New York City Urban Field Station
2017 Annual Progress Report

The New York City Urban Field Station ***improves the quality of life in urban areas by conducting, communicating, and supporting research about socio-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, land managers, designers, practitioners, artists, other professionals, and community members that facilitates discussion and science on urban ecology. The NYC UFS is sustained through a core partnership between the US Department of Agriculture Forest Service (USDA FS) Northern Research Station, the NYC Department of Parks & Recreation (NYC Parks), and the non-profit Natural Areas Conservancy (NAC). Since its founding in 2006, the NYC UFS has actively collaborated with non-profits, academic institutions, local stewards, and government partners to support urban land management and sustainability initiatives in New York City through innovative and stakeholder-driven research in action.

2017: Collaborative Conservation

The term "collaborative conservation" has been around since the late 1800s, and speaks to the necessity of working together to accomplish wide-ranging and long-lasting environmental goals. Collaborative efforts have yielded achievements such as the National Environmental Policy Act, the NY Watershed Protection and Partnership Council, and, locally, Central Park and the "emerald necklace" of parks in north and central Bronx.

In New York City, collaboration is essential: 8.5 million people live here, and we are growing. As a result of partnerships and the willingness to work together toward shared goals, many green spaces have been created or improved and volunteerism has been on the rise. These accomplishments are exemplified in NYC by efforts such as the recent Street Tree Census and the MillionTreesNYC campaign, which each engaged thousands of volunteers and cultivated new civic stewards.

In 2017, the NYC UFS helped to shape two special initiatives that embody the power of collective action:

- New York City Nature Goals 2050 is an initiative that includes over 60 local conservation and stewardship organizations. The coalition devised a set of goals that represent our vision for the role nature should play in NYC, and 25 actionable and measurable targets that will help us achieve those goals. New York City Nature Goals 2050 is about ensuring that nature is integrated into city planning efforts and that investment is significantly increased. These goals can't be achieved without collaboration and a willingness to accept that the whole is greater than the sum of its parts.
- STEW-MAP NYC 2017 was launched in the New York City Region. STEW-MAP is a tool developed by the USDA Forest Service that provides a publically available, online stewardship database and

map of civic organizations that work to conserve, manage, monitor, transform, or advocate for the environment, and/or educate the public, across a given landscape. From STEW-MAP, we learn who takes care of the NYC region and where there are opportunities to strengthen and support civic stewardship.

In addition to these keystone efforts, this annual report serves to highlight NYC UFS's portfolio of projects, partnerships, and achievements that are advancing the research and practice of collaborative conservation.

Report Contents

Research Updates

Research projects, programs, and partnerships presented in this report reflect the variety of work being done at and through the NYC UFS.

Stewardship Mapping and Assessment Project (STEW-MAP 2017). STEW-MAP, first launched in 2007, is a mapping tool and database of organizations designed to help identify community stewardship and strengthen our civic capacity to take care of New York's neighborhoods. STEW-MAP 2017, a partnership with the NYC Mayor's Office of Recovery and Resiliency, is the first ten-year update to the original project. The survey was updated, and new questions were added about impact, measurable outcomes, and changes over time. Lists of groups from more than 55 partner organizations were compiled and cleaned to create the survey population. In May, the survey was sent to over 9,000 stewardship groups in New York City and an additional 3,000 in the greater New York metropolitan area. Following the launch, an outreach team focused on following up with all non-respondents to ensure that they received the survey, with support from a collaboration with Green City Force. The survey closed on November 22nd. Meanwhile, a new "Stewardship Story Mapping" outreach activity was implemented at eight events across the city to spread the word about STEW-MAP and get people thinking about their personal connection to stewardship.

In addition to the local update, a STEW-MAP multi-city collaboration, led by NYC UFS researchers, continues to grow and exchange research ideas and tools in cities around the world. In April 2017, Lorien Jasny from the University of Exeter, UK, held a social network analysis (SNA) workshop at the NYC UFS to train STEW-MAP researchers in SNA methods. One project in a rural region of Hawai'i Island is currently in the data analysis phase (with funding from the USDA FS Pacific Southwest Research Station and research support from NYC UFS), and another project is planned for the greater Honolulu area in 2018 (with funding from USDA FS Region 5 and the Hawai'i Division of Forestry and Wildlife). Project leads Heather McMillen (NYC UFS) and Christian Giardina (USDA FS Pacific Southwest), are collabortating with the STEW-MAP team based at the NYC UFS, as well as Hawai'i State agencies, the University of Hawai'i, and local non-profit stewardship organizations to implement a place-based program to promote community capacity for stewardship. The STEW-MAP team continues to collaborate with partners in Paris, France on their CIVIC ACT project, which examines stewardship in the Gran Paris area in relationship to spatial inequalities, as part of the Politiques de la Terre research program. Collaborators include Nathalie Blanc (Paris Diderot), Flaminia Paddeu (Paris 13), Jean Chiche (Sciences Po), and Diego Antolinos Bassos (Sciences Po). In May 2017, these colleagues visited the NYC UFS for a week-long exchange of research ideas and planning.

Thank you to everyone who served as an advisor, shared data, hosted a STEW-MAP table or presentation, and helped us spread the word! (Press release)

Living Memorials. Following the 15 year anniversary of 9/11, Erika Svendsen, Lindsay Campbell, and Heather McMillen focused on publishing research conducted over the last two years. This includes an article and photo-essay in *Medicine Anthropology Theory* that describes the power of living things and considers living memorials as therapeutic landscapes. A second article in the *Journal of Ethnobiology* focuses on the flora in living memorials as symbols that help to create and keep memories, and promote resilience and recovery from 9/11 and other social-ecological disturbances. A third article, in progress, focuses on the beloved 9/11 Survivor Tree, a Callery Pear—a species that is now characterized as invasive—as a way to understand the dynamics of conflict management in urban green infrastructure.

City of Forests, City of Farms. *City of Forests, City of Farms: Sustainability Planning for New York City's Nature,* by Lindsay K. Campbell (USDA FS), was published by Cornell University Press in October 2017. This

book is a history of recent urban forestry and agricultural policy and programs in NYC. Centered on the 2007 initiative, PlaNYC, this account tracks the development of policies that increased sustainability efforts in NYC and dedicated more than $400 million dollars to trees via the MillionTreesNYC campaign.

Campbell zeroes in on an important omission in the original PlaNYC: despite the City having a long tradition of community gardening, the plan contained no mention of these gardens or urban farms. Campbell charts the change of course that resulted from burgeoning public interest in urban agriculture and local food systems. She shows how civic groups and elected officials crafted a series of visions and plans for local food systems that informed the 2011 update to PlaNYC. *City of Forests, City of Farms* is a valuable tool that allows us to understand and disentangle the political decisions, popular narratives, and physical practices that shape city greening in New York City and elsewhere.

Terrapin hatchling after emerging from an exclosure.
Photo credit: Carla Garcia

Terrapin Monitoring. Part of the mission of NYC Parks' division of Forestry, Horticulture, and Natural Resources (FHNR) is to protect and restore natural areas throughout the city. This includes safeguarding biodiversity, and sometimes special efforts are required to protect struggling species. In the spring of 2016, FHNR, including the Field Station's Novem Auyeung and Brady Simmons, visited Idlewild Park with Russell Burke (Hofstra University) and Alexandra Kanonik (Volunteer Coordinator, Jamaica Bay Terrapin Research Project) to get advice on surveying for and protecting terrapin nests. During the visit, we discovered numerous predated nests on the soccer field. That July, Carla Garcia visited the soccer field and observed two terrapin females nesting. The Idlewild crew also saw multiple terrapins on the Landing Lights berm that summer.

In July 2016, the first protective exclosures were constructed based on discussions with Russell Burke, but these were not deployed in time to prevent predation. A second attempt was made in May of this year. When an intact terrapin nest was found, a trench was dug around it and the exclosure was placed over the nest and partially reburied. Escape hatches were cut in the exclosures after 49 days (based on an incubation time of 60 days from Russell Burke), preferably toward nearby vegetation to provide cover from predators).

Biochar and plant growth. Rich Hallett, Novem Auyeung, Brady Simmons, and Ryan Baker-Urzua carried out a greenhouse study in cooperation with Richie Cabo (Citywide Greenhouse) to determine whether biochar amendments can improve the health and growth of selected perennials and shrubs used for restoration projects in NYC. Biochar is black carbon produced from wood waste by heating wood chips to 450 – 600 ˚C in the absence of air. On average, biochar amendments increased plant biomass aboveground (+24%) and belowground (+31%). This is consistent for both perennials and shrubs, although the effect is weaker for roots of perennial plants.

Eastern Parkway Soils and Street Tree Study. Street trees along Eastern Parkway near Prospect Park are showing signs of stress. The cause is currently unknown. Rich Hallett, Michelle Johnson, and West Point Cadets Ashtyn Hanna and Hannah Schwartz completed stress assessments on American elm, sawtooth oak, and red oak trees showing elevated levels of stress compared to other street trees in NYC. Jason Conheeney collected soil samples from the base of each tree. Tree stress seems to be correlated with soils with elevated sodium and low organic matter. This pilot study will inform the design of a remediation effort during the summer of 2018 which could include biochar and organic matter amendments. We will measure treated and untreated trees for several years in order to document the impact of treatment on the health of these mature street trees.

Eastern Parkway trees showing signs of stress. Photo credit: Rich Hallett


Early successional willow species numbered and ready for measurement. Photo credit: Rich Hallett

Freshkills Landfill to Park Transformation. Understanding factors that contribute to successful natural area plantings is critical to urban forest management. The Freshkills afforestation study was established to examine the effects of early successional and late successional tree and shrub species on site establishment. This year saw the installation of a deer fence and replanting of the Freshkills research plots in October with assistance from many of the UFS staff. After replanting, over 1,800 trees were measured for initial size and condition. Core team members include Rich Hallett, Michelle Johnson, and Max Piana, a Rutgers PhD student and CRL Fellow. In addition, the Freshkills Park Science Advisory Group, including USDA FS researchers Lindsay Campbell and Rich Hallett, is coordinating a June 2018 Reclaimed Lands Conference.

Deer Browse Impact Monitoring. Beginning in August 2016, 106 plots of urban forest in the Bronx and Staten Island were established to monitor how deer browse varies across different forest types, vegetation types, deer protection methods, and time. Based on the first season of data, nearly every park in the survey had signs of tree or shrub browse. Tree browse was greater in upland forests than other forest types, and shrub/vine browse was greater in Staten Island than the Bronx. Shrub/vine browse also differed across parks. Both the density of tree saplings and the density of shrub/vine stems were positively correlated with deer browse. Upland forests had greater tree sapling density than other forest types, and Staten Island had a greater shrub/vine density than in the Bronx, so it is possible that the differences in browsing patterns were partly driven by the density of tree saplings and shrub/vine stems. Freshkills afforestation study plots suffered 82% mortality. Early successional species (willows and poplars) were hardest hit. There was no evidence that deer repellent decreased browse. The main staff on this project were Carla Garcia, Becca Carden, Michael Hsu, and Novem Auyeung.

Climate Adapted Forest Species Palette for Forest Restoration. The Natural Areas Conservancy and NYC Parks, with a grant from the Wildlife Conservation Society, are creating new planting palettes and restoration targets to be used in future plantings throughout New York City's forested natural areas based on research about the changing climate. Specifically, the research has focused on adaptability of species to future temperature and precipitation regimes, as well as NAC's citywide ecological assessment data from over 1,200 research plots citywide. NAC is creating a toolset that provides current and future land managers with a planting list of native species more readily adaptable to shifting conditions in NYC. NAC is also partnered with the Prospect Park Alliance to pilot the new palettes, and with the Greenbelt Native Plant Center to source plant material that is both local and genetically appropriate for the region.

Priority Research and Monitoring Questions. Novem Auyeung, with input from FHNR senior staff, put together a table of research and monitoring priorities from teams within the division. This effort was designed to be an inventory of FHNR projects and to help determine which questions should be pursued by the division and which may be well-suited for outside collaborators. Questions were sorted into 3 main categories:

- **Condition/Assessment**: Questions that help to assess and better understand the systems being managed and the conditions of those systems (*What are the conditions of our streams?*)
- **Adaptive Management:** Questions that help to determine whether past/current designs or interventions are successful, and whether they have any unintended consequences (*What is the outcome of a particular planting strategy? What are the environmental impacts of herbicide usage?)* Also includes questions that help to determine what new designs or interventions should be implemented, and how their outcomes compare to existing designs or interventions (*What is the long-term effectiveness of various means for protecting and restoring salt marshes?*)
- **Policy, Program, or Communications**: Questions that help to determine whether our public-facing programs are doing what we intend, and questions that help us advocate for our work more effectively.

Using this table as a starting point, FHNR has begun looking into whether past, present, or future monitoring/research projects are collecting data that could help answer these questions. If they are not, we ask whether they could be modified to do so, or if we would need to develop new projects that could answer those questions. FHNR has also started meeting with outside collaborators to discuss which questions they could help us answer.

Piping Plover and Seabeach Amaranth Monitoring. Thanks to the hard work of the piping plover monitoring team from the NYC Parks Wildlife Unit, we documented one of the most productive years in the 21 years piping plovers have been nesting on Rockaway Beach. There were 20 piping plover pairs that fledged 41 chicks, which are the most chicks ever fledged here, and 34 American oystercatcher pairs that fledged 62 chicks. There were approximately 1,950 common terns, 540 least terns, and 400 black skimmers. Thanks to everyone from Maintenance and Operations, FHNR, Portia Dyrenforth, Jack Rohan, Roy Tellason, and Dan Piastuck for helping to make this a successful season.

Motivations of TreesCount! Volunteers. Analysis of TreesCount! volunteers from 2016 participant surveys and interviews has identified a series of motivations for volunteering with TreesCount! These include Contribute, Fun, Values, Incentive, Social, Outdoors, Past Experience, and Learn/Educate. Quantitative analysis determined that motivations varied by demographics, and identified an incentive

program as successful in reaching people that do not typically volunteer. Interview data enabled a deeper exploration of the volunteer experience and motivations; for example, exploring the city was a motivating factor in continuing to participate in TreesCount! Aligning recruitment strategies with volunteer motivations can help city agencies reach potential volunteers and may assist with retaining volunteers In 2017, NYC UFS researchers completed both a white paper and journal article (in press, Arboriculture and Urban Forestry). Core team members include Lindsay Campbell, Michelle Johnson, Erika Svendsen, and Phil Silva of Cornell University.

Forest Management Framework. The Natural Areas Conservancy and NYC Parks have developed a 20-year Forest Management Framework intended to guide the restoration and management of NYC Parks' 7,300 acres of forested natural areas. The framework, NYC's first citywide forest management plan, is based on new comprehensive data that includes ecological condition and visitor perceptions and experiences, as informed by the Social Assessment (below). The framework categorizes the condition of forests in more than 50 parks across the five boroughs, based on metrics for ecological health and threat. Each condition category is correlated with best practices, staffing, contractual structures, and cost estimates. This approach facilitates the prioritization of future restoration activities, the ability to track changes in forest health over time, and the ability to estimate the level of investment needed to maximize ecological condition and visitor experience at a park, borough, or city-wide scale. The framework calls for an investment of over $300 million over two decades to ensure that our city's forests achieve their full potential for recreation and conservation.

Social Assessment. The social assessment explores the use and social meaning of green spaces in New York City, and was conducted in parallel with the ecological assessment of natural areas by the NAC (above). Meetings among associated researchers and managers led to a multi-author journal article (Johnson et al. in press, Urban Ecosystems) about methods and experiences, which integrates these two datasets to understand social-ecological aspects of urban natural areas. The social assessment team also continued analyzing the larger social assessment dataset, with Nancy Sonti leading a paper on fear and fascination with urban natural areas (in review). Finally, we continue to examine the data collected in 2016 in Prospect Park, and worked with a high school intern, Charlotte Strickland, to understand how to measure park benefits using Twitter data and in-person interviews. Core team members of the social assessment include Erika Svendsen, Lindsay Campbell, Novem Auyeung, Michelle Johnson, Heather McMillen, and Nancy Sonti.

Cool Neighborhoods. The Mayor's Office of Recovery and Resiliency (ORR) led a Working Group on how best to address rising temperatures and the safety issues they pose. That work led to the Cool Neighborhoods initiative which identified the most vulnerable communities citywide. The initiative led to over $100 million in tree planting and forest restoration and also money for research that is centered at the NYC UFS but is being done in tandem with ORR and the Dept. of Health. The research will collect baseline data on spatial temperature variations as they relate to the intersection of the right of way and street trees. The two-year research effort will lead to insights to help decision-making on how best to use trees to mitigate the effects of intensified heat.

Science of the Living City

Science of the Living City (SoLC) includes the public facing activities of the NYC UFS and its artistic and scholarly residencies. The SoLC program engages diverse partners across the city and speaks to a wide professional and public audience to create engaging conversations and advance understanding about the

science, art, design, policy, and land management practices which sustain our city. Events include public seminars, informal "brown bag" lunch lectures, workshops, and symposia.

Bram Gunther speaking at the re-launch of Swale.
Photo credit: Ruth Rae.

This year, SoLC produced thirteen seminars, nine brown bag lectures, and two workshops. Topics of discussion included forestry, agriculture, soils, green infrastructure, conservation, heat resilience, coastal resilience, art, data, and ecology. 2017's highlights included the re-launch of the Swale floating food forest, a seminar highlighting the unveiling of NYC's Cool Neighborhoods program, and a three-part seminar series on coastal resilience in the Jamaica Bay Watershed, called New York City's Coastal Future: What Can Jamaica Bay Be? Evaluations of the Jamaica Bay events suggest that they helped to fill a real desire for conversations about sustainability and the future. When attendees of the events were polled, 94% agreed that the events created a meaningful exchange, 84% responded that the events raised their awareness about sustainability efforts in and around the Bay, and 82% stated that they were very likely to attend similar events in the future.

To make this year's events happen, SoLC partnered with more than 40 different local, national, and international organizations, up from 18 the year before. These include universities, land management agencies, policy makers, NGOs, representatives of the private sector, and community groups. These networking efforts facilitate continuing exchange between professional and public stakeholders throughout the city, and strengthen the NYC UFS's role in bringing engaging and unique land management, science, and planning discussions to the general public.

Stewardship and Outreach


Garden and pavilion at Beach 41st Street Houses.
Photo credit: Giles Ashford.

Landscapes of Resilience. The Landscapes of Resilience project entered a new phase in 2017, one framed by the challenge of ongoing maintenance at the Beach 41st Street Houses site after funding from the TKF Foundation ended. The project team applied for and was awarded additional funding from the USDA's Civil Rights Grant. This funding allowed for the hiring of a part-time horticultural specialist to work alongside the Beach 41st Street gardeners. The horticultural consultant also collaborated with the research project coordinator and an art consultant to design a four part workshop series to encourage continued stewardship of the public housing garden along Jamaica Bay, as well as ecological education through exploration of the surrounding environment.

Since the completion of the garden, we have had opportunities to highlight the work and experience of this community of stewards through a workshop exchange with the USDA FS Office of International Programs. This exchange brought representatives working in various capacities of forest management from 16 different countries to the local garden in Rockaway. A final summary this project is offered in a short film produced by Stoneworth Studios**,** titled *Healing Hurricane Garden*.

Agents of Discovery. The USDA FS and American Recreation Coalition have teamed up with Agents of Discovery, a game developer in Canada, to bring augmented reality mobile games to conservation education. Agents of Discovery is an interactive, location-based mobile game that brings kids out to parks and teaches them about nature. The USDA FS and other agencies provide the content and control the message. The game calls for virtual secret agents to travel around natural areas and discover hidden gold coins by answering questions tailored to a particular habitat, trail, or monument. Pre-designated challenge locations are picked by Parks staff, and the questions are unlocked by the GPS locator on the mobile device. Agents of Discovery has three "Missions," Agents of Culture, Agents of Water, and Agents of Nature. These are all flexible, and the content can change based on the seasons. The game provides a year round opportunity for kids to explore their natural spaces, which could be the neighborhood park, a large forest, or even street trees.

Agents of Discovery avatar

In NYC, this year's work included a spring workshop, a beta testing day in June with Margaret Bolger at MS 172 in Queens, and the ReLeaf Conference with Green-Wood Cemetery in July. Local content has been created, and the USDA FS is working with Parks' Urban Park Rangers to integrate the app into Parks programming and promotion.

Job trainees learning tree health assessment protocols at Hunts Point. Photo credit: Rich Hallett

Hunts Point Tree Health Assessment Project. Rich Hallett collaborated with TreeKit, Sustainable South Bronx, The Nature Conservancy, and NYC Parks to add a tree health component to a green jobs training program funded by the New York State Department of Environmental Conservation (NYS DEC). Trainees visited approximately 2000 street trees in the Hunts Point neighborhood of the South Bronx. Tree health data was collected using the HTHC Tree Health Assessment App developed by The Nature Conservancy and the USDA FS Northern Research Station. Hunts Point has a high heat vulnerability index and is targeted for additional tree planting. The information collected by the trainees (Hunts Point Tree Health Map) will be used to help select species and target locations for planting. This project used methodology that will increase our ability to monitor street tree health across the city by engaging community groups and volunteers. The more eyes we have on our trees, the sooner we can detect emergent tree health issues.

Green Readiness, Response, and Recovery. The *Green Readiness, Response, and Recovery: A Collaborative Synthesis* General Technical Report (GRRR GTR) is designed to share lessons learned about the ways that the stewardship of natural resources can help build resilient communities. The GTR is an extension of the "Cultivating Stewardship" workshop hosted in June 2016 by the NYC UFS, in collaboration with The Nature of Cities, TKF Foundation, Northeastern Area State & Private Forestry, and USDA FS Region 9.

NYC volunteers planting trees.
Photo credit: NYC Parks.

The report brings together case studies and synthesis chapters from many agencies and disciplines. These demonstrate how communities can prepare for, respond to, and recover from natural disasters and other disturbances through stewardship, civic engagement, and place-making. The intended audiences for GRRR include community groups, non-governmental organizations, government program managers, land managers, and researchers. The GRRR GTR will be published in mid-2018.

Partnerships

Stockholm Resilience Center. Starting in 2016, the Stockholm Resilience Centre (SRC) and the NYC UFS formalized a partnership to advance research and stewardship in urban social-ecological systems. Students engaged in PhD research, master's thesis projects, and master's traineeships in SRC's Urban Theme have collaborated with the NYC UFS. Participating students gain access to UFS research scientists, who can provide connections to NYC natural resource managers and civic stewards, as well as field research sites and relevant social and biophysical datasets. Students who do their MSc thesis project at UFS also have the opportunity to spend their five week traineeship working with UFS research scientists. This spring traineeship is an excellent way to build research methodologies, get exposure to the field of urban natural resources stewardship in New York City, and conduct background research leading up to a master's thesis fellowship the subsequent fall.

Demonstration of Hālau ʻŌhiʻa at the Learning from Place workshop. Photo credit: Giles Ashford.

Learning from Place Workshop. In collaboration with USDA FS colleagues at the Institute for Pacific Islands Forestry and Kekuhi Kanakaole (master teacher and creator of Hālau ʻŌhiʻa) in Hilo, Hawaiʻi, the UFS hosted a two-day workshop (October 9-10) in NYC. This workshop built on the momentum of the "Cultivating Stewardship" workshop from the previous year. The 46 workshop participants were primarily locals from diverse agencies, non-profit organizations, and universities, but also included colleagues from Hawaiʻi, Washington, Vermont, and Canada. We focused on learning from Hālau ʻŌhiʻa, a unique personal and professional development program for stewards in Hawaiʻi that focuses on establishing familial relationships to the world. Hālau ʻŌhiʻa skills encourage understanding

through storytelling, song, and ritual practices of asking permission and expressing gratitude. We look forward to continuing this conversation and advancing a curriculum for a Holistic Stewardship Professional Development Program in NYC.

New York City Nature Goals 2050. New York City Nature Goals 2050 is an initiative focused on creating a shared vision for NYC's nature. Nature Goals is about ensuring that nature is integrated into city planning efforts and that investment in nature is significantly increased. Begun by the NAC in 2015, this initiative is a collaboration of over 60 local conservation and stewardship organizations. In 2015, the coalition outlined five overarching goals. In 2017, through a series of workshops and plenary meetings, the coalition devised a set of 25 actionable and measurable targets that fulfil these goals and will advance their vision for the role nature should play in NYC:

1. **Expand natural areas**
2. **Manage natural areas**
3. **Encourage ecosystem diversity**
4. **Conserve native species**
5. **Restore lost species**
6. **Integrate nature into planning and policy**
7. **Expand tree canopy and increase permeability**
8. **Help mitigate air pollution**
9. **Help control storm water**
10. **Help cool the city**
11. **Provide clean and swimmable waters**
12. **Support sustainable local fisheries**
13. **Expand natural shorelines**
14. **Enable natural shoreline to adapt to sea level rise**
15. **Enhance built shorelines**
16. **Facilitate species movement**
17. **Enable people to get to natural areas**
18. **Make natural areas welcoming for all New Yorkers**
19. **Encourage environmental stewardship**
20. **Get kids into Nature**
21. **Provide jobs in nature**
22. **Highlight local natural spectacles**
23. **Create big quiet places**
24. **Recognize nature nearby**
25. **Celebrate nature in art**

The Nature Conservancy. The NYC UFS continued its tree health monitoring and youth engagement collaboration with The Nature Conservancy (TNC). Initially begun in New York City and Philadelphia, this collaboration is envisioned to expand into broader USDA FS urban field station and urban and community forestry networks, as well as TNC's North American Cities program. Summer 2017 saw monitoring trainings led by Rich Hallett in Washington DC and South Bronx, and training sessions with the Retirees in Service to the Environment (RISE) program in NYC. Future efforts will involve integrating this program with other urban research areas of the Forest Service.

Expanding tree health assessment training to the retired population in NYC.
Photo credit: Rich Hallett

Nature and Nature-Based Features Project. This project, based on a grant being managed by the Science and Resilience Institute at Jamaica Bay (SRIJB), was designed to develop a monitoring framework that can be used to track the status of nature and nature-based features in New York State. These features fall into four categories: tidal wetland complexes, living shorelines, constructed reefs/living breakwaters, and vegetated shoreline stabilization. A workshop held in January developed potential metrics for measuring the performance of the ecological function, hazard mitigation, structural integrity, and social impacts of these systems. Individuals from more than ten organizations and institutions are working on the project. These include Jessica Fain and Adam Parris (SRIJB), Bennett Brooks (Consensus Building Institute), Pippa

Brashear (SCAPE), Rob Pirani (Harbor Estuary Program/Hudson River Foundation), Marit Larson (NYC Parks), Chris Haight (NYC Parks), and Kristen Marcell (NYS DEC). The UFS is represented by Erika Svendsen (USDA FS) and Novem Auyeung (NYC Parks).

Rutgers University Center for Resilient Landscapes. The NYC UFS continues its collaboration with Rutgers University with the Center for Resilient Landscapes (CRL). The CRL brings together Rutgers faculty and graduate students with USDA FS researchers at the NYC, Philadelphia, and Baltimore field stations and Silas Little Experimental Station in central New Jersey. A primary function of this partnership is facilitating exchange among researchers and students through graduate fellowship opportunities. The CRL held its second annual Fall Symposium in September 2017, where three Fellows and one Postdoctoral Fellow presented their research affiliated with the CRL. This partnership has led to new collaborations, research projects, and conferences, with a focus on resilient landscapes in a social-ecological context.

Urban Forest Restoration Workshop. In April, Nancy Sonti and Bram Gunther organized an Urban Forest Restoration Workshop. It included 35 urban forestry professionals from municipal government and community organizations from seven cities throughout the Northeast and Mid-Atlantic interested in best management practices for urban forest conservation and restoration as well as researchers studying urban forest ecosystems. This workshop convened urban natural resource management professionals from the Urban Ecology Collaborative (UEC) and UFS networks, and focused on the conservation and restoration of forested areas within the urban environment.

Art, Data, and Ecology workshop. In June, Lindsay Campbell and Bram Gunther, with Harvestworks, a group focused on the intersection of technology and art, held this workshop to foster dialogue and partnerships among land managers, scientists, and artists. Attended by over 30 people from across the region, individual sessions were focused on how artistic practice and scientific inquiry can be combined and what these types of collaborations mean for public engagement and community development. The final report will be issued in the early part of 2018.

Arrivals and Departures at the UFS

In addition to the regular staff at the Urban Field Station, the UFS provides opportunities for researchers, students, land managers, community stewards, and artists to visit temporarily. These visitors collaborate with UFS scientists and NYC Parks' managers by participating in our varied programs, which include workshops, internships, traineeships, fellowships, and residencies. The residency program for both artists and scholars is a facet of Science of the Living City (described in an earlier section on pages 8 & 9).

Artists-in-Residence

The NYC UFS's Arts and Humanities Residency Program aims to bring perspectives from these fields to urban social-ecological systems management. These artists partner with the Field Station for one year, from June to June.

Katie Holten. Katie is a visual artist based in NYC. She grew up in rural Ireland and studied at the National College of Art & Design in Dublin, the Hochschule der Kunst in Berlin, Cornell University in New York, and the Santa Fe Institute in New Mexico. Deeply committed to social causes, especially as they pertain to environmental issues, she makes drawings, sculptures, installations, books, public artworks, and ephemeral actions that function as poetic alterations to the everyday. Holten often works on-site to explore the history, ecology, and other invisible aspects of an environment. At the root of her practice is a fascination with the contingency of life's systems and the inextricable relationship between humans and the natural world. https://www.katieholten.com/

Matthew Jensen. Matthew is part-time assistant professor of photography and studio art at Parsons School of Design at the New School. He received his MFA from the University of Connecticut and BA from Rice University. Jensen's multi-disciplinary practice combines photography with walking, collecting, and rigorous site-specific explorations of landscapes. His projects strive to connect people to places by expanding the traditions of landscape photography to include a range of mediums and actions. Each body of work develops from time spent in publicly accessible landscapes or by examining the way different technologies transform this experience. http://jensen-projects.com/

Heidi Neilson. Born in Oregon, Heidi and lives and works in New York. She is an interdisciplinary artist interested in giving visual and sensible form to the connections between people on the ground and above-earth conditions and infrastructure. Her work includes, recently: Ground Station, a project exploring the detection and use of earth-orbiting satellites using ham radio techniques; SP Weather Station, where weather data-gathering instruments serve as a hub for various activities addressing earth's atmosphere; and Menu for Mars Supper Club, a series of events to envision and emulate cuisine on Mars. http://heidineilson.com/

Scholarly Visitors

Diana Kaliff, NYC UFS master's trainee. Diana will write her master's thesis on the theme "resilience science for transformations" at the Stockholm Resilience Center. Diana worked for 5 weeks at the NYC Urban Field Station as a trainee. She was involved in supporting social assessments in Flushing Bay, the STEW-MAP project, and worked with the Sadhana community organization on understanding and documenting Hindu religious and stewardship practices in the Jamaica Bay area. Diana worked in coordination with both the NYC UFS and the Science and Resilience Institute at Jamaica Bay.

Cornell University Oyster Researchers. Katie McFarland (pictured right), Matthew Hare, Harmony Borchardt-Wier, and Sascha Hernandez, came to the UFS several times over the year to collect data for their research project, which aimed to address the question, does reduced genetic diversity negatively affect growth and survival of hatchery-produced oysters exposed to stressful conditions? Their research, using eleven experimental sites from the Tappan Zee Bridge to Jamaica Bay, involved testing the hypothesis that genetic diversity reductions resulting from hatchery propagation lower fitness-related aspects of oyster performance.

West Point Cadets. For the second year, two West Point cadets joined the NYC UFS for a 2-week summer internship. This year, Ashtyn Hanna and Hannah Schwartz learned tree monitoring and geolocation methods from Michelle Johnson and Rich Hallett, and assisted Elizabeth Ward (Yale University) with her Master's research to understand the impacts of vinelands on carbon and nitrogen cycles in NYC forests.

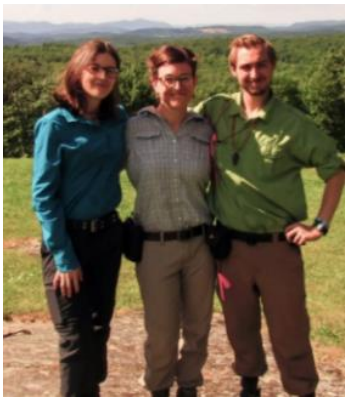
Stephanie Freeman, US Forest Service GIS Coordinator. Stephanie E. Freeman, Ph.D. is the Geographic Information System Coordinator for the USDA FS White Mountain National Forest, an 800,000-acre forest located in New Hampshire and Maine. This summer, she assisted the USDA FS staff at the UFS on the 2017 STEW-MAP survey. Stephanie worked to create a workflow for spatial analysis and develop a web portal for visualizing civic organizations in the NYC region. She also participated in educational outreach opportunities across the 5 boroughs.

Alicia Gonzalez, CUNY Queens College. While finishing a dual Bachelors in both Environmental and Urban Studies, Alicia spent the fall semester at the Urban Field station helping to organize and film Science of the Living City events. She worked on the "Friend or Foe? The Ecology and Aesthetics of Weeds and Street Tree Beds" workshop, which was a reflection by NYC Parks on the work they do with street tree beds on a daily basis and an examination of possible changes to those practices. Alicia created a video related to this event and street tree stewardship.

Nathan Kaplan, Drexel University. Nathan, a field technician in the Sustainable Water Resource Laboratory at Drexel, monitored green infrastructure stormwater capture sites across the city, asking whether we can draw inferences about green infrastructure performance across multiple sites. With over twelve sites in NYC, each with multiple sensors, Nathan made sure that sites were running properly by conducting sensor calibrations, installing hardware, updating software, collecting data, and making elevation surveys. The overall goal of this effort was to enhance the understanding of the hydrologic mechanisms by which green infrastructure can alter the ecosystem services in an urban watershed, with sites that ranged from green roofs to curb cut bio-swales to restored wetlands.

Elizabeth Ward, Yale University, Yale Hixon Fellow. Eli is a second-year Master of Forest Science candidate at the Yale School of Forestry and Environmental Studies. Her research focuses on the ecology of invasive plant species and their impacts on ecosystem processes in forested natural areas. This summer, Eli conducted research for her Master's thesis on the impacts of woody vines on carbon and nitrogen dynamics in New York's urban forests during her stay at the Urban Field Station. Her project explores the relationship between woody vines, carbon and nitrogen availability, and tree canopy health in invaded, uninvaded, and restored oak hickory forests. She is conducting her work in a subset of the citywide NAC Ecological Assessment plots, specifically in Inwood Hill, Van Cortlandt, Pelham Bay, Alley Pond, Cunningham, and Forest parks.

Lea Johnson, University of Maryland. Lea (in the center of the photo to the right) worked with her team, Bradley Simpson and Megan Carr, to continue her longitudinal research on three decades of ecological change along an urban-rural gradient. Dr. Johnson is an ecologist who joins research in plant ecology with applications in land management and design. Her work in NYC includes a network of long-term research sites focused on ecological restoration and change over time in urban forests, an expanding project that began in collaboration with Parks' FHNR in 2007. Megan is a doctoral student at the University of Maryland's Department of Plant Science and Landscape Architecture. Bradley Simpson is a senior in the Environmental Science and Policy program at the University of Maryland, with a concentration in Wildlife Ecology.



Mario Benito, Rutgers University. Mario and other researchers from Rutgers came to study the influence of water scarcity on urban ant food choices. This project related to the effects of Urban Heat Island, which is responsible for higher temperatures in urban areas. This leads to urban areas being drier than their surroundings, and a lack of water in urban environments affects the diets of the organisms which inhabit them. Their research focused on ants due to their vital importance in ecological processes, and examined the food preferences of ant communities in parks and other urbanized habitats of Manhattan.

Passing through

Artistic Retreat. During January, Mary Mattingly, an artist-in-residence from our 2016-2017 cohort, did an artistic retreat here for 3 weeks and found it to be a very productive time.

Denver Field Station. In April, USDA FS staff from Colorado, including Dave Chapman, Susan Daggett, and Austin Troy, visited the NYC UFS for a strategic planning session. They are setting up an Urban Field Station in Denver, and visited New York to discuss the workings of the NYC UFS and its Science of the Living City program.

Cultures of Sustainability. While staying at the UFS for a STEW-MAP Research Coordination Network meeting in May, Nathalie Blanc (along with Barbara Benish) gave a talk for a Science of the Living City event, Cultures of Sustainability, related to their 2016 book *Form, Art and the Environment: Engaging in Sustainability*.

Urban Forestry Students. In October, Coleen Murphy (Yale University and Urban Resources Initiative) brought students from her Urban Forestry class to see the work being done staff at the UFS.

International Programs Work Planning Retreat. The USDA FS Office of International Programs staff for Russia, Europe, and Eurasia stayed at the UFS in October. They held their annual work planning retreat here, and participated in various site visits and hands-on demonstrations with the Forest Service staff of the UFS. Jennifer Smith, a member of that program who also works at the NYC UFS, was joined by Leah Lord, Lara Peterson, Helen Petrozzola, Bella Gordon, and Shelia Slemp.

iTree Presentation. In November, Charity Nyelele and Jian Lin from SUNY Environmental Science and Forestry presented their iTree-related research at a SoLC Brown Bag event.

Stockholm Resilience Center Meeting. Eric Anderson, from the Stockholm Resilience Center, met with Forest Service staff in November to discuss the ongoing partnership between SRC and the NYC UFS (detailed on page 11).

Visitor for New York Botanical Garden Soils Conference. Ian Yesilonis from the Forest Service stayed at the Field Station in November to facilitate his attendance at the NYBG Soils conference.

New Staff

Jamie Ong. The UFS community gives a warm welcome to Jamie Ong! Jamie, Environmental Protection Project Manager at NYC Parks, has over 15 years of experience in wetland and riparian restoration, watershed planning, and green infrastructure design. At NYC Parks, she is piloting innovative salt marsh restoration techniques, managing conceptual planning for urban daylighting projects, and developing watershed-wide recommendations for water quality improvement, waterfront access, and citizen engagement. She holds a B.S. in Natural Resources from Cornell University and an M.P.S in Environmental Science from the SUNY College of Environmental Science and Forestry.

Farewells

Renae Reynolds. Since 2015, Renae served the Urban Field Station as Project Coordinator for the Landscapes of Resilience project at the Beach 41st Street Houses in Rockaway, Queens, and then as Program Coordinator for the Science of the Living City program. She combined her strong sense of place as a Rockaway resident with a tireless advocacy for environmental and social justice. Renae will be fondly remembered for her constant good humor, work ethic, and Jamaican cuisine tips. She departed the Urban Field Station in November of this year to join the NYC Environmental Justice Alliance. We wish her all the best!

Thank You!

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