

Setting a Trend with Turtle Tracks: Satellite Tracking on the Web

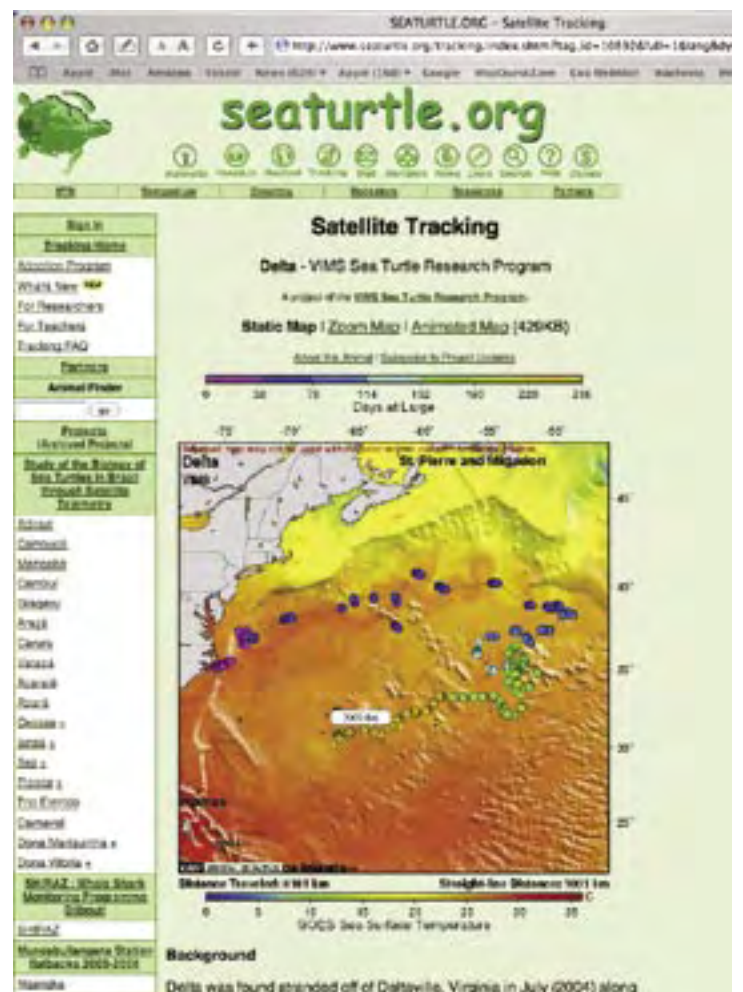
Until quite recently, very little was known of sea turtles' lives in the sea, where females spend the vast majority of their lives and males their entire post-hatchling existence. Countless studies of that minuscule fraction of a female turtle's lifespan spent at nesting beaches have left us with a relatively advanced level of understanding about the reproductive behavior of adult females, a fair idea of how eggs become hatchlings, and a reasonable comprehension of how hatchlings behave. But once they hit the open ocean, baby sea turtles more or less disappear. We never see the adult males again (except occasionally while scuba diving or in a market), and the period of time when a turtle grows from hatchling to young adult is, to this day, referred to as the "lost year," a term coined by pioneering sea turtle researcher Archie Carr in the late 1950s.

But modern technology is changing all of that, helping us to unravel many of the critical natural history mysteries of sea turtles—the understanding of which will vastly aid our efforts to conserve them. Today, we can place tracking devices on turtles and follow them via satellite, and even monitor the temperature of the water, the depths to which they dive, and a variety of other variables.

As the science and art of wildlife tracking garners growing interest from the general public, increasingly more studies using advanced electronic tags and satellite telemetry have found their way onto the Internet, offering anyone a glimpse into the daily lives of sea turtles with nearly real-time updates of their movements in the sea. This type of easily accessed, up-to-the-minute data reporting allows scientists to conduct their research rapidly and from anywhere in the world, and it offers unprecedented opportunities for collaboration among multiple scientists. Resource managers can see what tagged animals are doing, determine how the turtles' movements fit into conservation strategies, and use the information to instantly make changes on the ground to their own management actions. Focused outreach and education using these technologies offers a multiplicity of new avenues for public engagement.



Researchers in Florida, USA, equip this loggerhead turtle with a satellite tag.
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In this example from SEATURTLE.ORG, a loggerhead off the east coast of the U.S. is tracked on a map shaded with GEBCO one-minute bathymetry and showing U.S. National Oceanic and Atmospheric Administration's Geostationary Orbiting Environmental Satellite (GOES) sea surface temperature. © SEATURTLE.ORG AND VIRGINIA INSTITUTE OF MARINE SCIENCE

In 2003, SEATURTLE.ORG launched the Satellite Tracking and Analysis Tool (STAT) at www.seaturtle.org/tracking to help scientists manage satellite telemetry data and maximize the potential of these relatively expensive data for the study and conservation of sea turtles. The most valuable aspect of STAT is its ability to automatically retrieve, parse, and store telemetry data from the Argos Satellite network. A suite of summary maps, tables, and graphs updated each day, allowing investigators to easily check each of their subject animals. STAT also provides an array of mapping, filtering, and export functions to facilitate data analysis, as well as access to bathymetry, sea surface temperature, chlorophyll, sea surface height, and ocean surface currents—thus allowing researchers an exciting new way to see sea turtles' movements in the context of their local environment.

Tracking animals by satellite clearly offers a unique perspective into the lives of the animals we are working to study and conserve, helping scientists, managers, and conservationists obtain maximum value from their efforts and reach the widest audience possible.

Michael Coyne is a research scientist with the Marine Geospatial Ecology Lab at Duke University and Director of SEATURTLE.ORG.