

ORAL PRESENTATION

Characterizing the Penobscot River estuarine transition zone during Atlantic salmon smolt migration

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One factor impeding the recovery of Atlantic salmon is high mortality and smolt loss during their seaward migration through estuaries. High mortality rates may be due to a combination of physiological stressors, variable prey concentrations, and elevated predation pressure. Salmon migration success is likely influenced by physical conditions in the estuarine transition zone such as salinity, temperature and turbidity. The nature of the saltwater intrusion dictates how gradually smolts are exposed to seawater and thermal shifts. Another important factor is the strength of the turbidity maximum which could affect both smolt foraging success and predation risk. Despite the potential importance of such variables to smolt migration, a thorough characterization of the estuarine transition zone is lacking in the Penobscot estuary. The location and intensity of the salt intrusion and turbidity maximum is dually affected by riverine and tidal forcing. We conducted vertical profiles of temperature, salinity, turbidity, dissolved oxygen, and chlorophyll throughout the estuarine transition zone during smolt migration under various river flow conditions and tidal phases. We couple these data with surveys of zooplankton and fish to gain a holistic view of both biotic and abiotic conditions in the estuary during smolt migration. These data can be combined with ongoing acoustic telemetry efforts to determine what combination of physical variables contributes to smolt migration success in the Penobscot estuary.

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