# Dismissing Dogma: The Surprising Movement Patterns of Spiny Dogfish, In the North Atlantic

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The spiny dogfish, *Squalus acanthias*, is a relatively small species of shark (< 130 cm TL) distributed in the Northwest Atlantic from Greenland to Florida. Despite this wide distribution, information regarding the coordinated movement patterns and habitat preferences are lacking. The limited knowledge that does exist for this shark only suggests that a seasonal, inshore north-south movement occurs. Thus, the caveats surrounding the ecology of this shark make it an ideal candidate for not only examining the efficacy of using the PTT-100 Archival Pop-up X-Tags in tracking movements of small elasmobranchs, but also aiding in the responsible management of this species.
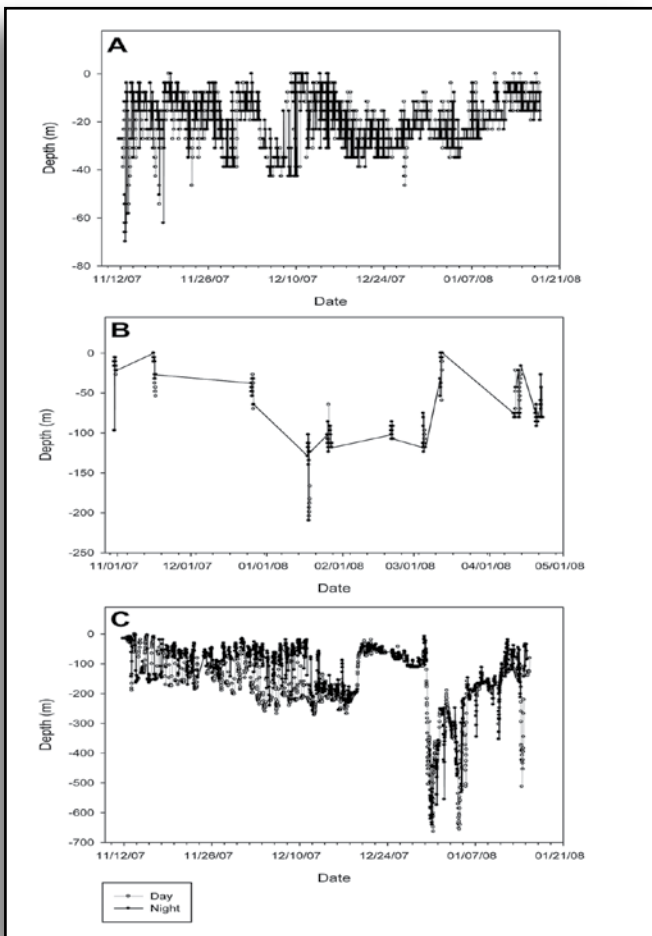
Differential time at depth patterns for spiny dogfish 78183 (panel A), 78184 (panel B) and 78185 (panel C). Spiny dogfish 78183 displayed a strong preference for depths less than 50 meters, while fish 78184 and 78185 displayed preferences of 80 to 130 m and over 200 m, respectively. Depth data analyzed by Walter Bubley; University of New Hampshire, Department of Molecular, Cellular and Biomedical Sciences, Kendall Hall, 129 Main Street, Durham, NH 03824, USA.

Research at the University of New England (funded by the Northeast Consortium) has begun to elucidate the activity patterns of this shark. In 2007, three X-Tags (one on October 31st and two on November 12th) were placed on mature (average fork length 82 cm) female dogfish 6 km off the coast of Portland, Maine USA. Two of the tags collected information on dogfish for over two months while the third recorded data for almost six months. Horizontal movement patterns were determined with the use of a state space Kalman filter that included SST and bathymetry data in the model. Preliminary results from these tags have provided compelling evidence that this shark species is much more vertically and horizontally mobile than once thought. After tagging, all three sharks appeared to move quickly offshore. Of particular interest are the movements of two specimens, as filtered data suggests that they ventured over 500 km east of the tagging location before heading south into

waters off the coast of New Jersey, USA. Diel depth patterns also yielded fascinating information in that each shark appeared to be equally active during both the day and night. Another interesting component of the depth data is the broad
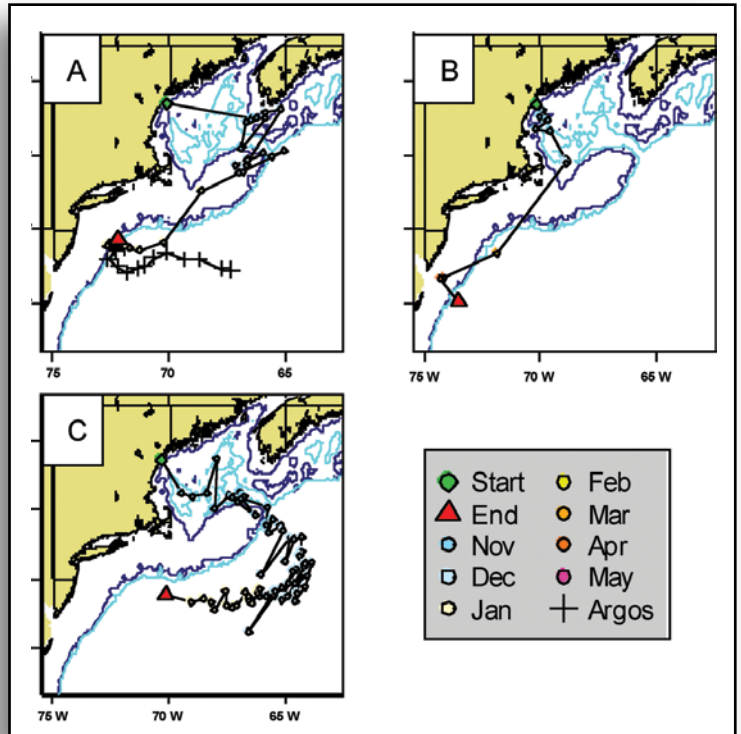
Final estimated tracks of spiny dogfish 78183 (panel A), 78184 (panel B) and 78185 (panel C) tagged off the coast of Northern New England with Archival Pop-up X-Tags in November 2007. These specimens were at liberty for 89, 189 and 65 days respectively. Geolocation data filtered by Ben Galuardi; Large Pelagics Research Lab, 177 Spaulding Hall, University of New Hampshire, Durham, NH 03824, USA.

differences in depth profiles exhibited by each shark over the course of their estimated horizontal movement patterns. While each shark moved in the same general horizontal pattern, the depths each occupied during this movement varied considerably from as little as 2 m to almost 700 m below the sea surface. The amount of time spent at the shallower depths is intriguing as this data is in contrast to traditional paradigms which considers this species to be more benthic in nature. The preliminary findings generated from the X-Tags have generated excitement and funding (from NOAA Fisheries) for 20 additional X-Tags to be placed on spiny dogfish in hopes of better understanding these and other surprising behavioral anomalies that may exist.

Photo by Angela Cicia

James Sulikowski wishing his fish good luck!