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Contingent structure of Northwest Atlantic mackerel evaluated using otolith stable isotopes

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Atlantic mackerel (*Scomber scombrus*) support an important commercial fishery and are prey for many larger species. Stock assessments for Northwest Atlantic mackerel currently assume a single stock, comprised of northern and southern contingents, with natal regions centered off coastal Nova Scotia and southern New England. We hypothesized that otolith $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values could discriminate fish from these regions on the basis of hydrographic differences and help to retrospectively understand migration and contingent structure of mackerel. Archived otoliths from extensive libraries in both the United States (source: NMFS Northeast Fisheries Center) and Canada (source: Fisheries and Oceans Canada), as well as otoliths from Iceland (source: Marine Research Institute) were carefully milled to extract material corresponding to the first year of life. Initial investigation comparing solely US sourced otoliths from two subregions of the southern New England natal region did not reveal significant geographical variation in isotopic content, but interannual differences were observed that corresponded to trends in regional ocean warming and a shift in the Gulf Stream position. We are now extending these studies of isotopic variation geographically by analyzing otoliths from the northern natal region in Canada and the Icelandic outgroup.

Keywords: Atlantic mackerel, otolith stable isotopes, Northwest Atlantic, population structure, contingent, natal origin

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