



New York City Urban Field Station 2014 Annual Progress Report

The New York City Urban Field Station's mission is: ***To improve quality of life in urban areas by conducting and supporting research about social-ecological systems and natural resource management.***

The NYC Urban Field Station (NYC UFS) is both a physical place to conduct research and a network of relationships among scientists, practitioners, and facilities focused on urban ecology. The NYC UFS is sustained through a core partnership between the USDA Forest Service Northern Research Station (USDA FS) and the NYC Department of Parks & Recreation (NYC Parks). They were joined by the non-profit Natural Areas Conservancy (NAC) in 2013. Since its founding in 2006, the NYC UFS has engaged non-profit, academic, and government partners creating innovative "research in action" programs to support urban ecosystem management and sustainability initiatives in New York City.

Below are our science highlights from 2014. For more information, visit our updated website at <http://nrs.fs.fed.us/nyc/>.

Science Plan

With hundreds of research-related requests per year, the UFS decided to engage in a process for developing a Science Plan, a guidepost for honing our core research areas and investments. This year, over 30 scientists, managers, and staff members of the Urban Field Station engaged in a collaborative process to: 1) Take stock of all research projects initiated and/or completed in the field station's history, 2) Articulate priority research questions spanning the range of our work areas, 3) Prioritize pressing research questions, and 4) Examine the other programs, initiatives, and tactics that bring meaning and value to our work. The goal of this collaborative and iterative process was to produce a living document that would provide both an account of efforts to date and a strategic guide for future research and programmatic work. Figure 1, below, shows the general research themes that emerged from the science planning process.

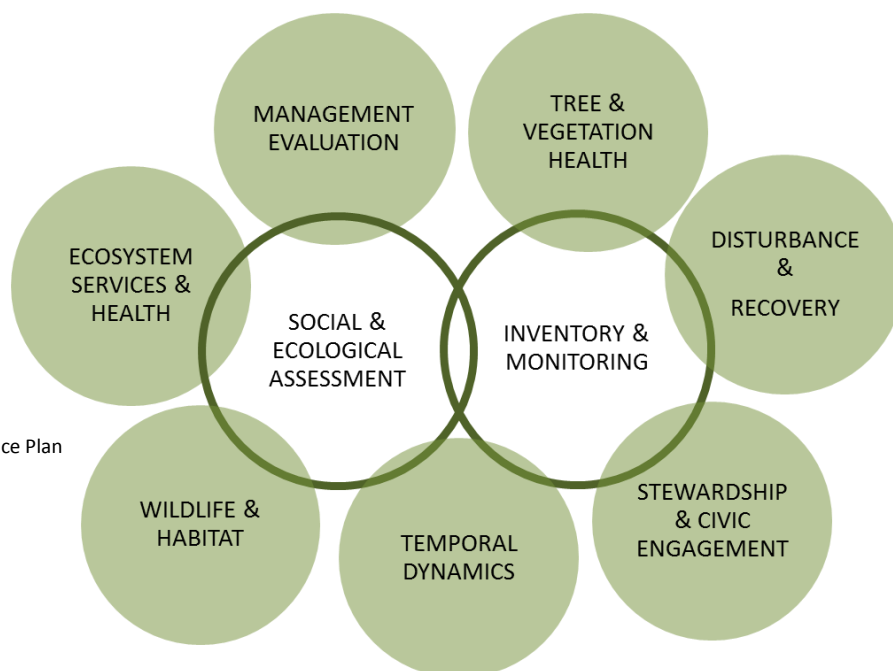


Figure 1. 2014 Science Plan
Research Themes

Research Updates

For this annual report, our research updates are organized by Science Plan research theme, although many projects fall under multiple themes.

Tree and Vegetation Health

NYC Afforestation Project: Rich Hallett (USDA FS), Nancy Sonti (USDA FS), and Michelle Johnson (USDA FS) continued their collaboration with Yale University researchers Alex Felson, Mark Ashton, Mark Bradford, Emily Stevenson, and Robert Warren II to investigate the sustainability of constructed, native, urban forests and their resilience to invasive species. Researchers collected data for a fourth year, tracking recruitment from the planted, native vegetation as well as the proliferation of invasive plant species and are investigating the impact of planted species diversity and organic amendments on these processes. Soil quality, water and carbon storage capacity are improving because of these afforestation efforts.

Freshkills Landfill to Park Transformation: Rich Hallett, Ron Zalesny (USDA FS), Nancy Sonti, Michelle Johnson, and Mark Bradford (Yale) continued with the design of the Freshkills afforestation project, which will compare three types of long-term plots: 1) native genotypes of willow/poplar trees, which are quick-growing species, 2) the NYC parks palette, and 3) a combination of native willow/poplar and the NYC parks palette. Planting of this 4-acre site is planned for October 2015. In 2014, the research team collected and analyzed soil samples for various nutrients and metals; resulting soil maps will be combined with contour data when developing the final plot designs. Alex Felson (Yale) has begun collaborating with Rich Hallett and Andrew Deer, a NYC Parks landscape architect, in design elements that will enhance demonstration and educational aspects of this long-term study.



Figure 2. Rich Hallett measuring the health of a London Plane

Trees Flooded by Hurricane Sandy: In year two of this effort, Rich Hallett, Nancy Sonti, Ross Whitehead (Rutgers intern), and Michelle Johnson re-measured 50 red maple street trees flooded by Sandy and 50 that were not impacted by saltwater in Queens. In an expansion of this effort, Rich Hallett and Michelle Johnson also measured 50 saltwater-flooded London Plane street trees and 50 London Plane street trees not impacted by saltwater in Queens. We collected foliage and will measure foliar chemistry for all trees. These data will provide the basis for future work as we strive to understand the chronic health impacts of hurricanes on urban forests in coastal areas. The flooded London Plane street trees were also measured by NYC Parks, creating two sets of tree health metrics. Comparison of these two datasets will enable the Urban Field Station to assess the quality of the tree health metrics.

TNC Tree Health: Rich Hallett and Nancy Sonti trained The Nature Conservancy (TNC) LEAF interns (<http://www.nature.org/about-us/careers/leaf/>) to evaluate the health of trees in Prospect Park. These undergraduate students focused on host species for emerald ash borer and Asian long-horned beetle and measured trees in plots throughout the park. Rich Hallett, Nancy Sonti, and Michelle Johnson collaborated with Leila Mougoui (NYC Parks) and the Gowanus Canal Conservancy (<http://www.gowanuscanalconservancy.org>) to

study the health of pin oak street trees around the Gowanus Canal in Brooklyn. Gowanus Canal Conservancy stewardship coordinators identified both pin oaks that had received recent attention from volunteer stewards and those that had not. In addition to the research staff studying the health of these street trees, the interns from TNC evaluated the same trees, allowing for a comparison of data quality and reliability in different groups of field researchers.

Greenhouse Soils Study: This year at the Ecological Society of America annual meeting, Nancy Sonti presented results of research conducted with Rich Hallett and Clara Pregitzer (NAC) assessing the performance of native tree species growing in NYC soils. The soil types tested included one custom-made greenhouse soil and twelve urban soils collected from reforestation sites on four typical NYC soil categories (coal ash, urban construction fill, sandy clean fill, and native till). After two growing seasons in a common greenhouse environment, they assessed red oak, silver maple, serviceberry, and black birch seedling health with the following metrics: height and diameter growth, leaf discoloration, and chlorophyll fluorescence (an indication of photosynthetic performance). In the paper, Nancy, Rich, and Clara combined these parameters into a single standardized tree stress variable, which significantly responded to soil type. In addition, first year tree stress was significantly correlated with both second year leaf biomass and height growth, revealing the utility of these tree physiology measures for predicting future growth and performance.

Green Infrastructure Plant & Soil Research Project: Novem Auyeung (NYC Parks), in collaboration with Rich Hallett, Brady Simmons (NYC Parks), Susan Stanley (NYC Parks), and Nandan Shetty (NYC Parks) from the Green Infrastructure Division started the Green Infrastructure Plant and Soils (GrIPS) research project. This project assessed tree health and soil properties across different green infrastructure designs: right-of-way bioswales (ROWB), stormwater greenstreets (SGS) and street trees. The goal is to determine if there are differences in the health of five commonly planted trees (ginkgo, pin oak, red maple, swamp white oak, thornless honeylocust) and soil properties across the different green infrastructure designs, surrounding land use, and volume of storm water intercepted. UFS researchers collected pilot data from 73 trees in the Bronx and Queens in the summer of 2014, and a report of the results will be available in early 2015.



Figure 3. Brady Simmons collecting data from a right-of-way bioswale in Queens

Long-term Forest Restoration Study in Pelham Bay Park, Bronx: Brady Simmons, Rich Hallett, Nancy Sonti, Novem Auyeung, and Jackie Lu (NYC Parks) submitted a manuscript on the outcomes of a forest restoration that took place 20 years ago in Pelham Bay Park to *Restoration Ecology*. They found that many of ecological metrics examined had better outcomes with greater human intervention. For example, after the initial removal of invasive vines and shrubs, planting native trees greatly increased canopy closure and tree diversity. In sites where there was repeated removal of invasive vines after native trees were planted, they observed further improvements tree diversity and native tree regeneration. Their findings demonstrate that urban forest restoration requires some level of continued maintenance to ensure success.

Smart Forest at Alley Pond Park: In October 2014, Alley Pond Park became the first urban site to be a part of the USDA FS Smart Forest Network. A group of USDA FS scientists led by Nick Grant linked existing environmental sensors in Alley Pond Park to the Smart Forest Network making it the first urban forest connected to the network. Franco Montalto, Associate Professor at Drexel University, initially installed these sensors as an ecological reference site to help monitor the performance of engineered urban green space around the city. They have been collecting information on air temperature, wind speed and direction, relative humidity, precipitation, solar radiation, and soil temperature and moisture since 2010. Now, thanks to the collaboration between Drexel University, NYC Parks and the USDA FS, this information – along with information from a tree phenology camera installed by the USDA FS – is part of an environmental monitoring network. This network provides near real-time data on forests and research sites that include Hubbard Brook Experimental Forest in New Hampshire and Silas Little Experimental Forest in New Jersey. For more information, see http://www.nrs.fs.fed.us/sustaining_forests/monitoring_assessment/smart_forests/.



Disturbance and Recovery

Landscapes of Resilience: Erika Svendsen (USDA FS), Lindsay Campbell (USDA FS), and Nancy Sonti are continuing their cross-disciplinary research that explores how urban green spaces promote individual and community resilience in Joplin, MO and New York City. These two municipalities face distinct stressors and are in different stages in their recovery timeline (an EF5 tornado in May 2011 vs. Hurricane Sandy in October 2012). Collaborating with Keith Tidball (Cornell University), Traci Sooter, Nancy Chikaraishi (Drury University), Chris Cotten (City of Joplin), Donna Coble (Forest ReLeaf of Missouri), Victoria Marshall, Colin MacFadyen (TILL Design), and others, the research team seeks to understand how the processes of collaborative planning and stewardship of natural resources can support recovery from a wide range of disasters and disturbances. In addition to research, each site is working to develop landscape designs to create new “Open Spaces Sacred Places” with partial funding support from the TKF Foundation. In Joplin, the Joplin Butterfly Garden in Cunningham Park was completed and dedicated. In Queens, New York, researchers selected New York City Housing Authority’s Beach 41st Street Houses on the Rockaway Peninsula. This site was completely inundated by Hurricane Sandy. Currently, the team is working with Lee Trotman of NYCHA Garden and Greening and Elizabeth Gilchrist, a NYCHA garden consultant to help organize and re-activate gardeners to engage in the site, while working with TILL to develop new design strategies and concepts. For more information, see <http://www.naturesacred.org>.

Recognizing Resilience: Erika Svendsen, Mary E. Northridge (NYU), Sara Metcalf, Helen Wang, and Harvey Palmer (University of Buffalo) continue their work using systems thinking to explore the relationship between urban greening and well-being. The group held two research summits last year in New York City and Buffalo. On-going work was presented throughout the year including by invitation from the Sacramento Tree Foundation, the Northern Climate Science Center and the Science and Resilience Institute at Jamaica Bay. The editorial, *Recognizing Resilience* (Svendsen et al.) was published in the Spring 2014 / Social Resilience issue of the American Journal of Public Health.

Stewardship and Civic Engagement

New Book Linking Trees and Democracy: Set for release in February 2015, the new book *Urban Environmental Stewardship and Civic Engagement: How planting trees strengthens the roots of democracy* (Routledge) is co-authored by Dana Fisher of University of Maryland, Erika Svendsen, and James Connolly of Northeastern University. The volume describes the role of urban natural resources stewardship in contributing to a more democratic and involved society. The authors interviewed MillionTreesNYC volunteers over two years, finding an important link between tree planting and an overall increase in civic engagement.

STEW-MAP: In 2007, Erika Svendsen, Lindsay Campbell and Dana R. Fisher (UMD) initiated the Stewardship Mapping and Analysis Project (STEW-MAP) in NYC. Since then, this work has expanded to other locales in the United States via Forest Service research teams in Chicago, Baltimore, Seattle, Los Angeles, and San Juan. This research deepens of understanding of stewardship organizations, but also results in a tool that communities can use to strengthen strategic environmental partnerships. In 2014, researchers launched a new STEW-MAP project in Philadelphia in conjunction with the Philadelphia Field Station. A July 2014 publication in the *Journal of Environmental Studies and Sciences* by UFS alum Dexter Locke (Clark University) and others used the NYC STEW-MAP to analyze spatial relationships between vegetation and stewardship organizations. STEW-MAP collaborator, James Connolly (Northeastern) led the team in a 2014 *Ecosystem Services* journal article entitled, Networked Governance and the Management of Ecosystem Services: The Case of Urban Environmental Stewardship in New York City. In fall 2014, Michelle Johnson began to standardize STEW-MAP projects across cities to enable a cross-city comparison. Also in fall 2014, the research team began working with the NY-NJ Harbor Estuary Program / Hudson River Foundation (HEP/HRF) to map waterfront stewardship organizations, activities and current outcomes. These efforts will contribute to the Urban Waters Federal Partnership in the New York City region.

Social Capital and Urban Greening: Ruth Rae (NYC Parks) continued to work with Antonieta (Toni) Castro, a doctoral student in The New School's Urban and Public Policy Program, on her dissertation project titled “Measuring the

Effects of Greening on the Social Capital of an Urban Community.” This project examines the Greening Western Queens Urban Forestry and Community Stewardship Project’s goal of organizing and connecting community stewards engaged in the care of the Western Queens urban forest. The research objective is to evaluate the effect of trees planted and associated stewardship activities on different levels of social capital (bonding, bridging and linking) on the local communities. The study uses mixed methods, including observations, in-depth interviews, and photography, to collect both quantitative and qualitative data. Interviews are in progress and will be completed in 2014 with analysis and writing to happen in 2015. The analysis will examine ways people perceive how trees have affected the different types of social capital in their community, which is also an indicator of community well-being.

City of Forests, City of Farms: Lindsay Campbell explores how urban nature is constructed in New York City from 2007 to 2011, in policy-making, planning, and implementation. Focusing on New York City’s municipal long-term sustainability plan, PlaNYC, the research examines the network of actors, discourses, and socio-natural environments that governs urban forestry and agriculture. Campbell has a chapter in the edited volume *Urban Forests, Trees, and Greenspace: A Political Ecology Perspective* (Routledge). She presented this research at various conferences and lectures, including the Dimensions of Political Ecology Conference in Lexington, KY and the CUNY Nature Ecology and Society Conference—where she won the CUNY-PSC “Cleaning the Air” Award for research on environmental justice. She is currently working on a book manuscript from this research.

Ecosystem Services and Health

i-Tree: Rich Hallett, Nancy Sonti, Michelle Johnson, Fiona Watt (NYC Parks), and Novem Auyeung continued to work on the i-Tree draft report based upon last summer’s data collection. The study provides an update to the New York City UFORE assessment conducted in 1997. i-Tree will be repeated every five years to track changes in New York City’s urban forest.

Wildlife and Habitat

Endangered Species Management: Susan Stanley and Rich Simon (NYC Parks Urban Park Rangers) oversaw the monitoring of the federally-listed piping plover at Rockaway Beach, Queens. This location in NYC is the most urbanized of all piping plover nesting sites in the Northeast and, therefore, presents many unique challenges. In addition to intensive public use, Rockaway Beach experienced recent dramatic changes, from Hurricane Sandy in 2012, followed by beach replenishment and the construction of a large berm in 2014. Amidst the changing landscape, the plovers were more successful in their breeding during summer 2014 than anytime during the previous decade. Twelve pairs of plovers fledged 25 chicks, a substantial increase from the three chicks fledged in 2013. Susan Stanley presented these data at the Harbor Herons Conference, a regional waterbird conference. Susan Stanley and Rich Simon also collaborated with NYC Audubon and the Manomet Center for Conservation Sciences to band American oystercatchers, another species of conservation interest at Rockaway Beach.



Figure 4. Natalia Quinteros, Victor Yin, Sergeant Brooke Scelly and a helper hold newly-banded American oystercatchers at the piping plover site

Lifetrack Egret: Erika Svendsen, Susan Stanley, Susan Elbin (NYC Audubon), and John Brzorad (Lenior-Rhyne University) have teamed up to implement Lifetrack Egret in NYC. This program tracks great egrets with GPS and cell phone technology, to understand their daily, seasonal and annual movements. Each tagged bird is matched with a class who receive regular text messages on the bird’s locations. These data can be tied into lessons on a variety of subjects including math, science, geography and social studies. Lifetrack Egret is also being implemented through the Philadelphia and Baltimore Urban Field Stations.

Harbor Herons: In summer 2014, Susan Stanley collaborated with Susan Elbin on nest surveys for colonial water birds on the quarantine islands of New York Harbor (<http://www.nycaudubon.org/issues-of-concern/harbor-herons>). These annual surveys help us understand metapopulation dynamics of wading birds and cormorants in the region. Species observed nesting on the islands included great and snowy egret, glossy ibis, little blue heron, little green heron, double-crested cormorant, fish crow, and multiple gull species.

Deer and Coyote Management: In recent years, increasing numbers of deer and coyotes have been spotted in NYC. Throughout 2014, Brady Simmons and Susan Stanley have participated in multiple interagency meetings to share information on the current status, monitoring efforts, and future management needs for management strategies for deer and coyote. They also continued their collaboration with Mark Weckel and Chris Nagy from the Gotham Coyote Project (<http://www.gothamcoyote.com>) to monitor coyote populations and investigate strategies for educating the public on coyotes.

Inventory and Monitoring

Plants Species Database: Brady Simmons continued to integrate plant species lists across multiple divisions of NYC Parks. The result is a complete, searchable database that can inform restoration actions and land management.

Investigating Urban Soils: In 2014, NYC Parks and USDA FS began a soil testing contract, managed by Novem Auyeung, Brady Simmons, Rich Hallett, and Jeff Merriam (USDA FS). The end result of this effort will be site characterizations of urban soils across NYC. NYC Parks' staff sent 141 samples to the USDA FS Northern Research Station's lab, collected from forests, wetlands, street trees, and landscaped areas on NYC Parks land. Jeff Merriam conducted four basic tests on all soil samples -- pH, organic content, soil texture, and bulk density. He also analyzed some of the samples for nutrients, heavy metals, and soluble salts. All soil samples were georeferenced, and the results are being combined with earlier results from previous NYC Parks soil testing contracts.

Natural Resources Group Data Management: Brady Simmons continued to work with the NYC Parks Natural Resources Group staff to archive historic and inactive records in order to inform current restoration projects, land acquisitions, and assessments. She is working in collaboration with Rich Hallett, who contacted USDA FS Southern Field Station researchers about creating an urban forestry and wildlife management database based on the web tool, Template for Assessing Climate Change Impacts and Management Options (TACCIMO). Further information on TACCIMO can be found here: <http://www.fs.usda.gov/ccrc/tools/taccimo>.

Management Evaluation



Figure 5. Susan Stanley conducting a winter waterfowl survey in Four Sparrow Marsh Preserve

Breeding Bird Monitoring and Analysis: Brady Simmons and Susan Stanley conducted a survey using spot mapping techniques to determine if there was a change in the avian species composition and abundance in Bronx River Forest after ecological restoration. This marks the 10th year of data collection after the removal of invasive species, such as Japanese knotweed (*Polygonum cuspidatum*), and re-vegetation with native plants in the forest. Comparisons with surveys before and two years after restoration show changes occurred in species preferring shrub habitat. Brady Simmons and Susan Stanley also continued to form collaborations to help analyze data from historic breeding bird surveys. Alexis Kleinbeck (New York University Polytechnic School of Engineering) joined the list and compared surveys at Inwood Hill Park in 1992 and 2001 for an Introduction to GIS class.

Street Tree Request Survey: Ruth Rae is working in conjunction with other NYC Parks staff (Matt Stephens, Neil Barrett and Tessa Leverone) on analyzing the New Street Tree Planting Request survey. This survey began as a customer service response to people who had received street trees, with the goals of understanding satisfaction with the service, motivations for individual street tree planting requests, and engaging with residents as stewards of newly planted trees. This project will provide useful methodological and programmatic information to other tree planting programs across the country. A forthcoming paper will summarize the results of five Street Tree Request Surveys from winter 2012 to winter 2014 that were sent to individuals who requested street trees and subsequently received them from Parks, and describe how and why the survey changed over time to address management needs.

Ecological and Social Assessments

Ecological Cover Type Map: In collaboration with the Spatial Informatics Group, the University of Vermont, and NYC Parks, the NAC completed an urban ecological covertype map (ECM) of New York City in late 2014. The map contains 37 unique covertype classes and was developed using data from multispectral orthoimagery, Light Detection and Ranging (LiDAR) data, and thematic Geographic Information System (GIS) layers. The covertype map is a mix of ecological and anthropogenic features and uses a classification scheme based on the United States National Vegetation Classification (NVC). This map provides a baseline for monitoring and protecting NYC's most important ecological features.

Freshwater Wetland Assessment: During the 2014 field season, NYC Parks and the NAC evaluated freshwater wetlands in three boroughs: Staten Island, Queens and the Bronx. Nearly 60 plots were completed in palustrine wetlands classified as scrub-shrub, emergent, or a combination of the two. The Freshwater Assessment team (Hayden Ripple, Kimberly Thompson, NAC) led by Susan Stanley and Ellen Pehek (NYC Parks) collected data on tree health metrics, canopy, mid-story and herbaceous vegetation as well as wetland characteristics and stressors. Data analysis will take place in winter 2014-2015.

Upland Forest Assessment: From May to October 2014, the NAC completed their assessment of all natural area forest and upland areas in New York City parkland begun in 2013. The NAC collected data on the forest health and condition of 1,142 fixed area plots across 5,300 acres and 50 parks in all of NYC's five boroughs. These data were collected by a team of 15 ecologists (Hannah Buck, Becca Carden, Kevin Corrigan, Jean Epiphan, Rebecca Gorney, Emory Griffin-Noyes, Catherine Molanphy, Jesse Moy, Beth Nicholls, Nathan Payne, Hayden Ripple, Aaron Rogers, Stephanie Smith, Brian Tarpinian, Kimberly Thompson) led by Clara Pregitzer. NAC selected a sub-set of the fixed area plots as permanent, long-term monitoring plots. Additionally, they initiated a study of the abundance and diversity of soil microbes at all the permanent forest plots in collaboration with Barnard College and Rockefeller University. Data analysis will take place in winter 2014-2015. Data from this forest assessment will help to establish baselines for forest health and condition in urban areas.

Salt Marsh Assessment: The NAC salt marsh field crew (Katie Conrad, Chris Haight, Maria Amin, and Jacob Sanua) led by Leah Beckett (NYC Parks), completed the salt marsh assessment that was started in 2013. Vegetation cover and shear vane strength data was collected from 6,250 plots across 25 salt marsh complexes in the four outer boroughs of NYC, with a total area of 1,226 acres. These data are currently being analyzed. They will be used to create a conditions report, as well as a spatial index that will provide a baseline snapshot of vegetation cover type and peat strength in NYC salt marshes. These data will also help inform a spatial index assessing the vulnerability of these salt marshes to sea level rise using the Sea Level Affecting Marshes Model (SLAMM) for New York (TNC, in collaboration with NYC Parks).



Figure 6. Maria Amin and Chris Haight setting up a transect at Richmond Creek in Staten Island

Social Assessment: The social science team (Erika Svendsen, Lindsay Campbell, Novem Auyeung, Nancy Sonti, and Michelle Johnson) expanded its Social Assessment of Parks and their Natural Areas from 2013's communities around Jamaica Bay to all five boroughs this summer. This research will inform the adaptive management of NYC's public open spaces and provides a new rapid assessment methodology for understanding the socio-cultural values and services embodied in and performed by parkland. A field crew of four social scientists (Alaine Ball, David Chang, Joanna Fisher, and Lakshman Kalasapudi) with the NAC and the UDSA FS surveyed over 9,000 acres of NYC Parks land and interviewed over 1,000 park users from June to September. The research team is currently analyzing data, developing products, and sharing findings. The SA research team also trained members of the public and community organizations in the implementation of the rapid social assessment method in Central Park. The research team led a seminar and field training exercise for 40 freshmen in the Macaulay Honors Program at CUNY. In addition to local presentations and meetings with managers, Lindsay Campbell presented the social assessment research at the Resilience 2014 conference in Montpellier, France, and to the FEMA New York Sandy Recovery Field Office, Inaugural Parks and Open Spaces Workshop. Erika Svendsen presented this work at the EDRA 2014 conference in New Orleans. The team currently has a manuscript in review with *Environmental Science and Policy*. To learn more, visit: http://www.nrs.fs.fed.us/nyc/focus/resilience_health_well_being/assessing_public Greenspace/.

Inwood Hill Park Hazard Tree and Social Assessment: In combination with a mapping study of hazard trees in Inwood Park, the social assessment project is being expanded and intensified at Inwood Hill Park. With grant funding from NYS DEC, the social assessment team collaborated with Kat Bounds (NYC Parks), Justin Bowers (NAC) and other NAC staff to inform a stewardship and management plan for the park, beginning in September 2014. The enhanced methodology will examine seasonal variation in use and social meaning by repeating the protocol in fall, winter, and spring. In addition, the structured observation and interview methodology will be triangulated with more unstructured participant observation, more fine-grained photo documentation, and key informant interviews.

Science Outreach and Communication

The UFS facility is an excellent space to brainstorm, present research in progress, and hold workshops. In the meeting space upstairs that is part of the common area for the residence, the UFS hosted **8 strategic planning meetings** for sharing ideas and developing strategies. We also held **9 brown bags talks**, where researchers presented and discussed their research-in-progress with participants.

The UFS co-sponsored two major symposia this year. The first was the **Yale Urban Ecosystem Services Symposium**, held at Yale University's Hixon Center for Urban Ecology, and co-sponsored with the Yale Office of Sustainability. The second symposium was the **Urban Bioblitz and Biodiversity Symposium** held at Macaulay Honors College of the City University of New York and was co-sponsored by the Central Park Conservancy.



Figure 7. Exploring NYC's Wild Side at Pelham Bay Park

The NYC Urban Field Station partnered with a range of academic and civic institutions to organize a rotating seminar series: **"Science of the Living City."** Public events launched in early 2014 and explored the urban environment and human well-being from a range of perspectives. Summer/fall 2014 saw the collaboration with the NAC in Exploring NYC's Wild Side, offering field talks in Forest, Inwood Hill, Conference House, Pelham Bay, and Prospect Parks. A full description of past events can be found here: <http://www.nrs.fs.fed.us/nyc/slc/past/>. Other partners include City College of New York – Spitzer School of Architecture; Columbia University Department of Ecology, Evolutionary, and Environmental Biology; CUNY Law Center for Urban Environmental

Reform; Drexel University / CCRUN; Gowanus Canal Conservancy; NAC; Parsons The New School, School of Constructed Environments; and the Wildlife Conservation Society.

New Partnerships

Rutgers: The USDA FS launched a new partnership with Rutgers University, to implement a **Center for Resilient Landscapes (CRL)**. Working with Jason Grabosky at Rutgers, initial research will focus on socio-ecological resilience and disturbance across the urban-rural gradient of the New Jersey landscape. Particular attention is devoted to the urban-rural gradient and disturbance regimes that are prevalent in New Jersey, such as fire in the wildland-urban interface, extreme storm events, developmental pressures, diseases, insect and animal pests, invasive plants, and changing economies and markets. The objective of the Center is to focus on the development of social-ecological system resilience, from short-term recovery, to longer-term restoration, to fundamental system re-organization. CRL personnel are studying and supporting improved urban natural resources stewardship and its linkages to enhanced community well-being, public attitudes and behaviors, and sound policymaking. In 2015, a postdoctoral fellow and summer graduate internships will be supported to initialize this research effort. For more information, visit: <http://crl.rutgers.edu/>.

People at the UFS

New UFS Staff: Dr. Michelle Johnson joined the NYC UFS in June 2014, as an Interdisciplinary Scientist with the USDA FS. She collaborates on social science and ecological research at the Urban Field Station and provides GIS expertise for many of the research projects.

Scholars-in-Residence: The NYC UFS hosted its first scholar-in-residence in 2014. Scholars in residence are senior scholars on sabbatical or visiting status who are working in with the USDA FS and NYC Parks over the course of several months to a year. **Dr. Franco Montalto** of Drexel University is a licensed civil/environmental engineer and hydrologist with 20 years of experience working in urban and urbanizing ecosystems as a practitioner, designer, and researcher. In November 2014, **Dr. Maite Lascurain Rangel**, an ethnobotanist from the Mexican Institute of Ecology's Department of Environment and Sustainability, joined the Urban Field Station as a scholar-in-residence. Her work at the Urban Field Station builds on USDA FS researcher Dr. Marla Emery's work on urban foraging and focuses on understanding urban foraging of Mexican communities within New York City. Read more about Franco and Maite here: <http://www.nrs.fs.fed.us/nyc/slc/#montalto>.

Totten Fellows: The Totten Fellows are emerging scholars—PhD candidates, early-career academics, and educators—from a broad range of social science disciplines conducting research on urban social-ecological systems. An inaugural workshop was held in June 2014 to launch this program, bringing together nine participants from the United States and Canada to share research-in-progress, seed a network of young scholars, and investigate the interface between research and practice across the New York City landscape. They continue to work together on developing publications for scholarly and practitioner audiences and will reconvene at Fort Totten for a writing workshop in January 2015. Meet the fellows here: <http://www.nrs.fs.fed.us/nyc/slc/fellows/> and read about their inaugural workshop here: <http://www.nrs.fs.fed.us/nyc/slc/esw/>.

Interns and Mentoring

The New York City Urban Field Station hosted three Yale Fellows during summer 2014, in partnership with the New Haven Urban Resources Initiative (<http://environment.yale.edu/uri/>), a non-profit dedicated to fostering community-based land stewardship; promoting environmental education; and advancing the practice of urban forestry. All of the fellows' work focused on the Alley Pond Watershed in Queens and will contribute to the Alley Pond Watershed Management Plan and the ongoing work of the Parks wetlands and green infrastructure team. Key guidance on this year's projects was provided by Erika Svendsen, Lindsay Campbell, Marit Larson (NYC Parks), and Vjeko Matic (NYC Parks). **Dana Baker's** project focused on conducting an in-depth social assessment to help inform a stewardship plan

for Alley Pond Park, while placing it in its neighborhood and citywide context. **Uma Bhandaram**'s project focused on developing a GIS model to identify suitable and preferential sites for green infrastructure installations within the park. **Dawn Henning**'s project focused on residents' adoption of stormwater management best practices and developing a typology of residential land management users.

NYC Parks Intern: Shabnam Bista, a student from Mount Holyoke, helped process soil samples that were collected from the Ecological Assessment.

National Environmental Hispanic Council: In June 2014, NYC Urban Field Station scientists hosted a group of students from the National Environmental Hispanic Council (NHEC, <http://nheec1.org>) as part of the 8th annual New York City Minority Youth Environmental Training Institute, an intensive, science-based, residential environmental education and environmental career development program for Hispanic youth. About twenty-five high school students from across the United States, ages 16-19, attended as part of their immersive, 7-day program, and had the opportunity to work at different National Forests and the NYC UFS. Two NHEC participants (Cassy Mulero and Marcos Tellez) were accepted as Urban Field Station interns for six weeks in July and August, participating in the social assessment and working with NYC Parks Urban Park Rangers.



Figure 8. WERM students at the Soil and Statistics WERMShop

Wave Hill Woodland Ecology Research Mentorship (WERM)

program: Nancy Sonti from USDA FS and Clara Pregitzer from NAC served as mentors to a group of academically high-achieving high school students from a number of underserved areas of the Bronx and Brooklyn, exposing them to both urban forest ecology and social ecological research methods. Nancy worked with students Jenely Guzman and Heather Vitale to develop independent research projects based on sugar maple health in Central Park and Riverdale Park and street tree health in neighborhoods of the Bronx and Brooklyn. The students learned to collect and analyze tree health data and to display their data spatially using GPS units and ArcGIS software. Also, Susan Stanley led a WERMShop on terrestrial salamander ecology and monitoring during the spring and fall terms, and Novem Auyeung led a Soil and Statistics

WERMShop in fall 2014, where students learned about basic soil physical and chemical properties and statistics.

UFS Facilities

Residents

The Urban Field Station had a busy year hosting a variety of researchers who stayed in our residential facility, conducting NYC-based socio-ecological research. Over 130 scholars came from the United States, Italy, Germany and Mexico. The busiest months were June and July, when we were 85% and 82% full, respectively.

Research Permits

This year, 68 research permits were granted by the NYC Parks & Recreation Natural Resources Group. Out of all the permits granted, 24 were renewals of ongoing research projects. Research was distributed throughout the five boroughs and spanned multiple parks, habitat types and taxa. We also issued our first research permit to a Canadian organization (Canadian Museum of Nature) this year. The full report can be found here:

<http://www.nrs.fs.fed.us/nyc/local-resources/downloads/2014ResearchPermitReportForParks.pdf>.

Laboratory

Researchers from Bates University, NAC, and NRG used the lab to identify invertebrates, sieve soils, and dry and weigh plant tissue. The UFS lab is now equipped with an additional precision balance and drying oven to increase the volume of soil and plant samples that can be processed.

UFS in the Media

The NYC Urban Field Station found itself in the media spotlight many times in 2014. Here are a few snapshots of our media coverage:

New York Times – Former Queens Fort Revamped for Work on Ecology:

<http://www.nytimes.com/2014/03/28/nyregion/former-fort-revamped-for-work-on-ecology.html>

New York Times – High-Tech Woods in Queens Help U.S. Monitor Urban Ecology:

<http://www.nytimes.com/2014/12/03/nyregion/high-tech-woods-in-queens-help-us-monitor-urban-ecology.html>

Newsweek – Money Growing on Trees:

<http://www.newsweek.com/2014/05/09/money-growing-trees-249162.html>

WNYC – The Harsh Winter Has Unexpected Effects on NYC Environment:

<http://www.wnyc.org/story/tree-eating-rats-blame-winter/>

WNYC – Science Friday – Sprouting a Forest in a City:

<http://www.sciencefriday.com/segment/09/26/2014/sprouting-a-forest-in-the-city.html>

USDA Blog – Young Scientists Network, Share Urban Research in New York City:

<http://blogs.usda.gov/2014/08/15/young-scientists-network-share-urban-research-in-new-york-city/>

City Limits – Huge Surveys Seek to Understand the Soil and Spirit of City's Parks:

<http://citylimits.org/2014/10/02/huge-surveys-seek-to-understand-the-soil-and-spirit-of-citys-parks/>

Columbia Spectator – Where the Wild Things Are: <http://columbiaspectator.com/eye/2014/09/11/where-wild-things-are>

Contact the Field Station

For additional information please visit <http://nrs.fs.fed.us/nyc> or contact:

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