

## ABSTRACT

NOAA's Office of Coast Survey annually reviews the NOAA Hydrographic Survey Priorities (NHSP) document to guide the prioritization, planning, and execution of its yearly hydrographic navigational surveys, allocating millions of dollars in assets to help ensure safe navigation in United States navigable waters. As the highest priority navigationally significant areas are completed with modern surveys, NOAA must re-examine how hydrographic surveys are prioritized. One potential source of information that NOAA can employ to analyze areas that might require surveying is ship-generated Automatic Identification System (AIS) data. Ship draft data from AIS can be compared with charted depths to reveal the under keel clearance vessels experience when transiting in and out of ports. The value of under keel clearance compared with a vessel's draft, combined with the proportion of ships operating at or around under keel safety limits can provide information beyond traditional sources to assess navigational risk. This thesis project assessed the feasibility of using AIS ship draft data to calculate under keel clearance and explore its utility as a factor to determine hydrographic survey priorities. The results proved under keel clearances calculated from AIS vary by port and can be quantitatively used to assign relative risks to ports using draft information. However, the attribute data from AIS must undergo significant quality control measures to remove a large amount of erroneous draft information input by the ships' crew. Because draft information in AIS messages is a static field, the reported draft carries a great deal of uncertainty; significant negative under keel clearance vessels were calculated during the study. With additional research into the nature of erroneous AIS draft entries and developing detailed, automated quality control measures, AIS data will have the opportunity to become a variable in a quantitative tool for planning future surveys by NOAA hydrographers.