

# Joint meeting of the Science and Technical Advisory Committee (STAC) and the Monitoring Advisory and Coordination Committee (MACC)

June 9, 2021, 9:30 AM - 2:15 PM

Remote Meeting Format (Zoom) – Hosted by the Partnership for the Delaware Estuary

# **Draft Meeting Minutes**

# **Meeting Attendees**

STAC

Don Hamilton (NPS) Ron Heun (Exelon)

Kevin Hess (PA DEP Coastal Program)
Doug Janiec (Sovereign Consulting)

Danielle Kreeger (PDE) Ron MacGillivray (DRBC) Megan Mackey (EPA)

Meg McGuire (Delaware Currents)

Jason Morson (HSRL)
Daphne Munroe (HSRL)
Irene Purdy (EPA Region 2)

Drew Reif (USGS)
Dave Smith (USGS)
Kelly Somers (EPA)
Kari St. Laurent (DNREC)

Ken Strait (PSEG) Namsoo Suk (DRBC) Steve Unger (PA DEP) Andrew Weber (NPS) John Yagecic (DRBC)

MACC

Bailey Adams (DRBC) Jake Bransky (DRBC) Beth Brown (Audubon) Sheila Eyler (FWS) MACC (ctd.)

Matthew Fritch (PWD)
Heather Desko (NJWSA)
Heather Heckahorn (USGS)
Joe Duris (USGS PAWSC)
Chris Kunz (NJ DEP)
Josh Lookenbill (PADEP)
Preston Luitweiler

Christopher Main (DNREC)
Eileen Murphy (NJ Audubon)
Elaine Panuccio (DRBC)
Marc Peipoch (Stroud Center)

Kevin Pregent Bill Richardson (EPA) Dave Teumim

Roger Thomas (ANSDU)

Other Participants

Kurt Cheng (PDE) LeeAnn Haaf (PDE) Kathy Klein (PDE) Kyle McAllister Leah Morgan (PDE)

Rachael Phillos

Meredith Strasser (Talen Energy)

1. Welcome and Call to Order: 9:30-9:40

2. DRBC 2021 Monitoring Activities: 9:40 – Elaine Panuccio

Estuary bacteria monitoring: John Yagecic

- Zone 3 and the upper part of Zone 4 of the estuary are being surveyed.
   Designated use is recreation secondary contact recreation activity where inundation is unlikely
- What is the potential for upgrading that space for more use than recreational activities?
- Samples are being collected at 9 sites: 5 in New Jersey and 4 in Pennsylvania, in addition to boat run monitoring (see next item).
- o Monitoring for Fecal coloform, enterococcus, E. coli
- In late June/early July 2021, boat based transects monitoring is being done to try to understand why there are differences between boat run data and nearshore data.
- Boat Run monitoring program: J. Yagecic
  - Boat run was paused last year due to COVID and resumed in July but surveyors only were able to visit Paulsboro and downstream. This year all requirements have been waived so all 22 stations are being visited with monthly monitoring in the center channel. This monitoring started in March and will continue through October.
  - o 1,4-Dioxane was added to monitoring plan in 2021
  - Data is available upon request or on DRBC data portal
- Thermal shading assessment in upper Delaware River Basin: J. Yagecic
  - There is wide consensus among fisheries and natural resource managers that management of temperature to keep conditions cool is appropriate.
  - Currently temperature is managed by doing thermal releases from reservoirs when conditions are hot. First thermal release took place a few days prior to this meeting (June 9, 2021)
  - With climate change, other options will be needed for temperature monitoring.
  - A thermal shading study is being looked into using a camera and special software. Upward looking photos will be taken of the tree canopies and software will differentiate sky vs tree canopy with direction of the stream orientation. This will also follow along the June/July 2021 time frame.
- 1,4-Dioxane monitoring and trackdown: J. Yagecic
  - New Jersey American water found 1,4-dioxane in the Delaware River so it was added to the boat run program in March 2020
    - When resumed in August 2020 after being paused in March, the boat run was more limited.
    - NJ instituted a 1,4-dioxane workgroup.
  - o In 2021, DRBC started their own monitoring.

- Lehigh boat based work began in April.
- Danielle Kreeger asked: Do any of the bacteria monitoring metrics distinguish between animal-derived (e.g., geese) vs human-derived?
  - J. Yagecic replied: Not yet but it is on the to-do list. DRBC is working with a researcher at Drexel University for looking into human versus wildlife derived bacteria.
- Non-tidal chloride monitoring: E. Panuccio
  - o Investigative project for site specific analyses
  - Seven conductivity loggers have been deployed.
  - Loggers are being maintained twice a month or more depending on weather/biofilm (spring through early fall). Between late fall and early winter loggers are monitored once a month.
  - Water quality monitoring
    - Concomitant surface water quality monitoring of chloride, turbidity, and TDS.
    - Two-year continuous logger deployment and once monthly monitoring equaling 24 total events.
    - The next round of monitoring will take place on June 16 after starting May 2021, and monitoring will continue through April 2023.
    - Joe Duris mentioned in the chat that USGS is doing similar monitoring and that data sharing should be discussed. Elaine responded that she emailed him a list of places where DRBC is monitoring. He also asked whether DRBC will be developing chloride predictive relations, to which Elaine replied that they would be.
    - Kurt Cheng shared that PDE monitoring of mussel metrics in the tidal Christina reflected that storm surge likely had something to do with changes in chloride, even though it was a mild winter.
    - Monitoring goals include: create more robust, current dataset for chloride, TDS, and conductance in lower and middle SPW tributaries; utilize discrete specific conductance chloride and TDS observations for regression models; identify results for further research and investigations; develop outreach programs and discuss mitigation of road salt and increasing chlorides
    - E. Panuccio shared this link to a map of locations of non-tidal chloride monitoring where loggers have been deployed: <a href="https://drbc.maps.arcgis.com/apps/MapSeries/index.html?appid="https://drbc.maps.arcgis.com/apps/MapSeries/index.html?appid="https://drbc.maps.arcgis.com/apps/MapSeries/index.html?appid="https://drbc.maps.arcgis.com/apps/MapSeries/index.html?appid="https://drbc.maps.arcgis.com/apps/MapSeries/index.html?appid="https://drbc.maps.arcgis.com/apps/MapSeries/index.html">https://drbc.maps.arcgis.com/apps/MapSeries/index.html</a>?appid=

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- Biological monitoring in non-tidal mainstem: Jake Bransky
  - Biomonitoring program occurs every other year on odd years. The last time DRBC sampled was 2017 but there will be sampling of macroinvertebrates occurring this summer in the nontidal DE river. Sites range from Trenton to the confluence of two branches at Hancock, NY.
    - Late July to September sampling timeline is likely.
    - Data will go into water quality assessment report.
- Microplastics monitoring update: J. Bransky
  - DRBC received grant funding to monitor microplastics in the upper region of the estuary.
  - Sampling is being done using surface water grab samples.
  - COVID paused much of the sampling that would have already occurred.
  - Preliminary results indicate that there is not much plastic in the samples.
     For the second round of sampling, nets were used instead of grab samples, and results will be ready later this summer and will be reported out later on.
  - The lab analyzing microplastic samples for DRBC is Wet Center at Temple University.
  - Jake replied to a question from Heather Heckathorn indicating the DRBC does not have a dedicated AIS monitoring program, but tries to keep an eye out for AIS when sampling for other projects.
- Delaware River PFAS monitoring: Ron MacGillivray
  - o Two efforts with PFAS in 2021
    - 40 different PFAS analytes
    - Samples were collected in April and have been sent to the lab for analysis; another sampling will be done in September.
  - Sampling ambient water, sediment, and fish
    - Spring sampling of tidal mainstem is complete and those samples will be shipped to the lab shortly.
    - Monitoring is scheduled for nontidal and Zone 5 sites in September.
  - R. MacGillivray clarified that monitoring both WWTPs and industrial dischargers for PFAS are being considered, and J. Duris mentioned that USGS PAWSC is doing a lot of PFAS work in tributaries and is interested in the "sources" of PFAS topics.

# 3. Group 2021 Monitoring Updates (10:19AM)

- a. EPA Kelly Somers
  - EPA is looking to do field work from mid-July to September to look at SAV doing hydro acoustic monitoring
    - i. ARCGIS web based map is in progress
  - ii. Acoustic monitoring and mapping
    - Could further look into hydrilla, etc. Heather Desko with NJWSA said she is interested in learning how far up the Delaware River hydrilla populations extend and that she will follow up with Kelly regarding this.
  - iii. New protocol includes using sea bins as a monitoring tool and involves a project with PDE at Bartram's Garden. Cleanout will be weighed daily to get an idea of the macro-litter coming downstream, which could help inform plastic work that DRBC is doing.
  - iv. Bill Richardson mentioned that if there are people who need staffing assistance in the field, reach out to DRBC or himself or K. Somers as they may be able to help.
- b. USGS Heather Heckathorn
  - i. USGS is doing a substantial amount of monitoring in the mainstem and in tributaries in conjunction with other agencies.
  - ii. Continuous water quality monitors that produce real time data are being used and data are published to NWIS Web. These data are collected every 25-30 minutes.
  - iii. Frenchtown water quality monitor is ongoing with the city of Trenton, collecting data on S, C, Ph, turbidity, others?
  - iv. NJDEP, NJ water supply authority and DRBC have worked within water quality monitoring networks. PFAS compounds and 1,4-dioxane have been added to those long term monitoring networks also and are sampled quarterly while the groundwater network is sampled annually.
  - v. Water observing systems software is monitoring SC and water temperature to create a more robust dataset.
  - vi. A study on HAB monitoring in Delaware River basin was conducted last summer and results evaluating cyanotoxins and their downstream transport will be analyzed soon.
  - vii. J. Duris (PAWSC) indicated that there are update calls every few weeks.
    - i. NGWAS project is primarily in Pennsylvania, but not exclusively.
    - ii. Fifty paired air temperature and water temperature sensors are being used to find a relationship for modeling efforts.

- iii. New level multi specific monitoring level sensors: minimum of 2 depths, maximum of 3 depths.
- iv. Continued monitoring and testing of new monitoring is ongoing at Penn's Landing; radiometer is being tested at Penn's Landing to calibrate remote sensing data for Chlorophyll, DOM in the water
- v. Swarm divers are tiny automated submarines that collect WQ data and talk to each other. The company is now out of business but a report will be published about potential for this technology.
- vi. A sediment project is ongoing in White Clay Creek in Pennsylvania and Neversink, Lehigh, and the south branch of Rancocas are also being evaluated. Rapid settlement prediction models focus on turbidity and regress turbidity on concentration.
- vii. Soil moisture and evapotransporation monitoring is ongoing in Delaware County. The ground is disturbed as multi-level soil moisture monitors are being installed.; over 100 diff parameters being collected and data sharing options are being considered.
- viii. Domestic supply well monitoring is ongoing. Ultrasonic monitoring technology clamps onto a pipe from a well and monitors domestic supply use to get better information on how domestic homes are using water.
- ix. USGS PAWSC is evaluating seasonality of loads and seeing if profile of PFAS present changes.
- x. About 75 gauges are being operated for temperature, pH, nutrients, chlorophyll, etc. All data collected can be found on national water information system (NWIS) web.
- xi. Water quality is being collected in three dimensions.

# viii. Drew Reif – USGS

- NJWAS work: Brandywine site: camera work is being done to see suspended sediment
- ii. In FY 22, 1,4-dioxane will be added to Lehigh River site.

#### c. Audubon -- Sheila Eyler

i. Adult shad monitoring has been completed for spring. Juvenile shad sampling will start in the upper and tidal river in August and will continue through October.

#### d. NJDEP -- Chris Kunz

i. Statewide monitoring in 2020 was a short field season but most have begun again. Exceptions include lake and fish monitoring, which are

- operating under limitations for health and safety with working with teams
- ii. Chloride/road salt monitoring only has one site with the DE river which is Cooper river at Haddonfield site. New sites will be selected in the next year.
- iii. PFAS was added to routine network in 2020, with 2 samples at each location and ~123 sites statewide with several tributaries to the Delaware river
- iv. Follow-up monitoring will be done in 2021 where only water column was done in 2020. This year 20 sites were selected state wide on PFAS data. Water column and sediment were sampled in Feb and March, including at most sites on the Delaware River tributaries which are a big focus for NJDEP.
- v. 1,4-dioxane samples will be collected at 123 sites statewide this August and September and again in February and March.
- vi. Continuous monitoring buoys were deployed this year to monitor HABs.

  On the Salem River there will be a buoy deployed on Daretown Lake,
  which is a site of interest for a non-game species program for turtle shell
  rot to see if HABs have relation to that.
- vii. Fish tissue is being monitored for PFAS. This has been limited due to health, safety because of COVID. Unsure if it will happen this summer.

#### e. PADEP -- Josh Lookenbill

- i. Coodination efforts with DRBC Bacterial data collection
- ii. Archive of fish tissue material is being studied to increase PFAS and fish tissue data that they have
  - Surface water criteria development efforts would give paired sample types for criteria development efforts
  - ii. Continuous instream monitoring in Wissahickon, Neshaminy, and Little Neshaminy

#### f. PWD - Matt Fritch

- PFAS monitoring is focusing on Pennypack Creek and data will be obtained by the end of the month, and USGS and DRBC should participate, and PFAS data collectors should reach out to Matt Fritch.
- ii. 1,4-dioxane working group samples for 1,4-dioxane weekly.
  - K. Strait provided this resource for background on 1,4-dioxane: <a href="https://cen.acs.org/environment/pollution/14-Dioxane-Another-forever-chemical/98/i43">https://cen.acs.org/environment/pollution/14-Dioxane-Another-forever-chemical/98/i43</a>.
- iii. USGS and water quality monitoring focuses on Darby-Cobbs watershed.

iv. Cooling benefits of green infrastructure projects in heat stressed areas are being considered. If anyone has experience with air temperature monitoring, please reach out with advice, etc.

#### g. PA Audubon – Beth Brown

- Two main long term bird monitoring items. National Audubon society climate watch will take place Jan 15 – Feb 15 and May 15 – June 15 and is fully volunteer run.
- ii. Mid winter bird census in Philadelphia continued through Covid, and a report is still being compiled for 2021.

### h. DNREC - Kari St. Laurent

- i. Delaware coastal programs were approved to do all monitoring and field work as normal.
- ii. Marsh road surveys including nekton trawls and vegetation surveys are scheduled for the summer.
- iii. PCO2 sensors will be used to start to monitor carbonate system but funding has not come through yet.
- iv. Ecotone monitoring between upland and marsh is ongoing. Surface water and surface salinity sensors will be monitored paired with LIDAR data.

# i. PDE – Danielle Kreeger

- i. PDE was largely able to do monitoring field work in 2020 and 2021.
- ii. 11 site specific intensive monitoring stations in the Delaware Estuary and Barnegat Bay
- iii. LeeAnn Haaf has put wells in at her sites to look at coastal transgression in the Delaware Estuary and at Barnegat Bay.
- iv. Other site specific monitoring has to do with PDE's living shoreline functionality spanning from the Maurice River to Nantuxent.
- v. PDE just installed living shoreline at lower Schuylkill at Bartram's Garden and is looking at other areas in DE river. Physical parameters like plant/animal cover, sediment, and RTK are also being monitored. PDE is trying to expand array of metrics being studied for these projects.
- vi. PDE is interested in monitoring fish use of our living shorelines how can we do this without putting nets in the water? Can any fish experts on the call offer advice? We are interested in other technology.
  - i. S. Eyler said it takes a long time to review video even though there aren't many bodies needed in the field.
  - ii. Jason Morson suggested looking into eDNA, which PDE will look into this and touch base with Dave Bushek about.

- iii. Monitoring of water quality is upsizing by going beyond TSS to look at nutrient content of particles, etc., to consider how oyster reefs, etc., affect particle composition.
- j. HSRL Jason Morson
  - i. Long term oyster reef sampling is being done to find dermo prevalence, size frequency, shell plant.
  - ii. Growth racks are out along the salinity gradient and monitored monthly. How is oyster growth changing over time?
  - iii. Upcoming programs include a resurvey program in July focused on high density oyster sampling on a natural reef to see how oysters are distributed and lends toward appropriate stock assessment.
  - iv. Stock assessment will be done in the fall to try to estimate size of population on the New Jersey side of the Delaware Bay.
- k. D. Kreeger requested anyone involved with academic involvement, university programs, industry projects to contribute.
  - i. Daphne Munroe HSRL/Rutgers University
    - i. Rutgers is involved with an oyster filtration project with PDE, focusing on oyster filtration, nitrate removal, and seston concentration over the course of the year with regard to temporal dynamics at oyster farms. How do climate change effects (increasing storm frequencies, etc) change oyster reef and farm filtration capacity? Results will hopefully be reported next year.
    - ii. NJ Sea Grant funded a project with horseshoe crabs and red knots looking at where egg resources are relative to the flat and linking this to bird behavior. This effort is collaborative between D. Bushek's lab, D. Munroe's lab, and another bird researcher at Rutgers. Not many red knots have been seen at these sites but others have seen big flocks further north.
  - ii. D. Kreeger said PDE is looking at whether we can introduce mussels into manmade systems for water quality benefits by stock mussels into built stormwater ponds and seeing whether they survive, what the seston and nitrogen loads are, etc.
  - iii. Doug Janiec mentioned Jules Brock from UD's plant and soil science department coastal resilience design studio is doing research on wake energy from boats that go by and installing living shorelines to see how they interact with wake energy.
  - iv. Andy Weber NPS in upper Delaware

- There is a continuous water quality monitoring station at Lordville has been transferred to USGS, and NWIS site has data
- ii. Hoping to do rusty crayfish surveys this summer in upper DE region
  - a. K. Cheng found a crayfish and a large claw with fresh meat assumed to be part of freshwater mussel predation, but could potentially be detrimental as a nonnative species.
- iii. YOY American shad run will take place later this summer and into fall
- iv. Biologist at NPS is open to hydrilla and will touch base with K.Somers

# 4. PDE and STAC Updates

- a. Nominations and elections
  - i. D. Kreeger didn't receive any nominations for new members.
  - ii. All members up for re-election noted that they would continue to serve.
  - iii. Election nomination was for Dorina Frizzera to move from vice chair to chair
    - i. K. Somers nominated herself for vice chair under assumption thatD. Frizzera will assume chair position.
    - ii. K. St. Laurent motioned to accept K. Somers and D. Frizzera for vice chair and chair, respectively. D. Janiec seconded. No oppositions were voiced and the motion was carried.
    - iii. D. Kreegr asked if we accept the incumbents for elections who were up for reelection. D. Janeic motioned to accept and D. Kreeger seconded. No oppositions were voiced and the motion was carried.
  - iv. S. Eyler is now a standing STAC member representing the Delaware River co-op.
- b. April STAC minutes
  - i. D. Janiec moved to accept the April 2021 minutes and Ken Strait seconded the motion and it was accepted.
- c. Kathy Klein informed everyone that PDE is planning to hold the annual fundraising dinner in person in Philadelphia in October.
- d. Monitoring Inventory and Needs Assessment
  - CCMP has been revised and the Needs Assessment will be an addendum to it. Monitoring report is completed every 5 years, TREB/State of Estuary report every 5 years, STAC/MACC meeting every year

- Focus is on CCMP tracking and the Delaware Estuary focus area and taking an inventory of what data are being collected – inventory began being built in early 2019.
- iii. Looked at nexus of CCMP strategies and TREB indicators; report summarizes the inventory but they are two standalone items.
- iv. Report is an NEP deliverable, which needs to be complete by Dec 2021
- v. STAC can provide comments on this by the end of this month

  (https://delawareestuary.s3.amazonaws.com/Monitoring+Inventory+and
  +Needs+Assessment+2021-05-30.pdf) suggestions, edits, comments,
  questions to be returned to D. Kreeger (dkreeger@delawareestuary.org),
  L. Haaf (lhaaf@delawareestuary.org), or Leah Morgan
  (lmorgan@delawareestuary.org) by June 30<sup>th</sup>.
- vi. K. Somers asked whether we would consider making the document into a Google drive for all STAC members to review and include NEP program requirements at the beginning of the document? EPA members can't create Google Docs but can work off of them.
  - L. Morgan to create this file to share with STAC members. People can choose to use Google Doc or track edits in the Word document given that some folks can't use google docs.
- e. Technical Report for the Estuary and Basin L. Haaf
  - i. Report is updated every 5 years last edition was in 2017
     (https://delawareestuary.org/data-and-reports/state-of-the-estuary-report/), next in 2022.
  - ii. Updating ~70% of 2017 TREB, but all chapters will be getting updates.
  - iii. New callout boxes include but are not limited to microplastics, marsh migration, blue carbon, and SAV; DEIJ portion to be included as well as incorporation to our work.
  - iv. Current timeline: Steering meeting scheduled for June 10, 2021; Oct-Dec 2021 first draft narratives and sharing; Jan-Mar 2022 formatting and review draft; Apr-Jun 2022 reviewing and final draft; Jun-Nov 2022 SOE translation of TREB.
  - v. L. Haaf requests photos that are permissible to use in TREB that would fit well with the report to be sent to her at <a href="mailto:lhaaf@delawareestuary.org">lhaaf@delawareestuary.org</a>.

    Include in the email that photos are allowed to be used in the TREB.
  - vi. If contributors are using others' data, include all (contributing and core) authors for chapters and indicators. The back of the report from 2017 has a full list of people who contributed to chapters and indicators. For each

- photo/figure/plot, L. Morgan and L. Haaf will need indication of how to credit these inclusions.
- vii. We are interested in new indicators. Members are encouraged to get in touch w D. Kreeger, L. Haaf, or L. Morgan with any ideas or suggestions.
- viii. At what point do we move from a callout box to a regular indicator?
- ix. STAC and MACC should prep for a whole review of the TREB in its revision stages. First draft should be around March of 2022.
- x. L. Haaf said type editing and proofing could always be done as well no expertise needed in a given area to help out.
- xi. K. Strait asked about indicators we don't plan to update: can we get a table/list of those?
  - i. L. Haaf to put this together.
- xii. D. Kreeger: are there any new indicators that we should have indicators for that no one has spoken up about?
  - i. L. Haaf is not sure. Macroinvertebrates need to be updated; J. Bransky said DRBC does similar work and could use Chesapeake work on macroinvertebrates as a guide. There is some interest and can be discussed offline within DRBC. D. Kreeger said J. Bransky should let us know what it takes, PDE might have \$\$ in FY2022. J. Bransky thinks the Academy has also done work with DRWI.
- xiii. K. Somers apprehensive to create a full report on microplastics or SAV and that 3-4 years of monitoring does not make an indicator due to not enough information. Feature boxes are feasible and maybe that will be enough information to continue work and expand in the next 5 years?
  - D. Kreeger indicated there is a similar story with freshwater mussels. Only historic trend data we can get is with species richness in PA but observations have been stretched.
  - ii. D. Janeic thinks waiting ~10 years to put in a trends document like the TREB isn't a good idea since we have some information we can include now.
  - iii. Next generation indicators list could potentially be included in the summary section of the report.
  - iv. With SAV we will need some recovery before reaching the end point.
- f. PDE Events D. Kreeger
  - i. PDE Dinner will be October 7 more info to be sent via email

#### 5. Roundtable discussion

- a. D. Kreeger is the nutrient budget balanced?
  - i. N. Suk current modeling work is the interaction with tidal marsh and the model does not include the tidal marsh but will include sediment diagenesis. This is better than prior trials but still has a lot of uncertainty. Patrick Center study on vegetation in the tidal Delaware River can be found here: <a href="https://www.nj.gov/drbc/library/documents/aquaticveg-delestuary1998.pdf">https://www.nj.gov/drbc/library/documents/aquaticveg-delestuary1998.pdf</a>.
- b. M. Fritch: looking at Pennypack, there has been a difference from upstream to downstream with PFAS, but moving away from known contamination sites has shown a pattern. M. Fritch also looking to hear about seasonality.
  - i. Who else can discuss PFAS?
    - i. J. Duris said there is seasonality in mass differences but diurnal differences may also be affecting results based on when sampling is done throughout the day. Doing measurements where there is discharge is essential due to many gaining and losing reaches.
    - ii. K. St. Laurent said MiLing Li from UD is studying PFAS in the St. Jones Reserve tidal marsh area.
  - ii. H. Heckathorn: USGS evaluated two passive samplers for PFAS compounds in fall 2020 at each well in ambient ground water quality monitoring network with NJDEP and NJWAS program.
    - Almost 30 wells in DE river basin, mostly shallow with known high concentrations of PFAS. Data just beginning review; targeting October of 2021 to publish.
- c. Dave Smith: Focus with regard to freshwater mussels will be on management and conservation decisions. There is a lack of predictive tools that limit evaluation of objects and uncertainties for funding allocation and conservation
  - Goal is to co-develop models and decision tools with FWS so they're most useful for decision makers. It is anticipated these models will prioritize space for habitat management and will respond to management questions.
  - ii. Some other FWM personnel will likely be contacted about sharing data.
- d. D. Kreeger notified attendees that the next STAC meeting will be the annual joint meeting with EIC in September -- options for dates/times will be sent soon. Next STAC/MACC meeting will be scheduled for April 2022.
- e. E. Panuccio thanked everyone who joined and participated in the meeting.
- **6. Adjourn** K. Strait made a motion to adjourn at 2:14 and D. Janiec seconded. Meeting adjourned at 2:14 PM.