Warmer Bay: The impact of increasing temperature on the metabolic rate of fish species

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Increasing water temperatures have been a problem for coastal ecosystems and it is expected to get worse in the next century. Warmer waters can have various negative effects on estuarine species, such as loss of breeding areas, loss of biodiversity, or impacts on marine organisms' biological functions. One particular area of concern is how these increasing temperatures can affect fish physiology. Even though past studies have looked at the interaction between metabolic rate and increasing temperatures, there has been little research done on the species commonly found in Narragansett Bay. Black Seabass (*Centropristis striata*), Scup (*Stenotomus chrysops*), and Atlantic silversides (*Menidia menidia*) are common fish species found in the Bay that serve as good model organisms to examine the effects of increasing water temperatures. Respirometry experiments were conducted at 18-24°C to test both basal metabolic rate (BMR) and maximum metabolic rate (MMR) to see how increasing temperatures affect the physiology of these species in Narragansett Bay. It was hypothesized that increasing water temperatures would result in increasing metabolic rates in all species tested since temperature plays such a large role in regulating the metabolic rate of ectotherms. Our results support the increase in basal metabolic rates but not of maximum metabolic rates past a certain point, indicating that aerobic scope is depressed in scup and silversides. These species appear to be less tolerant to increases in temperature and might be displaced by other species with more southern distributions such as the Black Seabass. Ongoing collaborations with other RI C-AIM partners can inform productivity models.