Flatfish distributions in the context of finely resolved seafloor habitats and associated benthic communities

Goals

• Use recently developed seafloor habitat maps (462 km²) spanning central Long Island Sound to explore relationships between seafloor habitats and the abundances and sizes of common flatfish species: fourspot flounder Paralichthys oblongus, summer flounder Paralichthys dentatus, windowpane flounder Scophthalmus aquosus, and winter flounder Pseudopleuronectes americanus.

• Describe ecological communities associated with seafloor habitats.
• Best approaches feature multiple spatial scales and seasonal variation.

Defining Seafloor Habitats

• Use spatially continuous physical, geological, geomorphological, and biological attributes to define seafloor habitats.
• Describe ecological communities associated with seafloor habitats.

Long Island Sound Mapping and Research Collaborative (LISMaRC)

• Describe the diversity of seafloor habitats in priority areas.
• Characterize and map infaunal and epifaunal communities relative to geo-physical attributes.
• These efforts resulted in the identification of 6 distinct seafloor habitats within the initial study area (western central LIS, encompassing Stratford Shoal, hatched area in above map).

Seasonal Spatial Distributions of Flatfish

• Depth distributions of seafloor habitat types and coincident survey trawl effort (separated by season; far right panels).
• Qualitative comparisons of ecological communities by habitat and season (abundance, richness, and diversity; left panels).
• Relatively small number of trawls within map area n=80.
• Some habitats not well sampled.
• Known start location and distance; Unknown end, direction, and tow path.
• Trawls sample multiple benthic habitats during single tows (mean distance 2.7km).

Connecticut DEEP LIS Trawl Survey

• Time series monitoring of abundance, biomass and size composition of fish resources and co-occurring environmental parameters.
• Evaluate effects of fishing and environmental conditions on the status of fishes.
• Seasonal sampling in spring (Apr-Jun) and fall (Sep-Oct).
• 40 sites (1 nm x 2nm) monthly, 200 sites annually.
• LIS divided into 12 strata defined by depth and bottom substrates (as defined in Reid et al. 1979)
• Sites randomly selected across strata.

Comparing Available Habitat and Trawl Sampling

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