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Keynote Address

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Send out the turtle fleet!

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In order to describe the oceanic habitats and migratory pathways of large pelagic animals, biological oceanographers are sending out fleets of animals with electronic tags. Since 1997, I have worked with a number of colleagues deploying fleets of pelagic animals including sea turtles, tunas, moonfish, and whale sharks. I will describe some of the insights we have gained from sending out fleets of loggerhead, olive ridley, and leatherback sea turtles in the North Pacific. The turtles we tracked come from a variety of sources including turtles caught in long-line fisheries, turtles captured by research scientists, and turtles released from aquaria. Electronic tags are attached to the turtles to transmit frequent estimates of the turtle's positions via an Argos satellite. These data together with environmental data from satellite remote sensing are used to describe the oceanic habitat used by these turtles. The results indicate that loggerheads travel across the North Pacific, moving seasonally north and south primarily through the region 28°-40°N, and occupy sea surface temperatures (SST) of 15°-25°C. Their dive depth distribution indicated that they spend 40% of their time at the surface and 90% of their time at depths less than 40 m. Loggerheads are found in association with fronts, eddies, and geotropic currents. Specifically, the Transition Zone Chlorophyll Front (TZCF) and the meanders and eddies in and south of Kuroshio Extension Current (KEC) appear to be important forage and migration habitats for loggerheads.

In contrast, olive ridleys were found primarily south of loggerhead habitat in the region 8°-31°N latitude, occupying warmer water of the subtropical gyre with SSTs of 23°-28°C. They have a deeper dive pattern than loggerheads, spending only 20% of their time at the surface and 60% shallower than 40 m. However, the three olive ridleys identified from genetics to be of western Pacific origin spent some time associated with major ocean currents, specifically the southern edge of the KEC, the North Equatorial Current (NEC), and the Equatorial Counter Current (ECC). These habitats were not used by any olive ridleys of eastern Pacific origin suggesting that olive ridleys from different populations may occupy different oceanic habitats. Finally leatherback turtles use a range of habitats including the California Current and the equatorial currents. Like the olive ridleys they forage subsurface with a high proportion of their time-at-depth in the 25-50 m depth range in both the eastern and equatorial Pacific.

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Abstracts

