



ACADIA NP • APPALACHIAN NST • BOSTON HARBOR ISLANDS NRA • MARSH-BILLINGS-ROCKEFELLER NHP • MINUTE MAN NHP
MORRISTOWN NHP • ROOSEVELT-VANDERBILT NHS • SAINT-GAUDENS NHS • SAUGUS IRON WORKS NHS • SARATOGA NHP • WEIR FARM NHS

The Temperate Times

Newsletter of the Northeast Temperate Network

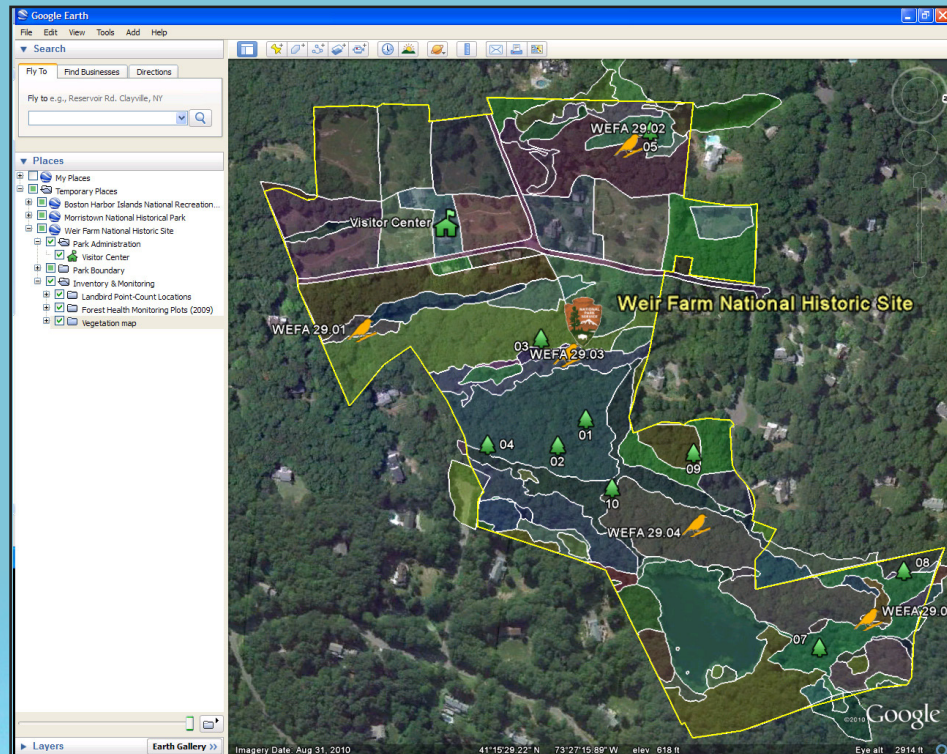
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Take a Flight to Your Nearest NETN Park On Google Earth



The free globe-trotting software known as Google Earth is well-known for its ability to give people the opportunity

to virtually fly to any location on Earth in a matter of seconds. With a click of the mouse-button, the program is capable of showing many kinds of data, including information on restaurants, parks, hotels, cities, and just about anything you can think of - all overlaid onto the latest satellite imagery. Meanwhile NETN staff had been struggling to find a way to quickly visualize all the research going on in network parks. The software program ArcGIS is a powerful tool, but not entirely user friendly and is limited by the quality of the available base layers (e.g. imagery). Even the relatively simple task of viewing a park's boundary with color imagery underneath can be a tedious task. Enter the NETN - Google Earth project. The marriage of this free web based program and NETN GIS information offers users an easy way to overlay I&M data 'Earth' continued on page 3.



Viewing information on Weir Farm NHS using the Google Earth interface.



Fall on Jordan Pond, Acadia National Park. Phillip K. photo.

Saugus Iron Works Amphibians and Reptiles are Assessed

An inventory of amphibians and reptiles was undertaken at Saugus Iron Works National Historic Site from April through September 2001. The diversity of amphibians and reptiles found in the park is limited by its small size, history, urbanized location, and limited habitats. Of the species found at Saugus, the northern two-lined salamander is the most habitat specific. Its entire life cycle (eggs, larvae, and adults) is spent in stream habitat, although adults may be found short distances upland from streams. Even in spite of the park's history of disturbance and presence in an urban landscape, these salamanders are abundant. The remaining species recorded at



Saugus – northern brown snake, eastern garter snake, northern green frog, and common snapping turtle – utilize a variety of habitats and are more general in their requirements.

Some areas of the park do provide an important and rare habitat feature in an urban area: turtle nesting habitat immediately adjacent to a river.

Amphibians, cont' page 4

Northern brown snakes are common, but seldom seen residents of most NETN parks. Bob Gutowski

Bird Migration Monitoring Along the Gulf of Maine Flyway

Along with the many changes a warming planet will bring, climate change has the potential to negatively affect the success of large-scale migration by many animal species. Migratory species are likely at higher risk of impact than more sedentary species because of the diverse array of habitat types and climates through which they must pass. Many of these species are already at the greatest risk to their own survival during the migratory period and experience as much as 80-90% of their annual mortality at this time. High quality “stop-over” habitats that provide species with food, rest, and a low risk of predation can lower the risk of migration and contribute to the long-term viability of migratory populations.



Black-bellied Plovers utilize the Maine coast as a stop over on their migration to the Arctic every summer. Len Blumin

animals use landscapes on both a small and large scale so they can identify management needs and predict future impacts on the value of our federal lands for migratory species.

Bird migration, cont' page 4

It is well understood that in Earth's past the relative quality of migratory routes and migratory stop-over sites changed dramatically under shifting climates and are expected to do so again in the future. The ability to migrate successfully during an era of climate change will be critical to the long-term viability of many species. National park managers and administrators are trying to improve their understanding of how

A Goodbye and a Welcome

This October, after several years of serving as a member and leader of the vegetation summer field season crew, Andrew Vincello departed NETN's ranks in order to join the military. We would like to thank Andrew for his contributions to NETN's, as well as the Mid-Atlantic Network's and the Northeast Coastal Barrier Network's forest monitoring programs over the last 3 years, and wish him all the best in his future pursuits.

Making Andrew's departure a little easier to take is the addition of Jesse Wheeler as the new NETN/MIDN/NCBN forest crew leader. Jesse served as a member of the forest health monitoring crew in 2010 and has many other experiences in the science

realm including a strong background in plant ecology and vegetation monitoring. Jesse received his M.S. from Antioch University New England in Conservation Biology in 2010, and his thesis research focused on salt marsh restoration in Cape Cod National Seashore.

Jesse will be based in Acadia National Park from October to May, and will travel to NETN and MIDN parks with the forest crew from June to September. Jesse can be reached at Jesse_Wheeler@nps.gov and his office phone number is 207-288-8739.



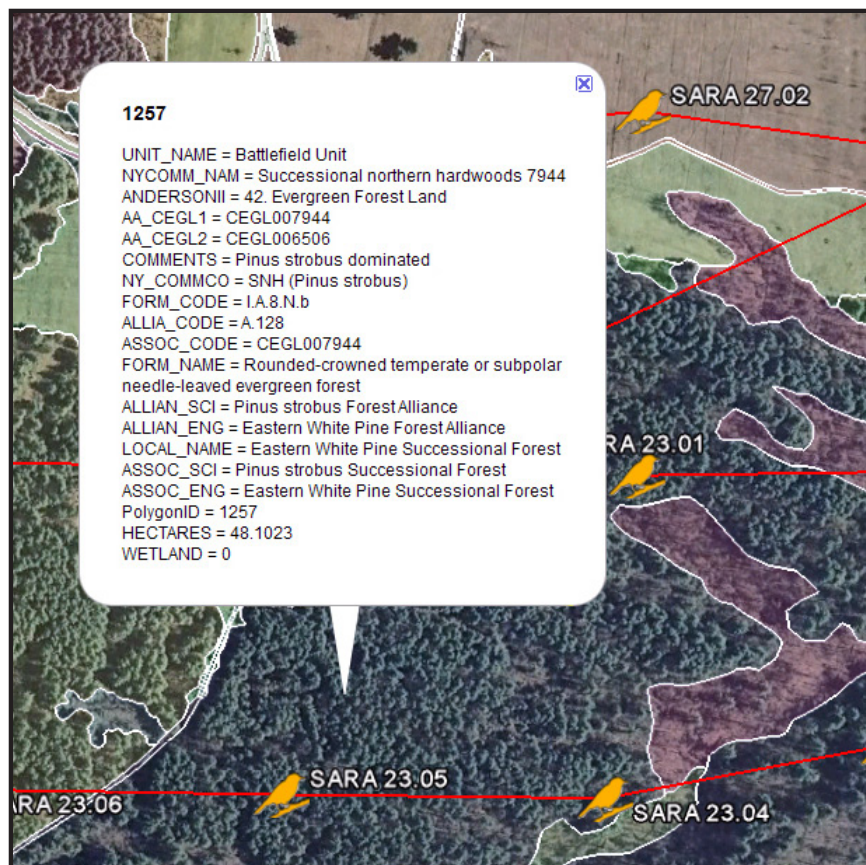
NETN/MIDN/NCBN's new forest crew leader: Jesse Wheeler

'Earth' continued from page 1.

with imagery and park boundaries, and much more. Users can browse the latest satellite imagery or turn-back-the-clock to view historical imagery, quickly zoom to any NETN park, turn multiple data layers on and off (bird points, vegetation maps, forest plots, water quality monitoring sites, etc.), view location attributes, take measurements, capture screen shots, and even post pictures and videos on a dynamic, 3-D globe. Best of all it is essentially free, easy to use, and data can be reached from any computer with internet access and Google Earth installed (a free download) – on the road, in the field, at the office.

As the project develops, park managers will be privy to more sensitive information than the average web visitor (i.e. rare and endangered species locations), but anyone will be able to access useful and interesting information from the maps. Visitor center locations, citizen science and school projects can all be plotted and viewed on the maps.

The project is still in the beginning phases, but as more data are uploaded and represented on park maps, NETN hopes that Google Earth will become a valuable and much-used tool to see trends in monitoring data and convey important and interesting information to network parks and the public. Check in on the website (http://science.nature.nps.gov/im/units/NETN/googleMaps/parkMaps_GoogleEarth.cfm) frequently for the latest Google Earth NETN park maps.



The layering ability of Google Earth allows park managers and the public alike to cross-reference information. With the bird monitoring sites and the vegetation map layers turned on, the viewer can see that one of Saratoga NHP's bird monitoring sites is located in an Eastern White Pine Successional Forest.

Sometimes, Just Talking About Climate Change Can Make You Falafel

NETN staff attended a meeting to discuss plans for monitoring coastal park resources affected by climate change at the University of Rhode Island in July. Other attendees included the Northeast Coastal and Barrier Network, National Capital Region Network, US Fish and Wildlife Service, and several park and regional science staff. In a show of sheer determination and will, even with one-third of the participants being laid low by tainted falafel,



The offending falafel

the group made progress on developing priorities and a work plan. Monitoring will focus on salt marsh surface elevation monitoring (see below for more on SET monitoring) and acquiring and interpreting existing data sets (e.g., weather, tides, sea level, and phenology). Marsh birds are an additional high priority concern, and will be monitored as funding allows.

SET Monitoring

With a warming climate comes sea level rise, creating the potential for the submergence of important salt marsh habitat. There is increasing evidence in the northeastern U.S. that some marsh sites may already be at the early stages of wetland submergence. For marshes to survive as sea level rises, marsh surface elevation must keep pace.

In the spring of 2010, the Surface Elevation Table (SET) and Marker Horizon Method monitoring program was initiated at Boston Harbor Islands and will begin in Acadia NP in the coming months. The elevation of a salt marsh is controlled by sediment and subsurface organic matter build-up, which increases elevation, while below-the-surface, sediment compaction, organic matter decomposition, and erosion of surface sediments can result in elevation loss. The monitoring method being employed at Boston Harbor monitors surface build-up processes by repeated sampling of artificial marker horizon plots. Marsh surface elevation is correspondingly monitored with a surface elevation table. Each individual SET station contains a benchmark pipe that is driven through the marsh peat and into the underlying sediment, to depths of 20-50 feet or more, providing a constant reference elevation through time. The SET is then attached to the benchmark pipe and pins are lowered to the marsh surface. Repeated pin measurements record changes in marsh surface elevation.

coastal climate, cont" page 4

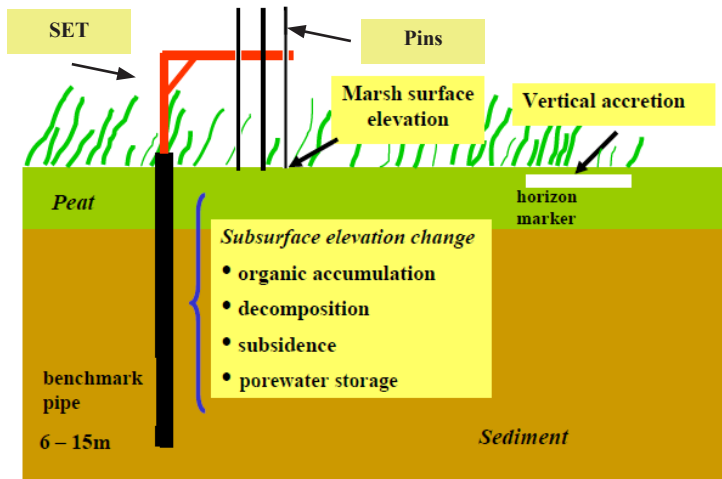


Diagram of a SET monitoring station.

Simultaneous with the SET measurements, marker horizons are used to measure surface deposition/erosion of material. Conceptually, if from time *a* to time *b*, an increase in marsh surface elevation was recorded from the SET readings, and the same increase was noted from accumulation of material above the marker horizon, it suggests that the marsh surface elevation increase was primarily due to the surface process of sediment deposition. If from time *a* to time *b* there was an increase in marsh surface elevation from the SET readings that was greater than the vertical build-up above the marker horizon, then the subsurface processes of below ground growth of roots and rhizomes and/or porewater

(groundwater held within soil or rock in gaps between particles) storage could be contributing to the marsh surface elevation increase. Finally, if the vertical build-up was greater than the marsh surface elevation change



A SET is used to measure the surface elevation of a marsh. NPS photo.

measured from the SET, then subsurface processes of organic matter decomposition, compaction, and perhaps porewater flux may be factors contributing to the shallow subsidence. Trends in marsh surface elevation change are then compared to local sea-level elevations. As years of data build, SET monitoring will be an important tool for scientists to measure sea-level rises impact on our salt marshes.

In order to paint a clearer picture of migratory movements along the Maine coast, NETN and Acadia National Park are collaborating with the University of Maine, Orono and the US Fish and Wildlife Service (USFWS) Maine Coastal Islands National Wildlife Refuge to pilot methods for bird migration monitoring. The purpose of this pilot study is to categorize the movement of migratory bats and birds across the Gulf of Maine as a function of weather, habitat characteristics, distance from the mainland, and relative location within the Gulf. The end result will be the development of a predictive model of animal movement under a variety of climate change scenarios.

Through mid-October, mist-netting and acoustic monitoring techniques were used at three sites in Acadia along a transect from an offshore island to a location near the mainland. This complements sites along a similar transect being monitored by the USFWS using the same methods.

Amphibians, from page 2

This spares females a risky nesting foray across busy roads and through urban neighborhoods, a major source of mortality for urban turtles. The long history of its use suggests that female turtles using this stretch of river have returned to the park repeatedly over the years.

Although Saugus Iron Works is subjected to global stressors, considering the extensive urbanization that surrounds it, and the history of the Saugus as one of the first American rivers to be harnessed for industrial purposes, it is likely that localized stressors have had a greater impact on its amphibians and reptiles than global stressors.

Another stressor likely affecting terrestrial amphibians is non-native earthworms. The earthworms currently found in New England are non-native and have been linked to decreased leaf litter, invasion by non-native plants, and declines in numbers of terrestrial salamanders. Casual observations in the park indicate that the leaf litter layer in forest habitats is very thin, and suggest that the quality of the forest floor habitats may be limiting to terrestrial amphibians, perhaps explaining the lack of any records of red-backed salamanders there.

For more information on this study visit NETN's website where you can download the report in its entirety or view the more detailed resource brief about the study.



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