

Possible Fisheries Priorities

Revised 10/29/12

Changes are from NCBO, CBL, SERC, VIMS, and TNC

- 1) Improving our understanding of habitat and fisheries linkages: more specifically ecosystem services provided by oyster reefs
 - a. How to adaptively re-establish reefs that can persist and provide maximum ecological function
 - b. Measure denitrification and nitrogen sequestration rates in restored subtidal oyster reefs in Chesapeake Bay, and how those rates are affected by oyster density and other factors. This would supplement an ongoing project we funded in FY11 done on subtidal oysters in Onancock Creek, which had to be shifted to a similar project on intertidal reefs in the VA seaside after most of the oysters died in Onancock Creek. May specify that work be done in the Little Choptank and/or Piankatank rivers.
 - c. Survey of nutrient and carbon content of oysters raised in aquaculture using a variety of methods, to improve estimates for trading calculations (effects of length and biomass, triploid vs. diploid, floats vs. cages, tumbled or not, effects of salinity and predators, etc.)
- 2) Land use and development impacts on fisheries health and production at bay wide and local scales
 - a. How to separate the effects of local and regional land use from the effects of cumulative stressors, like organically enriched sediments, nitrate in groundwater, and baywide declines in water quality, since the causes of these stressors may originate elsewhere
 - b. How to evaluate these impacts on a scale that is large enough to be meaningful, but small enough to be able to study them adequately
- 3) Science to support bay wide crab allocation discussions, and other fishery management issues
 - a. How to refine and use the female and male reference points for blue crabs
 - b. Develop and evaluate allocation strategies for blue crabs (based on historical landings, fishery production, or others) among the 3 jurisdictions and enforcement mechanisms.
 - i. Are separate quotas needed for males and females? How will spawning stock continue to be protected?
 - ii. Will quota sharing be allowed between jurisdictions if one jurisdiction doesn't expect to meet their quota?
 - iii. Will recreational fisheries be shut down if a jurisdiction's quota is reached?
 - iv. What are the consequences of fishing after a quota is met?
 - v. Are there mechanisms for setting up a quota system that won't result in a fishing "derby" to maximize profit before the quota is reached?
 - c. Evaluate mechanisms of allocation-based harvest for blue crabs that would maintain current protection of spawning stock and sufficient operational sex ratio.
 - d. Allocation-based harvest strategy for blue crabs requires good data on all sectors of the fishery – it is critical to track recreational harvest in a meaningful way for setting proper

commercial harvest allocations to prevent overfishing. If commercial fishing is shut down, will recreational harvest pressure increase?

- e. For oysters, work with state agencies in both MD and VA to develop critical estimates of fishing mortality, F , from fishery dependent data, and incorporate these into a bona fide fishery stock assessment.
- 4) Effects of climate change on commercial bay species, including:
- a. Predicting likely effects of increasing variability in rainfall
 - b. Predicting likely effects of rising temperatures (especially in winter)
 - c. Better understanding of how climate cycles that are unrelated to global warming are linked to multi-decadal changes in fishery production (alternating between conditions that favor shelf spawning or anadromous species), so we can separate those cycles from the current and future effects of climate change
 - d. How to bring climate change into stock assessments
 - e. How to monitor for climate effects in living resources
 - f. How to rank species susceptibilities to climate change
 - g. Measuring and modeling oyster reef role in carbonate cycling and alkalinity modulation
- 5) Effects of invasive species on fisheries production
- a. Impacts on fisheries for native species
 - i. Have blue catfish, snakeheads, carp, and other invasive species had negative, positive, or neutral effects on traditional fisheries for native species in places where they are currently well-established?
 - ii. What are the potential effects of invasive species on Bay fisheries if they spread throughout the Bay where environmental conditions allow? E.g. What effect will blue catfish have on traditional fisheries if they spread and develop mature populations throughout the upper Bay?
 - iii. How will climate change affect the dispersal ability of invasive species? As an example, blue catfish were thought to be restricted to tributaries of the lower Bay by high salinity. In 2011, salinities dropped much below normal and may have allowed catfish to spread between tributaries that would not have been connected by low salinity habitat in normal years.
 - b. Development of new fisheries targeting invasive species
 - i. What are the economic opportunities for developing commercial and recreational fisheries for invasive species both locally and for export to global markets?
 - ii. Are there health risks of consuming these species?
 - iii. Can fisheries for invasive species help limit their populations and thus limit their impact on Bay food webs and fisheries?