

URBAN FOREST CONNECTIONS

webinar series

Resilient Cities: Strengthening resilience through green space and stewardship

Wednesday, June 10, 2015 | 1:00 – 2:00pm ET

TRANSCRIPT

Dana Coelho: Now onto today's topic: *Resilient Cities: Strengthening resilience through green space and stewardship*. Joining us we have Samuel Carter from Rockefeller foundation and Lindsay Campbell from the U.S. Forest Service, Northern research Station. Our first speaker, Sam Carter is an Associate Director at the Rockefeller Foundation, working on their resilience team and global resilience partnership. He is currently leading the Foundation's partnership with the U.S. Department of Housing and Urban Development on the national disaster resilient competition. Prior to his working with Rockefeller, Sam helped to establish the Institute for Public Knowledge at New York University, and worked as program coordinator for the President's Social Science Research Council. Mr. Carter has taught at Harvard's Graduate School of Design and NYU's Stern School of Business. He has served as a researcher for Vice President Joe Biden and political strategist Robert Shrum. Mr. Carter holds an MPA in Public and Non-Profit Policy Analysis and Management from New York University. Thank you so much for joining us, Sam. I will turn it over to you for your presentation.

Samuel Carter: Thanks very much, and I really want to appreciate the team that organized this webinar – in particular, to have this conversation with all of you, but also for the whole series. As part of the lead up to this I had a chance to look at many of the webinars that have been part of this – it's really a great conversation going on. Thank you for doing this work in creating these opportunities.

I want to give you a little bit of an overview today about what the Rockefeller Foundation is doing in this space. Resilience is something of a hot topic right now. It's been included in some high-level reports coming out of the White House and other federal entities. There are active conversations going on at different federal agencies and certainly at state and city levels as well about how to think about resilience, how to think about how resilient their communities are, how resilient their infrastructure is, how resilient their economies are. I think, hopefully, by the end of the presentation you

will have a little bit of a richer understanding of the different threads of the conversation, and certainly what the Foundation has been doing to try to advance this conversation in the United States.

My portfolio that I work on I've started to refer to as "resilience by design" – that's sort of a riff on the "rebuild by design" process we ran with HUD last year and has yielded 7 interesting projects which I will talk about at the end. The idea, fundamentally, is we are in a place today that is characterized by very uncertain futures. The deep uncertainty around the risks that we're going to face, and certainly a recognition that the things we have been doing in the past have in some ways gotten us to where we are today and may not be the things we want to do in the future. The idea of design is that we can use design thinking and design principles to get new ideas on the table, and take calculated risks and chances to try to grow towards a more resilient future. Hopefully, I'll share a little bit about that with you today.

As was mentioned, I am Associate Director of the Rockefeller Foundation. What that means is that essentially I'm a program officer and I have been pretty fun job of traveling around the country – and sometimes the world – and connecting with partners and working with folks that want to work on this stuff with us and want to work with their communities on this. I hopefully will be able to share some particular moments of articulation where you guys can do this work with us on your own.

Just to frame the whole conversation, I want to say a few words about resilience and how I think about it and how we think about it at the Foundation. Oftentimes when people think about resilience they see it as the antonym of vulnerability. What I want to share with you is that resilience is actually on a spectrum where the opposite is collapse. In the system at any given point and if it's an urban system, it's the layer of systems – the system of systems – that function together to deliver all the functionality of what a city does. You have to look at all of those systems and think about (for each one of them) where they are on the spectrum. We are constantly moving between these states, and a city can have very uneven ideas about they are on the spectrum.

This is a cartoon – something for you to look at and think about. Not anything quantifiable yet but the idea is that what is at risk is the actual collapse of the functioning of our systems. This is a slide that some of you may be familiar with. It emerges from Brian Walker's work. The idea is essentially that in any given system there is a point of equilibrium (or a basin of attraction in his language) which is the place where we are and depending on how things shift around, you may reach a threshold moment where the system fundamentally changes and you are actually in a new system. Just to illustrate this with an international system slide, this is a pond that has been completely overtaken by duckweed. Those are ducks moving through the duckweed. You can imagine a state where the pond was pristine and did not have the algae boom. What is happening here is showing that things can change and can change quite rapidly. This is just an illustration.

What is really driving some of the stresses that are shifting these thresholds and shifting our systems in a fundamental level are global environmental change, urbanization, which is happening at an unprecedented scale, and globalization. These are the three major shifts that are converging in the next three- to five-decade period the Foundation is tracking and really concerned about. We should all be concerned about [these shifts] because these are the things that are going to fundamentally transform our systems. How resilient we are and how responsive we are to these challenges is going to define, from our point of view, our era.

As you all know, climate change is real and is happening. I'd be happy to have that conversation in the discussion time. In a NASA report that came out last year said the probability of stopping the trend is now at 0%. What we have been focusing on at the Foundation with a lot of our work is ideas around cities. Cities have the capability of providing something for everybody only because and only when they are created by everybody. This underlines our work: that cities are these massively constructed systems that are incredibly complex. These cities are things that we are actively making every day. One of the things that gives us a lot of interest and excitement about the selection of focusing on cities is these big trends – 75% of people in 2050 will be living in cities, 80% of global GDP is generated by urban areas, urban areas are expanding two times as fast as their populations. The point of all this is that cities are growing. We have an opportunity to influence the way cities are growing and changing, and actually drive them towards some resilience goals – that is, setting them up to deal with the challenges I mentioned before: the massive increase in urbanization which we talk about in the slides, the shifts in global climate and also the increasing population. That's why we focus on the resilience of cities.

I want to spend probably about five minutes walking through the framework of how the Foundation thinks about resilience – and in particular, the resilience of cities. This is a graphic showing the city resilience framework. I will send a link to the report so you can download it and read it. It is a short 20-page document and presents a compelling way to think about cities in the complex urban systems. Essentially, the framework was built on years of empirical research where we did both a lot of fieldwork and also desk-work and review of the full literature, asking the question: when something bad happens, and it could be a culmination of a lot of stresses or it could be a sudden shock to the urban system. It could be an earthquake, or it could be social tensions that mount to a boiling point. Systems start to collapse. Systems start to break down. The question we took to cities all over the world was: what made the difference? What enabled your urban systems to function and continue function – or if not continue to function, get back online as quickly as possible or as quickly as needed? When the systems did not get back online, why was that? What are the critical factors that made the difference?

The framework has four main quadrants that increase in scale. These were from the analysis – what emerged from the research. The first scale is labeled **health and well-being**. I like to think about it in terms of people. How well does the city:

- Meet basic needs – that's water, food supply, things like that.

- Support livelihoods and employment. This is about how a city creates a space and the city's system creates a space for people to make a living, to be able to have enough resources to keep their families and themselves safe.
- Ensures public health systems about necessary care they need to live.

The next scale is about **organizations**. This is about the structures that enable people to collaborate. We also think of this around infrastructure and environment. This is about how well a city promotes cohesive and engaged communities. It's about ensuring social stability, security, and justice. It's about fostering economic prosperity. How is the city organized to create economic opportunity? How is the city organized to ensure social stability – which is to say is there trust in the institutions that have policing functions and justice functions? Again, from a cohesive community perspective, is there space for people to come together to take collective action and support each other?

The third scale is about **place**. We also think about this in terms of economy and society. This is about those functions that enable places to take on the character they have and also a lot of the infrastructure and physical systems that enable a city to work: reliable mobility and communications, continuity of critical services, and reduced physical exposure. It's worth noting that if you were to simply do a review of the literature and think about how people have been writing about resilience, most of it drives in to this quadrant – the third quadrant on place. It's reflective of a privileging in the literature around physical infrastructure, especially grey infrastructure.

The fourth quadrant on **knowledge** is about effective leadership, empowered stakeholders, and integrated planning. What we found in our research is that cities that were actively working toward these three issues – these three indicators – were better set up to deal with whatever might come their way. This is about promoting leadership and effective management, empowering a broad range of stakeholders, and fostering long-term and integrated planning.

Another concept that we have introduced that is complementary to the city resilience framework is that of the resilience dividend. A book by our president, Judith Rodin, came out last year which I highly recommend: it's called *Resilience Dividend*. The fundamental concept (if you don't read the whole book, hopefully you can walk away with this) is that shocks and stresses to an urban system – or really any system - can bring opportunities for places to evolve and transform. That shock can provide a threshold for thinking about the future that can put you on alternative path. To use the diagram I showed earlier, you end up in a different basin of attraction. What that gives you is a better path forward and an opportunity to have that conversation. The dividend of thinking about resilience and dividend of doing resilience planning are the benefits that happen under normal times, because a lot of resilience-building projects that I will talk about in a minute are improving the ordinary lives of everyday people living in urban systems. These are also interventions that allow states, counties, and cities to recover faster. There is also value created in the avoided losses because the city adopted the resilience measures.

The question before the Foundation – because there are all of these interesting ideas going out and people are talking about this in a great conversation – is, how do we scale resilience? How do we scale these ideas and the projects and good work that people are doing? How do you scale it to improve the lives of millions of poor or vulnerable people?

This leads us to the portfolio of work that I'm going to breeze through – resilience by design. These are processes that are driving the creation of good ideas, testing them out through implementation partners, and then eventually (hopefully) scaling them up. We won't talk about this because we're running out of time. I want to get to these sorts of processes because I think they are quite interesting.

The first process is structures of coastal resilience, which was a partnership with Army Corps of Engineers as part of the North Atlantic Coast Comprehensive Study. The structure of the competition was that we had a core research unit based at Princeton University that was looking hard with the best available scientific tools at 4 specific communities: Norfolk/Hampton Roads, Atlantic City, Jamaica Bay, and Narragansett Bay. They took a deep look at surge risk, subsidence, and other factors that would lead to sea level rise, and did a detailed analysis for each of these places. They had models set up that they could run, depending on what came up in the process. The science team was paired with four teams at different design schools. They generated new and creative ideas that they then were able to task with the science team. The value of doing it in these places is these are all areas of focus for the Army Corps of Engineers to study. We can talk more about that if you have questions. There is a robust report that just got published at structuresofcoastalresilience.org.

The general idea of this entire process is to look at ways for attenuation, dissipation, protection, and planning – we're looking at layered systems that will increase coastal resilience. One project that came out of this was project in Atlantic City was idea of an amphibious suburb that over time would have the ability for this community to adapt and grow with sea-level rise. Again, there's much more information on this at structuresofcoastalresilience.org. This is an example of how this could be implemented in different locations in different ways given the streetscape and built environment already there.

The next competition I want to discuss is “Changing Course”. This is a partnership with the U.S. Army Corps of Engineers, the Port of New Orleans, and the State of Louisiana. The opportunity here is to capture a moment where there is going to be update to the 2017 coastal master plan for the State of Louisiana. Essentially, an open question in that process is the design and management – or wilding – of the lower Mississippi River in certain ways (just north of the city of New Orleans and south through the mouth). What this was exploring is how can we, over a 100-year time scale, think about reconnecting the river to its natural systems and thus restore sediment flow to the ecological systems that actually build coastal protection? The rate of loss is familiar to many of you on the phone, I'm sure, but the rate of loss of our coastal wetlands is astounding, frankly. In particular, on the Mississippi River Delta, it's

accelerated for a variety of reasons. The question we posed to the three teams was: how could you reconnect the river to build this wetland and at the same time build the social and economic systems of the entire region. I'm excited that probably in a month or two we will probably be able to announce the winners of that process. We're still deciding, but you can review some of the design work on their website which is <http://changingcourse.us> .

The next process I want to talk about is "Rebuild by Design". This was a partnership with HUD, the U.S. Housing and Urban Development. Through a strange set of bureaucratic reasons, they are actually the agency responsible for administering the lion's share of disaster recovery funds to get allocated after a disaster. The CDBG-DR grants are typically awarded on a formula basis, and are given to places that have nationally declared disasters. They are often given as discretionary funds that can be used by a governor or a mayor to help recover after a disaster. The opportunity and thinking about resilience is taking moments like a disaster and having a bigger conversation about future risk, future issues, what's known and what's unknown, and steering some of those funds towards projects that have that forward view and aren't just building back what was there or just recovering from the disaster.

The structure of this was having interdisciplinary teams formed – they could be international (in fact, all of them had international members) – and lead them through first a research stage and then through a four-month community engagement and design stage which would yield good ideas which could then be funded with the HUD funds. That's what we got. We ended up developing good ideas that yielded \$920 million in disaster recovery funds. They ran the gamut for different scales of individual. They really covered a lot of ground in terms of the Sandy-affected region: grants were made to the State of New Jersey, the State of New York, and New York City. There was also a grant made to the State of Connecticut to do some additional work on a Bridgeport proposal. What is shown here are the six winning designs, at least where they are on the map. I will go deep on one of them because I think it will be interesting to the group.

There is a proposal that is now being funded fully and will be implemented by the State of New York and Army Corps of Engineers called "Living Breakwaters." This is a system of offshore breakwaters that double as oyster habitat and other shellfish habitat. The breakwaters also have a function of reducing risk from flooding from the coast because of the reduction in surge. They worked closely with a team at Stevens Institute of Technology led by Phil Orton to model what would happen if they put these kinds of breakwaters in the system. What is interesting about this whole project is, in addition to creating these habitat breakwaters that slow the flooding, it also restores an entire economic function to the Staten Island community. It's going to be implemented in a town called Tottenville, which was built up entirely around shellfish industry, but that industry got wiped out due to environmental degradation and water quality issues. In addition to preparing for a future event and for future storms that we know are going to happen, it's also building the local economy as well – and even the city's economy. It's also making it a more beautiful place and better for habitat. I should also note it's

going to be stewarded and maintained by the schools and some of the organizations on Staten Island. It's an opportunity to build in educational opportunities and stewardship of the system.

One of the interesting things about this is they did not elect to build a wall, which is what might have happened for this community. They might have just built a wall between the community and the ocean and from our point of view, that's maybe not the best way to think about the future. It encourages development behind the wall and creates a sense of protection that may or may not be real. We don't actually know how bad things might get or what might be coming. This is an opportunity to create an understanding about the real risks that we have by living on the coast.

The final thing I want to mention is the National Disaster Resilience Competition. This was an effort by HUD to take what we did in Rebuild by Design for the Sandy-impacted region and invite folks everywhere around the country that had a federally declared disaster between 2011 and 2013 to participate in a similar competition. What is interesting about this is that this is a demonstration that HUD and the White House are taking this idea seriously – that communities can use disaster recovery dollars to think about the future in some new ways. It's a really broad opportunity because 48 of the 50 states in the U.S. are eligible, as is Puerto Rico. There is opportunity at each of these states to engage with a team that is working either at a city, a county, or a state level to partner up and think about these things collectively. There is a very big community engagement component to this. One of the other things I will circulate at the end of this call is the point of contact for each of the teams working on this in case you are interested in following up with them. Essentially, the Rockefeller Foundation's role in this federal process is to run a capacity building initiative that's helping communities respond to the call for good ideas from HUD. We have been running a series of resilience academies around the country that are getting communities prepared and thinking about these things in the right way, and really working through their project ideas and their overall strategies.

I'll stop there – I'm happy to entertain questions at the end. I know I went quickly and I apologize to folks if they didn't follow every word. I will be sure to make the slides available after the presentation and, potentially, we can follow up in Q&A. Thanks very much.

Dana Coelho: Thank you so much, Sam – that was great. Thanks, folks, on the phone and on the computer for shooting your questions in on the chat pod – keep that going!

Now I will introduce our second speaker, Lindsay Campbell. Dr. Campbell is research social scientist at the New York City Urban Field Station. Her current research explores the dynamics of urban politics, natural resource stewardship, and sustainability policymaking. She is a principal investigator on several interdisciplinary projects including the stewardship mapping project, which we heard about on the January

Urban Forest Connections webinar. She helped to lead research behind the Living Memorials project, which explores the use of green space in post- 911 New York City, as well as the TKF Foundation landscapes of resilience project, which looked at post disturbance stewardship of natural resources in Joplin, Missouri and New York City. Dr. Campbell holds a Bachelor's degree in Public Policy from Princeton University, a Masters in City Planning from MIT, and Ph.D. in Geography from Rutgers University. Lindsay, thank you so much for joining us today. I will turn the stage over to you for your presentation.

Lindsay Campbell: Thanks so much to Beth Larry, Amanda Egan, Dana Coelho, and the whole team for organizing this. It's really a pleasure to share in this conversation with Sam and all of you. I will be presenting on work today that I have co-developed with my collaborator and co-author, Erika Svendsen. I will draw mostly from cases here in New York City, but I think and I hope these have broad relevance to resilience planning conversations across both urban and rural areas broadly.

A quick bit of sense of place: the New York City Urban Field Station where I work is partnership between U.S. Forest Service in New York City Department of Parks and Recreation, as they are the primary natural resource manager in this city. From that core partnership, we have now expanded to include over 50 civic, academic, and other municipal partners. What we really aim to do is be both a conceptual space and a physical place where researchers and practitioners work together on our mission of improving quality of life in urban areas by conducting research about social-ecological systems and natural resource management. We have a facility for visiting scientists and students that folks can apply to, and I will put up our web link on the page.

Much of our research focuses on environmental stewardship. We define stewards as groups that conserve, manage, monitor, educate about, or advocate for the local environment. That includes broadly land, air, water, waste, toxics, and energy. We're interested in the whole system. In particular we draw attention to the role of civil society, meaning civic groups and NGOs. These groups exist in large numbers, and they persist over time. We think they are social innovations that influence how urban spaces are designed, managed, and used. They are social resources that we draw upon in good times and bad – post-disaster and in lean economic times. We think supporting resilience requires a greater understanding of stewardship dynamics. We're aiming to fill the gap that Sam noted in the literature where there is a lot of focus on physical or gray infrastructure. We're focusing on social dynamics and how these groups interact with green infrastructure.

On the map to the left you see green infrastructure mapping is relatively common in urban environmental planning and management. This project, STEW-MAP, is unique in that it maps the actors that care for that infrastructure. At the right you see a map of 2,800 civic stewardship groups with dots representing the address of these groups. In creating this project, we were responding to biases or patterns we saw where there

was skepticism there was environmental engagement in the city, or where there was “cherry picking” by funders picking certain groups over others. The goal of this project is to make visible the gaps and the overlaps in civic stewardship, with the aim of strengthening the whole system. As Dana mentioned, there is another webinar about this project that you can refer to the website for (www.fs.fed.us/research/urban-webinars/social-networks-knowledge-systems.php).

We’ve also looked at the connections among stewards. We use social network analysis to identify key organizations that serve as brokers or bridge organizations in the network. We found at the time we did this study in 2007 about a dozen civic groups playing this crucial role in sharing information and resources across New York City. What these groups do is they cross sectors and scales, and they connect smaller civic actors with larger public agencies. In a sense, these groups are creating a multi-scaled governance capacity and helping build a more flexible, adaptive, and resilient institutional structure. I should mention this work is being conducted with Dana Fisher (University of Maryland), James Connolly (Northeastern University), and a growing team of national Forest Service scientists.

Scientists often used disaster or disturbance as unfortunate opportunity for research. These moments of crisis can make plain underlying social and ecological conditions, mechanisms, and relationships. The Living Memorials project was a study of community-based memorials that use the landscape in memory of September 11. We documented sites ranging from single tree plantings to community gardens to memorial parks to forest restoration. We expected that a disturbance of this magnitude would yield a system-wide response. In addition to the grave loss of lives and property, we thought there would be an emerging and creative regeneration. Indeed, this map shows more than 600 memorials nationwide that we documented. We are now continuing the research longitudinally this summer. We’re revisiting sites to learn more about which of the sites were temporary and which ones have longer lasting impacts. Although some memorials remain completely unchanged, we’ve seen many have grown to encompass other tragedies and community needs. There is a fluidity of this space being used to accommodate new concerns. We think that will be really important to document for understanding resilience.

From the Living Memorials project we learned that stewards were caring for the land as a way to express their care and concern for each other. They are acting as first responders to these disasters, helping to knit people together by creating and stewarding sites that nurture and sustain us. We found that people are creating these sites out of very basic abiding and universal needs to beautify, to teach, to relax, to restore and to create or to reestablish a locus of control. This work led us to connect with other scientists who were looking at greening across the world in response to different social, political, and ecological disasters. Our colleague Keith Tidball at Cornell University examined greening in post-Katrina and post-war settings, and after the Fukushima nuclear disaster in Japan. He and his coeditor Marianne Krasny put together a book drawing upon dozens of cases of greening in the red zone, across the world. That is title of the book and I encourage you to look at it.

We also looked at greening in response to chronic or slower moving disturbances. New York City's fiscal crisis of 1970s led to large-scale arson, housing and property abandonment. There was capital flight and white flight from the city, but remaining residents – often low-income people of color – used community gardening as a neighborhood stabilization strategy, and served as key managers of the land. So you have a context of disinvestment and loss that was countered by neighborhood residents' investments of time, effort, sweat equity, and indeed love to create spaces that re-centered themselves and their communities. Many of these gardens have persisted to this day through changing economic times, neighborhood shifts, and leadership transitions. We're working on longitudinal research to understand the motivations and experiences of community gardeners over the last decade. The more we know about who engages with these sites, why, and the challenges they face in doing so, the better we can support the spaces with just the right amount of ongoing baseline support that helps residents but doesn't stifle emerging creativity and local leadership.

Acute disturbances are becoming more common and more severe under conditions of climate change, including tornadoes, hurricanes, floods, and heat waves. As researchers, we are examining social ecological resilience through comparative research across two sites: Joplin, Missouri, in the wake of the 2011 tornado and New York City post-Sandy. With this research we're examining the recovery and rebuilding process to understand how people are using trees and green space in the wake of such devastation. Particularly we're interested in stewardship, memorialization, and even the creation of sacred space. It's remarkable to us how nature – the very thing that destroyed so much of what we loved – becomes something we turn to in recovery and solace and something we seek to restore.

These are images from Joplin of the use of art to reimagine and reshape the standing dead trees of the urban forest. In the lower left is an image of a memorial space created at Cunningham Park which is essentially Joplin's central park, which was completely destroyed by the tornado. In studying this site – its redesign, rebuilding and reuse – we're observing that the park is a key site of social meaning to community both before and after the storm. The nature narratives were used the restoration period to counter narratives of decline and loss. In terms of governance, we see a mix of government and civil society, with many public servants working beyond their 40-hour workweek and thousands of residents donating money, time, and sweat equity to restore the park. We see the blurring of roles and responsibilities across the sectors during this window of reorganization post disturbance.

In New York City, we have seen some emergence as well, just like in Joplin. The Rockaways of the New York City peninsula near JFK Airport that were completely inundated during Hurricane Sandy. We see these artworks that use natural elements and counter the narrative of decline. This is the Sea Song Memorial in the Rockaways featuring flags that illustrate concepts of resilience. It was no surprise to us that in searching for a permanent home for this memorial, the artist ended up working with a

local stewardship group to site the work at a community garden. This points to need for flexible space, for unprogrammed space, where we can express our creativity and bring our community together to build something anew.

We also saw an uptick of civic engagement and stewardship post-Sandy. This increase included changes in the use of social media, changes in the distribution of funding, and changes in the role of the civic groups. This is an image of a MillionTreesNYC tree planting that occurred about one year after Sandy in the Rockaways. It was largest such volunteer event of the entire campaign. Again our colleague James Connolly re-interviewed those broker organizations – that I showed earlier from our STEW-MAP research – after Hurricane Sandy. He found that many broker organizations were able to pivot and respond to the hurricane by providing information, volunteer opportunities, and greening resources. We begin to see that the government's network has adaptive capacity to the role of these flexible civic brokers. These brokers have dual accountability both to government agencies and funders but also to the grassroots. They provide novel resources such as grants and stewardship programs. They build new alliances and can even in some cases address uneven resource distribution. James is working on a manuscript with these findings and we think it's an exciting piece of new work.

Now, turning to stewardship and park use every day. In order to cultivate social ecological resilience we need to understand relationships between people and nature in the time before the disturbance – under more everyday conditions. Our more recent research has honed on the relationship between people and ecosystems at parks and natural areas – meaning woods, meadows and wetlands that were set-aside and not programed for active recreational use.

One way of understanding human environment relationships is through the concept of ecosystem services. These include the provisioning, regulating, habitat supporting, and cultural functions of the natural world. Cultural ecosystem services are those nonmaterial, non-biophysical benefits – including aesthetics, spirituality, recreation, education, cultural heritage, knowledge systems, and physical and mental health. The cultural is sometimes overlooked or oversimplified because in the past humans were excluded from concept of ecosystems. In the city, we are the dominant ecosystem engineer. We can describe cultural services as co-created by the interactions of people or stewards and ecosystems. In cities, this can occur anywhere from single street tree to a vacant lot to a shorefront to a forest.

Working with the New York City Parks Department and the Natural Areas Conservancy (a local NGO), we have documented the use, value, and meaning of urban parkland in 39 parks over two summers. We covered more than 9,000 acres and interviewed more than 1,600 park users. We ask people, why did you come to this park? We can see at left the primary themes that emerged. In summary, we found that urban park land is crucial form of nearby nature. It provides space for activities, recreation, socialization, and environmental engagement, and supports social ties and place attachment. We see that these themes connect directly to socio-cultural ecosystem services defined by

the Millennium Ecosystem Assessment – particularly social relations, sense of place, aesthetics, recreation, inspiration and spiritual values. Thus urban nature is a critical part of the sustainable and resilient city precisely because it supports social, psychological, and in some cases spiritual needs of its citizens.

We found that parks support these dimensions of health and well-being at three scales: by helping people connect to self, others, and a larger reality. Connecting with self occurs as park users seek out the refuge of woods away from the dense urban environment. Because I'm a qualitative researcher, I'll share some quotes. A respondent said, "There's no other place out there to read out there in peace and quiet without seeing 1 million people." (*from Fresh Creek Park in Brooklyn*).

Connecting with others occurs through socializing, such as barbecuing, picnicking, or talking on a bench – which we found in about a third of park users we observed. About 26% of respondents visited their parks on a daily basis, and another 42% visited weekly. Another quote: "We love this park! We're here seven days a week. This is our second home. If there were eight days in a week, we would be here the eighth day, too." (*from Helen May in the Bronx*).

Connecting with a larger reality refers to using parks to engage in spiritual, religious, and even sacred practices. A few respondents engaged in ministry, prayer, meditation, or making offerings. At some waterfront parks in Queens and Brooklyn we found evidence of sacred practices, including ritual debris and posting religious writings. Other respondents engaged in solitary meditation or prayer, making specific reference to doing so in a natural setting.

Turning back to the question of stewardship, we also asked park users if they were involved in groups to take care of the environment. We found that overall, 15% of park users are also stewards – showing a very high engagement that form of stewardship. The word cloud shows names and types of groups in which people are engaged. I apologize if it's hard to read, but just to give you a feel for the types of groups we're talking about in stewardship.

We are also interested in what people said when they didn't participate in stewardship. The primary barriers that exist are no surprise: lack of time and lack of awareness about how to get involved. Perhaps of most interest to natural resource managers who are trying to cultivate stewardship was those that said: no, they are not engaged, but shared with us other ways in which they engage – from civic engagement at church to recycling at home to picking up litter at parks outside of the context of a group. We see that these respondents are already engaging with social ecological systems in their own way and in their own time, but they might also be potential recruits for new programs and opportunities. If you want to strengthen the connection between people and the urban environment, we would do well to use these building blocks to meet people where they are in our outreach and programming.

Wrapping up, I will raise some questions for us to consider about how stewardship can be part of a strategy for cultivating resilience.

- In thinking about civic stewards as first responders to the challenges that will inevitably come, how do we harness their capacities? How do we insure that stewards are listened to, valued, and meaningfully engaged in decisions about the spaces of their neighborhoods and cities? Stewardship groups have a role to play in creating urban nature as they persist over time, they formalize, and professionalize – they're playing a crucial role in our governance networks.
- How can actors and state and private sector learn to embrace civil society? How can we continue to build parity in our systems?
- After a disturbance we need space – to gather, to meet, to organize material, to socialize, to rest. As the timeline extends out from the immediate aftermath, we need places to express ourselves: to create beauty, teach, and connect. How can we consider these later stages part of the disaster recovery process? When the magic of so much of these spaces comes in their very emergence and unplanned nature, we can we plan for the unprogrammed? How can we cultivate places of social meaning?
- Finally, thinking about nature as a restorative mechanism, how can we envision nature not only as a buffer or service but as part of our social infrastructure that supports health and well-being and serves as platform for the co-creation of ecosystem services. We don't just want to adapt to the prior disturbance, we want to think about how we can sustain healthy and just urban communities always.

I'll briefly touch on the next steps in our resilience-related work. We have a number of manuscripts in preparation or review with journals, drawing on the social assessment of parklands and the STEW-MAP research. If anyone on the webinar wants to get in touch with me directly, I'm happy to share our previously published work. As well, this summer we are ramping up our research on the Landscapes of Resilience project. With funding from the TKF Foundation's Nature Sacred program, we are studying a single resident garden at a New York City Housing Authority public housing complex on the Rockaways as a case-study of the role of community-based stewardship in the recovery from Hurricane Sandy. We plan to produce journal articles, blogs, and other media from that project. Finally – and this is an invitation – we working on planning a strategic workshop to continue this discussion on the role of community-based stewardship and post-disaster re-greening. We are actively developing our partners and participants for this event. Feel free to contact me with questions or feedback if you are interested in that effort.

I would like to briefly knowledge our funders, co-authors, and collaborators here, and I have put up the website for New York City Urban Field Station. Thanks for your time, and feel free to visit the website to learn more about our research and our programs. Thanks.

Dana Coelho: Excellent, Lindsay. Thank you so very much! For everyone, now we have time for questions -about 10 or 15 minutes. Just a reminder, if you would like to ask a question, please go ahead and type it into the chat pod. If you have been following the chat pod, Sam has been responding already to some of the specific questions. I will be able to read those and we'll get discussions going with the presenters now.

Going back to a couple of the first questions that were asked during Sam's presentation: Lyle points out that GDP (which Sam referenced) only measures economic transactions and asked whether GPI – the genuine progress indicator – might be a better predictor of (or measure of progress toward) urban resilience?

Sam Carter: I didn't mean to imply that GDP was some kind of magic metric for understanding the resilience of a place. I think GDP is an incredibly flawed indicator. We could have a conversation about that. I'm not familiar with GPI, but it sounds interesting. What we are doing with the city resilience framework is we are advancing the notion that there are these 12 indicators that you need to think about when you are understanding or trying to understand the resilience of an urban system. Underneath each of those indicators, ultimately will sit about 140 to 150 different metrics, collectively, that would be aggregated up to each indicator, which would give us some quantifiable sense of the resilience of a place. I want to use a lot of cautionary words here: indices are problematic as a fundamental thing when you start to measure resilience, things get weird. Resilience is in many ways only measurable in indirect ways. It's also incredibly complicated. So, it really is an attempt – we don't know how well it's going to work, and we will be piloting it in 2016 in a few cities to see how well it works. What I don't think it will ever be able to do effectively is compare one city to another city in a kind of ranking. I don't think that's effective, I don't think that's productive, I don't think that's useful. I don't think it's more of an effort to be able to benchmark in cities the current state of its systems and to work toward strategic goals for increasing its resilience over time – but I appreciate the question.

Dana Coelho: Next we had another question during Sam's presentation: Anthony was asking about the migrating wetlands idea that you mentioned: will the average person desire to live in an area that could be inundated for several months of the year with invasive mosquitoes?

Sam Carter: I think the way the question is phrased, who would want to live there? I don't like mosquitoes, and I don't think anyone on the call does. I might be wrong about that. The key element of each of these is the community-led design process. These designs emerged from discussions with communities about hard decisions they have to make. So, if the decision is between living with mosquitoes and not with mosquitoes, then I think the answer is: no, I don't want to live with mosquitoes. But if the decision is between leaving my home that I have been at for X number of years (and I want my kids to live at) and adapting to the changing conditions on the ground, it may be a different answer. I do think it is important in these conversations to be realistic about

some of the time frames and horizons of communities and where they can live, but ultimately it's going to be a combination of individual homeowners' collective social risk we are willing to take, and resources to allow communities to continue to live in places that are at threat. It's complicated, though.

Dana Coelho: It certainly is complicated. Thanks, Sam. The next question came in for Lindsay: does New York's Million Trees project provide the necessary monitoring of planting success and woodland development after a planting is done?

Lindsay Campbell: Thanks for the question. Yes, the Million Trees campaign is really going through the transition now from emphasis on planting to a real emphasis on monitoring, maintenance, and stewardship. They are planting the final millionth tree this fall. The Parks Department is one half of the Million Trees campaign. Their mandate to care for the urban forest will go forth in perpetuity as long as we have a city of New York. They have showed a really strong commitment to the stewardship piece by creating a new position called the Director of Stewardship who will work to engage people across all site types, from the forested natural areas to parklands to street trees. That's a pretty new unique new position. In terms of monitoring and performance, all the street trees are guaranteed contractually by the contract planters for the first two years of their lives – that's when street trees are often most vulnerable. Beyond that, they take monitoring to upkeep the street trees, and that includes a massive, citywide complete street tree census going on this summer and engaging volunteers, again. In terms of the woodland areas, monitoring takes a little bit longer. Change takes a little longer to detect, but that's where a number of folks in the natural resources group and here in the Forest Service are working on long-term studies to understand how these afforestation and restoration sites perform.

Dana Coelho: Great! Thanks, Lindsay. Another question for Sam: noting that your presentation focused a lot on sea level and issues around too much water, climate change with more warming here in the Arctic, and changes in the jet stream and {unclear?} may lead to extreme reductions in precipitation and interruptions in the established food production models. Will your work have any focus on alternative models for food production?

Sam Carter: It's a flaw in my presentation that all of the projects I presented have to do with water, but it's also a reflection of a lot of the immediate needs and concerns of the communities we have been working within the United States. For an area of our work which I did not present on – competence tackling with a lot of the food production and also the food-to-market issues – there are two streams of work at the foundation. The first is the Global Resilience Partnership, which is a partnership with USAID, the Swedish International Development Agency, a growing host of partners, and the Rockefeller Foundation. We are asking a lot of questions around food security and food production, but really looking at the developing world where there are the most vulnerable and poorest populations, and where we see there are chronic food shortages. The Grand Challenge that we are running currently has some teams looking at this issue, although their solutions have not been presented and shared yet

– so keep an eye on that! The other initiative that I want to point you to as an effort in the Sahel and other southern parts of Africa that is in development here at the Foundation. It's a waste and spoilage initiative. We are considering what all of the factors are that are leading to waste and spoilage in the food supply chain. That includes issues connected to shifts in climate change and how food can be safely stored in increasingly extreme environments. I know that's not a direct answer, but it's hopefully pointing you to some interesting ideas down the road.

Dana Coelho: Great, thanks Sam. We will go to a couple of more questions. A note to those who may need to leave at the hour, we do have some information up on the screen about our next webinar, which will be in September. On to our last question, which was asked to Lindsay: how do you resolve the interface of urban forestry with solar access rights in residential neighborhoods?

Lindsay Campbell: Okay, I hope I understand the question correctly – in terms of space conflicts between putting in trees versus putting in solar panels? I would say that goes to the issue of how you select sites for trees more broadly. A lot of the tree planting that's occurring in citywide green infrastructure campaigns is happening in the public right-of-way, meaning in sidewalks – retrofitting our urban fabric to be a little more multifunctional as opposed to just concrete. I don't think that's in conflict, it's just a smarter retrofit of our streetscape. A lot of the larger-scale forest plantings are happening in already existing parklands, natural areas, or remnant spaces surrounding highways and infrastructure. A platform for making those decisions about where you have trees and where you might want to have trees is an urban tree canopy mapping tool that has been developed by colleagues at the Forest Service, University of Vermont, and elsewhere. It uses remotely sensed imagery, including LIDAR if you can get it, along with parcel data, so you can get fine-grained about where you have trees, you could possibly have trees, and where it might be preferable. A tree isn't the solution to everything – you might want a solar panel or bio-swale. You can use urban tree canopy as a platform for having some sort of a stakeholder-based dialogue with weighting or priorities given. We think if you can have an urban tree canopy map along with a stewardship map where you know where you have capacity to care for your investments in green infrastructure, that is sort of the gold standard and something we are working to align those tools here in Forest Service Research and Development. I hope that answers the question about solar access – if I totally missed it, send me another note.

Dana Coelho: Lindsay, for what I know about that phrase, I think you hit it – but I'll keep an eye out on the pod to see if anyone disagrees. One final question, since we have until 15 minutes after the hour, and then I will give a couple of closing comments. Another question to Lindsay: when communicating with urban planners on development of green spaces, can you recommend any tactics that could help facilitate cooperation among uninterested parties.

Lindsay Campbell: I would have to know a little more what's behind that question – it's probably a pretty site-specific or context-specific question. The first thing off of the top

of my head is I need to speak someone's language, whatever will be compelling to them. Often that is a mix of metrics and story lines, with metrics meaning using data or indicators or scientifically backed evidence to support your claims as well as storyline in terms of the quality of richness of why something matters to people's lives. The combination of those two, generally, can compel someone to action. Facilitating collaboration, particularly in deliberative settings, is a whole field of practice and there are a lot of best practices out there.

Dana Coelho: Great. Thank you for that. I think with that last question, we will go ahead and wrap up for today. I would like to thank both of our presenters so much for their time and their creative thoughts, and sharing all of this information with us about such a hot topic.

Thanks to all of you for participating! If you would like to leave us feedback about today's webinar, please do so using the two polls that we will put up on your screen. You can provide a one – through five- star rating and/or written comments. Your responses to these questions will not be viewable to other participants, so feel free to be honest. As Amanda mentioned in the chat pod, we do not have ISA continuing education credentials available for this webinar, but if you are interested in receiving a certificate of participation to submit in two other education programs, please type your full name and e-mail address into chat pod. We will keep the meeting room open for a few more minutes for you to do so and to leave your feedback. As always, if you have any questions, feel free to e-mail us using the link on our web page.

Last but not least, a note on schedules: there will be no webinars hosted in July or August, so enjoy your summer vacations and getting caught up on all webinars you may have missed that are archived on our website. The next Urban Forest Connections webinar will be on September 9, 2015 – The title is: *Urban FIA: Bringing the nation's forest census to urban areas*. Our speakers will be Mark Majewsky with the U.S. Forest Service, Chris Edgar with the Texas A&M Forest Service, and Dick Rideout or Andrew Stoltman with the Wisconsin Department of Natural Resources. Thanks again for everyone who joined today and you enjoy the rest of your day.

[Event concluded]

www.fs.fed.us/research/urban-webinars/
