

## **Short Scientific Report – Vittoria Gnetti**

### **Developing the concept of an European Urban Field Station**

#### **1. PURPOSE OF THE STSM**

The activities carried out in this Short Term Scientific Mission (STSM) were developed in the frame of the ongoing European project GreenInUrbs, under the supervision of Dr. Carlo Calfapietra. GreenInUrbs approach aims to identify the main priorities and challenges in terms of future research on Green Infrastructure (GI) and Urban Forest (UF), comparing different approaches and conditions (climatic, socio-cultural, economic and urban planning), in order to develop best practice guidelines for land managers and decision makers to assist in the maximization of benefits from GI and UF. The works was carried out at the New York City Urban Field Station (NYC UFS), a physical place to conduct research and a network of relationships among scientists, practitioners, and facilities focused on urban ecology. The NYC Urban Field Station is sustained through a core partnership between the USDA Forest Service Northern Research Station and the NYC Department of Parks & Recreation. In addition to New York City, there are three other Urban Field Stations (UFSes) in Baltimore, Philadelphia and Chicago. The main purpose of my STSM was to understand how the concept of Green Infrastructure can work in combination with urban development and land managers to create innovative programs that support the urban ecosystems. More in detail, the project focused on the works and collaboration between social and ecologist scientists and managers at the New York City Urban Field Station in order to make up the entire urban ecosystem, including the abiotic and biotic features, the human communities and the built environment. Finally, another goal was to understand how the research projects within the Urban Field Station are integrated with the public dimension. My aim was in fact to develop a methodological advancement in the urban forest research in Europe, in order to enhance an Urban Field Station (UFS) concept. How could we enhance comparative urban ecosystem research with decision-makers and researchers in Europe?

#### **2. DESCRIPTION OF THE WORK CARRIED OUT DURING THE STSM**

With a focus on green infrastructure and urban forests, this project examines how the Urban Field Station (UFS) works with land managers, government and civil society actors to create innovative research programs about social-ecological systems and natural resource management in order to improve the quality of life in urban areas. Attention was also paid to the social context, understanding the engagement of multiple stakeholders—including civil society actors, and showing how research projects within the Urban Field Station are shared with the public. The study thereby contributed to develop a deeper understanding of programs and initiatives associated with the Urban Field Station, with a specific focus on “research-in-action” programs. I examined all the available tools—including inventory and assessment, field experience, and

applied scientific research— in order to implement best practices and apply and adapt the Urban Field Station concept in Europe. Finally, the project focused on the urban environmental stewardship research of the Urban Field Station, in order to understand motivations for and stewardship actions of a combination of larger public agencies operating at the citywide, regional and state-scales along with civil society groups.

The activities carried out during the STSM took place in two different phases:

- NYC UFS visiting researcher period (from October 26<sup>th</sup> to November 16<sup>th</sup> and from the 4<sup>th</sup> to the 24<sup>th</sup> of December):

Deeper understanding of programs and initiatives associated with the NYC urban field station, including:

1. Collection of data on the development of the New York City (NYC) Urban Field Station (UFS):
2. Collection of information on the research themes carried out by the NYC Urban Field Station: i) Biodiversity and habitat restoration, stormwater and water quality ii) Social Assessment, including environmental stewardship and investigations on park and natural areas users and on communities resilience after natural and human disasters iii) Education project, youth involvement and empowerment program on urban forestry. Finally, Inventory and assessment program, including studies on Urban Tree Canopy Assessment, Ecosystem Services and Health provided by trees.
3. Field experiences and research in action programs initiatives (participation in TreeCensus Program and visits to the study sites: community gardens, parks and forest restoration plots)
4. Conference:
  - Yale Conference Science and Management of 21st Century Urban Parks focus on the future of urban parks in US cities given projections of increasing urbanization and the range of possibilities to meet needs for future populations including how science can guide better design solutions, and the role of private investment in public lands.
  - Columbia University: Interdisciplinary Workshop on Urban Green Infrastructure focus on a report of the monitoring, modelling, performance and design work on Green Infrastructure in New York City
  - Syracuse University: Conversation on Science for a Sustainable World focus on Science Policy Exchange projects in energy & climate change, clean water, and healthy forests
5. Meeting with NYC UFS's partnership (NGO – Natural Areas Conservancy - NYC Parks and Recreation Natural Resources Group, Drexel and Columbia University)

- Baltimore/Philadelphia/Washington UFS visiting researcher period (from November 16<sup>th</sup> to December 4<sup>th</sup>)

- Deeper understanding of programs and initiatives associated with the Philadelphia field station, including:

1. Collection of information about the development of the Philadelphia Field Station and the funding process
2. Collection of information on the research themes carried out by the Philadelphia Field Station: i) Ecosystem Benefits and Urban Forest Change including inventory on trees mortality and growth and urban tree canopy assessments for the Philadelphia Region ii) social research on environmental stewardship and citizen Science Research. Finally, the Philadelphia Field Station main themes are also human Health and Safety studies (changes in public health and crime associated with greening of vacant land), Youth Engagement, and Conservation Education.
3. Field experiences: visit at the sample sites in Philadelphia (Saylor Grove Stormwater Wetland, Smith Memorial Playground and Playhouse, Vacant Lot and Wissahickon)
4. Meeting with the partnership of the Philadelphia Field Station (NGO – Nature and People and Pennsylvania Horticultural Society, Philadelphia Parks and Recreation, Davey Institute and University of Pennsylvania, Drexel University, Delaware University and Rutgers University).
5. Involvement in the Environmental Youth Program at Fairmount Park organized by Philadelphia field station in partnership with Philadelphia Parks and Recreation.

- Deeper understanding of programs and initiatives associated with the Baltimore field station, including:

1. Meeting with key partnerships of the Baltimore Field Station - The Baltimore Ecosystem Study (BES) Staff Meeting, a National Science Foundation's Long-term Ecological Research Network.
2. Baltimore Field Station history.
3. Collection of information on the research themes carried out by the Baltimore urban field Station: i) Environmental Justice, analysing the spatial patterns of environmental inequality and the social and institutional processes responsible for creating those patterns. ii) Forest Ecology and Management, including studies on Urban Tree Canopy Assessment, Urban Soil, Aquatic Ecology and Management iii) School Partnerships & Environmental Education.
4. Field experience about aquatic ecology research concerning relationships between chemistry, temperature, flow, and aquatic species presence to identify mechanisms of urbanization effects on aquatic species and aquatic ecosystems (Patapsco River, Baltimore County)

- Visit at the headquarter of the USDA Forest Service in Washington D.C.. In particular, I visited Beth Larry, the national program leader of the Forest Service urban research and coordinator of the Urban Field Stations.

### 3. DESCRIPTION OF THE MAIN RESULTS OBTAINED

The first results of my Short Term Scientific Mission is a collection of data on the Urban Field Station approach of Green Infrastructure and Urban Forests in order to provide both an account of the efforts done and to do. In the European Mediterranean Cities the GI approach is under-developed because of weakness partnerships and low awareness on potential ecosystem services provided by GI and absence of national strategies. The Urban Field Station aspects that I present in this report could help to integrate activities, data, approaches, information from the different sectors dealing with the GI issues in Europe and to push green infrastructures upward on the political agendas in order to build a common strategic vision on green infrastructure and urban forest. In particular, my work focused on understanding the key aspects of an Urban Field Station. I collected information on:

- Story of the Urban Field Station - How it got conceptualized and how it has been established (see also attached Powerpoint file): The Urban Field Station was developed by the USDA Forest Service Northern Research Station, in partnership with local stakeholders and institutions, in order to establish long term research projects in urban ecology. USDA Forest Service started to show interest in urban environment in the mid 1990s, characterized by a strong development of the cities, with consequent air pollution, water quality issues. The New York City Urban Field Station was established in 2006 as a partnership between the USDA Forest Service Northern Research Station and the New York City Department of Parks & Recreation. The Forest Service and the New York City Parks Department are still the main financial actors of the Urban Filed Station for the staff, the facilities and the lab equipment. During these years, the UFS worked on key partnership (NGOs - Natural Area Conservancy; University – Drexel University; philanthropic organization - Cary Institute of Ecosystem Studies, TKF Foundation in order to obtain private and public funding). The

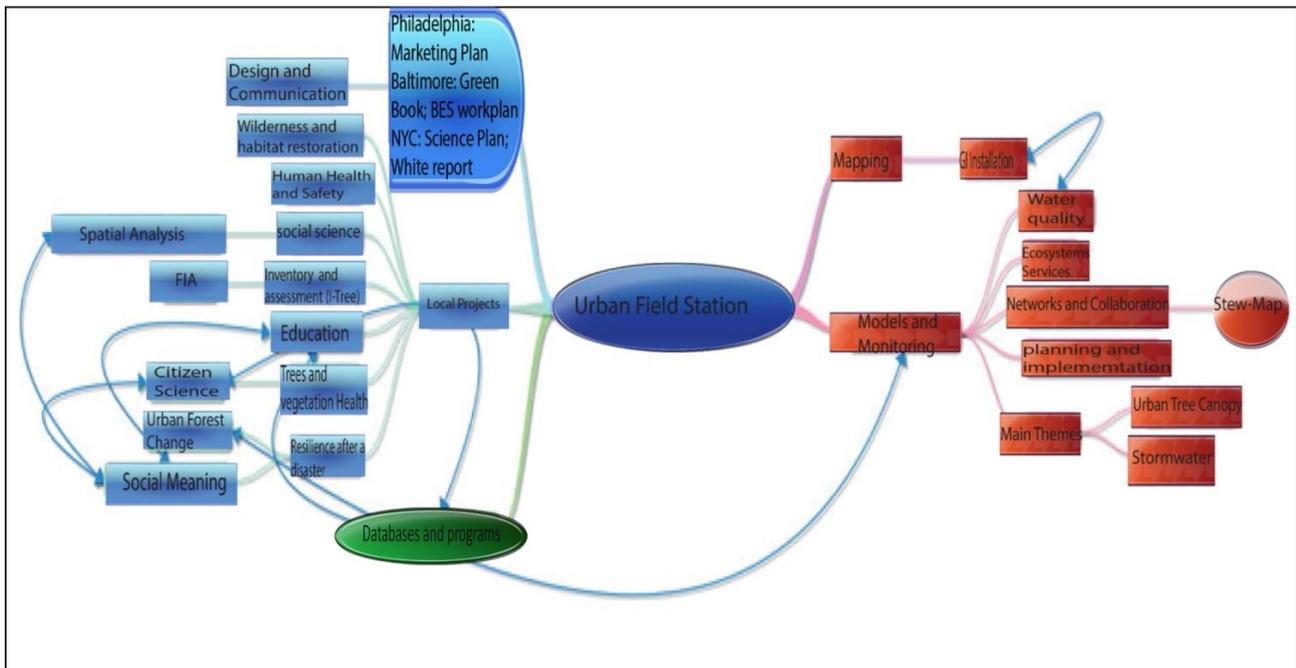
Baltimore Field Station was established in 2011 as a federal research investment (Forest Service – Northern Research Station) in the Chesapeake Bay Watershed for understanding relationships between urban and urbanizing areas and the Chesapeake Bay. The Philadelphia Field Station was established in March 2011 as a Memorandum of Understanding (MOU) between a NGO - the Pennsylvania Horticulture Society (PHS) - and the USDA Forest Service, Northern Research Station (NRS). The Philadelphia Field Station started immediately to develop project with local, public partner, as University of Pennsylvania (UPenn), City of Philadelphia Parks & Recreation Department and private partner as Davey Institute in order to obtain staff and funding. The research themes carried out by the different Urban Field Stations concern Urban Tree Canopy; Ecosystem Services and Social Impacts; Ecosystem Disturbance; Public Health and Well-being, Spatial and Temporal change of urban forest; Ecological Literacy; and Stewardship Regimes.

- The Identification of the Core Aspects of the effectiveness and successful of the Urban Field Stations: i) collaborative work of a interdisciplinary scientists and managers network ii) strong partnerships and integration of federal agencies' goals in local sectors (federal agency – Forest Service and city agency – Parks Department and Recreation or private sectors - NGOs). Finally, the UFSs use a middle level approach (permanent structure – not influenced by change in the government) and key leadership support and develop Long-Term ecological research (LTSER) place-based.

- The identification of the tools and outcomes provided by the Urban Field Stations research. The basic and applied urban ecosystem-focused research of the Urban Field Stations develop through the engagement of citizen (neighborhood and local actions) and plans, practices, programs, and policies established with local city agencies and government city office. The outcomes provided by the socio-ecological research are firstly publication (peer reviewed and non-peer reviewed research) and management efforts of public land. Secondly, the Urban Field Stations develop common database and citywide maps (neighborhood, municipal, regional and national scale) in order to connect environmental stewardship stakeholders and to measure, monitor, and maximize the contribution of civic resources. Finally, the Urban Field Stations outcomes are also focus on environmental education, through the engagement of youth, awareness campaign and trainings courses for students and managers.

- Gathering the Information and presents the items that have to be considered for the establishment of a European Urban Field Station in a holistic model. This part includes a collection of information on essential baseline assessments of the urban forest resource itself at the Urban Field Stations, as well as a wide range of tools – plans, practices, programs, and policies – associated with the Urban Field Station to guide the efforts and help to establish a Urban Field Station model in the EU.

## Urban Field Station Systems (elaboration of Vittoria Gnetti)



*Urban Field Station System: This graphic show the Urban Field Station System. In blue, I represented the local projects and main researches focus carry out by the Urban Field Station. In red, I represented the main products and elaboration (mapping, monitoring and modelling) made by the Urban Field Station. In green, I represented the contribution of the Urban Field Station work to the implementation of database and programs at local, regional and national level.*

- Presentation of the work carried out during the Short Term Scientific Mission at the NYC UFS (see attached Powerpoint file).

- The identification of main issues for a potential establishment of an Urban Field Station in Europe. Firstly, the network of the Urban Field Station is guaranteed by a federal agency, the USDA Forest Service, which invested money and resources in order to integrate the federal agencies' urban research goals in cities and local sectors. This model probably may be replicated in a different way in Europe. Secondly, the concept of an Urban Field Station was developed by the USDA Forest Service as a LTER (long-term ecological research) in urban areas in order to construct a long-term platform and a network of interdisciplinary scientist working on urban research themes.

The next steps of my research will focus on the integration of the Urban Field Stations core aspects into a potential European Urban Field Station model, based on the structure of European cities. In particular, I will focus my research on the construction of a framework and a resource management approach suited to the establishment of an UFS in Europe, highlighting sources of funding and assorted policies in order to launch the UFS concept in Europe. This approach will be useful to identify collaboration across public agencies and cross-sector partnerships and key partners in Europe need to be engaged for a successful outcome, including

representatives from all sectors – government agencies, nonprofit organizations, private industry, utilities, large landholders, and diverse community groups and local neighborhood activists.

The future steps will focus also on the development and the Implementation aspects of the plan, providing an overview of the many considerations involved in setting and prioritizing specific goals and ongoing risk assessment, planning for change, and monitoring performance.

#### 4. FUTURE COLLABORATION WITH THE HOST INSTITUTION

The success of the collaboration strategy carried out in this STSM ensures the cooperation between the two groups within this research and for future proposals combining. The elaboration of further plans and strategy, including future research and programmatic work on the UFS model, will be conducted in cooperation between the two institutions (USDA Forest Service and GreenInUrbs Project).

#### 5. CONFIRMATION BY THE HOST INSTITUTION OF THE SUCCESSFUL EXECUTION OF THE STSM

See attached PDF document.

#### 6. OTHER COMMENTS

The applicant acknowledges the funding of this travel grant to the COST project and the supervision of the STSM carried out by Carlo Calfapietra and by the partnership institution USDA Forest Service, in particular Bram Grant and Erika Svendsen. The results obtained thanks to this grant will significantly contribute to provide new outcomes for the ongoing GreenInUrbs project, in order to develop an Urban Field Station in Europe and to reinforce the collaboration strategy carried out between the institutions involved in this STSM.