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Spatial distribution, food habits, and energetics of age-0 walleye pollock and Pacific cod during summer in the eastern and central Gulf of Alaska

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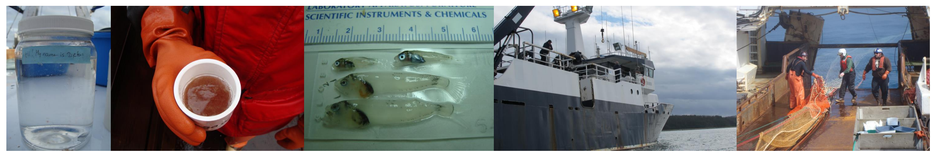
Overview

Walleye pollock (*Gadus chalcogramma*) and Pacific cod (*Gadus macrocephalus*) occupy similar early life history niches and demonstrate a high degree of spatial overlap in the surface waters of the Gulf of Alaska (GOA) during summer months. Fisheries oceanographic surveys targeting age-0 pollock and cod were conducted during July and August 2012. Statistically significant differences in the regional and interspecific composition of prey in the diets of pollock and cod were not detected. Body condition and total energy content of cod was greater than that for pollock, however total energy content increased with length at a similar rate for both species. Pollock inhabiting continental slope waters had higher energy stores relative to the continental shelf and basin indicating an energetic advantage for individuals remaining off the shelf during summer months, or potentially the advection of fish with higher energy reserves off of the shelf. Previous studies have documented the importance of energy stores for surviving winter and future studies should focus on understanding the mechanisms influencing lipid storage and somatic growth for theses species in the eastern and central GOA.



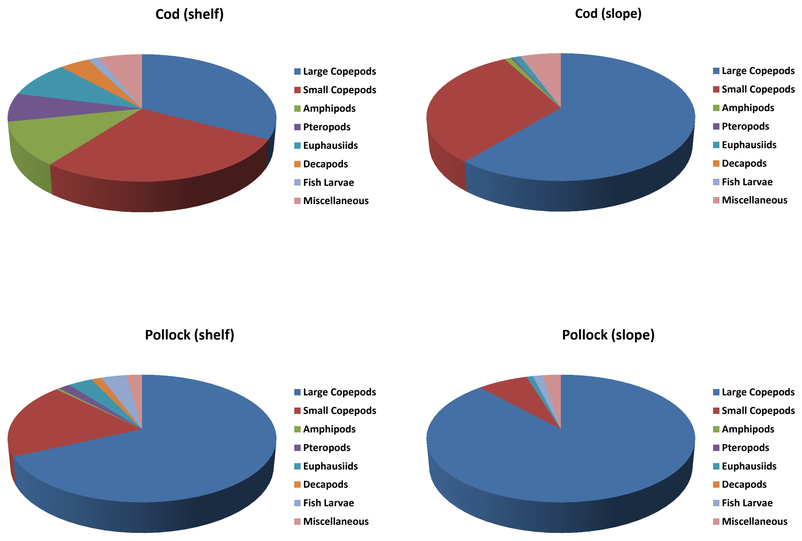


Figure 2. Percent prey contribution by weight for age-0 pollock and cod inhabiting shelf and slope habitat in the western study region

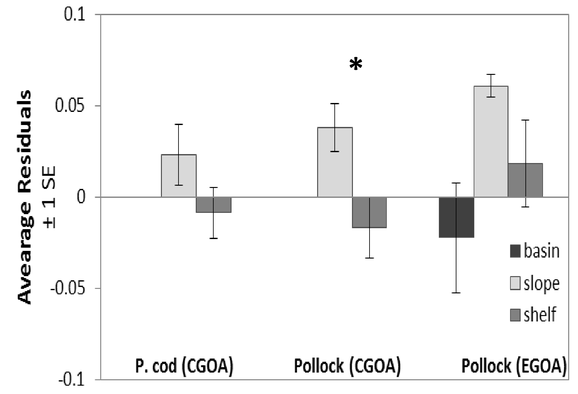


Figure 4. Residuals from the regression of dry weight to length. (* indicates significant difference between habitats)

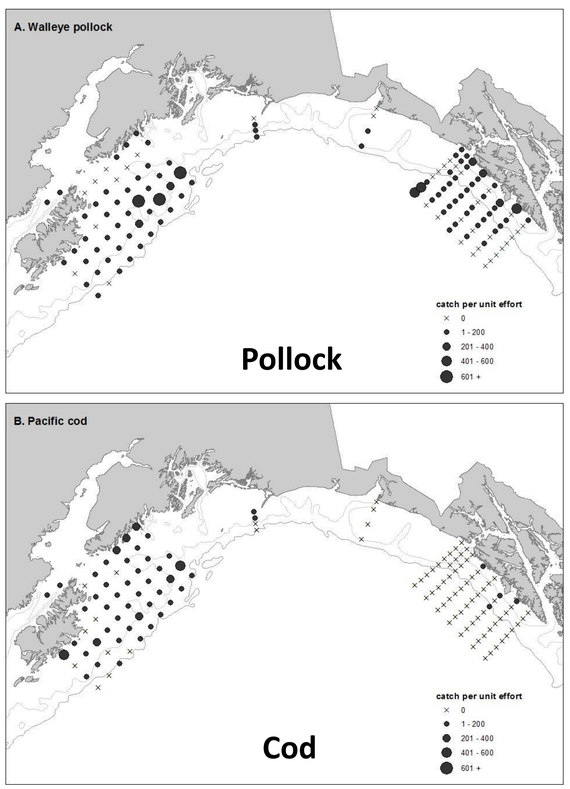


Figure 1. Survey stations with catch per unit effort during July and August 2012 in the Gulf of Alaska.

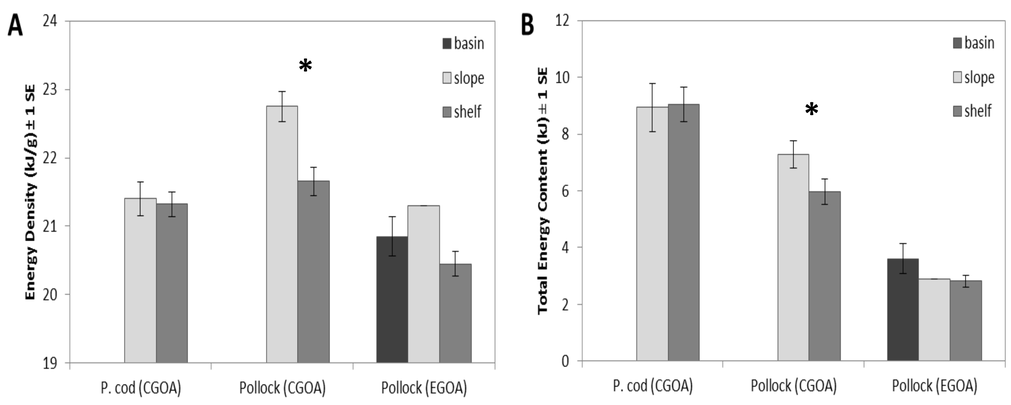


Figure 3. Average (A) energy density (kJ/g) and (B) total energy content (kJ) of age-0 pollock and cod in the Gulf of Alaska during July and August 2012. (* indicates significant difference between habitats.)

Results

✓ Pollock and cod were more abundant in western study region relative to eastern study region during July and August

✓ Zooplankton prey in the eastern and western study regions were similar in composition and energetic quality

✓ High proportion of large energy rich large copepods in the diet of pollock and cod inhabiting continental slope waters

✓ Copepods composed a greater proportion of diet than euphausiids

✓ Pollock had higher energy density relative to cod but lower total energy content

✓ Pollock inhabiting slope waters had significantly higher energy reserves than those inhabiting the shelf