

Christian Reiss

NOAA - Fisheries, USA

Assessing the trends in mesopelagic fish resources in the Southern Ocean: Inferences from acoustics and predator diets

Christian S Reiss [1], Anthony M Cossio [1], Angela Klemmedson [2], Michael E Goebel [1], Emmanis Dorval [3] and Ronald S Kaufmann [2]

[1] NOAA Southwest Fisheries Science Center, Antarctic Ecosystem Research Division, La Jolla CA; [2] Dept. of Environmental & Ocean Sciences, University of San Diego, San Diego, CA; [3] NOAA Southwest Fisheries Science Center, Fisheries Resource Division, La Jolla CA

Assessing the status and trends of mesopelagic resources is critically important given their central role in the Southern Ocean ecosystem, especially as alternate prey for top predators and as competing predators on krill (*Euphausia superba*). Despite their importance, mesopelagic fishes are notoriously difficult to sample owing to gear avoidance. Here we show how trends in mesopelagic resources may be assessed using acoustic data collected as part of annual U.S. AMLR summer Antarctic krill biomass surveys and how population dynamics of these populations can be inferred from the analysis of otoliths recovered from the scats of Antarctic fur seals (*Arctocephalus gazella*). Mesopelagic fish relative backscatter shows variability in excess of two orders of magnitude suggesting that the abundance of mesopelagic fishes is highly variable in the Antarctic Peninsula. Likewise, analysis of the time series of age and reconstructed lengths of mesopelagic fish show a decline in the mean age of *Gymnoscopelus nicholsi* between the mid-1990s and present. These findings indicate considerable variability in the dynamics of mesopelagic fish is present in Southern Ocean and suggest that dynamics of these taxa are important for understanding the future status and resiliency of this ecosystem. Further work to better resolve species composition of acoustic targets and detailed analysis of otoliths will provide perspectives on the regional changes in mesopelagic fish resources and link this variability to both climate and predator prey interactions.