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Low concentrations of pesticides are entering coastal estuarine systems via run-off from agricultural fields and residential areas. These low sub-lethal concentrations of pesticides may not kill coastal species, but may negatively impact important behaviors such as the ability to forage and avoid predators. Understanding how pesticides alter these behaviors is important because these behaviors dictate the magnitude of trophic cascades which can affect the structure and function of coastal marsh communities. Periwinkle snails (Littoraria irrorata) are significant primary consumers in coastal marshes because they fungal farm and forage on Spartina alterniflora grasses. Periwinkle snails can drastically reduce marsh production unless they are limited by predators that either consume snails (non-consumptive effects) or cause them to reduce their foraging and alter other behaviors due to fear (non-consumptive effects). Despite the importance of trophic interactions in this marsh system, minimal studies have been conducted on whether pesticides impact periwinkle predator avoidance behavior and foraging which would ultimately impact marsh production. To determine if the insecticide fipronil influences periwinkle snail foraging and predator avoidance behaviors, we are exposing periwinkle snails to sub-lethal concentrations of the pesticide with and without exposure to blue crab (Callinectes sapidus) chemical cues. Seawater was prepared with and without blue crab chemical cues, after which fipronil was added at four concentrations: 0ug/L, 1 ug/L, 5 ug/L, 10ug/L. This water was placed into bowls with four snails, and four plastic dowel rods which were used to mimic the structure of Spartina grasses. One 8cm piece of Spartina leaf and one 1cm square of algae was added to measure grazing throughout the experiment. Over a five-day trial period, we measured snail climbing height, emergence and righting times to measure the differences in snail behavior; as well as Spartina and algae consumption to measure foraging. We hypothesized that higher concentrations of fipronil will result in reduced foraging on Spartina and algae due to avoidance of the pesticide dosed water and that responses to blue crab chemical cues will be reduced due to pesticide exposure. The results of our experiment will demonstrate if low concentrations of pesticides may alter consumer foraging behavior which can lead to the loss of important marsh ecosystem services such as sediment trapping and nursery habitats.