

Abstract Submitted
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Hydrodynamics of Lemon shark's (*Negaprion brevirostris*) dorsal fins VIVIAN TURNER, ROI GURKA, ERIN E. HACKETT, Coastal Carolina University — To improve understanding of the hydrodynamic functionality of dorsal fins of sharks, we focus on the Lemon shark (*Negaprion brevirostris*), which features a second dorsal fin that is almost as large as its first dorsal fin; an uncommon feature of migratory shark species that is not well understood from both a physical and biological perspective. Laboratory experiments are performed in a flume using PIV to measure the near wake flow behind the first and second dorsal fins, and behind the tail of a deceased Lemon shark as well as a 1:1 ratio 3D printed flexible shark model. Vortex shedding in the wake is characterized through POD applied to vorticity fields estimated from the PIV data. Hydrodynamic forces are estimated using the velocity deficit in the wake to estimate drag, and a thrust model based on the characteristics of the vortex street in the wake. Drag and thrust coefficient results behind the first dorsal, second dorsal, and caudal fin are compared.

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