016

Reconstruction of three-dimensional moving paths of green turtles by means of magneto-resistive loggers

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We reconstructed the spatial and temporal diving behavior of a green turtle using cutting edge data loggers. Reconstruction of three-dimensional moving paths of the green turtle has been one of important themes in our project.

To reconstruct three-dimensional moving paths of green turtles, we developed the magneto-resistive acceleration logger (MR-logger) to record geomagnetic field and acceleration. Field experiments were conducted in Huyong Island, Thailand. The MR logger and a Speed/ Depth/ Temperature logger (PDT logger) were attached on a carapace of a female green turtle nested on the beach in the Huyong Island. Sampling frequencies of the data loggers were 10 Hz for the MR logger and 1 Hz for the PDT logger. The 3-D moving paths of the green turtle were reconstructed by her horizontal body directions, vertical tilt angles and swimming speeds. The horizontal body directions of the green turtle were calculated from the surging and swaying geomagnetic field. The vertical tilt angles of the green turtle were calculated from the surging acceleration.

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