

## STAC 1/19/2022 Meeting Minutes

### Bill Dennison (Intro and Announcements):

- MD Coastal Bays Report Card Release on Oct. 13<sup>th</sup>
  - C+ overall score
- State of the Bays Report will be coming out
- 22 wetland assessments completed by MCBP science team in mid-Chincoteague Bay, some were done on Assateague National side

### Shareefa Williams MD State Statistician (USDA)- 2020 MDA Pesticide Survey

- NAS – statistical company for USDA
  - Conducts census every 5 yrs
  - Prepares reports for every aspect of agriculture
- Survey methodology, questionnaire, milestones of survey, data collection process, and publication
- External project agreement:
  - NAS works with entities that want to conduct surveys, form contractual agreement that covers what needs to be done for the survey and project planning
  - Also discuss costs for work
  - The pesticide survey is an external project agreement
- History of survey:
  - Last conducted in 2014
  - Has been conducted every 3 yrs since 1996 (?)
  - Looks at pesticide applications, fertilizer combinations, etc.. to determine if pesticide usage is being followed appropriately and under the legal limits
  - Survey includes MD and DE
- Survey's sample:
  - Certified applicators, businesses, and public agencies as well as 1,500 randomly selected farmers were samples
  - For the next survey (if budget allows) electronic data reporting will be used, the previous ones were done by snail mail, in-person, and phone
  - Had a phone follow-up for people who had not responded to survey mail
    - Offered incentive to complete the survey
  - Did not have enumerators to do face-to-face data collection due to COVID
- Publication:
  - Pesticide active ingredient estimates are published only when there were a sufficient # of reports and/ or amounts applied. Active ingredients reported w/o sufficient # of reports or amounts less than one pound is listed on a separate table w/ total amount estimated.
  - Publication is on MD Dept. of Agriculture website
- Questions:
  - Bill Dennison: Is there a table that can show what pesticides are on the up in usage and which ones are declining in usage?
    - Answer: Yes there is a table that shows difference in top 20 pesticide usage over the past 5 yrs.

- Bill Dennison: Do you think you would have gotten as good of data if you were able to go to people in person?
  - We did take a small hit with not being able to conduct surveys face-to-face, however the phone follow-up helped
  - Some people did struggle to fill out survey and they received many phone calls for assistance in filling out the survey but they still got good data for this survey
- Can we get VA pesticide use data?
  - Yes, Shareefa would be able to get that data for Coastal Bays

**\*\*\*Mapping Idea from Carly: look at pesticide application- what's being applied in Coastal Bays watershed where and overlaying with WQ information**

**Haoran Lu (PhD student UMES): Model Simulation for Biogeochemical cycling in the MD Coastal Bays:**

- HABs- brown tide
- Coupled Biophysical Model- FVCOM
  - Calc. salinity and Temp. distribution, current transport, and density structure
  - Particulate organic nutrient, DO inorganic nutrient, and DO organic nutrients are taken into consideration
  - Captures complex models of Coastal Bays
  - Model domain: 453km<sup>2</sup>
  - Data is from Jan 2003 – Sept 2005
  - Modeled phosphate and nitrate
    - Model simulates low concentrations in nitrate summer months while phosphate is high
    - Look at wind effect (direction and speed) to see how this impacts WQ
    - Then can include river, tide, and nutrient input
  - Simulated wind at OC Inlet for 3 days in Summer, controlled wind speed and direction
    - Wind significantly affects the bloom spatial distribution and the plume structure
  - Coupling benthic algal model to improve models' ability
    - Oysters, algae, and seagrasses
    - Benthic algae can change dissolved nutrients and sediment and therefore organic matter
    - When temp increases the biomass of algae goes up and competes with plankton in water column, consuming more nutrients in water
      - Lowers phosphate concentration in Coastal Bays
- In the future: see the effect of various physical forcing (wind conditions, tidal flows, and salinity variations) on the distribution and transport of phytoplankton
- Questions:
  - Bill Dennison: Why is nitrate not calibrating correctly? What about brown water as a major input?
    - B/c CBs are shallow the atmospheric loading is high (?) Need to use high resolution data in the future
    - Nitrate levels are lower in CBs during the Summer
  - Bill Dennison: Chl a data spilling out of inlet- could this model work for entrainment of offshore water into the inlet? (in relation to Morgan and Judy's work) Connecting offshore, nearshore, and embayment.

- Answer: The model may be able to be of use in this because you can include wind and tide- can link the data together.
- Cathy Wazniak: has video of Chl a moving out of the inlet
  - She has benthic algae operation data that she can provide for Haoran
  - Fisheries crews collect macroalgae biomass data, which may help with macro vs. microalgae difference in modeling.

**Daniel Szimanski (OC Navigation Project Manager-USACE) and Rick Dreistadt (Assateague National Park Bypass work) – Dredging activities in OC and Assateague for 2022**

- Assateague Island Bypass Renourishment Cycle
  - 2022 bypass dredging will be conducted by the Dredge Murden semi-annually in Feb and Sept
  - Feb bypass dredge (COE) is 13 days
  - September bypass dredge (NPS) 13 days as well (26- 12hour shifts)
  - Borrow areas outside and inside the Inlet for restoration of Assateague Island in certain areas where material is lost.
  - To get most productivity out of work- take material out of inlet and then place on Assateague and then go out to ebb shoal if weather permits
- OC Inlet focused dredging
  - Priority dredge areas are IDed before dredge surveys
  - Average cubic yardage per day = 3,000cy
  - All material placed at northern Assateague Island placement site as area of concern
    - Will monitor elevation and erosion changes
    - Starting to see loss at southern end near Isle of Wight coast guard station and one other area.
  - All dates are subject to change based on dredge availability and weather conditions
  - USACE Dredge Murden will be working 24-hr shifts to get as much work done as possible
- OC Beach Renourishment (completed Dec. 2021)
  - Occurs once every four years roughly, last one occurred from Oct 2021 – Jan 1 2022
  - Project was ~16 million dollars for OC replenishment
- Continuing Authorities Program Studies
  - Section 107 (Inlet Channel)
    - Design is roughly 65% completed
    - Environmental assessment will be available in March 2022 with 30 day public commenting period made available around same time
    - Finalizing engineering documentation
    - Report package to undergo agency technical review
  - Section 204 (Scour Hole)
    - Final model and observation reports under review
    - 30- day commenting period will also occur
- Questions:
  - Bill Dennison: Any models available to show impacts of the movement of such mass amounts of sediment?
    - Answer: Yes, research was conducted in looking into ebb and flow of OC Inlet that went to Rt. 90 Bridge and south into Sinepuxent showing where material is coming from, looking at grain size and sediment movement.

- Most of sediment from inlet is coming from Oceanside, depositing between buoys 11 and 12
- Kevin Smith: Any additional info on dredging in 2023 and beyond?
  - Answer: Not yet, they are currently working on 2024 budget (have to be 2 years in advance). Getting enough funding to take care of OC Inlet, but not enough funding to take care of IOW outside of Coast Guard station
- Roman Jesien: Which program deposits sand onto the North side of Assateague?
  - Answer: Section 107 Ocean city.
- Roman Jesien: Will these projects be going on this year based on design completion?
  - Answer: Looks like it will be taking place next year for both projects (107 and 204)

**Dr. Helen Bailey, Amber Fandel, Kirsten Silva, and Dr. Mark Baumgartner (UMCES)- Marine Mammal species in Coastal Bays**

- In coastal mid-Atlantic waters:
  - Mysticetes (baleen whales)
    - North Atlantic Right whale
    - Humpback whale
    - Blue whale
    - Fin whale
    - Sei whale
    - Minke Whale
  - Odontocetes (toothed whales)
    - Bottlenose dolphins (depleted pops.)
    - Common dolphins
    - White-sided dolphins spotted
    - Harbor Porpoise
- Underwater listening devices to determine what species are present
- Can detect these whales 24/7 based on acoustics, regardless of weather or time of day
- Acoustic array off OC MD in 2014- 2017
  - Consists of 10 hydrophones- had to be recovered and data downloaded
  - Units were inshore, within the wind energy area, and offshore (60 km)
  - Lower frequencies travel further
  - Sounds will be able to travel to shore even with wind turbines present
  - When whales are present have ships slow down or other regulations change to keep whales protected (since they are endangered)
- Whales offshore of MD
  - Baleen whales are known for seasonal migrations- feed more north in Summer/Autumn, and move south to breed in winter
  - We are the middle ground of this migration- when they're in the process of migrating they are near Coastal Maryland
  - These whales are mostly traveling in a migration channel while migrating that is 20 – 60 km offshore.
- Near Real-Time Whale Detection- most recent project:
  - Acoustic recorder (DMON) near the seafloor w/ low frequency detection and classification system software connected to specialized quiet mooring designed by WHOI with Iridium satellite data transmission

- Only focuses on whale noises to reduce other sound interference
  - Buoy was deployed at end of May 2021 and will be funded for 12 months
    - Hoping US Wind will fund for another year
  - Whale alert app provides data and whale detection
  - Even if multiple species are present at same time, the buoy can separate and ID separate calls and sounds
  - Ship sounds can mask whale calls
  - US Wind Surveys impacted whale calls, but Right whale was spotted
  - Can detect some whale calls up to 100km out
- Questions:
  - Kevin Smith: Why were pilot whales not listed on frequented visitors?
    - Answer: mainly focusing on coastal (Shelf) species- pilot whales are further offshore off the shelf in deeper waters
  - Bill Huslander: Do you know if the acoustic detection methods used is the same for dolphins and porpoises?
    - Answer: Yes, they have specific detectors and equipment since these species have much higher frequency calls and clicks. With the new real-time method, it is much harder to get funding to detect and monitor these species since they're not endangered.
  - Roman Jesien: Could you detect any changes in behavior or recordings from the seismic survey noise that was occurring from US Wind?
    - Answer: US Wind was not doing seismic surveys, oil companies do that. US Wind was doing geophysical surveys using equipment with higher frequencies that have a small cone that is outside the frequency most whales can hear. Those surveys would impact more so the porpoises and dolphins. However, the vessel noise masks their ability to detect the whales which can be an issue and the whales are responding to the vessel noise. The whales would have to be directly in the path of the noise however to be impacted at all, an increase in vessel traffic may start to impact whale movements. The fish may have been impacted slightly from the surveys, but this won't really impact the whales too much since they are migrating and not staying long off the coast of Maryland.
  - Roman Jesien: Do your instruments pick up seal noises?
    - They can pick up some seal noises- like harbor seal male mating calls. But they do not look into that data too much because they don't have the funding for that. Would be worth exploring though.

**Rich Mason (USFWS: Chesapeake Office)- Marshes in the Coastal Bays:**

- Accomplished 1,976 projects in 2020
- Salt marsh sparrow- focus species for marsh restoration
  - Population declines due to nest failure, nest flooding
    - Tidal restrictions associated with negative pop growth rates
- Black rail are also species of concern (listed as threatened) and very few individuals are left
  - Found west Nile virus in western population, may be cause of decline as well
- EA Vaughn Wildlife Management Area- Scarborough Marsh
  - Historical ditching in MD Coastal Bays marshes (~90% of wetlands) was reason to try ditch plugging
  - Way too much water sitting due to ditch plugs, caused more harm to marsh than good
    - Ponding, vegetation die off, elevation changes

- Will ditch plug removal cause vegetation regrowth and reduce ponding?
- Ditching changes the natural drainage system of the marshes
- SMARTeam: coalition of salt marsh restoration experts (Salt Marsh Assessment & Restoration Team) that provide advice to local field teams (like the Coastal Bays SMART field team)
- What can we do to solve this problem?
  - Improve drainage with runnels
    - Cost-effective but short-term, maintenance required
    - Does not address SLR
  - Tidal gut/creek restoration
  - Thin layer placement
  - Natural shoreline protection techniques:
    - Wave attenuation devices (WADS), oyster reef balls/ oyster castles, dynamic shoreline method
  - Marsh migration and land protection (conservation easements)
- South Point Runnel project on private property as a pilot along with EA Vaughn
- Croppers Island ponding has increased ponding significantly over a short period of time- area of concern and future restoration project.
- Slough's Gut DE restoration project :
  - 3yrs pre-monitoring and then post-monitoring data collection
  - Restore network of meandering tidal guts in marsh, used fill to fill in straight man-made ditches
  - Project was deemed a success and accomplished project goals and objectives
- Rapid method to determine the best technique for marsh restoration
- Funding- political support and sustained funding like nutria project
- Outreach to private landowners and government that own marshes (initial effort is underway)
- Increase staffing to develop and manage multiple restoration projects
- Brainstorming innovative projects
- Questions:
  - Rick Kutz: How does this interact with the open marsh management techniques used by mosquito management? How does your work influence mosquitos?
    - Answer: Not sure, hopefully improve/ reduce mosquitos when ponding decreases. Plantings will reduce open water and other restoration projects show that mosquitos were reduced.
    - Kevin Smith: UMD study done on mosquito pops- there was not really a change in West Nile virus or population numbers, but change in species
  - Cathy Wazniak: Are you able to calculate wetland loss or start in small areas of the Coastal Bays?
    - Answer: Some of our GIS analysts are working on this currently. We reached a tipping point that lead to a drastic increase in ponding and veg die-off

**Cindy Palinkas and Bill Nardin (UMCES)- Comparing sediment-vegetation interactions in living shorelines and natural marshes in the Coastal Bays**

- The challenge: protecting shorelines with ecologically friendly sustainable infrastructure
- Possible solution: living shorelines (constructed marsh fringes with or without additional structures)
- Metrics and models used to assess potential vulnerability of natural marshes applicable to the created marshes of living shorelines?

- 3 living shorelines w/ different ages:
  - Selsey Road: 0 years (2022 install, DNR collaboration)
    - Sampling once in Spring and once in Summer- sedimentation rate and vegetation surveys (stem density, species composition and density, and height)
  - Assateague: 4 years (2017 install)
  - Sunset Islands 14 years (2008 install)
    - natural marsh next to living shoreline to compare
- Approach:
  - Shoreline positioning (RTK-GPS) surveys
  - Sediment (cores and ceramic tiles): grain size, org. content, accretion rates
  - Vegetation: stem height and density
  - Calculate volume of sediment eroded from marsh edge
- Model:
  - Outputs: net sediment flux; volume of marsh-edge erosion
  - Looking at GIS data and indicators
    - Compare UVVR with modeled sediment fluxes
    - Compare UVVR and erosion/deposition ratio
    - Goal: test shoreline change as an estimate of marsh-edge erosion, and EDR as an indicator of marsh vulnerability, in created marshes. If these relationships hold, they provide a relatively easy way to assess potential marsh vulnerability to prioritize them for action.
- Questions:
  - Bill Dennison: Could you extract Chl a from samples to determine changes with sediment and how living shoreline impacts Chl a?
    - Answer: They would need assistance from someone who knows more about Chl a, but yes they can look into it.

#### **State of the Bays:**

- Adding wetland GIS data into wetland chapter of state of the bays
  - What is the timeframe for GIS wetland data? Need analysis completed by *June*.
  - Can use aerial imagery to calculate wetland loss in specific areas over time
    - Just need to determine which sites and how many- will be discussed at next SMARTeam meeting
- HABS- cyan problems in upper bays, usually during dry years
- Talking about marine litter and microplastics as indicator- UMES has been collecting microplastic data in fish guts
  - Trial indicator- stating that the data is inconclusive but is of interest and here's what we know so far
  - What data can we tie in or include for this?

\*\* Idea from Carly : WQ volunteers collecting microplastic sample monthly as well?