Poster: Bering Sea - Ecosystem Perspectives

Three Decades of Change in a Far North Eelgrass Food Web

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In 1974-76, a baseline transect was established to sample the abundance, biodiversity and isotopic values of organisms across a morphological range of eelgrass in Izembek Lagoon, Alaska (McConnaughey & McRoy 1979). The same transect, visited in July 2008, established a current snapshot of the eelgrass (Zostera marina) ecosystem s trophic architecture. Now standard in food web analysis, ^{13}C isotope investigations were rare for the 1970 s, and ^{15}N analysis was not yet viable. This preliminary report compares present and historical data to assess food web shifts over the last three decades.

Facing the Bering Sea (N55°18 by W162°54), Izembek Lagoon shelters one of the world s largest eelgrass beds. This habitat offers high quality refuge compared to other types of nearshore ecosystems (Jonhson *et al*, 2003). It is essential to the survival of resident and migratory bird species, including threatened Steller s Eiders (Taylor and Sowl 2007), and as nursery ground for important fisheries. In the last three decades, climate oscillations in the Gulf of Alaska have critically changed the marine ecosystem. Tracking consumption shifts of primary production in Izembek s food web can forecast similar change in the Bering. General warming trends in the Bering Sea, coupled with a decrease in overcast days at nearby Cold Bay, potential production of eelgrass increased in the last several decades. Therefore, we predict the food web at Izembek Lagoon has shifted to higher reliance on eelgrass-based carbon. This would present itself as an overall enrichment in ´13C compared to the original data. Our objectives were to sample eelgrass ecosystem biota and calculate significant differences occurring over the last several decades.

Samples were collected in July 2008 within Izembek Lagoon s eelgrass beds and analyzed for ^{13}C and ^{15}N ratios in the Alaska Stable Isotope Facility at the University of Alaska, Fairbanks.

Although organisms of Izembek Lagoon apparently have more eelgrass in their diets now vs. in 1974-76, no significant overall food web shift has occurred. A few lower trophic level organisms have made the opposite shift from eelgrass to POM, and several upper trophic level organisms show significant transitions from primarily POM to mostly eelgrass.

Student Presentation