

❖ Larger Perspectives Than Just Dollars: Larger-Scale Restoration Efforts, Other Approaches and Potential Regional Efforts

Loren D. Coen- Department of Biological Sciences and Harbor Branch Oceanographic Institution (HBOI), Florida Atlantic University (FAU)

Oyster reef restoration science is still in its infancy (Powers and Boyer 2014), although states have been in the business of planting 1000s of bushels of shell (cultch) for decades. We still have a lot to learn, especially if our goal is not just to harvest more oysters. Restoration is focused on non-consumptive ecosystem services (Beck et al. 2011) with aquaculture's use increasing across the U.S. Replanting shell and letting "mother nature" do the rest no longer works as it often did in the past (e.g., Chesapeake Bay, Apalachicola, FL). Changing short- and long-term environmental and biological conditions are making it harder to use tried and true, one size fits all approaches. Shell ($10-30 \times 10^2$ bushels/acre @4-12" high) is often unavailable and states that want to restore long-extirpated reefs (NY-NJ) have few recruits requiring the addition of expensive seed or spat-on-shell. The value of scaled-up projects to impact water quality or nutrient sequestration is also unclear. 'Living Shoreline' approaches to reduce erosion are relatively new to the mix. We must be able to assess successes and failures given nature's vagaries within and among localities, programs, states, regions and even oceans and be able to mobilize ever more limited funding (DWH oil spills cannot provide scarce dollars). This not only helps overcome hurdles such as authorization and permitting as we scale-up, but also success rates using adaptive management based on more extensive, longer-term (3-5 year) monitoring. Finally, what is critical is that biologists and physical scientists work together, along with engineers as we scale up our efforts.