Dataset Description: Field survey data, analysis results, created datasets, and eDNA analysis data to better understand the interconnectedness of climate change, nuisance mosquitoes, and resilience of coastal salt marsh systems

This document provides detailed information about five categories of data that were generated through a 2016 - 2020 collaborative research project titled *Investigating the Interconnectedness of Climate Change, Nuisance Mosquitoes, and Resilience of Coastal Salt Marsh Systems*. The project was supported by the National Estuarine Research Reserve System (NERRS) Science Collaborative, which is funded by the National Oceanic and Atmospheric Administration. All Science Collaborative supported projects that collect new data adhere to federal data sharing and archiving requirements.

Data access and archival: The first four categories of data described in this document have all been archived with the NERRS Centralized Data Management Office. These data are available through a data request form on the Science Collaborative website: http://www.nerrssciencecollaborative.org/resource/interconnectedness-climate-change-and-nuisance-mosquitoes-datasets.

The data produced as part of the development of the mosquito assays will be made available via GenBank by January 2023.

Five categories of data are described in this document:

1) Field Data

The project generated of a number of field datasets, including transect and site information; site conditions; environmental variables; observational presence of mosquitoes, mosquito larvae, and fish in sampled ponds; the results of environmental DNA analysis of water samples for mosquito larvae DNA; and field data sheets.

1. LathropSC_2017_2018_GridSiteData_042019.csv
2. LathropSC_2018TreelineSiteData_042019.csv
3. LathropSC_2019PondEdgePoints_012021.csv
4. LathropSC_2019SiteLevelWeeklyData_012021.csv
5. LathropSC_2019WeeklyDataCollection_012021.csv
6. LathropSC_2019Weekly_eDNAResults_012021.csv
7. LathropSC_2020DroneandHandCollectionPoints_012021.csv
8. LathropSC_2020_eDNAResults_012021.csv
9. LathropSC_2017_FieldDataSheets.pdf
10. LathropSC_2018_FieldDataSheets.pdf
11. LathropSC_2019_FieldDataSheets.pdf

2) Forest Edge Migration

The project included extensive mapping of the marsh-upland edge at eight locations along the Delaware Bayshore and Atlantic back-bay marshes, documenting how dynamic this landscape change can be with the forest edge retreating inland and new marsh forming in its place. The rate of this forest edge retreat was analyzed with the use of the USGS Digital Shoreline Analysis System (DSAS). This software calculates rates of change statistics and is typically used to quantify the erosion or accretion of shorelines, or in this case, the movement treeline. DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change. The following include shapefiles of the baselines for each of the sites used in the DSAS analysis completed for this project, digitized seaward forest edge (or "treelines") for each of the sites used in the DSAS analysis, the positional information about each transect/shoreline intersections, and the rate and distance measurement results.

12. LathropSC_DSAS_BaselinesforAllSites.shp
13. LathropSC_DSAS_TreelinesforAllSites.shp
14. LathropSC_DSAS_InterseptOutputs_forAllSites.csv
15. LathropSC_DSAS_RatesOutputs_forAllSites.csv

3) Marsh Change Mapping:

To project future marsh change under projected sea level rise (SLR), a composite marsh change and marsh retreat model was employed to project the status of coastal marshes for the Year 2050. This model includes additional locally derived data sets to project changes at the marsh shoreline, the marsh interior platform and upland edge. This mapping product was added on NJFloodMapper (www.njfloodmapper.org) in January 2020.

16. LathropSC_ NewJerseyCoastalMarshChangeMaps.tif

4) Tidal Marsh Land Cover Mapping:

This data layer represents a detailed land cover classification of New Jersey tidal marshes. This mapping includes *Spartina patens*-dominated High Marsh as a distinct category as this habitat type can serve a mosquito breeding hotspots.

17. LathropSC_NJTidalMarsh.tif

5) Mosquito qPCR Assays:

The environmental DNA analysis required the development of species-specific real-time qPCR assays for *Aedes sollicitans, Ae. taeniorhynchus, Ae. cantator, and Culex salinarius.* These are the most common salt marsh mosquitoes in New Jersey and the Middle Atlantic US states. Assays were developed by sequencing the rRNA internal spacers I and II using primers in the flanking exons (18S and 5.8S and 5.8S and 28S, for ITS1 and ITS2, respectively) for *Aedes sollicitans*, *Ae. taeniorhynchus* and *Ae. cantator.* Sequences that were already in existence were used to develop the assay for *Culex salinarius*.

18. Sequence of *Aedes sollicitans* ITS 1
19. Sequence of *Aedes taeniorhynchus* ITS 1
20. Sequence of *Aedes cantator* ITS 2

About the Associated Project

Project title: Investigating the Interconnectedness of Climate Change, Nuisance Mosquitoes, and Resilience of Coastal Salt Marsh Systems

Reserves involved in the project: Jacques Cousteau National Estuarine Research Reserve, NJ

Project period: November 2016 to November 2020

Science Collaborative project page:
http://www.nerrssciencecollaborative.org/project/Lathrop16

Project lead and contact information:

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Abstract:

As climate change and sea level rise alter salt marsh habitats, a less understood impact with implications for human health is how changes in marsh habitat affect the production and location of nuisance mosquito populations. Understanding how coastal ecosystems are being impacted by climate change, and how nuisance mosquito populations are changing, is critical to ensuring mosquito control agencies and coastal managers make the most informed decisions going forward.

Through data-collection, mapping, and modeling efforts, this project has increased clarity about marsh habitat change to inform mosquito control and coastal restoration efforts in New Jersey. Future modeling and marsh-upland edge mapping suggest that the marsh-upland is and will be a hotspot for change, and field sampling confirmed that these "new" habitats can serve as breeding areas for mosquitoes. The project team developed environmental DNA (eDNA) assays for the most common salt marsh mosquitoes in the Middle Atlantic United States. Working closely with mosquito control agency personnel, major advancements were made in mosquito surveillance through the deployment of drone-based sampling of breeding pools paired with the eDNA analyses. The team also developed outreach materials to inform the public about health risks posed by mosquitoes, including how climate change might exacerbate those risks, and a module for middle/high school educators.

About Each Dataset

1. Field Data: LathropSC_2017_2018_GridSiteData_042019.csv

General description of data:
Data collected in the field on sites using a gridded transect method at a number of sites in New Jersey during June through August of 2017 and 2018. Transects were set 5m apart, max 10 points per transect for an area of 50m2.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:

- The X, Y, and Z, coordinates were collected using a Real Time Kinematic Global Positioning System. The accuracy of the unit was vertically 2-3cm and horizontally 1cm.
- The bearing capacity was collected using a drop hammer and pvc pipe with a closed end cap.
- The species information was collected using trained visual observation.
- The mosquito abundance and species abundance was collected by collecting a 324 cm3 soil core (4” x 2” hole) at each transect point, Incubating the soil core at 28oC with a 14:10 light/dark cycle for 4-6 day, flooding the sample for 72 h, and counting the number of and visually determining the species of larvae hatched in each sample. The water was removed and the sample was incubated and flooded again to ensure all eggs in the soil were given a chance to hatch.
- Data Projection: NAD_1983_UTM_Zone_18N

Data collection period:
June – August 2017 and June – August 2018

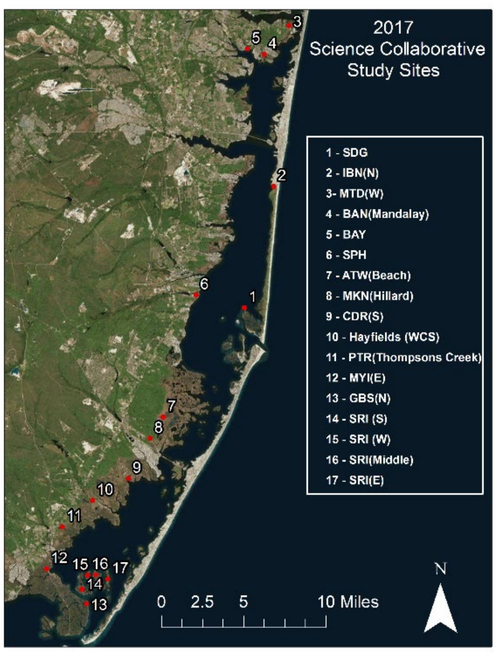
Geographic extent:

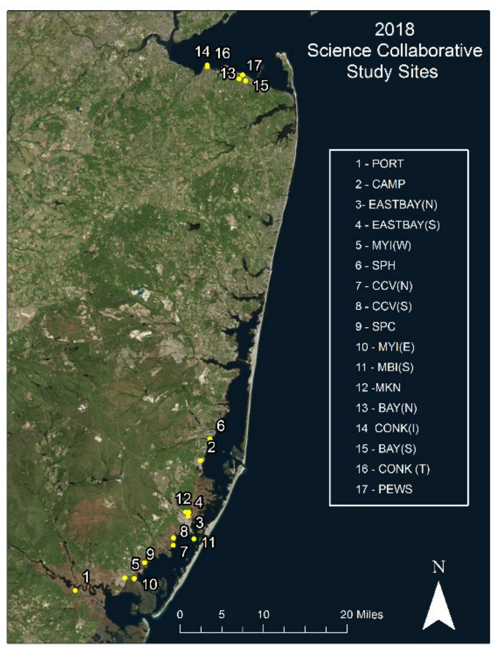
Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
SDG	2017	-74.11822284	39.79662282	Sedge Island, Island Beach State Park, Seaside Park, New Jersey
IBN(N)	2017	-74.08419283	39.90345214	Island Beach State Park, Seaside Park, New Jersey
MTD(W)	2017	-74.06571061	40.04515789	Mantoloking, New Jersey
BAN(Mandalay)	2017	-74.09416015	40.01994797	Baywood, New Jersey
BAY	2017	-74.1132976	40.02489651	Cherry Quay, New Jersey
SPH	2017, 2018	-74.1732803	39.80808886	Sands Point Harbor, Holiday Beach, New Jersey
ATW(Beach)	2017	-74.21132981	39.70061348	Manahawkin, New Jersey
MKN(Hilliard)	2017, 2018	-74.22631508	39.68168259	Manahawkin, New Jersey
CDR(S)	2017	-74.25130816	39.64651361	Manahawkin, New Jersey
WCS(Hayfields)	2017	-74.29226648	39.6272036	Eagleswood Twp, New Jersey
PTR	2017	-74.32692058	39.60395053	Tuckerton, New Jersey
MYI(E)	2017, 2018	-74.34472297	39.56688926	Little Egg Harbor Twp, New Jersey
GBS(N)	2017	-74.29943001	39.53610268	Little Egg Harbor Twp, New Jersey

SRI(S)	2017	-74.30466021	39.54880096	Little Egg Harbor Twp, New Jersey
SRI(W)	2017	-74.29811678	39.56119494	Little Egg Harbor Twp, New Jersey
SRI(Middle)	2017	-74.28902777	39.56165842	Little Egg Harbor Twp, New Jersey
SRI(E)	2017	-74.27531263	39.55791471	Little Egg Harbor Twp, New Jersey
PORT	2018	-74.47737766	39.54665689	Port Republic, New Jersey
CAMP	2018	-74.19439094	39.77119286	Waretown, New Jersey
EASTBAY (N)	2018	-74.2214922	39.68141902	Manahawkin, New Jersey
EASTBAY (S)	2018	-74.22312271	39.67513146	Manahawkin, New Jersey
MYIW	2018	-74.3663828	39.56858941	Little Egg Harbor Twp,, New Jersey
CCV(N)	2018	-74.25652521	39.63730669	Eagleswood Twp, New Jersey
CCV(S)	2018	-74.25676297	39.6246881	Eagleswood Twp, New Jersey
SPC	2018	-74.32156103	39.59452384	Tuckerton, New Jersey
MBI(S)	2018	-74.21024985	39.6357283	Long Beach Twp, New Jersey
BAY(N)	2018	-74.09581956	40.43880718	Port Monmouth, New Jersey
CONK (I)	2018	-74.17648521	40.45590636	Union Beach, New Jersey
BAY(S)	2018	-74.08938527	40.42859732	Port Monmouth, New Jersey
CONK (T)	2018	-74.17649283	40.45320781	Union Beach, New Jersey
PEWS	2018	-74.10409919	40.43192601	Port Monmouth, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection





Egg sampling

- The distribution of *Ae. sollicitans, Ae. taeniorhynchus,* and *Ae. cantator* eggs was studied by soil core sampling (Bidlingmayer and Schoof 1956, Ritchie and Johnson 1991). A single 324 cm^3 soil core is taken at 5 m intervals within the defined 50 m^2 transect (100 total cores taken per site) of each selected salt marsh patch. Soil cores are taken by cutting the vegetation to within 1” of the soil and cutting the outline of the core with a 4” x 2” hole saw bit. The soil core is then removed from the soil by cutting the vegetation roots with hedge shears. Each soil core is then placed into a clear 500 ml (10 cm diameter) container, labeled (location, date) and stored in an insulated cooler for transport.

Determination of presence/absence of viable eggs

- Each soil core needs to be incubated uncovered at 26^{o}C under a 14:10 (light:dark) photoperiod for at least 3 d to allow recently laid eggs to mature or break “diapause” (Moore and Bickley 1966, Ritchie and Johnson 1991). Samples are then flooded and larvae counted after 72 h. Based on previous reports of incomplete hatch from single flood events (Travis 1953, Andreadis 1990), a second series of drying, incubation, and flooding is necessary for all soil cores in which the first flooding produced larvae to maximize the number of larvae observed. After counting, larvae should be maintained on a laboratory diet of fish protein (Tetramin Fish Flakes) until they reach the 4th instar stage, after which they will then be stored in 70% EtOH for later morphological/molecular identification.

2. Field Data: LathropSC_2018TreelineSiteData_042019.csv

General description of data:
Data collected in the field along random transects through the marsh-forest ecotone at a number of sites in New Jersey between June and August of 2018.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- The X, Y, and Z, coordinates were collected using a Real Time Kinematic Global Positioning System. The accuracy of the unit was vertically 2-3cm and horizontally 1cm.
- The bearing capacity was collected using a drop hammer and pvc pipe with a closed end cap.
- The species information was collected using trained visual observation.
- The mosquito abundance and species abundance was collected by collecting a 324 cm3 soil core (4” x 2” hole) at each transect point, Incubating the soil core at 28oC with a 14:10 light/dark cycle for 4-6 day, flooding the sample for 72 h, and counting the number of and visually determining the species of larvae hatched in each sample. The water was removed and the sample was incubated and flooded again to ensure all eggs in the soil were given a chance to hatch.
- Data Projection: NAD_1983_UTM_Zone_18N

Data collection period:
June – August 2018

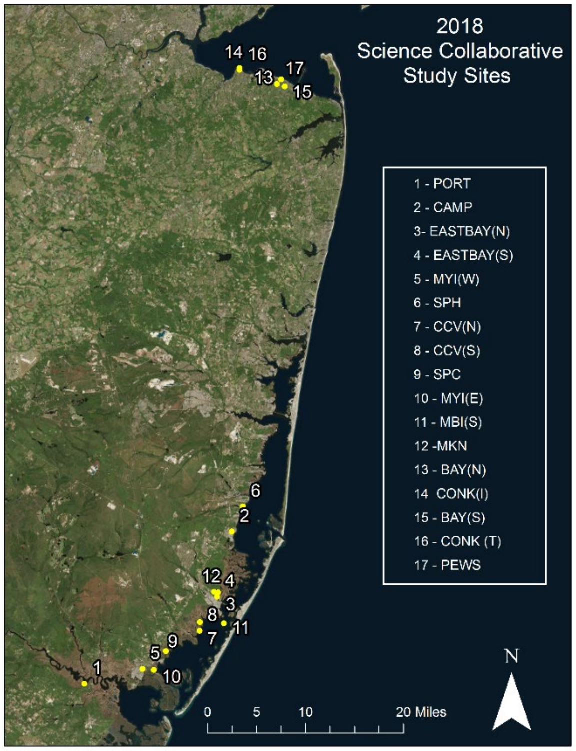
Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
SPH	2018	-74.1732803	39.80808886	Sands Point Harbor, Holiday Beach, New Jersey
MKN(Hilliard)	2018	-74.22631508	39.68168259	Manahawkin, New Jersey
MYI(E)	2018	-74.34472297	39.56688926	Little Egg Harbor Twp, New Jersey
PORT	2018	-74.47737766	39.54665689	Port Republic, New Jersey
CAMP	2018	-74.19439094	39.77119286	Waretown, New Jersey
EASTBAY (N)	2018	-74.2214922	39.68141902	Manahawkin, New Jersey
EASTBAY (S)	2018	-74.22312271	39.67513146	Manahawkin, New Jersey
MYIW	2018	-74.3663828	39.56858941	Little Egg Harbor Twp,, New Jersey
CCV(N)	2018	-74.25652521	39.63730669	Eagleswood Twp, New Jersey
CCV(S)	2018	-74.25676297	39.6246881	Eagleswood Twp, New Jersey
SPC	2018	-74.32156103	39.59452384	Tuckerton, New Jersey
MBI(S)	2018	-74.21024985	39.6357283	Long Beach Twp, New Jersey
BAY(N)	2018	-74.09581956	40.43880718	Port Monmouth, New Jersey
CONK (I)	2018	-74.17648521	40.45590636	Union Beach, New Jersey
BAY(S)	2018	-74.08938527	40.42859732	Port Monmouth, New Jersey

CONK (T)	2018	-74.17649283	40.45320781	Union Beach, New Jersey
PEWS	2018	-74.10409919	40.43192601	Port Monmouth, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection



Egg sampling

- The distribution of *Ae. sollicitans, Ae. taeniorhynchus,* and *Ae. cantator* eggs was studied by soil core sampling (Bidlingmayer and Schoof 1956, Ritchie and Johnson 1991). A single 324 cm^3 soil core is taken at 5 m intervals within the defined transect of each selected salt marsh patch. Soil cores are taken by cutting the vegetation to within 1" of the soil and cutting the outline of the core with a 4" x 2" hole saw bit. The soil core is then removed from the soil by cutting the vegetation roots with hedge shears. Each soil core is then placed into a clear 500 ml (10 cm diameter) container, labeled (location, date) and stored in an insulated cooler for transport.

Determination of presence/absence of viable eggs

- Each soil core needs to be incubated uncovered at 26^{o}C under a 14:10 (light:dark) photoperiod for at least 3 d to allow recently laid eggs to mature or break "diapause" (Moore and Bickley 1966, Ritchie and Johnson 1991). Samples are then flooded and larvae counted after 72 h. Based on previous reports of incomplete hatch from single flood events (Travis 1953, Andreadis 1990), a second series of drying, incubation, and flooding is necessary for all soil cores in which the first flooding produced larvae to maximize the number of larvae observed. After counting, larvae should be maintained on a laboratory diet of fish protein (Tetramin Fish Flakes) until they reach the 4th instar stage, after which they will then be stored in 70% EtOH for later morphological/molecular identification.

3. Field Data: LathropSC_2019PondEdgePoints_012021.csv

General description of data:
A number of salt marsh ponds were sampled and surveyed at 8 sites on a weekly basis in New Jersey between June and August 2019. The number of ponds sampled per site varied between 1 and 4 ponds. These ponds were visited weekly to collect water samples to be tested for environmental DNA to determine presence of salt marsh mosquito larvae and to collect other related environmental data. This data set contains the geographic locations of the edges and depths of the surveyed ponds.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- The X, Y, and Z, coordinates were collected using a Real Time Kinematic Global Positioning System. The accuracy of the unit was vertically 2-3cm and horizontally 1cm.
- These data were collected in conjunction with water samples and environmental data from 1-4 ponds at each site.
- The environmental data collected weekly from the ponds described in this data may be requested by going to the data page listed at the top of this document.
- Access to the results of the weekly environmental DNA analysis for presence of mosquito larvae may be requested by going to the data page listed at the top of this document.
- Other data connected to this field campaign regarding conditions at each site on each day of visitation may be requested by going to the data page listed at the top of this document.
- Data Projection: NAD_1983_UTM_Zone_18N

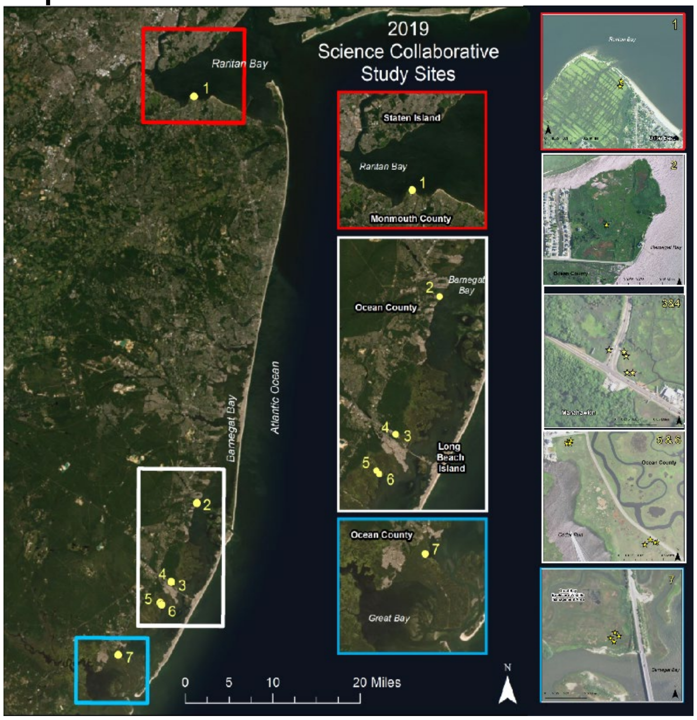
Data collection period:
June – August 2019

Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
MYIE	2019	-74.34327432	39.5661393	Little Egg Harbor Twp, New Jersey
SPH	2019	-74.17334792	39.80769435	Sands Point Harbor, Holiday Beach, New Jersey
MKNE	2019	-74.22890806	39.68194312	Manahawkin, New Jersey
MKNW	2019	-74.22937787	39.68219932	Manahawkin, New Jersey
CDRN	2019	-74.25325582	39.64906169	Manahawkin, New Jersey
CDRS	2019	-74.24989539	39.6459684	Manahawkin, New Jersey
MON	2019	-74.17657948	40.45595222	Union Beach, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection



4. Field Data: LathropSC_2019SiteLevelWeeklyData_012021.csv

General description of data:
A number of salt marsh ponds were sampled and surveyed at 8 sites on a weekly basis in New Jersey between June and August 2019. The number of ponds sampled per site varied between 1 and 4 ponds. These ponds were visited weekly to collect water samples to be tested for environmental DNA to determine presence of salt marsh mosquito larvae and to collect other related environmental data. This data set is information regarding time of visit and weather of the given day at the various sites.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- The data is information recorded on time of collection, air temperature, weather conditions at each site on each day of visitation.
- These data were collected in conjunction with water samples and environmental data from 1-4 ponds at each site.
- The water samples were tested for the presence of environmental DNA.
- For locations of these ponds please see data archived at the data page listed at the top of this document.
- The environmental data collected weekly from the ponds described in this dataset may be requested by going to the data page listed at the top of this document.
- Access to the results of the weekly environmental DNA analysis for presence of mosquito larvae may be requested by going to the data page listed at the top of this document.

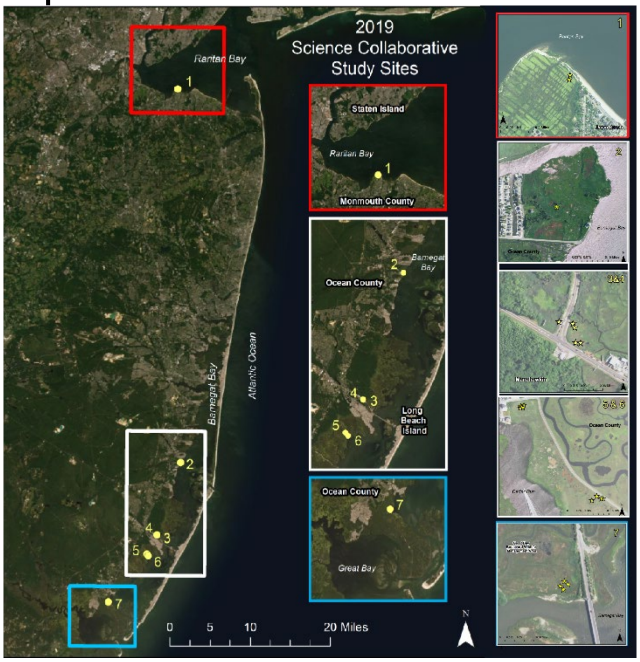
Data collection period:
June – August 2019

Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
MYIE	2019	-74.34327432	39.5661393	Little Egg Harbor Twp, New Jersey
SPH	2019	-74.17334792	39.80769435	Sands Point Harbor, Holiday Beach, New Jersey
MKNE	2019	-74.22890806	39.68194312	Manahawkin, New Jersey
MKNW	2019	-74.22937787	39.68219932	Manahawkin, New Jersey
CDRN	2019	-74.25325582	39.64906169	Manahawkin, New Jersey
CDRS	2019	-74.24989539	39.6459684	Manahawkin, New Jersey
MON	2019	-74.17657948	40.45595222	Union Beach, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection



5. Field Data: LathropSC_2019WeeklyDataCollection_012021.csv

General description of data:
A number of salt marsh ponds were sampled and surveyed at 8 sites on a weekly basis between June and August 2019. The number of ponds sampled per site varied between 1 and 4 ponds. Each week a 200ml water sample was taken for each pond to be analyzed for environmental DNA to determine presence of salt marsh mosquito larvae. This data set contains environmental variables including water temperature, salinity, vegetation, pond depth, and observational presence of larvae, mosquitos, and fish in or around the pond that were collected weekly along with the water samples.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- These data were collected in conjunction with water samples and environmental data from 1-4 ponds at each site.
- The water samples were tested for the presence of environmental DNA.
- Water temperature and salinity were collected with a calibrated probe
- Vegetation and presence of larvae, mosquitoes, and fish were observed by trained field technicians.
- Pond depth was collected at the same points the water samples were collected and averaged.
- For locations of these ponds please see data archived at the data page listed at the top of this document.
- Access to the results of the weekly environmental DNA analysis for presence of mosquito larvae may be requested by going to the data page listed at the top of this document.
- Other data connected to this field campaign regarding conditions at each site on each day of visitation may be requested by going to the data page listed at the top of this document.

Data collection period:
June – August 2019

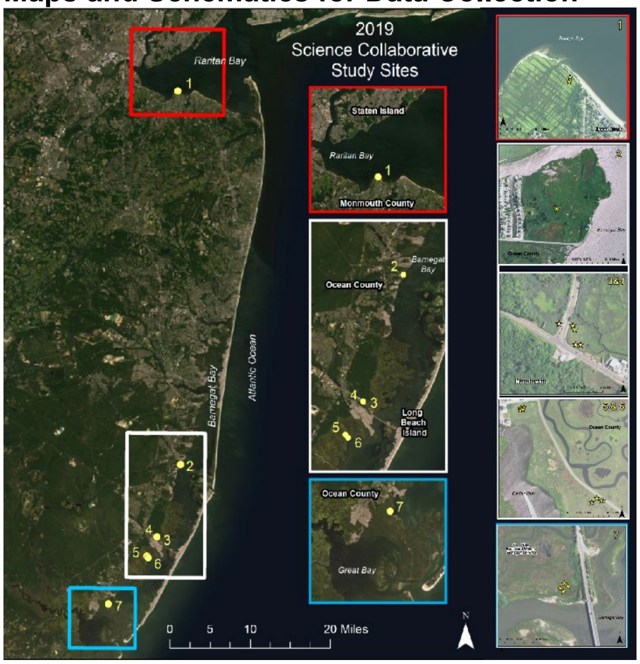
Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
MYIE	2019	-74.34327432	39.5661393	Little Egg Harbor Twp, New Jersey
SPH	2019	-74.17334792	39.80769435	Sands Point Harbor, Holiday Beach, New Jersey
MKNE	2019	-74.22890806	39.68194312	Manahawkin, New Jersey
MKNW	2019	-74.22937787	39.68219932	Manahawkin, New Jersey
CDRN	2019	-74.25325582	39.64906169	Manahawkin, New Jersey
CDRS	2019	-74.24989539	39.6459684	Manahawkin, New Jersey

MON	2019	-74.17657948	40.45595222	Union Beach, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection



6. Field Data: LathropSC_2019Weekly_eDNAResults_012021.csv

General description of data:
A number of salt marsh ponds were sampled and surveyed at 8 sites on a weekly basis between June and August 2019. The number of ponds sampled per site varied between 1 and 4 ponds. Each week a 200ml water sample was taken for each pond to be analyzed for environmental DNA to determine presence of salt marsh mosquito larvae. This data set contains environmental variables including water temperature, salinity, vegetation, pond depth, and observational presence of larvae, mosquitos, and fish in or around the pond that were collected weekly along with the water samples.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- These data were collected in conjunction with water samples and environmental data from 1-4 ponds at each site.
- The environmental DNA analyses was carried out on 200ml water samples that were collected from a set of ponds that were sampled by collecting 50ml water samples from 4 locations within each pond corresponding to the cardinal directions.
- The environmental DNA analysis involved the development of species-specific real-time qPCR assays for *Ae. sollicitans, Ae. taeniorhynchus, Ae. cantator,* and *Culex salinarius,* and. These are the most common salt marsh mosquitoes in New Jersey and the Middle Atlantic US states. To request these assays please go to the data page listed at the top of this document
- To test for aquatic DNA, collected grab samples from the field were filtered through a 2 and a 10 μm polycarbonate track etch (PCTE) filters. These filter were then used for a qPCR analysis utilizing the developed assays.
- For locations of these ponds please see data archived at the data page listed at the top of this document.
- The environmental data collected weekly from the ponds described in this data may be requested by going to the data page listed at the top of this document.
- Other data connected to this field campaign regarding conditions at each site on each day of visitation may be requested by going to the data page listed at the top of this document.

Data collection period:
June – August 2019

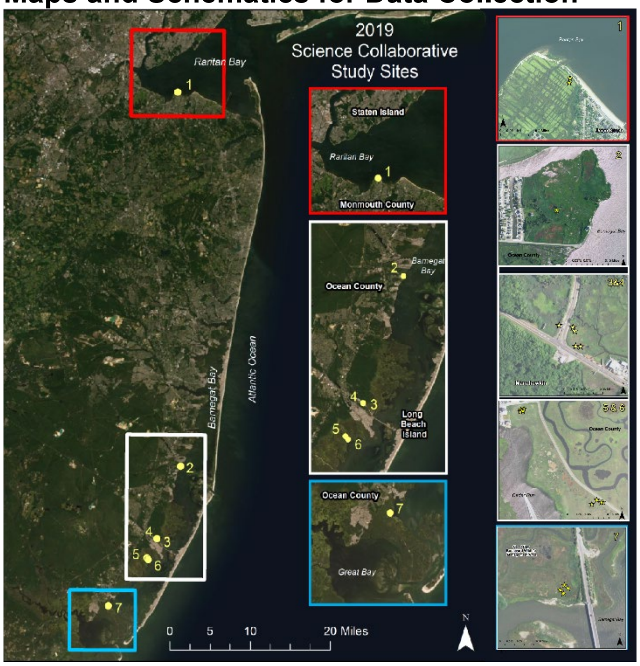
Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
MYIE	2019	-74.34327432	39.5661393	Little Egg Harbor Twp, New Jersey
SPH	2019	-74.17334792	39.80769435	Sands Point Harbor, Holiday Beach, New Jersey
MKNE	2019	-74.22890806	39.68194312	Manahawkin, New Jersey

MKNW	2019	-74.22937787	39.68219932	Manahawkin, New Jersey
CDRN	2019	-74.25325582	39.64906169	Manahawkin, New Jersey
CDRS	2019	-74.24989539	39.6459684	Manahawkin, New Jersey
MON	2019	-74.17657948	40.45595222	Union Beach, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection



7. Field Data: LathropSC_2020DroneandHandCollectionPoints_012021.csv

General description of data:
Between June and August 2020, water samples were collected from a number of salt marsh ponds at various locations in New Jersey with both a drone based collection method from a distance and by approaching the pond (referred to the "hand" method). The between 50ml and 200ml of collected water samples were analyzed for the presence of salt marsh mosquito larvae DNA via environmental DNA analyses. This data contains the geographic locations of the sampled ponds and collected environmental information including water temperature, salinity, and surrounding vegetation type.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- At each pond described within this dataset, 50ml – 200ml water samples were collected by both a drone based collection method from a distance and by approaching the pond.
- The drone based method involved a water collection rig created by Gregory M. Williams, PhD, Superintendent of Mosquito and Vector Control with Hudson Regional Health Commission. The rig involves attaching a 50ml falcon tube to a line hanging from a drone which is then flown over a pond and dunked into the water filling up the falcon tube with a water sample. The tubes were cleaned between ponds to prevent contamination.
- The in person collection method (referred to the "hand" method) was done by a field crew member walking up to the pond and dipping a 50ml falcon tube into the pond.
- The in person field team member also collected information on water temperature, salinity, and vegetation type surrounding the pond. Water temperature and salinity were collected with a calibrated probe. The vegetation type was determined by the trained field team member.
- To request access to the results of the environmental DNA analyses for presence of salt marsh mosquito larvae go to the data page listed at the top of this document.
- Data Projection: GCS_North_American_1983

Data collection period:
June – August 2020

Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
SH	2020	-74.082271	40.754223	Laurel Hill Park, Hoboken, New Jersey
CI	2020	-74.12106	39.97526	Cattus Island Park, Toms River, New Jersey
BC	2020	-74.11788	40.78536	North Arlington , New Jersey
DS	2020	-74.11823	40.78712	North Arlington , New Jersey
WG	2020	-74.04095	40.81002	Rutherford, New Jersey
FNWR	2020	-74.42059	39.585733	Little Egg Harbor Twp, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection

8. Field Data: LathropSC_2020_eDNAResults_012021.csv

General description of data:
Between June and August 2020, water samples were collected from a number of salt marsh ponds at various locations in New Jersey with both a drone based collection method from a distance and by approaching the pond (referred to the "hand" method). The between 50ml and 200ml of collected water samples were analyzed for the presence of salt marsh mosquito larvae DNA via environmental DNA analyses. This data set contains the results of this environmental DNA analyses.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- Each environmental DNA analyses was carried out on 50ml – 200ml water samples that were collected from a set of ponds that were sampled by both a drone based collection method from a distance and by approaching the pond.
- The environmental DNA analysis involved the development of species-specific real-time qPCR assays for *Ae. sollicitans, Ae. taeniorhynchus, Ae. cantator, Culex salinarius,* and *Anopheles bradleyi.* These are the most common salt marsh mosquitoes in New Jersey and the Middle Atlantic US states. To access these assays please contact Dina Fonseca (dina.fonseca@rutgers.edu)
- To test for aquatic DNA, collected grab samples from the field were filtered through a 2 and a 10 μm polycarbonate track etch (PCTE) filters. These filter were then used for a qPCR analysis utilizing the developed assays.
- The drone based method involved a water collection rig created by Gregory M. Williams, PhD, Superintendent of Mosquito and Vector Control with Hudson Regional Health Commission. The rig involves attaching a 50ml falcon tube to a line hanging from a drone which is then flown over a pond and dunked into the water filling up the falcon tube with a water sample. The tubes were cleaned between ponds to prevent contamination.
- The in person collection method (referred to the "hand" method) was done by a field crew member walking up to the pond and dipping a 50ml falcon tube into the pond.
- The in person field team member also collected information on water temperature, salinity, and vegetation type surrounding the pond.
- The locations of the ponds sampled can be requested at the data page listed at the top of this document.

Data collection period:
June – August 2020

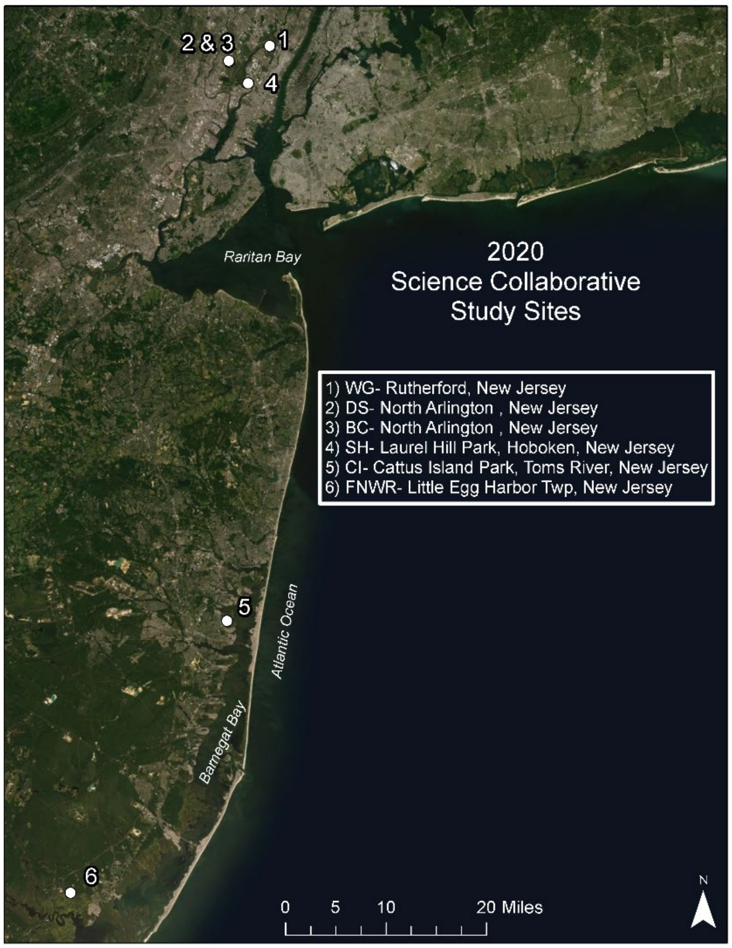
Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
SH	2020	-74.082271	40.754223	Laurel Hill Park, Hoboken, New Jersey
CI	2020	-74.12106	39.97526	Cattus Island Park, Toms River, New Jersey
BC	2020	-74.11788	40.78536	North Arlington , New Jersey
DS	2020	-74.11823	40.78712	North Arlington , New Jersey

WG	2020	-74.04095	40.81002	Rutherford, New Jersey
FNWR	2020	-74.42059	39.585733	Little Egg Harbor Twp, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection



9. Field Data: LathropSC_2017_FieldDataSheets.pdf

General description of data:
This pdf includes scanned copies of original field data sheets collected during a field campaign on sites in the coastal salt marshes of New Jersey between June and August of 2017. This data was collected using a gridded transect method with transects set 5m apart, max 10 points per transect for an area of 50m^2. At each point along the transect, a 324 cm^3 soil core was collected for lab analysis to determine salt marsh mosquito eggs. The data sheets compiled within this pdf were used to collect the bearing capacity and vegetation species surrounding the transect point.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- The bearing capacity was collected using a drop hammer and pvc pipe with a closed end cap.
- The vegetation species information was collected using trained visual observation.
- To see a digitized version of the information within these data sheets, locations of the transect points, and results of the lab analysis for salt marsh mosquito eggs, request the data by going to the data page listed at the top of this document.

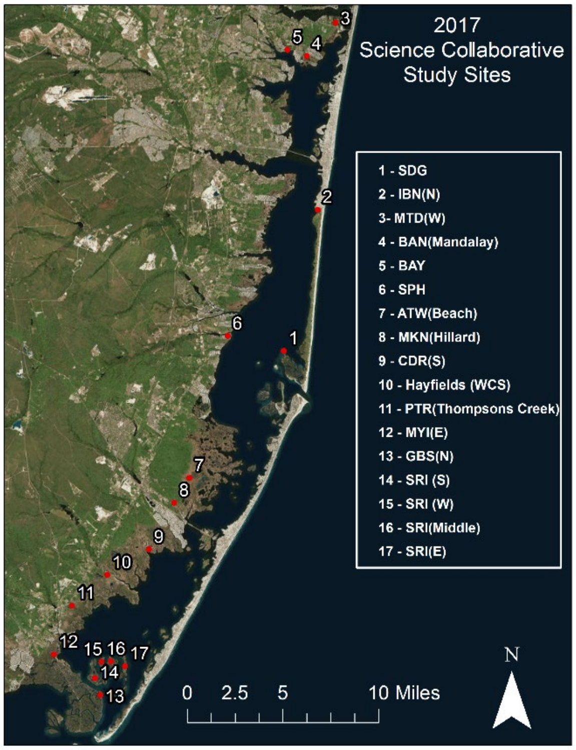
Data collection period:
June – August 2017

Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
SDG	2017	-74.11822284	39.79662282	Sedge Island, Island Beach State Park, Seaside Park, New Jersey
IBN(N)	2017	-74.08419283	39.90345214	Island Beach State Park, Seaside Park, New Jersey
MTD(W)	2017	-74.06571061	40.04515789	Mantoloking, New Jersey
BAN(Mandalay)	2017	-74.09416015	40.01994797	Baywood, New Jersey
BAY	2017	-74.1132976	40.02489651	Cherry Quay, New Jersey
SPH	2017	-74.1732803	39.80808886	Sands Point Harbor, Holiday Beach, New Jersey
ATW(Beach)	2017	-74.21132981	39.70061348	Manahawkin, New Jersey
MKN(Hilliard)	2017	-74.22631508	39.68168259	Manahawkin, New Jersey
CDR(S)	2017	-74.25130816	39.64651361	Manahawkin, New Jersey
WCS(Hayfields)	2017	-74.29226648	39.6272036	Eagleswood Twp, New Jersey
PTR	2017	-74.32692058	39.60395053	Tuckerton, New Jersey
MYI(E)	2017	-74.34472297	39.56688926	Little Egg Harbor Twp, New Jersey
GBS(N)	2017	-74.29943001	39.53610268	Little Egg Harbor Twp, New Jersey
SRI(S)	2017	-74.30466021	39.54880096	Little Egg Harbor Twp, New Jersey
SRI(W)	2017	-74.29811678	39.56119494	Little Egg Harbor Twp, New Jersey
SRI(Middle)	2017	-74.28902777	39.56165842	Little Egg Harbor Twp, New Jersey
SRI(E)	2017	-74.27531263	39.55791471	Little Egg Harbor Twp, New Jersey

File format:
Adobe PDF

Maps and Schematics for Data Collection



10. Field Data: LathropSC_2018_FieldDataSheets.pdf

General description of data:
This pdf includes scanned copies of original field data sheets collected during a field campaign on sites in the coastal salt marshes of New Jersey between June and August of 2018. This data was collected using a gridded transect method with transects set 5m apart, max 10 points per transect for an area of $50m^2$. At each point along the transect, a 324 cm^3 soil core was collected for lab analysis to determine salt marsh mosquito eggs. The data sheets compiled within this pdf were used to collect the bearing capacity and vegetation species surrounding the transect point.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:

- The bearing capacity was collected using a drop hammer and pvc pipe with a closed end cap.
- The vegetation species information was collected using trained visual observation.
- To see a digitized version of the information within these data sheets, locations of the transect points, and results of the lab analysis for salt marsh mosquito eggs, request the data by going to the data page listed at the top of this document.

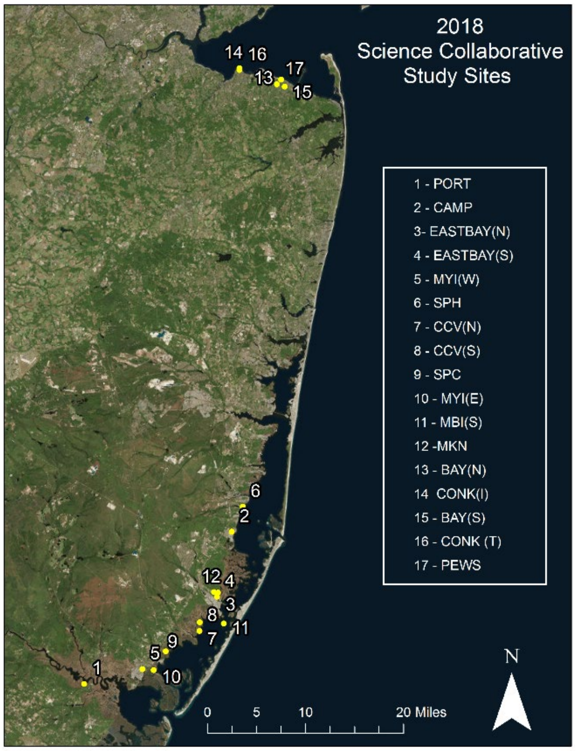
Data collection period:
June – August 2018

Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
SPH	2018	-74.1732803	39.80808886	Sands Point Harbor, Holiday Beach, New Jersey
MKN(Hilliard)	2018	-74.22631508	39.68168259	Manahawkin, New Jersey
MYI(E)	2018	-74.34472297	39.56688926	Little Egg Harbor Twp, New Jersey
PORT	2018	-74.47737766	39.54665689	Port Republic, New Jersey
CAMP	2018	-74.19439094	39.77119286	Waretown, New Jersey
EASTBAY (N)	2018	-74.2214922	39.68141902	Manahawkin, New Jersey
EASTBAY (S)	2018	-74.22312271	39.67513146	Manahawkin, New Jersey
MYIW	2018	-74.3663828	39.56858941	Little Egg Harbor Twp,, New Jersey
CCV(N)	2018	-74.25652521	39.63730669	Eagleswood Twp, New Jersey
CCV(S)	2018	-74.25676297	39.6246881	Eagleswood Twp, New Jersey
SPC	2018	-74.32156103	39.59452384	Tuckerton, New Jersey
MBI(S)	2018	-74.21024985	39.6357283	Long Beach Twp, New Jersey
BAY(N)	2018	-74.09581956	40.43880718	Port Monmouth, New Jersey
CONK (I)	2018	-74.17648521	40.45590636	Union Beach, New Jersey
BAY(S)	2018	-74.08938527	40.42859732	Port Monmouth, New Jersey
CONK (T)	2018	-74.17649283	40.45320781	Union Beach, New Jersey
PEWS	2018	-74.10409919	40.43192601	Port Monmouth, New Jersey

File format:
Adobe PDF

Maps and Schematics for Data Collection



11. Field Data: LathropSC_2019FieldDataSheets.pdf

General description of data:
This pdf includes scanned copies of original field data sheets collected during a field campaign on sites in the coastal salt marshes of New Jersey between June and August of 2019. A number of salt marsh ponds were sampled and surveyed at 8 sites on a weekly basis between June and August 2019. The number of ponds sampled per site varied between 1 and 4 ponds. Each week a 200ml water sample was taken for each pond to be analyzed for environmental DNA to determine presence of salt marsh mosquito larvae. This data set contains environmental variables including water temperature, salinity, vegetation, pond depth, and observational presence of larvae, mosquitos, and fish in or around the pond that were collected weekly along with the water samples.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- These data were collected in conjunction with water samples and environmental data from 1-4 ponds at each site.
- The water samples were tested for the presence of environmental DNA.
- Water temperature and salinity were collected with a calibrated probe
- Vegetation and presence of larvae, mosquitoes, and fish were observed by trained field technicians.
- Pond depth was collected at the same points the water samples were collected and averaged.
- For locations of these ponds please see data archived at the data pate listed at the top of this document.
- Results of the weekly environmental DNA analysis for presence of mosquito larvae may be requested by going to the data page listed at the top of this document.
- Other data connected to this field campaign regarding conditions at each site on each day of visitation may be requested by going to the data page listed at the top of this document.

Data collection period:
June – August 2019

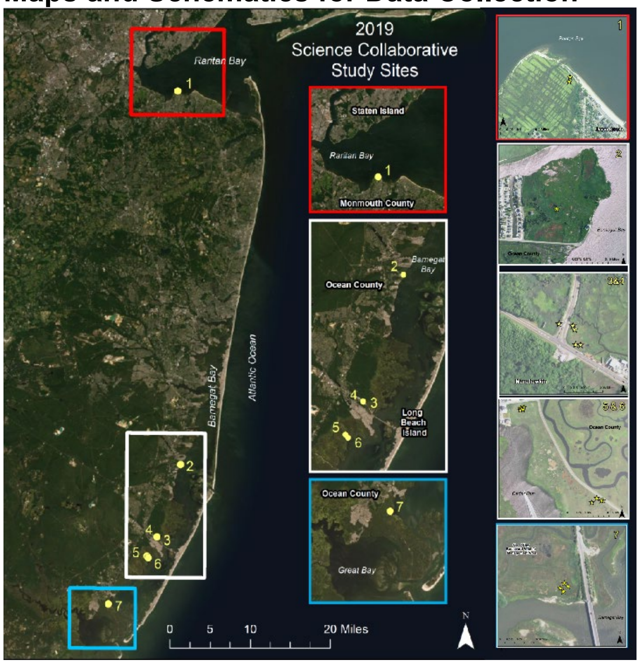
Geographic extent:

Code Name	Year Surveyed	Center Point X	Center Point Y	Nearest Town
MYIE	2019	-74.34327432	39.5661393	Little Egg Harbor Twp, New Jersey
SPH	2019	-74.17334792	39.80769435	Sands Point Harbor, Holiday Beach, New Jersey
MKNE	2019	-74.22890806	39.68194312	Manahawkin, New Jersey

MKNW	2019	-74.22937787	39.68219932	Manahawkin, New Jersey
CDRN	2019	-74.25325582	39.64906169	Manahawkin, New Jersey
CDRS	2019	-74.24989539	39.6459684	Manahawkin, New Jersey
MON	2019	-74.17657948	40.45595222	Union Beach, New Jersey

File format:
Adobe PDF

Maps and Schematics for Data Collection



12. Forest Edge Migration: LathropSC_DSAS_BaselinesforAllSites.shp

General description of data:
Extensive mapping of the marsh-upland edge at eight locations along the Delaware Bayshore and Atlantic back-bay marshes was undertaken that documents how dynamic this landscape change can be with the forest edge retreating inland and new marsh forming in its place. The rate of this forest edge retreat was analyzed with the use of the USGS Digital Shoreline Analysis System (DSAS). This software calculates rates of change statistics and is typically used to quantify the erosion or accretion of shorelines, or in this case, the movement treeline. DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change. This shapefile contains the baselines for each of the sites used in the DSAS analysis

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans*, *Aedes taeniorhynchus*, *aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- Historical aerial imagery for years between 1940 and 2015 was compiled and were assessed for accurate geo-registration to the New Jersey State Plane projection system.
- DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change.
- At each of the eight sites, the seaward forest edge (henceforth referred to as the “treeline”) was visualized on screen and heads- up digitized at a 1:5000 scale. These digitized lines were checked for accuracy at a 1:2,500 scale.
- To request access to the treelines used in this DSAS analysis go to the data page listed at the top of this document.
- To request access to DSAS outputs go to the data page listed at the top of this document.
- Data Projection: NAD_1983_UTM_Zone_18N

Data collection period:
1940-2015, Compiled and analyzed in 2019.

Geographic extent:

Code Name	Center Point X	Center Point Y	Nearest Town
Reedy Creek	-74.09139366	40.03505315	Mantoloking, New Jersey
Cattus Island	-74.12156158	39.98499683	Cattus Island Park, Toms River, New Jersey
Nantuxent	-75.20807891	39.3049362	Nantuxent, Newport, New Jersey
Little Egg	-74.3575815	39.56699015	Little Egg Harbor Twp, New Jersey
Belleplain	-74.86095267	39.18754671	Dennisville, New Jersey
Cape Shore	-74.90647305	39.06806669	Cape May, New Jersey
Delmont	-74.96214514	39.21667202	Delmont, New Jersey
Fortescue	-75.16898604	39.2621514	Fortescue, New Jersey

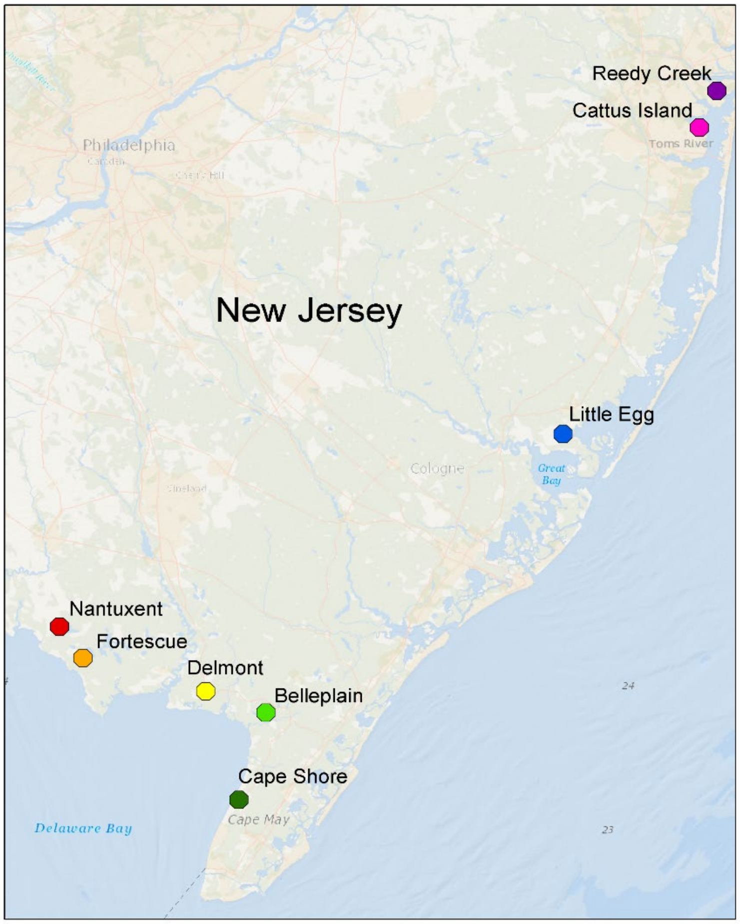
File format:

ESRI ArcGIS Shapefile

Shapefile named LathropSC_DSAS_BaselinesforAllSites.shp. Please note: you must download all files related to this shapefile including: .cpg, .dbf .prj, .sbn, .sbx, .shp, and .shx.

Maps and Schematics for Data Collection

Forest Edge Migration Study Sites



13. Forest Edge Migration: LathropSC_DSAS_TreelinesforAllSites.shp

General description of data:
Extensive mapping of the marsh-upland edge at eight locations along the Delaware Bayshore and Atlantic back-bay marshes was undertaken that documents how dynamic this landscape change can be with the forest edge retreating inland and new marsh forming in its place. The rate of this forest edge retreat was analyzed with the use of the USGS Digital Shoreline Analysis System (DSAS). This software calculates rates of change statistics and is typically used to quantify the erosion or accretion of shorelines, or in this case, the movement treeline. DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change. This shapefile contains the digitized seaward forest edge (or "treelines") for each of the sites used in the DSAS analysis

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:

- Historical aerial imagery for years between 1940 and 2015 was compiled and were assessed for accurate geo-registration to the New Jersey State Plane projection system.
- DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change.
- At each of the eight sites, the seaward forest edge (also referred to as the "treeline") was visualized on screen and heads- up digitized at a 1:5000 scale. These digitized lines were checked for accuracy at a 1:2,500 scale.
- To request access to the baselines used in this DSAS analysis, go to data page listed at the top of this document.
- To request access to the DSAS outputs, go to data page listed at the top of this document.
- Data Projection: NAD_1983_UTM_Zone_18N

Data collection period:
1940-2015, Compiled and analyzed in 2019.

Geographic extent:

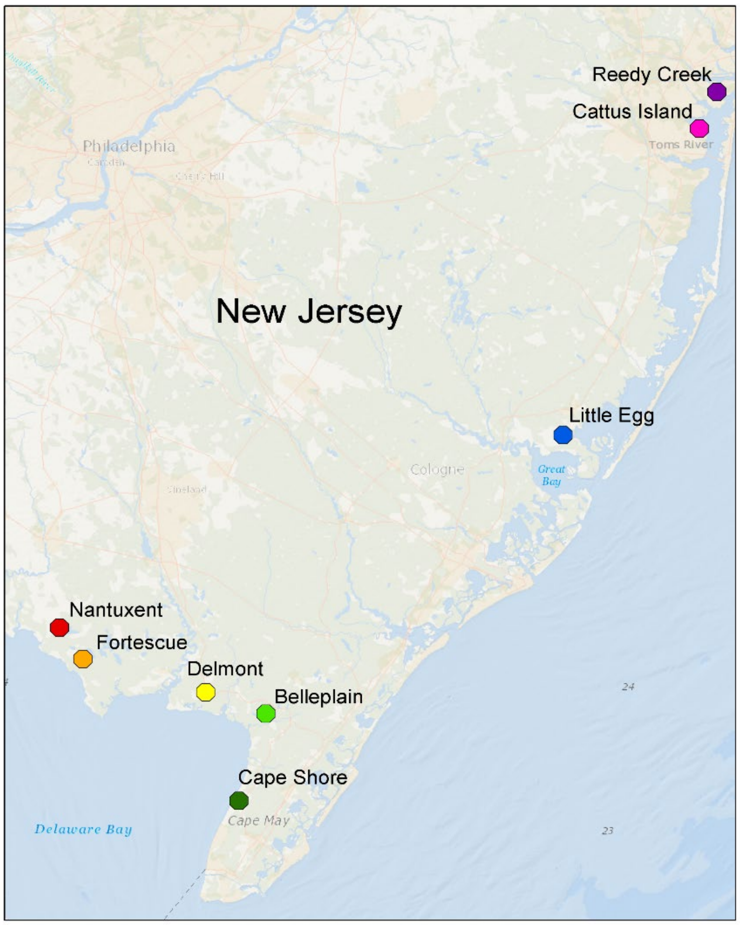
Code Name	Center Point X	Center Point Y	Nearest Town
Reedy Creek	-74.09139366	40.03505315	Mantoloking, New Jersey
Cattus Island	-74.12156158	39.98499683	Cattus Island Park, Toms River, New Jersey
Nantuxent	-75.20807891	39.3049362	Nantuxent, Newport, New Jersey
Little Egg	-74.3575815	39.56699015	Little Egg Harbor Twp, New Jersey
Belleplain	-74.86095267	39.18754671	Dennisville, New Jersey
Cape Shore	-74.90647305	39.06806669	Cape May, New Jersey
Delmont	-74.96214514	39.21667202	Delmont, New Jersey
Fortescue	-75.16898604	39.2621514	Fortescue, New Jersey

File format:
ESRI ArcGIS Shapefile

Shapefile named LathropSC_DSAS_TreelinesforAllSites.shp. Please note: you must download all files related to this shapefile including: .cpg, .dbf .prj, .sbn, .sbx, .shp, and .shx.

Maps and Schematics for Data Collection

Forest Edge Migration Study Sites



14. Forest Edge Migration: LathropSC_DSAS_InterseptOutputs_forAllSites.csv

General description of data:
Extensive mapping of the marsh-upland edge at eight locations along the Delaware Bayshore and Atlantic back-bay marshes was undertaken that documents how dynamic this landscape change can be with the forest edge retreating inland and new marsh forming in its place. The rate of this forest edge retreat was analyzed with the use of the USGS Digital Shoreline Analysis System (DSAS). This software calculates rates of change statistics and is typically used to quantify the erosion or accretion of shorelines, or in this case, the movement treeline. DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change. The DSAS software computes the distance between the baseline and the digitized treelines by finding where these two lines intersect a transect. This data set contains all of the positional information about each transect/shoreline intersections

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator,* salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- Historical aerial imagery for years between 1940 and 2015 was compiled and were assessed for accurate geo-registration to the New Jersey State Plane projection system.
- DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change.
- At each of the eight sites, the seaward forest edge (also referred to as the "treeline") was visualized on screen and heads- up digitized at a 1:5000 scale. These digitized lines were checked for accuracy at a 1:2,500 scale.
- To request access to the baselines used in this DSAS analysis, go to the data page listed at the top of this document.
- To request access to other DSAS outputs, go to the data page at the top of this document.
- Data Projection: NAD_1983_UTM_Zone_18N

Data collection period:
1940-2015, Compiled and analyzed in 2019.

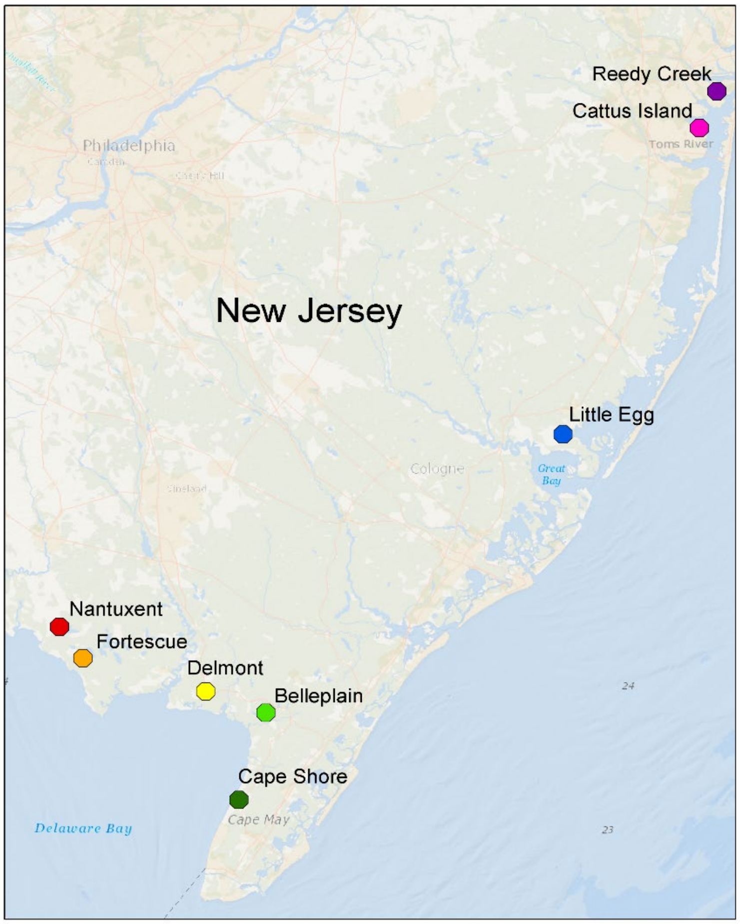
Geographic extent:

Code Name	Center Point X	Center Point Y	Nearest Town
Reedy Creek	-74.09139366	40.03505315	Mantoloking, New Jersey
Cattus Island	-74.12156158	39.98499683	Cattus Island Park, Toms River, New Jersey
Nantuxent	-75.20807891	39.3049362	Nantuxent, Newport, New Jersey
Little Egg	-74.3575815	39.56699015	Little Egg Harbor Twp, New Jersey
Belleplain	-74.86095267	39.18754671	Dennisville, New Jersey
Cape Shore	-74.90647305	39.06806669	Cape May, New Jersey
Delmont	-74.96214514	39.21667202	Delmont, New Jersey
Fortescue	-75.16898604	39.2621514	Fortescue, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection

Forest Edge Migration Study Sites



15. Forest Edge Migration: LathropSC_DSAS_RateOutputs_forAllSites.csv

General description of data:
Extensive mapping of the marsh-upland edge at eight locations along the Delaware Bayshore and Atlantic back-bay marshes was undertaken that documents how dynamic this landscape change can be with the forest edge retreating inland and new marsh forming in its place. The rate of this forest edge retreat was analyzed with the use of the USGS Digital Shoreline Analysis System (DSAS). This software calculates rates of change statistics and is typically used to quantify the erosion or accretion of shorelines, or in this case, the movement treeline. DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change. The DSAS software computes the distance between the baseline and the digitized treelines by finding where these two lines intersect a transect. This data set contains all of the rate and distance measurement results.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:
- Historical aerial imagery for years between 1940 and 2015 was compiled and were assessed for accurate geo-registration to the New Jersey State Plane projection system.
- DSAS uses the digitized lines from the imagery and an arbitrarily created baseline to compute rates of change.
- At each of the eight sites, the seaward forest edge (also referred to as the “treeline”) was visualized on screen and heads- up digitized at a 1:5000 scale. These digitized lines were checked for accuracy at a 1:2,500 scale.
- To request access to the baselines used in this DSAS analysis, go to the data page listed at the top of this document.
- To request access to other DSAS outputs, go to the data page listed at the top of this document.
- Data Projection: NAD_1983_UTM_Zone_18N

Data collection period:
1940-2015, Compiled and analyzed in 2019.

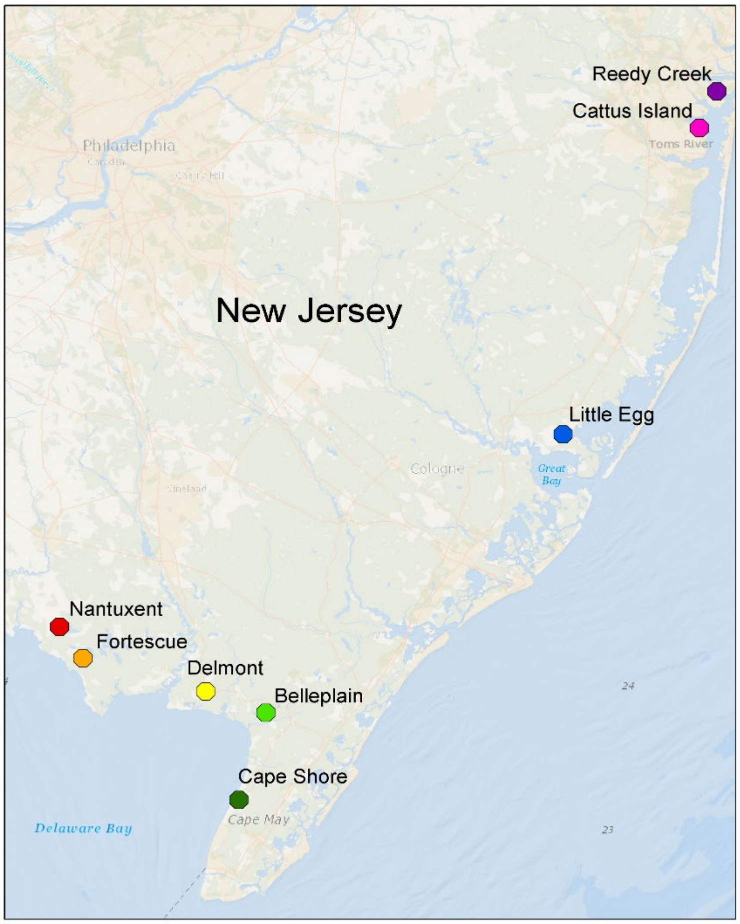
Geographic extent:

Code Name	Center Point X	Center Point Y	Nearest Town
Reedy Creek	-74.09139366	40.03505315	Mantoloking, New Jersey
Cattus Island	-74.12156158	39.98499683	Cattus Island Park, Toms River, New Jersey
Nantuxent	-75.20807891	39.3049362	Nantuxent, Newport, New Jersey
Little Egg	-74.3575815	39.56699015	Little Egg Harbor Twp, New Jersey
Belleplain	-74.86095267	39.18754671	Dennisville, New Jersey
Cape Shore	-74.90647305	39.06806669	Cape May, New Jersey
Delmont	-74.96214514	39.21667202	Delmont, New Jersey
Fortescue	-75.16898604	39.2621514	Fortescue, New Jersey

File format:
CSV(Comma Separated Values) tabular data

Maps and Schematics for Data Collection

Forest Edge Migration Study Sites



16. Marsh Change Mapping: LathropSC_ NewJerseyCoastalMarshChangeMaps.tif

General description of data:
To project future marsh change under projected sea level rise (SLR), a composite marsh change and marsh retreat model was employed to project the status of coastal marshes for the Year 2050. This model includes additional locally derived data sets to project changes at the marsh shoreline, the marsh interior platform and upland edge. This mapping product was added on NJFloodMapper (www.njfloodmapper.org) in January 2020.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:

- A marsh change data product provided by the NOAA Office for Coastal Management that was developed for the US Digital Coast Sea Level Rise Viewer (https://coast.noaa.gov/digitalcoast/tools/slr.html) was employed as a starting point. The NOAA marsh change product, based on SLAMM, identifies coastal marsh areas (includes estuarine and brackish marsh areas dominated by Spartina alterniflora, Spartina patens and Phragmites australis) that may be vulnerable for conversion to either non-vegetated or open water.
- Three scenarios of sea level rise (1’, 2’ and 3’) out to the Year 2050 were examined. Based on the consensus SLR estimates determined for New Jersey (Lathrop, Kopp and Kaplan, 2014), 2.5’, 5 and 7’ Year 2100 SLR scenarios were employed. These levels were then scaled to the Year 2050, equating to 1’, 2’ and 3’ of SLR (at 2050) using the NOAA guidance 2017 document. A moderate accretion rate of 4mm per year was used.
- Marsh areas that are predicted to be submerged below Mean Tide Level are classed as converting to tidal flats (i.e., non-vegetated mud/peat/sand unconsolidated shore and/or tidal flat).
- When the marsh elevation dips below the Mean Low Water threshold, the marsh is classed as converting to open water.
- Further upstream along tidal rivers and creeks existing tidal brackish/freshwater marsh may convert to salt marsh when submerged below MHHW.
- As the NOAA-predicted marsh change product does not explicitly model marsh shoreline edge erosion, estimated past shoreline erosion rates to project future shoreline location. Shoreline erosion rates were determined by comparing the shoreline position changes between a baseline year during the 1970s and a contemporary year in the 2010s. The baseline shoreline was defined by the 1977 New Jersey Tidelands Claimed line. The NJDEP Tidelands claims map (http://www.nj.gov/dep/gis/tidelandsshp.html) depicts areas formerly water covered at or below mean high tide as of 1977. The marsh shoreline erosion rate was projected from the 2010 MTL shoreline gridded map for each 10 m grid cell to establish an estimated 2050 marsh shoreline location.
- Using geospatial analysis software, future marsh retreat zones were modeled for these same 1-3’ sea level rise scenarios. Those portions of New Jersey’s coastal wetland

complex that are free to retreat inland as part of the natural landward migration process were mapped and labeled as unimpeded marsh retreat zones.

- Areas where future tidal marsh retreat are blocked by developed uplands, other coastal protection structures or roads were mapped and labeled as impeded marsh retreat zones.
- The marsh retreat zone maps were combined with the marsh change maps to provide a composite view of predicted salt marsh change as of the year 2050.
- Roads were masked out based on the NJ 2012 Land Use/Land Cover
- Data Projection: NAD_1983_StatePlane_New_Jersey_FIPS_2900_Feet

Data collection period:
1977, 2010, 2015, 2017, Compiled and analyzed in 2020.

Geographic extent:
Coastal New Jersey

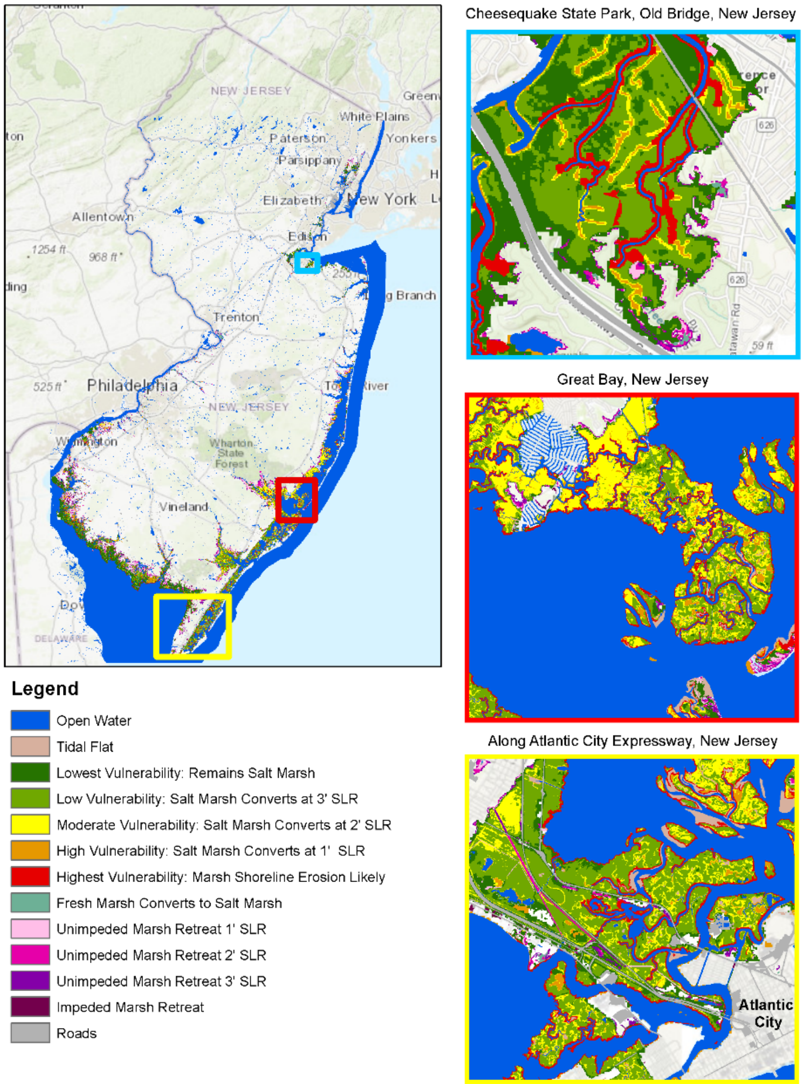
	Raster Extent	
Top Left Point	-75.5739	41.03064
Bottom Right	-73.8255	38.91908

File format:
Tagged Image Format File (TIFF or .tif)

Please note: you must download all files related to this TIFF file including the .tfw, .tiff, .tiff.aux.xml, .tiff.ovr, .tiff.vat.cpg, and .tiff.vat.dbf files.

Maps and Schematics for Data Collection

New Jersey Marsh Change Map



17. Tidal Marsh Land Cover Mapping: LathropSC_NJTidalMarsh.tif

General description of data:
This data layer represents a detailed land cover classification of New Jersey tidal marshes. This mapping includes Spartina patens-dominated High Marsh as a distinct category as this habitat type can serve a mosquito breeding hotspots.

Search keywords:
Mosquito, mosquito control, mosquitoes, *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator*, salt marsh, coastal ecology, breeding habitat, climate change, sea level rise, wetlands, salt water wetlands, gis, remote sensing

More about the data:

- The data were extracted from the NJDEP 2012 Land Use/Land Cover GIS dataset (http://www.state.nj.us/dep/gis/lulc12.html), then further edited by the Center for Remote Sensing and Spatial Analysis (CRSSA), Rutgers University, using 2017 high resolution National Agricultural Imagery Program (NAIP) digital orthophotography for the purposes of the marsh impact/marsh retreat zone modeling and analysis.
- The 2017 leaf-on National Agricultural Imagery Program (NAIP) digital orthophotography was employed in a supervised classification to map areas of “High Marsh” (i.e. *Spartina patens* and *Distichlis spicata* dominated saline marsh, Category 3)
- The resulting map was compared with nearly 3000 survey ground points where the dominant coastal marsh vegetation type was observed and recorded during the summers of 2017 and 2018.
- Data Projection: NAD_1983_UTM_Zone_18N

Data collection period:
2012 and 2017, Compiled and analyzed in 2020.

Geographic extent:
Coastal New Jersey

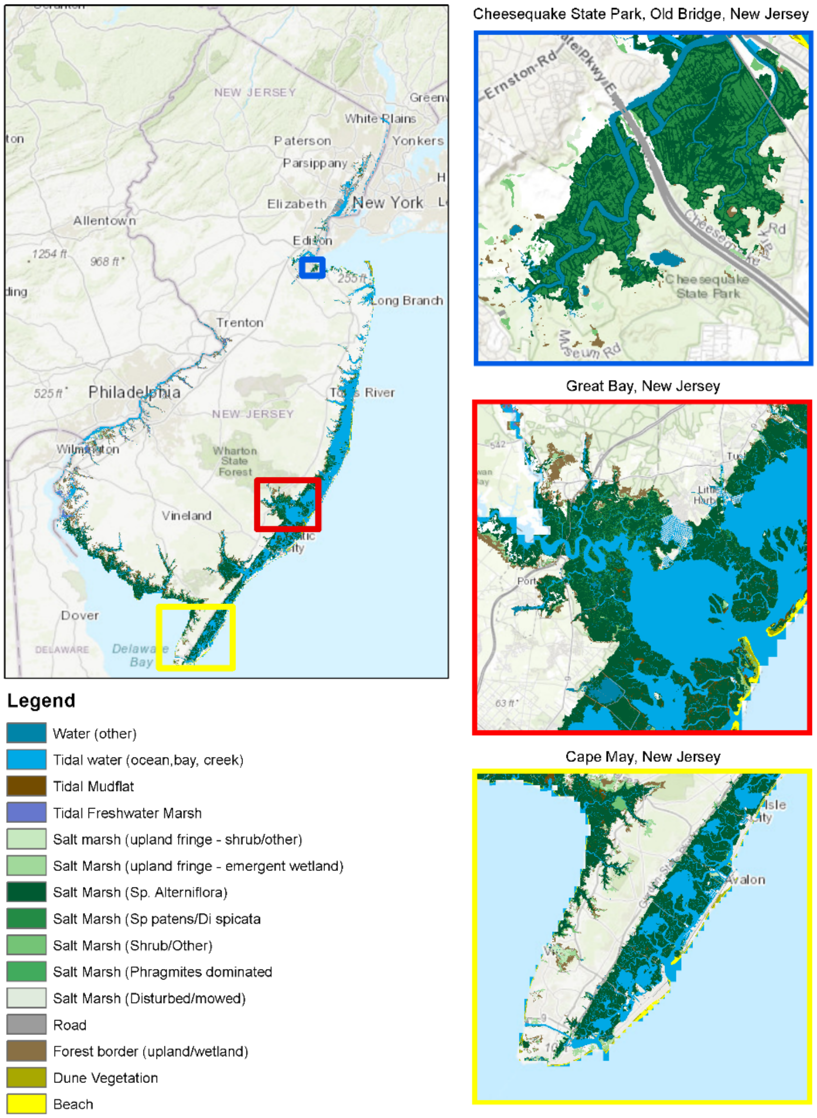
	Raster Extent	
Top Left Point	-75.5739	41.03064
Bottom Right	-73.8255	38.91908

File format:
Tagged Image Format File (TIFF or .tif)

Please note: you must download all files related to this TIFF file including the .tfw, .tiff, .tiff.aux.xml, .tiff.ovr, .tiff.vat.cpg, and .tiff.vat.dbf files.

Maps and Schematics for Data Collection

New Jersey Tidal Marsh Land Cover



18. Putative 18S ribosomal RNA and putative 28S ribosomal RNA genes, partial sequence, putative 5.8S ribosomal RNA gene, complete sequence and internal transcribed spacers 1 and 2 from *Aedes sollicitans*

General description of data:
Fragments of flanking exons and of the internal spacers 1 and 2 (ITS1 and ITS2) of the ribosomal RNA (rRNA) genes were sequenced from morphologically identified specimens obtained from multiple states across the US Atlantic coast.

More about the data:
To increase the quality and length of ITS1 and ITS2 sequences available for assay development, the ITS1 and ITS2 regions of each species were sequenced by Next-generation sequencing (NGS) on an Illumina MiSeq system. Sequencing in this way helps eliminate poor sequence reads due to multiple gene copies that may differ slightly from each other.

Data collection period: 2017-2018

File format: Genbank entry; Fasta format

Data access and archival:
This dataset has been archived and will be embargoed until the release of the peer-reviewed manuscript details the development of the qPCR rapid assay, but no later than January 2023. The curated and annotated sequences will be also be submitted to GenBank (https://www.ncbi.nlm.nih.gov/genbank/) by January 2023. Prior to this date, please contact Dina Fonseca (dina.fonseca@rutgers.edu) with questions or to request access to these data. Check the data page listed at the top of this document for updates about accessing these data.

19. Putative 18S ribosomal RNA and putative 28S ribosomal RNA genes, partial sequence, putative 5.8S ribosomal RNA gene, complete sequence and internal transcribed spacers 1 and 2 from *Aedes taeniorhynchus*

General description of data:
Fragments of flanking exons and of the internal spacers 1 and 2 (ITS1 and ITS2) of the ribosomal RNA (rRNA) genes were sequenced from morphologically identified specimens obtained from multiple states across the US Atlantic coast.

More about the data:
To increase the quality and length of ITS1 and ITS2 sequences available for assay development, the ITS1 and ITS2 regions of each species were sequenced by Next-generation sequencing (NGS) on an Illumina MiSeq system. Sequencing in this way helps eliminate poor sequence reads due to multiple gene copies that may differ slightly from each other.

Data collection period: 2017-2018

File format: Genbank entry; Fasta format

Data access and archival:
This dataset has been archived and will be embargoed until the release of the peer-reviewed manuscript details the development of the qPCR rapid assay, but no later than January 2023. Prior to this date, please contact Dina Fonseca (dina.fonseca@rutgers.edu) with questions or to request access to these data. Check the data page listed at the top of this document for updates about accessing these data.

20. Putative 18S ribosomal RNA and putative 28S ribosomal RNA genes, partial sequence, putative 5.8S ribosomal RNA gene, complete sequence and internal transcribed spacers 1 and 2 from *Aedes cantator*

General description of data:
Fragments of flanking exons and of the internal spacers 1 and 2 (ITS1 and ITS2) of the ribosomal RNA (rRNA) genes were sequenced from morphologically identified specimens obtained from multiple states across the US Atlantic coast. qPCR assays composed of two specific primers and an internal probe (Applied Biosystems TaqMan) were designed, optimized and shown to be specific for *Aedes cantator*, one of the primary salt marsh mosquito species in New Jersey and the Middle Atlantic US states.

More about the data:

- Internal rRNA spacers (un-transcribed DNA) are a common target in environmental DNA (eDNA) studies because they occur as multigene families and therefore there are multiple copies per cell which increases the probability of detection from degraded samples as expected in eDNA.
- To increase the quality and length of ITS1 and ITS2 sequences available for assay development, the ITS1 and ITS2 regions of each species were sequenced by Next-generation sequencing (NGS) on an Illumina MiSeq system. Sequencing in this way helps eliminate poor sequence reads due to multiple gene copies that may differ slightly from each other.

Data collection period: 2017-2018

File format: Genbank entry; Fasta format

Data access and archival:
Details of the assay (primer and probe sequences and amplification conditions, as well as details of how the eDNA was collected, processed and extracted) will be incorporated in a manuscript to be submitted to Molecular Ecology Resources, but no later than January 2023. Prior to this date, please contact Dina Fonseca (dina.fonseca@rutgers.edu) with questions or to request access to these data. Check the data page listed at the top of this document for updates about accessing these data.

21. Mosquito qPCR Assays for *Aedes sollicitans, Aedes taeniorhynchus, Aedes cantator* and *Culex salinarius*

General description of data:
We obtained morphologically identified specimens of *Aedes sollicitans, Ae. taeniorhynchus* and *Ae. cantator* obtained from multiple states across the US Atlantic coast. We sequenced fragments of flanking exons and of the internal spacers 1 and 2 (ITS1 and ITS2) of the ribosomal RNA (rRNA) genes from all three species (refer to items 17-19 above). For *Culex salinarius* we used several putative 18S ribosomal RNA and putative 28S ribosomal RNA genes, partial sequence, putative 5.8S ribosomal RNA gene, complete sequence and internal transcribed spacers 1 and 2 from *Culex salinarius* available from Genbank (Accession#s: U22139-U22144).

We then designed and optimized qPCR assays composed of two specific primers and an internal probe (Applied Biosystems TaqMan) for each of the four species. Finally, we demonstrated the reciprocal specificity of the assays to each species of salt marsh mosquito.

More about the data:
Internal rRNA spacers (un-transcribed DNA) are a common target in environmental DNA (eDNA) studies because they occur as multigene families and therefore there are multiple copies per cell which increases the probability of detection from degraded samples as expected in eDNA.

Data collection period: 2017-2019

File format: peer-reviewed manuscript

Data access and archival:
Details of the assay (primer and probe sequences and amplification conditions, as well as details of how the eDNA was collected, processed and extracted) will be incorporated in a manuscript to be submitted to Molecular Ecology Resources, but no later than January 2023. Prior to this date, please contact Dina Fonseca (dina.fonseca@rutgers.edu) with questions or to request access to these data. Check the data page listed at the top of this document for updates about accessing these data.