

# NITROGEN ISOTOPE RATIOS OF JUVENILE WINTER FLOUNDER AS AN INDICATOR OF ANTHROPOGENIC NITROGEN INPUTS TO ESTUARINE SYSTEMS

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Nitrogen isotope ratios ( $\delta^{15}\text{N}$ ) were measured in muscle tissue of juvenile winter flounder, *Pseudopleuronectes americanus*, collected from several estuarine systems (lagoons, river, bay) along the coast of Rhode Island, USA over a three-year period. Significant differences in  $\delta^{15}\text{N}$  were observed among estuarine systems; fish from the coastal lagoons had the lowest  $\delta^{15}\text{N}$  values followed by those from an estuarine river and then Narragansett Bay. This trend was the same over the three years and is consistent with several indicators of anthropogenic influence such as population density and known nutrient sources. Within Narragansett Bay some unexpected trends in  $\delta^{15}\text{N}$  were observed. Flounder from stations in the lower Bay had depleted  $\delta^{15}\text{N}$  values as expected. However,  $\delta^{15}\text{N}$  values for fish from the other Bay stations along a nutrient gradient were not different from each other except for the station furthest north in the estuary which had a significantly lower  $\delta^{15}\text{N}$  value. Depleted  $\delta^{15}\text{N}$  values at this nutrient-rich station may indicate that concentration dependant fractionation should be considered when using nitrogen isotope ratios in biota to infer the relative influence of anthropogenic nitrogen inputs among locations.