Plan
 - Identify appropriate external reviewers or review panel of subject matter experts
 - Develop a marketing approach for the distribution and socialization of the Implementation Plan.

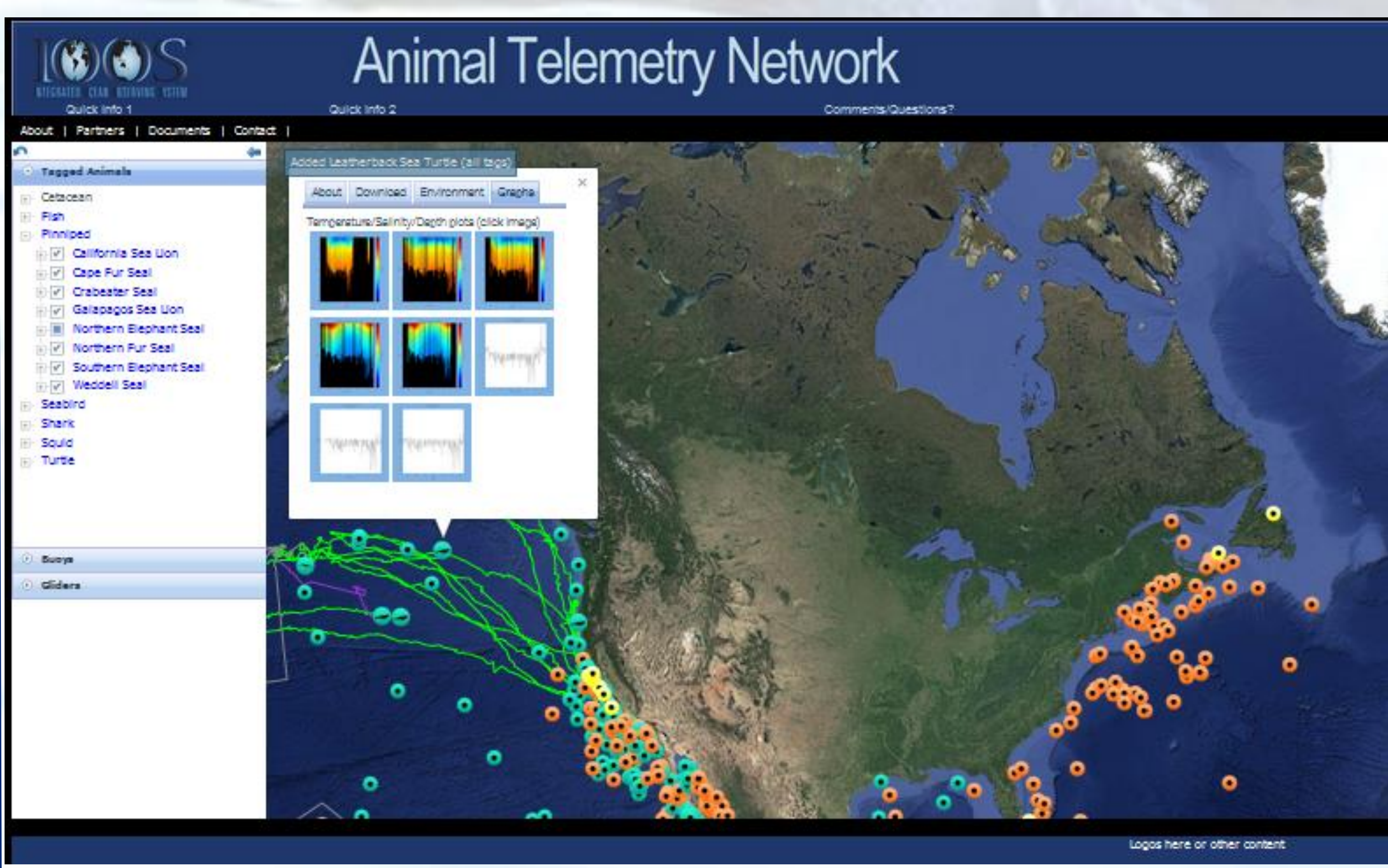


Figure 1. Beta Version of the US Animal Telemetry Network Data Portal

Demonstration Projects

The U.S. IOOS Program Office, ONR Marine Mammal & Biology (MMB) program, and Navy NAVOCEANO have co-funded several demonstration projects to develop and launch the initial capability of the ATN. The projects include:

- **Data Interoperability Tools** (2011-12) – a collaboration with the TOPP program at Stanford Univ., NAVOCEANO, NOAA NCEP to develop data interoperability tools to deliver oceanographic data coming from tags to ocean modelers.
- **Metadata Standards for Acoustic Tags** (2012-13) – a collaboration with NANOOS and POST, NOAA, HYDRA, GLATOS, IMOS AATAMS and OTN to establish data content and metadata standards for acoustic telemetry data, which have been adopted by the global OTN and will be implemented in the ATN DAC efforts.
- **ATN Data Assembly Center** (ATN DAC) (2013-14) – the goal is the development of a prototype ATN Data Assembly Center at Stanford Univ. & TOPP Program with a web portal and proof-of-concept for operational ATN with real-time delivery of ocean observations to the ocean model community at NAVO (Fig. 1).

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