**Confronting the Challenge of Whale Detection from Large Vessels (Poster)

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As a result of a moratorium on commercial whaling, most populations of large whales are increasing across the globe. However, concurrent growth in shipping means that lethal ship-whale collisions constitute a significant threat to whale conservation efforts. This study investigates the ability of ship operators to detect and avoid whales by quantifying the predictability of whale surfacing behaviors, which are the cues used to determine whale presence. Whale avoidance is challenging because whales spend most of their time underwater and thus unavailable to be detected (the "availability process"), but must be detected at sufficiently large distances (the "detection process") to enact an effective avoidance maneuver. We quantified one of the main characteristics of whale behavior that governs detectability – time breaking the surface – to create a novel model of whale surfacing patterns around ships while accounting for the detection process. We then estimated the frequency with which cues go undetected (i.e. whales break the surface but ship operators are unaware of them), as well as the frequency with which whales are present but unavailable for detection (i.e. below the surface of the water). This work will enable the prediction of close ship-whale encounters given different combinations of detected and/or missed cues at varying ship speeds. It will support ship operators' avoidance efforts by quantifying the availability and detection processes in a way that facilitates the development of whale avoidance protocols.