Chesapeake Bay Stock Assessment Committee
Winter 2021 Meeting

Monday, January 11, 2021
1:00 – 3:00pm

Attendees:

Glenn Davis	Alexei Sharov	Pat Geer
Mike Wilberg	Genine McClair	Dave Maginnes
Rom Lipcius	Adam Kenyon	Mandy Bromilow
Dan Hennen	Tom Miller	
Bruce Vogt	Alexa Kretsch	

- **Maryland Depletion Experiments**

  Presenter: Glenn Davis (MDNR)

  - MDNR conducted depletion experiments from 1992-2012 to examine the efficiency of the WDS sampling at various locations and depths
    - Particularly interested in the differences in efficiency between MD and VA vessels
    - Experiments focused in the tributaries where crabs are more abundant
    - Experiments were often carried out on days when conditions were poor for WDS sampling (e.g. high winds)
  - Glenn coordinated with Mike Seebo (VIMS) to come up with a sampling plan for further tests of efficiency differences
    - Jointly sample 80 sites total in the area surrounding Tangier Island
    - VA and MD both sample the same 20 sites in Tangier Sound
    - VA and MD separately sample 15 sites each in both VA and MD

  Discussion:

  - Mike Wilberg (UMCES): Could use previous WDS data in the Tangier area to examine average catches b/w VA and MD to inform catchability differences – do we have a boundary laid out for the comparable sites?
    - Glenn: Can go back and identify the boundaries and follow up with the group via email
  - Pat Geer (VMRC): What are the depth ranges in the area around the state line?
    - Glenn: There's a broad range of depths from very shallow to 80-90 ft; the habitat is decent in Tangier Sound, but can be variable in the mainstem
    - Mike Seebo: Typically very shallow, under 15 ft, and mostly sand, but one spot on the VA side hits about 120 ft
  - Dan Hennen (NOAA): Why are there some negative efficiencies?
    - Glenn: Some percentage of the experiments resulted in negative values
  - Dan: What's the experiment protocol? How do you know when to stop the depletion experiment?
    - Glenn: We did 6 rounds of sampling covering 3 tracks; each coverage of the 3 tracks is one round of sampling – we use this to determine the slope of the line, but there are situations where it's not enough due to inconsistencies in the tracks (wide/long)
    - Mike Seebo: More difficult to carry out efficiency experiments in deeper water; you can put down buoys to mark the tracks but the wind/tide may change; you can try to navigate back to the track using GPS, but you may end up dredging untouched bottom – this may result in higher catch in later runs than earlier ones, which can lead to negative efficiency

    - Dan: I've done a lot of these experiments with clams and it takes a lot of tows to deplete a site
    - Mike Seebo: We have done some experiments in the 70-80 tow range and still didn't reach depletion
- Glenn: We also may be changing the fishing characteristics if we're going over the same tracks (e.g. moving substrate); initially undisturbed
- Mike Wilberg: We did alternative depletion experiments where we dredged in one direction and then perpendicular to quantify a grid area; we conducted 9 experiments and 7 of them caught more crabs in the second round of tows than the first; came to the realization of how complicated the problem is
- Pat: Is there a temperature threshold at which point you wouldn't want to conduct these experiments?
    - Mike Seebo: Wouldn't want to do it at any temperature at which crabs might be moving (>10 C)
    - Glenn: I'm not sure at what temperature there would be a significant impact on dredge efficiency, but there are not many problems with avoidance in slightly warmer waters
- Alexei Sharov (MDNR): Catchability of Mydra Ann is pretty consistent, seem to have a good estimate of efficiency for this vessel and is overall pretty convincing; it tells us that the boat/captain is important and they do differ; beyond absolute estimates of gear efficiency coefficient, it would be good to have a measure of relative efficiency of the two boats in use; if we can't get good estimates from each individually, we could at least measure relatively; also note that the sample size for the co-occurring samples (MD and VA sample same sites) should be large enough to account for variability in sediments, crab density, etc; overall, optimistic that we have good estimates
    - Mike Wilberg: It would be useful to co-sample sites around mid-Bay to determine relative efficiency, I would be cautious about conflating accuracy and precision as it can be easy to get biased estimates; the difference in catchability b/w the MD and VA vessels wasn't as different as would be implied by our estimates; we would expect MD to catch 2-3x as many crabs based on our estimates, but we didn't see that big of a difference in catch
- Glenn: We have a fairly robust sampling design with 80 total sites and will be a multi-year project to get more samples and ensure we're taking samples over a range of conditions (wind, tide, temp)
    - Alexei: Should try to keep conditions as similar as possible except for the vessel/capt; sample a large number to cover the variability; 80 is a lot of sites, but the proportion of 0 catches is very high, we may only end up with info for 30 sites
    - Mike Wilberg: We can include other paired tow samples to increase the sample size; some are outside the area but still relevant and could be incorporated into the analysis
- Dan: Fine-scale differences in crab density are pretty high given the results of previous experiments; side to side comparisons may not be that useful if density is that variable at such fine scales
    - Rom Lipcius (VIMS): Our bycatch study found that a large fraction of crabs are damaged but not removed by the dredge in the first sample run and we catch more crabs in the second tow, maybe by picking up the damaged crabs left on the bottom
    - Glenn: It was not uncommon for the second round tow to catch more crabs in our initial depletion experiments

    - Rom: Agree with Dan that it may be better not to have tows in the exact same places, but this would require larger sample sizes in larger areas to ensure no overlap
- Mike Wilberg: We also want to be careful not to introduce factors that might affect crab presence at a size (e.g. timing – if VIMS sampled at the beginning of the survey season and MD sampled at the end, it would be hard to determine if the difference is due to catchability or crab movement)
    - Rom: Need to keep track of variables that are likely to be important (depth, sediment)
    - Glenn: Our normal sampling schedule will work well for this; should be late Feb for VIMS and early Feb for MDNR
- Dan: This sampling design sounds like a better approach than the depletion experiments, but have suggestions for improvement if you continue the experiments
    - Rom: Welcome any comments or insight
- Pat: What is the status of the R/V Bay Eagle as far as long-term use?
    - Mike Seebo: We'll probably have this year and next, but not sure after that
    - Rom: We're trying to get the administration to keep the Bay Eagle on the water as long as possible
- Tom Miller (UMCES): There is high variability in efficiency even with the same vessel, a power of comparison would be worthwhile; advise numerical experiments with realistic assumptions about the spatial distribution of crabs to determine how likely we are to see differences due to vessel/gear efficiency
    - Mike Wilberg: That's a good idea and could be done with existing WDS data from that location to inform likely catches and proportion of 0 tows
    - Tom: Don't need much more data than what we've got (existing catches from WDS from that area, catch differences by vessel, expected vessel catchability differences); we can numerically sample from those distributions and develop a power curve of likelihood of detecting the difference given the assumed differences in catchability
    - Rom: It would be worthwhile to do that; since the 2008 management actions, there's been high variability in terms of spatial distribution; would recommend using samples from the last decade to carry out Tom's suggested analysis
    - Mike Wilberg: The analysis would need to assume the difference in catchability of the two vessels based on the depletion experiments and paired tow experiments

Action: Glenn will look into the boundaries of the coordinated sampling design and email the group.
Action: Dan will follow up with the group via email with suggestions for improving the depletion experiments.

➢ **CBSAC Chair Nomination**
Glenn Davis, Mandy Bromilow (NCBO)

- Glenn's term as chair is up and we need to nominate a new chair for the next 2 years
- Typically alternates between MDNR and VMRC representatives
- Pat Geer was nominated and agreed to take on the task

Action: Mandy will coordinate a meeting with Bruce, Glenn, and Pat to discuss the transition of chairmanship.
Action: Mandy and Glenn will draft a letter to the SFGIT Executive Committee regarding Pat's nomination for approval.

- **Member Updates**
  - Pat Geer
    - Started experimental fishery for penaeid shrimps off the coast of VA running Oct-Dec
    - Caught 300,000 lbs with 8 boats using a 16-ft beam trawl
    - NEAMP is continuing to see large abundances of shrimp
    - Trawl fishery would be restricted to coastal waters in the Bay
  - Rom Lipcius
    - York River has also seen high abundances of white shrimp
    - Catching a lot of horseshoe crabs in the sandy areas of the lower Bay; been collecting data for at least 7-8 years
  - Glenn Davis
    - Clammer mentioned new invasive crab species near the coastal waters
    - Rom: Maybe *Callinectes similis*? Lesser blue crab found further south along the east coast, but maybe moving northward due to climate change?