

Technical Advisory Committee Meeting January 11th, 2023 - Minutes

10:00 AM Welcome – Matt Sclafani (CCE, TAC Co-Chair) and *Brad Peterson (SBU, TAC Co-Chair)

Committee Organizations	Individual
PEP Chair Technical Advisory Committee (CCE)	*Matt Sclafani, PhD
PEP Co-Chair Technical Advisory Committee (SBU)	*Brad Peterson, Phd
Peconic Baykeeper	Pete Topping
US EPA Region 2	Aimee Boucher
NYSDEC	Alexa Fournier
Suffolk County Dept. of Econ. Devt. & Planning	*Camilo Salazar
Cornell Cooperative Extension	*Greg Rivara
Suffolk County Soil and Water	*Corey Humphrey
Cornell Cooperative Extension	*Stephen Schott
US EPA Region 2	*Bon Nyman
Peconic Land Trust	Josh Halsey
Smithsonian Research Center	*Jonathan Lefcheck
NYSDOS SSER	Jeremy Campbell
Local interest	Derrick Gale
EPA LISS	Cayla Sullivan
Town of Southampton	C. Theresa Masin
Local interest	Derrick Gale

*indicates attended in person

Additional Attendees:

*Sara Cernadas-Martin (PEP), C. Theresa Masin (Town of Southampton), Derrick Gale (), Michael Jensen (NYSDEC DOHS), Josh Halsey (PLT), *Jade Blennau (PEP), Alexa Fournier (NYSDEC), Matthew Sclafani (CCE), Chris Engelhardt (NYSDEC- Region 1), Matt Richards (NYSDEC), Pete Topping (Peconic Baykeeper), Aimee Boucher (EPA PEP cORDINATOR), *Abigail Costigan (PEP MCP Fellow), Jackie DeFede (SSER), Cayla Sullivan (EPA LISS), Camilo Salazar (Suffolk County Dept. of Econ. Devt. & Planning), Jeremy Campbell (NYS DOS SSER), Adam Starke (TNC), Mellissa Winslow (Town of East Hampton), John Aldred (East Hampton Town Trustees), Maureen Dunn (Seatuck), Brittney Scannell (SBU SoMAS Graduate Student), Shauna Kamath (NYSDEC), Mark Tedesco (EPA LISS), Atifa Hoque (EPA), *Jonathan Lefcheck (Smithsonian Research Center), *Corey Humphrey (Suffolk County Soil and Water), Derrick Gale (local interest), Mike Jensen (Suffolk County), *Camillo Salazar (Suffolk County), *Bob Nyman (EPA), *Greg Riivara (CCE), *Barry Volson (PEP)

10:05 AM Roll Call – *Sara Cernadas-Martin, PEP Water Quality Program Manager*

10:10 AM Presentation: Future Research Suggestions and Policy Implications of Horseshoe Crab Spawning Habitat Selection in the Peconic Estuary– *Abigail Costigan (PEP MCP Fellow, SBU)*

Abigail highlighted 3 major threats to horseshoe crab in the Peconics - Bait harvest, Habitat loss and Hardened shorelines. Major dieoff of Peconic Horseshoe crabs occurred between 1998 - 2019

10:30 AM Discussion: Horseshoe crab strategy, next steps – *Matt Sclafani (CCE) and Barry Volson (PEP)*

Matt sclafani- Abigail work covered basic understanding based on NOAA maps and habitat types. Link to shoreline hardening, although an unbalanced design, it does show the effect on the amount of beach and wave energy associated. Abigail's research showed Horseshoe crabs spawning preferences for natural habitats and when hardened shorelines were present the abundance of horseshoe crabs declined. Interesting observation was seen in the groin fields that had a noticeable effect on habitats. The data showed that horseshoe crabs used groin fields as a habitat. We are looking to build on this as well as shoreline inventory based on GPS maps previously worked up by PEP. Using shoreline as a proxy and other factors as well, gives info on climate and storm effects on this habitat. Peconic Horseshoe crab populations are currently very low and shows the importance of this research. We are looking to mimic the Seatuck statistical models to predict spawning and design a usable management to plan to make best decisions. Taking these actions now will prevent potential die offs.

Brad Peterson: Do we have a usable model for sea level rise for the Peconics?

Matt - Not to my knowledge, maybe something linked in on a larger scale for Long Island.
Follow up with Sara/Joyce or Barry

Brad Peterson - Has there been a decrease in Peconic Horse crabs?

Matt - Decline overall in Peconic horseshoe crabs. Data from NYSDEC Trawls analyzed by Bob Cerrato (SBU) *et al* show cyclic patterns linked to HSC decline in the Peconics. Their data provides evidence of regime shift in the Peconics which led to the decline in Peconic horseshoe crab populations.

Theresa Masin - commented that round truthing of hardlined shoreline data was performed in Southampton and is available. Matt - Ground truthing of shoreline data for the whole Peconic does not exist and PEP would welcome access the data of Southampton,

Theresa Masin - *Other state have moratoriums, can this regulation be imposed in the Peconics*

Matt – Yes, moratoriums are beneficial. The DEC has lowered the quota and managed the fishery around the moon phases to maximize stock recruitment. NYSDEC has trawl data for Horseshoe crabs. It is maintained by the Conch industry for bait. Tagging data shows crabs move from east to west in the Peconic. DEC should be included in the overall horseshoe crab discussion in order for both management and conservation actions to be in sync.

Pete Topping- harvest of commercial fishery from zones- asked if commercial horseshoe fisherman must state what zone they fished from? And if zone declaration is reporting is part of the standard requirement for this type of fishery? Any fidelity on Peconic Horseshoe crab?

Matt – DEC has added this requirement. No site fidelity on Peconic horseshoe crabs. Moriches data show about 46% of tagged crabs return. There are many habitats for horseshoe crabs in the Peconics. I had suggested using satellite tags to follow the crabs as there are many bays, islands that we don't have access too. GPS satellite tags could show where horseshoe crabs migrate to are estuary wide.

Pete Topping – any updates on Cornel's Artificial Bait Study

Matt – Artificial bait study – No funding but we are keeping alive, Matt commented that whelk attraction to horseshoe crab bait might be linked not only to females and more research is needed to examine the chemical composition of Horseshoe crabs. The consensus was only females, but we have seen males also and it may be due to chemical composition n in the prosoma. Eventually if this can be teased out we may someday be able to produce a chemical that mimics that found in horseshoe crabs thus reducing pressure on the crabs by the Bait industry.

Maureen Dunn - NOAA has developed a tool, ERMA (Environmental Response Management Application). It was developed to provide environmental resource managers with the data

necessary to make informed decisions for environmental response, damage assessment and recovery restoration. But it can be used as a shoreline tool to identify habitat type, shoreline characterization that can be used with ground truthing shoreline aerial photography.

SLAMM (Sea level Affecting Marshes Model) exists for marsh migrations and can be used for sea level rise in the Peconics. What is concerned with sea level rise in the Peconics? There are many models out there.

Matt – Tidal squeeze is rampant in the Peconics, and shoreline hardening is an issue. If this continues, the horseshoe crab population will continue to decline. No SLAMM are useful, but none exist that can be applied for the Peconics. SLAMM predicts that tidal squeeze overtime. Example in Jamaica Bay where the Belt Parkway is right against it makes it very critical in that system causing a tidal squeeze that diminishes the extent of the intertidal.

Environmental Sensitivity Index (ESA) is another name for ERMA, Abigail used in her analysis, but it is at a very coarse level so it must be used with that in mind.

Jade Blennau – Peconic Estuary Critical Lands Protection Strategy and Ranking Tool (CLPS) was developed in 2005 and updated in 2020 with NOAA SLAMM levels specifically for the Peconics; accounted for sea level rise in the Peconics. An updated version is needed.

Matt – Sea level rise is an action in the PEP CCMP and will be addressed as these different Work Groups get going. Horseshoe crabs are a Species of concern and are at risk in Japan and in other estuaries.

Maureen Dunn - there is correlation between horseshoe crab population and hardened shorelines, this balance is critical to understand, and this is very important work.

Theresa Masin - Satellite tags are a good idea to account for that part of the population that is removed by offshore fishermen. Tags that moved away from the shoreline – should be accounted for and looked into at the State level to make policy that safeguards the horseshoe crabs.

Matt – Pilot study is needed to test satellite tags and can be used on diamond terrapins also. Would allow to see when horseshoe crabs are harvested from bycatch or offshore and may fill in gaps in data.

Steve Schott - What water level are horseshoe crabs using in reaction to high water mark? Should shoreline projects be at mean seal level to mean high water and how do we adapt best practices?

Matt – depends on estuary shoreline slope. Crabs usually exist in the area between the midline to high tide mark.

Steve Schott - Should restoration in shorelines change? Given that the shorelines that exist now are the ones Abigail's research shows, fine grain sands, that the horseshoe crabs prefer. We



don't plant near mean high water. PEP should propose plans to look into what species utilize various tide levels and how they are affected when restoration is performed on different levels.

Matt - We should look into this. As we don't want to save one habitat over the another and push flora and fauna out of an ecosystem when restoration is undertaken.

Steve Schott - alleviate hardened shorelines; optimize restoration for all species.

Matt – we should revisit this topic.

Greg Riivara – shared a guest essay by NYTimes on horseshoe crabs today advocating for the end of harvest and the use of synthetic substitutes for their blood.

Matt – Synthetic analogs for horseshoe crab blood would be a game changer for this species. Crabs are returned to the wild after being bled. If synthetic analog is accepted by FDA and artificial bait is developed, then the fate of the horseshoe crab might be changed.

10:50 AM Discussion: Wildlife monitoring efforts – Sara Cernadas-Martin (PEP)

Corey Humphrey – PEP funding to the River otter survey is solely for the Peconic Estuary Watershed?

Sara Cernadas-Martin – Mike Bottini does conduct river otter work outside the PE but this funding is specifically for the Peconic Estuary.

11:00 AM Presentation: PEP plans for SAV monitoring and reporting – Sara Cernadas-Martin (PEP)

Brad Peterson – PEP, Joseph Tamborski (ODU) & I are recipients of the 2023 Coastal Watershed Grant. This is a great honor, and we are humbled. Coastal Watershed Grant Administered by Restore America's Estuaries, the Coastal Watershed Grant is funded by federal dollars that Congress earmarks for National Estuary Programs and their CCMP priorities.

Expanding Seagrass Monitoring in the Peconic Estuary Methods & Efforts from Shinnecock Bay
Flynn DeLany and Dr. Bradley Peterson, Peterson Marine Community Ecology Lab, Stony Brook University.

Flynn DeLany - presented on his work with Brad Peterson in the Peterson Marine Community Ecology Lab

Flynn commented Dr. Peterson's Progression in Pictures from balloons to Drones (manual flights, local Area & fine resolution) to Orthoimagery Classification (regional area, machine learning support & courser resolution) to Satellite Classification (daily repository, Improved accuracy and correlative estimates).

This progression has given Peterson Marine Community Ecology Lab a better understanding, improving accuracy in the delineations from different imagery acquisitions.

Flynn stated that PEP will find much benefit in using different acquisition tools for specific habitat types and having multiple applications to wetlands delineation creates a more accurate picture of the habit type.

Machine Learning methodology has proven to be very useful as it can map into the past as well as into the future. Flynn commented that Machine learning is the core of where the power is for image acquisition. PEP can benefit from this in many ways.

Flynn commented that the Peterson Lab will be collaborating with Dr. Victoria Hill Old Dominion University. They have been working on this methodology with her lab. Her experience ranges from Florida to Chesapeake Bay. She is using this methodology within ground surveys at VIMS. Flynn spoke of Neural Networks (a method in artificial intelligence that teaches computers to process data in a way that is inspired by the human brain) is the way of the future and Dr. Hill is working with NW and is using data from the Peterson Marine Community Ecology Lab. Results to follow.

Flynn noted that Satellite Imagery is the way of the future.

11:15 AM Discussion: SAV monitoring, methodology update –*Jonathan Lefcheck*
(*Smithsonian Institution*)

PEP has been having regional discussions about the health of eelgrass habitat in the North East and working collaboratively on this important issue. As a result, PEP will look to the TAC to guide the necessary changes which will be required to update the annual monitoring methodology. This will allow PEP to acquire annual quantitative data for decision making and comparative eelgrass health regionally.

Jonathan Lefcheck, marine community ecologist, from the Smithsonian Institution presented ‘ SAV monitoring and methodology update to TAC meeting.

Lefcheck stated that there are many SAV monitoring methodologies but these protocols are not global. Many organizations collect seagrass data; but without common standards, these data sets cannot easily be shared and are not being used to their full potential. The fate of seagrass is a global issue and there is need for uniformity in SAV monitoring and central repository of this data.

Lefcheck stated that to improve SAV monitoring efforts, MarineGEO scientists have identified several key variables, and agreed on a series of recommendations and best practices for each.



Lefcheck stated Essential ocean variables (EOV) can be prioritized. MarineGEO's standard survey design for sampling seagrass habitats, included key measurements of the plants, associated fauna, and other properties of the ecosystem. Additionally, it provides best practices for site selection, layout, and workflow.

Lefcheck commented that the overall design and replication adheres as closely as possible to other seagrass monitoring programs, such as SeagrassNET and SeagrassWatch. The goal is to provide a standardized sampling design and measurements of the key aspects of seagrass habitats that can be compared globally. MarineGEO protocol provides data on above- and belowground seagrass biomass, composition, and shoot density from a standard core.

Lefcheck stated that MarineGEO protocol encompasses the monitoring of carbon in a system, that is Blue Carbon. The protocol has some modest attempts to assess the organic carbon content in the sediment through simple small carbon cores. Another assay of the MarineGEO protocol is the predation assay. The Predation assay measures relative predation intensity and consumption of standard bait by generalist omnivores. How many hungry mouths are out there? These Assays can be developed to address the different stakeholders that perform SAV monitoring and use the data.

MarineGEO has developed a Strong data management collection and data submission portal for automated quality control before into the database and will share data across many parameters.

Field data sheets, standard presentation of data, etc

MarineGEO is multifaceted and promotes equitable and open shared data banks and it has many partners that puts the global connectivity at quick access.

Sara Cernadas-Martin – fish trawls can damage beds. How do you survey and sample for fish in delicate habitats?

Jonathan LefChek - The question that comes up many times...seagrass is spotty. Do we risk sampling over the little plots that we have so by risking damaging the habitat. LefChek suggested Edge trawls when looking at pristine or delicate sites.

Brad Peterson - when you get 7 academics in a room you get 7 things that should be measured. In the creation of this program- how confident are you that the metrics being measured are the ones to look at when looking to make management goals in the Peconic Estuary?

LefChek - SAVs are very diverse. MarineGEO is a multifaceted protocol and in the Essential Ocean Variables permits the stakeholder a unique toolkit to be able to access community composition, ecosystem structure, ecosystem structure and ecosystem function.

Lefcheck stated that with all protocols is a compromise - time, money, site specificity and stakeholder interest.

Brad Peterson – what protocol we can use to maximize the worth of the data collected in the Peconics to generate data that we can use to project statements for management to adapt.

Lefcheck shared an opposite viewpoint to Fynn - many management goals are quantified in acreage and so are restoration goals but these ignore key issues that might be affecting the habitat. Aerial imagery lacks detail on species level for example an algal bed versus a seagrass meadow of *Ruppia* sp. or *Zostera* sp.

Brad Peterson – SAV monitoring means different things for different people. A major issue in NYS is that we have data collected for stock in a vacuum and is made available for the common good of the ecosystem. Consistent imagery is lacking and a central repository is needed. Brad Peterson stated that having a MarineGEO eliminates that problem.

Lefcheck - importance in coherence of remote and local observations are not in sync and localized design monitoring exercise. It may be important to observe not just your best site but all sites when assessing the health of the habitat.

Steve Schott - comparing Shinnecock with similar sites at Peconics

Brad Peterson – compare digital aerial with the data from MarineGeo to get error estimate overtime. Such a measure will be essential in the Peconics.

Steve Schott - groundtruthing is an essential tool and important in machine learning which aerial misses.

Flynn - macro algae vs seagrass teasing out and with sea level rise is very difficult with solely using aerial

Steve Schott - commented that he favors MarineGEO and having similar methodologies and being able to share with other institutions

Brad Peterson – commented that he favors MarineGEO as it allows a more robust and sound restoration and managerial actions to be developed.

Steve Schott - How do we collect or know if we have collected enough data? Is MarineGEO is feasible

Lefcheck - How do we design surveys that are representative of the ecosystem one is monitoring? This is trial and error exercise - MarineGEO protocol facilitates different habitats and produces the best representation of the sites Essential ocean variables.

Brad Peterson – one thing driving the mechanism of the system is wrong - essentially, we will use established protocol and build on it to a more complete picture of the status of SAVs in the Peconics.

Steve Schott - his team is familiar with some of the building blocks of MarineGEO

Flynn - there is learning curve for the identification of of algae, fish and epiphytes

Brad Peterson, Steve Schott and Lefcheck - once the learning curve is smooth out, MarineGEO's end product is one that can reach a wider database of comparison.

Lefcheck - MarineGEO minimizes time and effort - one stop shop using multiple EOVs.

Lefcheck - Comparability to historical datasets - first year of running MarineGEO should be in tandem with previous protocol and compare the results. That factor difference can then be applied to past datasets; no data is lost, all is useful. Gives you higher confidence in the new survey.

Steve Schott - do not want to lose 2 decades of data

Lefcheck - I am available this summer to participate in sampling in side by side comparison surveys. .

Steve Schott - 23 years, this will be culture shock, and a learning curve. Wants to be in line with the new status quo in SAV monitoring.

Brad Peterson - Read through MarineGEO and looks forwards to the new methodology

Jade - next steps PEP Seagrass Working Group to assist in the transition to new protocol

Matt - satellite images over time with machine learning

Brad Peterson - There is industry push to move from aerial to satellite imagery

Theresa Masin - South and East Hampton has a contract with NEARMAP for imagery annual.

Brad Peterson - a major setback with aerial imagery is that NOAA protocol limits the flight to capture images to 40 days out of the year. Cost = airplanes waiting for a good day. We should use all opportunities.



Cayla Sullivan - LISS effort will recommence this year after some setbacks. Delay of aerial imagery 2023 +2024. Inter-comparison study aerial study planet & drone surveys. Long term monitoring protocol. LISS is reconsidering Seagrass net vs using MarineGEO.

Lefcheck - notes that seagrass net is being merged into Marien GEO and suggests using marine Geo Protocol for things moving fwd' Smithsonian is now taken over seagrass net.

Sara Cernadas-Martin – gave instructions to voting members of TAC on PEP adopting the new SAV monitoring protocol.

Jade - informed general audience members if their organization wants to be part of the TAC please contact Sara Cernadas-Martin

11:45 AM Update: PEP Natural Resource Sub-committee; Recommended target number of protected acres in the Peconic Estuary watershed – *Barry Volson (PEP)*

Natural Resource Program Manager presented an update from the Natural Resource Sub-committee on the recommended target number of protected acres in the Peconic Estuary watershed. He stated that this is a CCMP action 28, and PEP is committed to deciding on a formal number of acres the program is committed to protect over a 10-year time period. He also stated that the target acreage decision will be made by Summer 2023 as the deadline for all CCMP decisions is September 2023.

11:55 AM New Business/Public Comment Period

Alexa Fournier from the NYSDEC announced that the DEC is hiring a new Seagrass Coordinator

12:00 PM Wrap Up/Adjourn