

Harnessing fishing vessel acoustics for stock assessment – 10 years later

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A new, low-cost, spatially-explicit index for midwater walleye pollock (*Gadus chalcogrammus*) biomass has been developed using acoustic data collected since 2006 from two commercial fishing vessels conducting an annual bottom trawl survey of pollock on Alaska's Bering Sea shelf. This index is highly correlated to midwater pollock biomass estimates from a biennial acoustic survey of the Bering Sea shelf ($r^2 = 0.90$, 2006-2015) and provides annual pollock distribution and abundance information to supplement the acoustic survey. Index estimates since 2010 have been used in the pollock stock assessment model as an additional time series by assuming the index has the same length/age selectivity as the biennial acoustic survey time series, but higher variance. Index catchability is estimated by the model. The index time series captures trend information not seen by other surveys used in the model and reduces uncertainty in the spawning stock biomass trend. Several key elements contributed to the success of this project. First, the midwater fish assemblage in the Bering Sea is dominated by a single species, enabling time-saving shortcuts in backscatter data processing and analysis. Second, the bottom trawl vessels provided regular access to their electronics and sampled a regular grid of stations. Third, the quality of these opportunistic data was ensured by developing and implementing robust calibration and data collection protocols with help from collaborating scientists and fishing industry partners. Finally, the index was initially conceived, and subsequently created, to provide specific and critical information to the stock assessment process.

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