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TITLE: Animal-Borne Telemetry: An Integral Component of the Ocean Observing Toolkit

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ABSTRACT:

Animal telemetry is a powerful tool for observing marine animals and the physical environments that they inhabit, from coastal and continental shelf ecosystems to polar seas and open oceans. Satellite-linked biologgers and networks of acoustic receivers allow animals to be reliably monitored over scales of tens of meters to thousands of kilometres, giving insight into their habitat use, home range size, the phenology of migratory patterns and the biotic and abiotic factors that drive their distributions. Furthermore, physical environmental variables can be collected using animals as autonomous sampling platforms, increasing spatial and temporal coverage of global oceanographic observation systems. The use of animal telemetry therefore has the capacity to provide measures from a suite of essential ocean variables (EOVs) for improved monitoring of Earth's oceans. Here we outline the design features of animal telemetry systems, describe current applications and their benefits and challenges, and discuss future directions. We describe new analytical techniques that improve our ability to not only quantify animal movements but to also provide a powerful framework for comparative studies across taxa. We discuss the application of animal telemetry and its capacity to collect biotic and abiotic data, how the data collected can be incorporated into ocean observing systems, and the role these data can play in improved ocean management.

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