

NORTHEAST COASTAL AND BARRIER NETWORK (NCBN)

FY2024 Annual Report

NCBN Parks:

Assateague Island National Seashore (ASIS), Cape Cod National Seashore (CACO), Colonial National Historical Park (COLO), Fire Island National Seashore (FIIS), Gateway National Recreation Area (GATE), George Washington Birthplace National Monument (GEWA), Sagamore Hill National Historic Site (SAHI), and Thomas Stone National Historic Site (THST)

Stewardship Savvy



Michaela Compo / NPS Photo

A podcast from the Northeast Coastal and Barrier Network about the people behind the iconic Arrowhead Patch, who use their skills to make the National Park Service mission possible: to preserve America's cultural and natural resources.

Herpetologist Bob Cook / Cape Cod National Seashore

"I just sat down in my waders in that pond. And I could literally, in my chest, I could feel the pressure waves from their calls. It was a visceral feeling. You could feel the sound waves from all of the calling of these hundreds of spring peepers hitting your body."

NCBN FY2024 Highlights

[Quick Dives: Communicating Changes in Estuarine Water Quality \(U.S. National Park Service\)](#)

NCBN long term monitoring water quality data were made available to the parks and public through a suite of science communication products, including yearly status reports as web articles.

NCBN coastal parks are home to dynamic estuarine systems that rely on healthy aquatic resources to sustain these complex ecosystems. These waters experience detrimental effects of estuarine nutrient enrichment, largely from human activities, that impact water quality. More than 18 years of monitoring data collected from these systems have been synthesized into annual resource briefs in the form of web articles, providing historical analysis and current conditions. This is the first set of the articles that have been produced for all our parks and were put together by one of NCBN's new biological science technicians, Michaela Compo, and Holly Plaisted, NCBN Water Quality Protocol Lead. Our monitoring data behind the briefs also supports our newly developed Water Quality Dashboard, which offers an opportunity for park staff to interact more closely with our data in an efficient and engaging way. For CACO, we developed a trial Story Map to illustrate recent conditions and used interpolated surfaces to illustrate our findings across the systems of interest. Our aim is to provide parks with a range of accessible science communication materials for a variety of audiences, from park resource managers and superintendents to the public.

[SIP, SOPs, and Salt Marshes: Edward Cascella's Work Using Remote Sensing to Analyze Salt Marsh Vegetation \(U.S. National Park Service\)](#)

Salt marshes have been a key monitoring site for NCBN for several decades. Coastal salt marshes are a hub for biological diversity, and they perform a number of essential ecosystem processes, such as filtering nutrients. They are also a crucial and natural form of protection from coastal storms. However, the effects of climate change are causing rapid changes to salt marsh ecosystems within the Network, leading to critical habitat loss and other drastic environmental changes. While NCBN has monitored salt marsh vegetation in addition to tidal wetland elevation, the promises of remote sensing pose another opportunity for analyzing this vital sign of marsh health. This summer, Scientists-in-the-Parks (SIP) intern

Edward Cascella worked on expanding NCBN's salt marsh monitoring to include using satellite imagery to track salt marsh composition changes. Through cooperating with the Southeast Coast I&M Network and researchers at the USGS Woods Hole Coastal and Marine Science Center, Cascella drafted two standard operating procedure (SOP) documents for using satellite imagery to monitor the vegetated and unvegetated areas within NCBN coastal marshes.

The crux of the analysis involves deriving the unvegetated/vegetated ratio, which relates the amount of unvegetated area to the amount of vegetated area within the area of interest in the marsh. Cascella created areas of interest for the parks and then downloaded National Agricultural Imagery Project (NAIP) imagery from USGS's EarthExplorer to analyze change in the spatial extent of the saltmarshes. Cascella's SOP also involves using topobathymetric digital elevation models (TDEMs) from the USGS's Coastal National Elevation Database (CoNED). Cascella used the NAIP imagery and CoNED to run an unsupervised classification to determine vegetated and unvegetated land cover in the areas of interest. An unsupervised classification uses the spectral characteristics of each pixel in the input data to

categorize them into distinct classes. Once the pixels are categorized, Cascella can run further analyses that compare vegetated area to the unvegetated area within the marsh unit. Repeating the procedure over a long period of time, such as five or ten years, will draw attention to trends in vegetation changes that will inform management decisions at each park.

Cascella's work will extend into using satellite imagery to monitor changes in marsh edge. Although his SIP internship has ended, he is continuing work on the SOPs while completing his master's degree in environmental science and management at the University of Rhode Island. His efforts have contributed to NCBN's commitment to finding new and innovative approaches to monitoring that utilize advanced technology and cooperation across other networks and agencies to promote scientific excellence and integrity.

Rooting for the Shoots: A Strong Start to NCBN's Seagrass Resilience and Restoration Project

Infographic of the project: [Rooting for the Shoots: A Strong Start to NCBN's Seagrass Resilience and Restoration Project \(U.S. National Park Service\)](#)

After being awarded \$800,000 in IRA funds, the Network launched the start of our Seagrass Resilience and Restoration Project, covering seven parks across three Networks, SECN, NCBN and NETN. All \$800,000 in funding was obligated among seven CESU partner Universities, Boston University, Stony Brook University, University of Maryland Eastern Shore, University of Maryland Center for Environmental Science, University of North Carolina Wilmington (UNCW), Virginia Institute of Science, Cornell Cooperative Extension. This year, along with many partners up and down the Atlantic coast, seagrass samples were collected across 10 states in over 85 meadows. The samples were shipped to our partners at UNCW for processing and sent out for genomic sequencing. Currently over 1,000 samples have undergone, full genomic sequencing. While neutral genetic diversity has been characterized in seagrass meadows, recent work indicates that this has limited relevance for conservation genetics, and mapping of adaptive genetic variation in the genome is essential. This dataset will enable us to identify regionally and locally adapted genetic variants and determine key demographic and environmental drivers behind such patterns of variation and adaptation, with the goal to identify those meadows that will be key for seed collection used in restoration, as well as maintaining the species, *Zostera marina*.

At the end of September, we were very excited to receive a \$1,000,000 donation from the National Park Foundation, to launch us into the next phase of the project, pilot restoration at CACO, FIIS, ASIS, CALO and CAHA.

[Stewardship Savvy Ep. 02: Knee-deep with peepers, pools, & The Rolling Stones \(U.S. National Park Service\)](#)

Network staff worked with colleagues at Cape Cod National Seashore to produce a second episode our podcast, Stewardship Savvy, which features Bob Cook, retired herpetologist from CACO.

Last spring, Michaela Compo, NCBN Science Communication Lead, and Kristin Vinduska, Visual Information Specialist at Saratoga National Historical Park (previously intern at CACO), sat down with Bob, and hit record on a conversation that transcended decades of his noteworthy career, touching upon everything from peepers and the seashore to the Rolling Stones. We had the opportunity to hear firsthand about Bob's career beginnings, up through his time at the seashore and into his current day life

and advice for the future. On a second day of recording, we joined Bob out in the field, walking through vernal pools to look out for wood frogs and spring peepers. Later that evening we met back up with him after dark to go out on the marsh to find spotted salamanders. We were able to capture the two days in the form of a second episode to our network's podcast, following up on a first episode with Mark Adams, retired GIS specialist from CACO.

NCBN Monitoring Activity (FY2024)

Inventory or Vital Sign	Park(s) Sampled in 2024	Actual Months of Sampling (or cancellations)
Coastal Shoreline Position	ASIS, FIIS, GATE, GEWA, SAHI	Fall Oct-Nov /Spring March-April
Coastal Topography	ASIS, GATE	Fall Oct-Nov /Spring March-April
Marsh Elevations (SET)	ASIS, FIIS, GATE, COLO, CACO, BOHA, ACAD	Fall Oct-Nov /Spring April-May
Marsh Veg/Nekton	FIIS, ASIS, GATE, SAHI, COLO	Monitoring on hold, re-evaluating
Estuarine Water Quality	ASIS, GATE, COLO	June-August
Seagrass	ASIS, FIIS, CACO	June-August
Forest Health	ASIS, GEWA, THST, COLO	May-August
Weather and Climate (Articles)	CACO, FIIS, ASIS, SAHI, GATE, COLO, THST, GEWA	Not completed in 2024 due to staff vacancies.
Nesting Diamondback Terrapin inventory	FIIS, GATE, SAHI	Waiting on reports
Meso-Mammals with a focus on Coyotes	CACO	Draft report

Tidal Wetland Elevation monitoring (SET)

1. **Description:** Wetlands exist within a narrow range of elevation which is influenced by local hydrologic conditions. The monitoring of wetland elevation and other processes are important for determining the resilience of these wetland communities in the face of changing climate. Elevation monitoring normally occurs twice a year once in the fall and spring. Sampling trips consist of Surface Elevation Table (SET) and marker horizon measurements. Water level data loggers are typically serviced during these trips.
2. **Data Collection:**
 - Sampling trips consist of Surface Elevation Table (SET) and marker horizon measurements, and water level data loggers are typically serviced during these trips. Sample sites at NCBN and NETN parks were visited twice in FY24 with 109 SETs sampled. SET and marker horizon data was collected, and water level logger data downloaded.
 - A system for updating older SETs that are buried was successfully tested at GATE in FY23. Approximately half of the 109 actively monitored SETs in the NCBN network were updated in FY24 (48) FY23 (3).

	# Active SETs	# Updated
COLO	12	12
ASIS	16	16
GATE	24	12
FIIS	9	7
CACO	27	0
BOHA	9	4
ACAD	12	0
TOTAL	109	51

3. Data Management:

- All SET and marker horizon data collected through fall 2023 were entered into the NPS SET database and checked for errors (QA/QC), and the data package published by NETN data manager, Adam Kozlowski in Feb 2024. All associated water level data through Fall 2023, have been QA/QCd, and uploaded to Aquarius and approved. Datasets containing SET and Marker horizon data up through 2023 are available here: [NPS Data](#) – all NPS SET/MH data.
 - This year, NCBN Data Scientist, Laura Feher, reviewed 16,900 records and corrected 14 years of SET data for CACO. Laura and Jim Lynch went through every record and made corrections to data that had been collected by various park staff who had collected the pin data differently from the NCBN protocol but at least had documented how they collected it. Laura devised specific calculations to correct the data to be consistent with the protocol and then applied these corrections to the multi-network SET database.
 - Laura reviewed and edited the metadata associated with the annual SET data package for 2024.
 - Staff from several networks implementing Sediment Elevation Table (SET) monitoring – including NCBN, NETN, NCRN, SECN, and SFAN – met to continue collaborations and work together to develop a suite of quality-control and visualization tools in R for use by SET Project Leads for QA/QC. These multi-network meetings continue to be held once a month.
4. **Analyses:** Western Ecosystems Technology Inc. completed a multi-park trend analysis of SET and marker horizon data for NCBN, NETN and NCRN Networks that was completed 2022. No additional analyses were completed in FY24, but NCBN Data Scientist, Laura Feher, created R scripts for accessing and analyzing NCBN SET data going forward.
5. **Reporting and Publications:** Trend report for years 2002-2019 can be found here: <https://irma.nps.gov/DataStore/Reference/Profile/2296580>. This year, the NCBN Data Scientist created a PowerBI dashboard for communicating SET protocol results to the parks (development is still in-progress).

6. **Protocol Changes:** The NCBN protocol was revised in FY24 and in review with USGS and NOAA authors, and NCBN staff. SET locations and access maps were developed for all parks.
7. **Protocol Reviews:** NCRN Lead the Annual Operational Review for SETs, that included NCBN. NCBN up until Spring 2024 collected all NCRN SETS. NCRN staff will be collecting their own data going forward.

Salt Marsh Vegetation and Nekton Monitoring

1. **Description:** The NCBN vegetation and nekton monitoring programs are designed to detect shifts in species composition and abundance to provide an early warning to larger ecosystem threats or alterations and to inform sound management decisions.
2. **Data Collection:** The Network has put both the Nekton and Vegetation monitoring protocols on hold due to staffing and funding, as well as the results of the latest trend report and power analysis, that will be evaluated as part of the NCBN Network Review in 2024-2025.
3. **Data management:** All data for the previous field seasons have been entered/verified/validated/accepted and posted to IRMA.
4. **Analyses:** NCBN Data Scientist, Laura Feher, who started with the Network in March 2024, has begun re-analyzing all of the NCBN Salt Marsh Vegetation data to help us further evaluate whether the network should continue to collect these data. This will be presented as part of the NCBN Network review in 2025.
5. **Reporting/presentations/brief:** Draft Salt Marsh Vegetation trends completed fall 2024.
6. **Protocol changes/deviations:** No changes were made to either protocol. The NCBN Program continues to research options for revising and enhancing the network's Salt Marsh Monitoring program using remote sensing data. Laura Feher attended a workshop on the use of drones for monitoring, held in MD in August. Title: Coastal Geospatial Horizons Workshop: What's next for drone research and management, University of Maryland UAS Research and Operations Center.

During the summer of 2024 NCBN DHA SIP Fellow. Edward Cascella, worked with both the Southeast Coast Network and USGS scientist to develop an SOP calculating the USGS Unvegetated/Vegetated Marsh Ratio, that the USGS scientists from the Woods Hole Coastal and Marine Science Center, had developed for NCBN parks as part an NRPP funded project. The team had not documented the process for calculating the Unvegetated/Vegetated Marsh Ratio (UVVR), other than in metadata files. The Fellow worked closely with the USGS staff to write up the procedure, and test running the processing through for FIIS. We hope to use this metric going forward as part of our Salt Marsh monitoring program.

7. **Protocol reviews:** No Reviews occurred in FY24, but our overall salt marsh monitoring program (Nekton, Vegetation, Elevation, Water Levels, UVVR analysis, and Drone data) will be a part of the full network review in 2025.

Shoreline Change and Coastal Topography Monitoring

1. **Description:** Ocean Shoreline Position and Coastal Topography. An essential question in all coastal parks is the magnitude and rate of shoreline change. The Ocean Shoreline Position Protocol is implemented at GATE, FIIS, ASIS, SAHI, and GEWA. Monitoring at CACO has been on hold since the Mark Adams, the part GIS Manager retired. Prior to his retirement the Network along with Rutgers U staff, reviewed the issues related to implementing the protocol at CACO along the park bluffs, and whether the protocol as it is, is appropriate to use in those areas.

Dune, cliff, and bluff erosion and migration often involve direct threats to resources, infrastructure, and human safety and are major management issues in many parks. Our Coastal Topography monitoring protocol is currently implemented at GATE and ASIS and is used to describe the beach-dune-bluff system. These data provide information about the temporal and spatial changes in beach-dune-bluff morphologies in the parks. We began plans to implement this protocol at FIIS, but the pandemic interrupted the plans, and most recently our coastal geomorphology monitoring tech, left the network for a position at CACO.

2. **Data Collection:** Shoreline Position was monitored in the fall of 2023 and spring 2024 at ASIS and GEWA, and the spring 2024 at FIIS, GATE, ASIS, SAHI, and GEWA. Park staff continued to collect these data for the Network at ASIS, while NCBN collected the data at the remaining park units. Coastal topography monitoring occurred at both ASIS (collected by park staff) and GATE (collected by NCBN, spring 2024). Fall 2023 monitoring for some parks did not occur due to NCBN vacancies, including two protocol leads.
3. **Data management:** The fall 2023 and spring 2024 survey data for all monitored park units has been received, entered, and certified. An updated workflow was developed for the Shoreline protocol that was necessitated by changes to the DSAS software.
4. **Analysis:** No analyses were performed in FY24.
5. **Reporting/presentations/brief:** Trend Reports are currently all up-to-date for NCBN parks. For each protocol, data visualizers have been developed for each park where monitoring occurs: Note- Visualizers were not updated in 2024 due to Staff vacancies.

Coastal Topography AGOL Dashboard Visualizers:

ASIS: <https://www.arcgis.com/apps/dashboards/4f508c9fccde47dfb3e6c647fe4388aa>

GATE-SHU:

<https://www.arcgis.com/apps/dashboards/f1daaebad5f44e95b348a72cc51ce66d>

GATE-JBU: <https://www.arcgis.com/apps/dashboards/41a9eff9bfd049a889876943f1fe6b3b>

GATE-SIU: <https://www.arcgis.com/apps/dashboards/57c5196fab64cb09424af6081631462>

Ocean Shoreline Position AGOL Dashboard Visualizers:

ASIS: <https://www.arcgis.com/apps/dashboards/e2675272123342ce988af5236ca4f07e>

FIIS: <https://www.arcgis.com/apps/dashboards/0b1a919c6d2c405c95de9cb17c836ed0>

GATE-SHU:

<https://www.arcgis.com/apps/dashboards/810e016fcbdb4fd69d406684b29042f3>

GATE-JBU:

<https://www.arcgis.com/apps/dashboards/bebb4159c8064010b18e02ad4472e753>

GATE-SIU:

<https://www.arcgis.com/apps/dashboards/c24f1fe51b0546d1b1209c6bbb9965e1>

SAHI: <https://www.arcgis.com/apps/dashboards/4a5c06bedba24f89be159e5acf24ce69>

6. **Protocol changes/deviations:** No changes made or deviation from the protocols, other than fall 2023 data collection for some parks did not occur because of staff vacancies.
7. **Protocol reviews:** The annual operational review for both the Ocean Shoreline Position and Coastal Topography Protocols was completed in February 2024. Annual surveys and post-season questionnaires used in preparation for the annual operational review were posted to IRMA: <https://irma.nps.gov/DataStore/Reference/Profile/2300300>

Estuarine Nutrient Enrichment Monitoring (Water Quality and Seagrass)

1. **Description:** Nutrient enrichment of the coastal zone is a worldwide consequence of human population growth. To assess how estuarine natural resources are affected by changing nutrient inputs, NCBN implements long-term systematic monitoring of estuarine nutrient enrichment within six parks (CACO, FIIS, GATE, ASIS, GEWA, COLO). Monitoring began in the mid- 2000's following the development of the Network's monitoring plan (Stevens et al. 2005). Seagrass condition and distribution in parks with significant seagrass resources (CACO, FIIS, ASIS) were also selected as "vital signs" or indicators of estuarine nutrient enrichment condition. Water quality is monitored at each of the six parks on a biennial basis and seagrass is monitored annually at the three parks.
2. **Data Collection:** (ENE water quality component) Water quality data was collected on schedule in 2024 at two parks: ASIS and GATE. GATE data was collected through our cooperative agreement with Dr. Brad Peterson from SUNY Stony Brook University, and ASIS through a new Task Agreement (TA) with Stephen Tomasetti, University of Maryland Eastern Shore. (Seagrass Component) Seagrass data was collected at ASIS, CACO and FIIS. ASIS and FIIS data were collected through a TAs with Erin Shields from Virginia Institute of Marine Science (VIMS), Dr. Bradley Peterson from SUNY SBU. CACO data were collected by NCBN staff in collaboration with CACO park staff and visiting researchers from the center for Coastal Studies and Boston University.

3. **Data management:** All 2023 monitoring data has been certified. Certification of the 2023 seagrass data is complete for CACO and underway for ASIS and FIIS.
4. **Analyses:** Trend analysis of all years (2006-2020) and components (water quality and seagrass condition) of the ENE protocol were completed in early 2023 by Neptune and Company. An update of this analysis to incorporate data through 2022 is underway with assistance from Dr. Jessica Nagel through a professional services contract.
5. **Reporting/presentations/brief:** A trend report developed by Neptune and Company as well as park-specific summaries were produced and completed in FY2024. NCBN SIP intern, Michaela Compo, drafted annual resource briefs of water quality trends, as well as an interactive AGOL dashboard application for spatial water quality visualizations.
6. **Protocol changes/deviations:** Program sustainability planning and results of statistical power analyses conducted by Neptune has led us to review the results of our water quality monitoring for each park and evaluate the results in relation to their relevance to park management. Additionally, with assistance from VIMS staff through our cooperative agreement, we began a comprehensive revision of the protocol and supporting SOPs. We planned to complete the revision in FY24 but have pushed the target completion date out through 2025.
7. **Protocol reviews:** The annual operational review for the NCBN ENE protocol was conducted in March 2024.

Forest Health Monitoring (GEWA, THST, COLO, SAHI, ASIS) This monitoring is in collaboration with NETN and MIDN

1. **Description:** Monitoring trends in forest condition and health among five network parks. Schoodic Institute interns are hired to serve on the forest crew.
2. **Data collection:** Data collection occurred at COLO, THST, GEWA, and ASIS in 2024. (Note: ASIS funds the implementation of this protocol in their park).
3. **Data management:** All previous data has been verified and certified. All final datasets associated with this protocol are posted to Data Store and are publicly accessible. The team started to work on documentation to publish forest data into IMD's new data package format. All final datasets associated with this protocol will be posted to [DataStore](#) as publicly accessible once quality checked (~January 2025).
4. **Analyses:** finalized and published regional regeneration trend analysis: <https://irma.nps.gov/DataStore/Reference/Profile/2299183>. A variety of scripts were updated in the forest NETN and forest MIDN R packages to improve data summary and quality checks.

5. **Reporting and outreach:** Map-based summary reports for NCBN parks were completed in January 2024. Worked with IPMTs and interested parks to complete Strategic Invasive Management Plans.
6. **Protocol changes/deviations:** Revised and updated SOPs as needed.
7. **Protocol Reviews:** Annual operational review for MIDN/NCBN/NETN was completed winter 2024.

Weather and Climate Monitoring

1. **Description:** Weather and climate play significant roles in driving both physical and ecological processes. For example, the active processes that shape the North Atlantic coastline are largely the result of meteorological events such as wind-driven waves. For research and long-term ecological monitoring, weather and climate data provide the potential for correlations to be made with observed physical and ecological pattern data.
2. **Data Collection:** Temperature, precipitation, wind, and tidal data downloaded from the NOAA National Centers for Environmental Information website for each of the parks and park-based tables and figures created. (<https://www.ncei.noaa.gov/>).
3. **Data Management:** The previous year's data for the area each NCBN park resides in will be downloaded yearly in January and made available to NCBN parks and the public through resource briefs (available on NCBN website and IRMA) and nps.gov shared articles. The NCBN Data Manager developed new guidance and consolidated existing guidance on the production of Weather Monitoring Resource Briefs for NCBN parks.
4. **Analysis:** Weather data summaries were created for each park.
5. **Reporting and Publications:** Weather and Climate Articles had to be put on hold because of NCBN Staff Vacancies. We expect to resume developing the articles for 2024 data for each park when it becomes available in 2025.
6. **Protocol Changes:** No changes were made to the protocol.
7. **Protocol Reviews:** no reviews were necessary.

Additional Data Management Activities

- ~150 items on AGOL were updated and to improve compliance with the acceptable use policy

Science Integration into Management

1. **Direct support of park planning:**
 - Cooperative agreements were established with Boston University, Stony Brook, University of Maryland Eastern Shore, University of Maryland Center for Environmental Science, University of North Carolina Wilmington, Virginia Institute of Science, Cornell Cooperative Extension. These agreements were established for NCBN water quality and seagrass monitoring data collection and the majority were put in place for the NCBN Seagrass Resilience and Restoration, IRA funded project.

- Michaela Compo, NCBN biological science technician, continues to maintain the Estuarine Water Quality Data Dashboard that she developed as a SIP intern. The dashboard includes data from the following NCBN parks: ASIS, CACO, FIIS, GATE, GEWA and COLO.
- Michaela Compo developed annual water quality web articles for the following NCBN parks: ASIS, CACO, FIIS, GATE, GEWA and COLO.
- Jim Lynch supported FIIS with 3-D scanning of the recently closed, wilderness area breach that opened in 2012 during Hurricane Sandy.
- Both Sara Stevens and Jim Lynch have been part of the Northeast Region Salt Marsh SDM Workgroup since 2023.

Partnerships and Collaboration

1. Other activities that support parks, regions, and I&M (multi-network or national)

- The Cape Cod Pleasant Bay Alliance, the Center for Coastal Studies, Boston University and the NCBN worked together on the Massachusetts Municipal Vulnerability Preparedness: Community Climate Adaptation Plan for Pleasant Bay Ecosystem and Infrastructure project. This work was based on the results of the NRPP project.
- The Northeast Coastal and Barrier Network, the Center for Coastal Studies, Boston University, and Mass Bays Program, also developed a detailed implementation plan for SCC funded project: Identifying factors preventing recovery of eelgrass from large declines to inform management actions at Cape Cod National Seashore. This will be a three-year project beginning in FY24.
- NCBN SET Protocol lead is a member and co-leader of the NPS I&M SET database group. This collaborative effort includes five I&M Networks working together on the development of a SET monitoring database as well as the procedures for processing SET and Marker Horizon data. Work continued on this shared database project throughout FY2023.

2. Other NPS, federal, and external partnership activities (with state agencies, universities, etc.)

- The NCBN continues to be a member of the Chesapeake Bay Sentinel Site Cooperative which is a collaborative group of SET users in the Chesapeake Bay region.
- The NCBN Tidal Wetland Elevation Monitoring Lead, is also a member of the SET metadata standardization group which is overseen by the US Global Climate Change Program and is working on standardizing metadata for SET users in the US and abroad.
- The NCBN continues to be a member of the SET cross-collaboration group of government and academic SET users which met throughout the year to discuss and share analytical methods being used for trend analyses of SET data. The group was started by NPS quantitative ecologist Dr. Ellen Cheng and has participants from the NPS, USFWS, NOAA, EPA, The Smithsonian Institution, Clemson University and The University of Delaware.

- NCBN Staff maintain close working relationships with many coastal ecosystem scientists, including USGS scientists, Boston University professors and students working on coastal ecosystem science, Seagrass scientists from Mass. Division of Marine Fisheries, Cape Cod Center for Coastal Studies, and actively maintain close working relationship with EPA REGION 1 - New England marine scientists. The network is newly collaborating with the Piscataqua Region Estuaries Partnership (PREP) as well.
- NCBN continues to be an active and long-term member of the SeagrassNet global program: participating in long-term program sustainability.
- NCBN Staff stationed at the University of Rhode Island continue to provide teaching support and mentoring opportunities to students. (Sara Stevens)

3. Workgroups and Task Force Engagement

- Chesapeake Bay Sentinel Site Cooperative (Jim Lynch and Holly Plaisted, NCBN)
- Northeast Region Salt Marsh SDM Workgroup. (Sara Stevens and Jim Lynch NCBN)
- Massachusetts Seagrass Workgroup (Holly Plaisted, NCBN)
- Pleasant Bay Climate Adaptation Action Plan (work group w/Pleasant Bay Alliance). (Holly Plaisted, NCBN)
- SAVvy Braintrust (National Estuarine Research Reserve Science Collaborative). (Holly Plaisted, NCBN).
- East Coast SAV Collaborative. (Holly Plaisted, NCBN).
- IMD Program Review Workgroup (Sara Stevens, NCBN)
- Atlantic Coast SET Workgroup (Jim Lynch, Sara Stevens, Laura Feher, NCBN)

Communication

Reports and Publications

Peer Reviewed Publications

- Grace, J.B., Huntington-Klein, N., Schweiger, E.W., Martinez, M., Osland, M.J., **Feher, L.C.**, Chivoiu, B., Johnson, D.J., Guntenspergen, G.R., & Thorne, K.M. *Causal effects vs causal mechanisms: Two traditions with different requirements and contributions towards causal understanding*. Under Review at Ecology Letters.
- Neville, J.A., Kovalenko, K.E., Snedden, G.A., Osland, M.J., Thorne, K.N., **Feher, L.C.**, Moorman, M.C., Moon, J.A., Krauss, K.W., Grace, J.B., Lane, T.C., Sanspree, C.R., Cahoon, D.R., & Guntenspergen, G.R. *Most coastal wetlands of the conterminous United States are submerging and undergoing ecological transformations under recent rates of relative sea-level rise*. Under Review at Nature Climate Change.
- Saintilan, N., Rovai, A., Khan, N., Kovalenko, K.E., Weeks, J., Rogers, K., Lovelock, C.E., Friess, D.A., Krauss, K.W., Mackenzie, R.A., Gao, Y., Cassalas, M.N., Goddard, M., Hutley, L., Jones, A., Kelleway, J.L., McKee, K.L., Chen, L., Kimeli, A., Castillo, J.A., Sidik, F., Swales, A., Hensel, P., Guntenspergen, G., Whelan, K.R.T., Akter, S., Raw, J., Adams, J., Murdiyarso, D., Sasmito, S., Ravelonjatovo, J., Wang, M., Zhang, J., Bhomia, R.K., Horton, B., Bennion, V., Wilson, C., Rana, M., Hossain, A.N., Cormier, N., Sklar, F.H., Rodriguez, J., Lal, K.K., Mosley, L., Bomer, E.J., Prabakaran, N., Sharma, S., Cairo, J., Osland, M.J., **Feher, L.C.**, **Lynch, J.C.**, Coronado-

Molina, C., Cahoon, D.R. *Global patterns and drivers of mangrove resilience to rapid sea-level rise*. Under Review at Science.

NCBN Inventory and Monitoring Reports: No trend reports were published in FY24 or inventory reports.

Outreach products

- NCBN Infographics (NPS.gov article series) [Series: NCBN Infographics](#)
 - [Northeast Coastal and Barrier Network Brochure](#)
 - [Ready? SET. Go!](#)
 - [What we mean when we talk about: Estuarine Nutrient Enrichment](#)
 - [Rooting for the Shoots: A Strong Start to NCBN's Seagrass Resilience and Restoration Project](#)
- NCBN Yearly Status Reports | Estuaries (NPS.gov article series) [Series: NCBN Yearly Status Reports | Estuaries](#)
 - [2021 Estuarine Nutrient Enrichment Status Report: Fire Island NS](#)
 - [2021 Estuarine Nutrient Enrichment Status Report: Cape Cod NS](#)
 - [2022 Estuarine Nutrient Enrichment Status Report: Gateway NRA](#)
 - [2022 Estuarine Nutrient Enrichment Status Report: Colonial NHP](#)
 - [2021 Estuarine Nutrient Enrichment Status Report: George Washington Birthplace NM](#)
 - [2022 Estuarine Nutrient Enrichment Status Report: Assateague Island NS](#)
- Episode 02 of [Stewardship Savvy](#) released, featuring Bob Cook, retired CACO herpetologist
- Collaboration with network park's (GEWA, THST, FIIS, and GATE) visual information and interpretation staff to foster shared content and activate Science & Research pages on park websites.
 - [Science & Research - George Washington Birthplace National Monument](#)
 - [Science & Research - Thomas Stone National Historic Site](#)
- SET Location, Navigation, and Access Point ArcGIS offline-ready Field Maps
 - [FIIS/GATE SET](#)
 - [COLO/ASIS SET](#)
 - [BOHA/ACAD SET](#)
 - [CACO SET](#)
- Draft Condition and Trend Reports of Estuarine Water Quality and Seagrass for ASIS, CACO, COLO, FIIS, GATE, and GEWA completed and in-review.
 - NCBN Highlights | FY24 (NPS.gov article series) [Series: NCBN Highlights | FY24](#)
 - [Stewardship Savvy Ep. 02: Knee-deep with peepers, pools, & The Rolling Stones](#)
 - [SIP, SOPs, and Salt Marshes: Edward Cascella's Work Using Remote Sensing to Analyze Salt Marsh Vegetation](#)
 - [Quick Dives: Communicating Changes in Estuarine Water Quality](#)
 - [Rooting for the Shoots: A Strong Start to NCBN's Seagrass Resilience and Restoration Project](#)

Organizational Excellence

1. Safety

The following links to the safety site and safety plans for each protocol:

- [NCBN Safety SharePoint Site](#)

- [Coastal Geomorphology](#)
- [Salt Marsh Vegetation](#)
- [Tidal Wetland Elevation](#)
- [Water Quality and Seagrass](#)

2. Staffing

Fall 2023-March 2024 Permanent Staff (3 staff only since August 2023)

- NCBN Program Manager, Sara Stevens (Nerone)
- Biologist/Tidal Wetland Elevation Monitoring Lead, Jim Lynch
- Biologist/Estuarine Monitoring Lead, Holly Plaisted

Spring 2024-Present (4 new staff hired)

- March 2024-Hired Laura Feher, Data Scientist vice Data Manager, Dennis Skidds
- June 2024-Hired Michaela Compo, Perm Biological Science Technician (GIS, Sci Comm and Remote Sensing)
- June 2024-Hired Katie Button, Perm Biological Science Technician, (SET, WQ and Seagrass Monitoring)
- FY25 -Oct 2024-Hired Sarah Heavren, Perm Biological Science Technician, (Coastal Geomorphology Monitoring Lead, GIS/Remote Sensing)

2024 SIP Interns:

- DHA SIP Fellow-Edward Cascella-Remote Sensing Analysis for FIIS, development of UVVR Analysis SOP.

NCBN board members and technical/steering committees:

Park Name	Board Member
Cape Cod NS	Jennifer Flynn
Fire Island NS	Alexcy Romero
Gateway NRA	Jen Nersesian
Sagamore Hill NHS	Jonathan Parker
Assateague Island NS	Hugh Hawthorne
George Washington Birthplace NM/THST	Melissa Cobern
Colonial NHP	Jerri Marr

Technical Steering Committees	
Coastal Geomorphology (Dennis Skidds and Scott Rasmussen)	
Dr. Norb Psuty	Rutgers University
Scott Rasmussen	Cape Cod NS
Lauren Kramer	Assateague Island NS
Jordan Raphael	Fire Island NS
Dennis Skidds	Northeast Region GIS
Estuarine Nutrient Enrichment/Seagrass (Holly Plaisted)	
Betty Neikirk	Virginia Institute of Marine Science
Erin Shields	Virginia Institute of Marine Science
Bradley Peterson	Stony Brook University

Stephen Heck	Stony Brook University
Sophia Fox	Cape Cod NS
Kelly Medeiros	Cape Cod NS
Salt Marsh SETs (Jim Lynch)	
Philippe Hensel	NOAA
Don Cahoon	USGS
Kelly Medeiros	Cape Cod NS
William Vervaeke (Ches)	Southeast Coast Network
Geoff Sanders	Cape Cod NS
Sue Adamowicz	USFWS
Laura Mitchell	USFWS
Aaron Weed	Northeast Temperate Network
Salt Marsh Vegetation and Nekton	
TBD	

Budget

In FY24 the Network received \$984,151 Vital Signs Funding, and \$82,300 WRD funding for water quality monitoring. Because of staffing, the majority of FY24 we had lapse salary from three vacant position (GS07, GS09, GS12). Funding was used in our Task Agreements for water quality and seagrass monitoring, as well as purchasing much needed equipment for Shoreline monitoring, and SET/Salt Marsh monitoring. New staff EODed in March, (1 GS11) and June, (2 GS07s).

Category	Amount
INCOME	
Vital Signs Monitoring (base)	\$984,151
WRD	\$82,300
TOTAL INCOME	\$1,066,451
EXPENDITURES	
Personnel (BOC 11 & 12)	\$644,485
Travel (BOC 21)	\$23,811
Transportation (BOC 22)	13,468
Rent, communication, utilities (BOC 23)	\$0
Services and contracts (BOC 25)	\$66,910
Supplies and materials (BOC 26)	\$27,865
Equipment (BOC 31)	\$43,169
Agreements (BOC 411c) NCBN Monitoring	\$221,383
TOTAL EXPENDITURES	\$1,066,451
TOTAL FIXED COSTS*	\$644,485
TOTAL WATER MONITORING EXPENDITURES**	\$97,400.
% BUDGET FIXED (total fixed/total income)	60%

*Fixed costs: permanent, utilities, leases, mandatory training, mandatory equipment service contracts, uniforms.

