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EARLY DEVELOPMENTAL EXPOSURE TO STRESSORS RELATED TO INDIVIDUAL FITNESS IN AQUATIC ORGANISMS AND THE SUBSEQUENT REPRODUCTIVE SUCCESS AND FAILURE ON POPULATIONS.

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Within this chapter will be discussed the impact of several chemical stressors (halogenated compounds, estrogenic mimics and pesticides) known to primarily impact the early developmental stages of bivalves and finfish. How an individual’s fitness (biochemical, cellular physiology) can modulate the toxic response that are observed and how population level effects can result will be argued. The highest concentrations of these compounds are often present in our waterways, which are nursery areas for shellfish and finfish. It is well documented that in aquaculture and aquarium raised teleosts that even within the same species that strain differences can dramatically alter the dose response and impact fecundity. Field populations have been shown that exposure life-history of the specific population from which the individual is obtained can dramatically influence the dose response and impact the reproduction curve. The sensitivity of the early developing embryonic stages to specific xenobiotics is due in part to the requirement for synchronization of programed cell movement, primordial organ formation and the disruption of programmed biochemical and physiological pathways. Even in the adult organisms when oogenesis and spermatogenesis are occurring several of these compounds can disrupt this process reducing the fecundity and survival of the eggs and larvae, disrupt gonadal structure and function and also interfere with behavioral cues. The xenobiotic impacts on reproductive success, larval survival and altered hormonal cues at the individual level can dramatically increase the natural mortality and decrease the maximum sustainable yield of a population. (NJAES 01202)