

Title: Developing geospatial isotope maps “isoscapes” of the Northeast US Continental shelf waters to study animal foraging and migration.

Description: Understanding the migration of economical and ecologically important species is important because it aids in informing stock assessment models and management practices of local fisheries. Traditional methods for tracking animal movement, such as external tags, have notoriously low return rates and require the low probability capture, marking, and recapture of organisms. Novel intrinsic isotope methods can provide an alternative approach to studying animal movement ecology. Animals record isotopic information about the habitats in which they live and feed, providing an internal chemical address of their movement in space and time. In order to interpret the internal isotopic signals in animals, we need to develop maps of the geospatial variation in environmental isotope values through which they move, often termed isotope landscapes or “isoscapes”. The McMahon lab is recruiting a student to use stable isotope methods to characterize the spatial patterns in nitrogen isotopes of zooplankton along the Northeast US Continental Shelf. The isoscapes developed in this project will be integrated into a larger, ongoing study about the movement ecology of understudied populations of important New England fisheries, such as Jonah crab. The summer student will play a hands-on role in sample collection in the field on boats, laboratory wet chemistry work, stable isotope analysis, and data modeling and interpretation. This work lies at the intersection of ecology, chemistry, environmental science, and fisheries management.

Requirements: We are seeking a highly motivated, curious, and enthusiastic student with demonstrated professionalism and reliability. Preference for students with strong quantitative skills, particularly in R. Students should have upper-level college level biology and chemistry courses. We actively seek students from diverse backgrounds to join our lab.

Mentors: Primary Advisor Dr. Kelton McMahon and Graduate Student Lindsay Agvent