Awarded in 2011

11-DG 11132544-130

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COVER SHEET

2010 U.S. Forest Service
National Urban and Community Forestry Challenge Cost-Share Program

INNOVATION GRANT CATEGORY:
GREEN INFRASTRUCTURE ASSESSMENT

PROJECT CONTACT INFORMATION:
Dr. David P. Robertson
Natural Resources, Virginia Tech
4623 Fieldale Road
Lynchburg, Virginia 24503
PHONE: 434-610-0491
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PROJECT TITLE:
Green Infrastructure Assessment: Mapping and Evaluating the Support System for Green Infrastructure Planning in the United States

FUNDING REQUEST AND MATCH:
REQUESTED: $217,013 + MATCHING: $217,608 = TOTAL PROJECT: $434,621

OUTREACH:
Is this project being developed to reach a minority or underserved population? NO
Is this pre-proposal being submitted by a minority or underserved population (owned/operated/directed) business, organization, or college/university? NO

PROJECT PARTNERS:
NAME: National Association of Regional Councils (NARC)
LETTER OF SUPPORT INCLUDED: YES
MAILING ADDRESS: 1666 Connecticut Avenue, NW Suite 300
CITY: Washington, DC
STATE: District of Columbia
ZIP CODE: 20009
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ABSTRACT:
Since the mid-1990s, the idea of green infrastructure has spread rapidly, and numerous and diverse stakeholders now practice green infrastructure planning at multiple scales nationwide. As the green infrastructure field matures, it is important for its practitioners and champions to assess past accomplishments and future opportunities. To build the capacity of the national network of green infrastructure practitioners, including the Green Infrastructure Community of Practice, and encourage a positive evolution of the green infrastructure movement into the mainstream, Virginia Tech and the National Association of Regional Councils (NARC) propose a two-year project to conduct a comprehensive assessment of the institutional support system for green infrastructure planning and implementation in the United States. The project will produce a series of specific deliverables, including a final report and "road map" that will 1) describe the current state of practice and existing support system for green infrastructure planning (including how the system is perceived by planners); and 2) evaluate opportunities for improving the support system for green infrastructure planning at multiple scales (including specific recommendations at the national level). The project also will distribute findings to a national audience of professional planners, government program managers, and policymakers at various governmental levels.

Green Infrastructure Assessment: Mapping and Evaluating the Support System for Green Infrastructure Planning in the United States

LETTER OF INTENT

Since the mid-1990s, the idea of green infrastructure has spread rapidly and numerous and diverse stakeholders now practice green infrastructure planning at multiple scales nationwide. As the green infrastructure field matures, it is important for its practitioners and champions to assess past accomplishments and future opportunities. The National Urban and Community Forestry Advisory Council (NUCFAC) recognizes that a "plethora" of green infrastructure programs, funding sources, and regulations "complicate—and sometimes confound" planning efforts and we do not know how well or even if local, regional, state and federal green infrastructure programs are working together to improve landscape scale conservation.

To build the capacity of the national network of green infrastructure practitioners, including the Green Infrastructure Community of Practice, and encourage a positive evolution of the green infrastructure movement into the mainstream, Virginia Tech and the National Association of Regional Councils (NARC) are pleased to propose a two-year project to conduct a comprehensive assessment of the institutional support system for green infrastructure planning and implementation in the United States. The project will produce a series of specific deliverables, including a final report and "road map" that will 1) describe the current state of practice and existing support system for green infrastructure planning (including how the system is perceived by planners); and 2) evaluate opportunities for improving the support system for green infrastructure planning at multiple scales (including specific recommendations at the national level).

The project will gather and evaluate information from all governmental levels but will necessarily focus on critical scales for green infrastructure planning and implementation, including the metropolitan scale represented by NARC. (Metropolitan is defined as a substate region, which includes multiple jurisdictions, and serves as a bridge between state and local government.) Natural systems typically extend beyond the boundaries of a single local jurisdiction, and natural resource planning, transportation planning and in some cases, economic development and housing planning, occur at the regional level. Other critical scales that we will examine include state and multi-state regional efforts, watersheds, transportation corridors, energy systems, and other significant drivers of ecosystem dynamics as identified by key stakeholders that will participate in the project.

The project also will distribute findings to a national audience of professional planners, government program managers, and policymakers at various levels. Primary target audiences include 1) federal agencies and national level decision-makers; 2) state government agencies and multi-state regional efforts; and 3) professional planners at the local and regional level nationwide. Given the overall intent of the project—to build capacity in the green infrastructure network and community of practice to engage and assist funding, administration, and practice of green infrastructure—disseminating project findings to both the federal agencies and national decision makers and to those working on the ground in green infrastructure planning represents an essential element of our project and will maximize the resources invested in it.

Approximate project cost: $434,621.00 ($217,013 from sponsor; $217,608 from match)

NARC
Building Regional Communities

National Association of Regional Councils
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December 14, 2009

Dr. David P. Robertson
Natural Resources, Virginia Tech
901 Jefferson Street, Suite 6l
Lynchburg, Virginia 24504

Dear Dr. Robertson:

The National Association of Regional Councils (NARC) writes this letter of support and partnership for Virginia Tech's proposal to the National Urban and Community Forestry Challenge Cost-Share Grant Program, entitled *Green Infrastructure Assessment: Mapping and Evaluating the Support System for Green Infrastructure Planning in the United States*. NARC believes this is an innovative project founded on a strong partnership between two organizations with a long history of conducting excellent work in green infrastructure and urban forestry.

NARC will assist Virginia Tech with developing the comprehensive assessment and outreach elements of the project, including the Project Advisory Committee, case studies, web presence, conference sessions, and the final report. This work will commence no earlier than the date of the award of funding and end no later than the end of the project period. To provide this support, NARC has requested $85,024, in addition to offering $35,136 in matching funds. The budget below represents NARC's financial requirements and contribution to the project in more detail.

	Sponsor Cost	NARC Match	Total Cost
Total Salary	$33,418	$3,906	$37,324
Fringe @ 19.80%	$6,616	$773	$7,390
Indirect/Overhead @90.96%	$36,415	$4,257	$40,671
10 Advisory Council Members' Time	$0	$15,000	$15,000
Travel	$5,000	$1,000	$6,000
Meeting / Workshop Expenses	$2,000	$10,000	$12,000
Conference Call / Webinar Expenses	$1,575	$200	$1,775
Total	$85,024	$35,136	$120,160

NARC is a recognized authority and leading advocate for regional planning organizations and solutions that positively impact American communities through effective inter-jurisdictional cooperation. NARC has a unique alliance of members from Regional Councils, Metropolitan Planning Organizations, and local elected officials from around the country. NARC's membership accounts for the major economic hubs of the nation, and covers 97 percent of U.S. counties and 99 percent of the population. We look forward to the opportunity to contribute to this worthwhile project.

Sincerely,

Fred Abousleman
Executive Director

Green Infrastructure Assessment: Mapping and Evaluating the Support System for Green Infrastructure Planning in the United States

PRE-PROPOSAL NARRATIVE - PROPOSAL OUTLINE

1. Category Application

Since the mid-1990s, the idea of green infrastructure has spread rapidly and numerous and diverse stakeholders now practice green infrastructure planning at multiple scales nationwide (Schilling and Logan 2008; Dapolito Dunn & Stoner 2007; Benedict & McMahon 2006; Randolph 2004) and internationally (Mell 2008; Ahern 2007; Tzoulas et al. 2007; Kambites & Owen 2007). In 2007, a Green Infrastructure Community of Practice (GI CoP) was formed to serve as a national network for green infrastructure practitioners[1]. Representing public and private institutions at local to national levels, the GI CoP has experienced considerable growth since 2007. In November 2009, a new Steering Committee was formed which will meet for the first time in January 2010 to begin strategic planning for the future. The GI CoP has several Working Groups, including a Federal Working Group, with representation from multiple federal agencies involved in green infrastructure planning and implementation. As evidenced by a recent internal survey conducted by the GI CoP, green infrastructure comprises a growing movement with a strong and committed base of support.

While numerous and diverse stakeholders promote and engage in green infrastructure activities nationwide, the National Urban and Community Forestry Advisory Council (NUCFAC) recognizes that a "plethora" of green infrastructure programs, funding sources, and regulations "complicate—and sometimes confound" planning efforts at the local and regional level. Additionally, while "multiple federal, regional, state and local agencies and departments regulate, provide data for, incentivize or fund environmental and conservation programs that deliver benefits across metropolitan boundaries," we do not know how well or even if local, regional, state and federal green infrastructure programs are working together to improve landscape scale conservation. Moreover, while the green infrastructure movement continues to grow, critical green infrastructure information may not be accessible to the individuals making daily land use planning and development decisions and confusion may exist over how best to include green infrastructure considerations in local and regional decision-making. As the green infrastructure field matures, it is important for its practitioners and champions to assess past accomplishments and future opportunities in order to take strategic next steps.

The Obama Administration's declaration that sustainable community development, regional planning and "place-based" policies are important national priorities encourages many green infrastructure proponents. Yet, while this focus is a positive step forward, it is not clear how well green infrastructure or natural resource conservation will be integrated into this agenda. For instance, the Federal Interagency Partnership for Sustainable Communities identifies "concentrating development" in existing communities as a principle, stating that safeguarding rural landscapes is one of many reasons to do so; however, this initiative has not yet addressed the role of green infrastructure in this initiative (EPA 2009). Clearly, the profile of green infrastructure needs raising and its support system better articulation (Dapolito Dunn & Stoner 2007; Mell 2007). Ultimately, green infrastructure advocates still must demonstrate that green infrastructure planning is a wise investment, and an efficient and effective strategy for achieving local, regional, and national sustainability goals (Norton 2005).

[1] See http://www.greeninfrastructure.net/content/community-practice for more information.

Green Infrastructure Assessment: Mapping and Evaluating the Support System for Green Infrastructure Planning in the United States

In order to build the capacity of the national network of green infrastructure practitioners including the GI CoP, and encourage a positive evolution of the green infrastructure movement into the mainstream of national planning and policy, Virginia Tech and the National Association of Regional Councils (NARC) are pleased to propose a two-year project to conduct a comprehensive assessment of the institutional support system for green infrastructure planning and implementation in the U.S. The project will produce a series of specific deliverables, including a final report and "road map" that will 1) describe the current state of practice and existing support system for green infrastructure planning, including how the system is perceived by planners and 2) evaluate opportunities for improving the support system for green infrastructure planning at multiple scales, including specific recommendations at the national level. The project also will distribute findings to a national audience of professional planners, government agencies and policymakers at multiple levels.

Our project seeks to answer four specific questions posed by NUCFAC:

1) How do various government agency and department programs, particularly federal programs, intersect, overlap, or support each other in green infrastructure planning?
2) How do planners at multiple levels view these programs?
3) To what extent does the current system improve or hinder good decision-making and resource allocation at the municipal, state and regional levels?
4) What efficiencies might be realized at the national level that could maximize the positive impact of federal green infrastructure investment on the ground at state and regional levels?

The project will gather and evaluate information from all governmental levels but will necessarily focus on critical scales for green infrastructure planning and implementation at the metropolitan or regional scale. (We use "metropolitan" and "regional" here to refer to substate regions which include multiple local jurisdictions and serve as a bridge between state and local government.) Natural systems typically extend beyond the boundaries of a single local jurisdiction, and natural resource planning, transportation planning and in some cases, economic development and housing planning, occur at a metropolitan. By harnessing the actions of multiple jurisdictions across a geographic area, metropolitan regions represented by regional planning organizations have conserved substantial acreage, protected fragile water bodies and achieved many other significant conservation goals. Other critical scales that we will examine include state and multi-state regional efforts and watersheds, transportation corridors, energy systems and other significant drivers of ecosystem dynamics as identified by project participants.

While numerous assessments have been conducted of existing and potential green infrastructure at specific scales (e.g., Weber et al. 2006; Wickham et al. 2009), little analysis has been carried out of the institutional support system of public and private programs that can promote green infrastructure planning and implementation at multiple scales. This project will fill this void with a comprehensive assessment of the support system for green infrastructure planning, culminating in a final report with the potential to inspire change at local to national levels.

2. Scope and Applicability/Justification- Proposal objectives

Our proposed project directly addresses the intent of the Green Infrastructure Assessment category by creating a comprehensive assessment of green infrastructure planning in the United States. Its primary objectives are to 1) describe the current state of practice and existing support

relevant temporal and spatial scales. We will emphasize key components and drivers of the system. Critical scales may include the local and regional scale represented by NARC members and statewide and multi-state programs led by state and federal agencies, especially transportation and energy/climate driven planning.

- Design and launch a new *graduate course* to serve as a research engine for the project. The three-credit graduate course titled "Green Infrastructure: Theory and Practice for Planning and Policy" will be offered via Virginia Tech's Falls Church campus. Online and distance learning options will allow students to participate nationwide. The course will serve as a forum for collecting, analyzing and interpreting data that will inform the comprehensive assessment. Students will work closely with a team of faculty and project partners to conduct research and policy analysis, and develop outreach and technology transfer applications. The course will be offered twice during the project (Spring 2011 and Spring 2012) and in subsequent years following completion of the project.

Phase II: Research & Policy Analysis for the Comprehensive Assessment (Months 6-18)

- *Survey and map* the support system for green infrastructure planning at the national level. The survey and mapping process will include an in-depth analysis of relevant programs, policies and stakeholders. We will conduct a series of interviews, focus groups and workshops with key informants, building upon those held in Phase I, to gather and analyze data. The survey will begin with federal agencies including USDA, EPA, DOT, DOD, HUD, DOI, and others as necessary, and track federal programs and funds to regional, state and local levels. Note: It will not be possible to diagram all elements of the support system at all levels, so we will need to be make strategic decisions about where to focus the project's limited resources. NUCFAC, USFS and the PAC will be instrumental in these decisions.
- Develop *case studies* of specific green infrastructure planning initiatives at local and state levels and evaluate their connection to the support system at the national level, especially federal programs. We will investigate and write at least three to six case studies focusing on different attributes of green infrastructure planning at multiple scales and in different regions across the country. Criteria developed in collaboration with the PAC will govern the strategic selection of the case studies so as to provide the optimal amount of detailed information to inform the comprehensive assessment. The case studies may build on those recently conducted by NARC's *Regional Centers of Excellence* program or other project partners. A case study approach is appropriate since the unit of analysis is a system of action (e.g., Yin 2009). Data collection and analysis will occur iteratively, with triangulation of data, periodic member checking and peer review processes to ensure accuracy and reliability. Data will come from a variety of sources including archival review of published and unpublished literature and plans, key informant interviews and focus groups, and direct observation and participant-observation.
- Offer *graduate course* for the second time.
- Refine *conceptual map.*
- Continue to *meet with PAC.*
- *Monitor, evaluate and report project goals and accomplishments.*

Phase III: Outreach, Technology Transfer & Professional Development (Months 18-24)

- *Field test findings* from Phase II via a series of outreach events targeting planners, government agencies and decision-makers at multiple levels:
    - Special meetings with GI CoP, including the Steering Committee and Federal Working Group, and other target audiences determined by the research process to be key stakeholders for affecting change.
    - Special conference sessions at a series of strategically selected national conferences including NARC's annual conferences or meetings.
    - Webinars and web forums offered in collaboration with partners.
- Develop a *web presence* highlighting the project with links to and from NARC, Green Infrastructure Network, and other relevant websites.
- Produce a *Final Report* (the comprehensive assessment with a "road map" and strategic recommendations for the future) for distribution to target audiences.

5. Product

The primary deliverable is a final report. Other important deliverables include a series of education and outreach elements that support and build on the final report. Below is a complete list of the project deliverables, the recipients, and other pertinent information. These products are direct results of the activities described in Section 4 above.

- *Final Report*: A final report will be made available for download for free from the project, NARC, Green Infrastructure Network and other partner websites. In addition, we will produce 500 hardcopies of the executive summary of the report for distribution to target audiences defined above. The report will contain a description of the project's research methods; literature review; summary of key outcomes from project focus groups and major interviews; the case studies listed below; and an overall assessment of the current state of the practice and recommendations to NUCFAC, USFS, the GI CoP, and other stakeholders on ways to improve the support for green infrastructure planning. The report may be directed toward federal agencies, but also will provide useful information to multiple audiences, including professional planners, state agencies, local elected officials, regional planning organizations and other stakeholders.
- *Case studies*: Three to six case studies will be produced and made available for free download from the websites listed above. Copies will be printed as needed for distribution to NUCFAC and federal agency stakeholders and target audiences, including local governments, regional planning organizations and other state level agencies similar to those profiled as actors in the case studies.
- *Website Presence*: We will develop and publicize an extensive web presence for the project for information dissemination to urban forestry, academic, local elected official, regional planning and other stakeholder groups as appropriate.
- *Advisory Committee*: Project staff will form and maintain a PAC. This offers an opportunity to engage additional stakeholder networks and potentially increase the reach of project products to non-traditional audiences.
- *Graduate course and graduate students trained*: We will direct the Virginia Tech graduate courses toward graduate students in the fields of planning, public policy or resource management. The students will not only serve as the primary audience of the course, but will also serve as a vehicle to expand the course's reach to the students' colleagues and organizations in their future professions. Through this course, the project

will gain feedback on the most successful methods for training future stakeholders about green infrastructure planning.

- *Conference sessions*: We will target conference sessions to planners and other state and local policy makers. Other venues may include smart growth conferences, NARC, American Planning Association (APA) or National Governors Association (NGA) meetings, and others determined best for affecting institutional change. We expect attendance of more than 200 at these conference sessions.
- *Webinars and web forums*: A series of webinars and more in-depth and interactive web forum—that will provide a semi-structured, moderated discussion and exchange of ideas among experts—will target government agencies and professional planners at multiple levels. We expect to have more than 200 participants in these sessions.

Deliverables that are not part of the scope of this project but likely to be developed and offered following completion of the grant funded project:

- Continuing education and professional development short-courses on green infrastructure planning to be taught online to national audiences and in-person to audiences in the National Capital Region at Virginia Tech's campuses in Falls Church and/or Alexandria.
- The graduate course will continue to be offered in subsequent years. The target audience and dissemination will continue as listed above.
- Publications in the academic and professional press.

6. Collaboration

To conduct a comprehensive assessment that will have significant impact at local to national levels, we have assembled a team of strategic partners including research scientists, policy analysts, professional planners and education/outreach specialists from Virginia Tech and NARC. We recognize that the field of green infrastructure planning is quite diverse and that there are other highly qualified universities and organizations working in this field. We are open to collaborating with other partners based on their skills and interest in conducting the work.

Virginia Tech (Virginia Polytechnic Institute and State University) is a public land-grant university serving the Commonwealth of Virginia, the nation and the world community. The discovery and dissemination of new knowledge are central to its mission. The College of Natural Resources and Department of Forest Resources and Environmental Conservation is one of the top programs in natural resource management in the U.S. Our education and research programs focus on the latest applications to uncover the science needed to manage forests and other natural resources. The Department of Urban Affairs & Planning Program offers graduate degree programs in urban and regional planning with faculty recognized nationally and internationally as innovators in planning education, research and outreach.

The *National Association of Regional Councils* (NARC) is a recognized authority and leading advocate for regional planning organizations and solutions that positively impact American communities through effective inter-jurisdictional cooperation. NARC has a unique alliance of local elected officials, regional planning organizations and metropolitan planning organizations from around the country. For many years, NARC has partnered with the Forest Service to spread the concepts of green infrastructure to regional planning organizations across the country. Among NARC's other work in transportation, economic and community development, homeland security and the environment, NARC has conducted green infrastructure workshops at its

national conferences, published related articles, featured green infrastructure information on the NARC website, and created and supported *Regional Centers of Excellence* in green infrastructure planning. NARC represents the more than 35,000 local jurisdictions across the country through their participation in regional planning organizations.

7. National Distribution/Technology Transfer of Your Findings

The tasks listed in Section 4 and the products listed in Section 5 above will provide ample vehicles for Virginia Tech and NARC to distribute and offer technology transfer opportunities. As detailed above, the project will reach three major audiences, including 1) federal agencies and national level decision-makers; 2) state government agencies and multi-state regional efforts; and 3) professional planners at the local and regional level nationwide. The following tasks, listed in detail in Section 4, comprise this national distribution and technology transfer:

- Meetings with Green Infrastructure Community of Practice, including the Steering Committee and Federal Working Group, and other target audiences that are determined by the research process to be key stakeholders.
- Conference sessions at a series of national conferences including smart growth, NARC, American Planning Association, or National Governors Association meetings or conferences, and others determined to be most effective for affecting institutional change.
- Webinars and web forum offered in collaboration with partners.
- Website(s): develop website highlighting the project with links to and from NARC, the Green Infrastructure Network and other relevant websites.
- A Final Report (the comprehensive assessment with a "road map" and strategic recommendations for the future).

Keywords: green infrastructure, assessment, planning, government, region, sustainability

8. Project Evaluation

The project leadership team will conduct performance evaluation on an ongoing basis and report to the USFS at least quarterly. It will also prepare reports for NUCFAC's annual meetings. Evaluative feedback will be sought in all aspects of the project to determine effectiveness and fine tune project management and application of lessons learned. Adaptive management will be used to continually improve the project performance. Criteria to judge the success of the project in regards to heightening the public's awareness of the importance of urban and community forestry include the national distribution and technology transfer activities and benchmarks listed in Section 7. To measure the project's success in meeting its primary objectives of 1) describing the current state of practice and existing support system for green infrastructure planning (including how the system is perceived by planners); and 2) evaluating opportunities for improving the support system for green infrastructure planning at multiple scales (including specific recommendations at the national level), the project team will measure its success in meeting the tasks identified in section 4. These include:

Phase I: Project Initiation & Management (Months 1-6)

- *Successfully establishing contracts and submitting reports.*
- *Successfully establishing a PAC with commitment of at least 50 percent participation in meetings.*
- *Completion of literature review and distribution to PAC.*

- *Successfully holding at least 10 interviews/focus groups; benchmark may be adjusted based on PAC input.*
- *PAC review of the initial conceptual map.*
- *Design and offer initial graduate course.*

Phase II: Research & Policy Analysis for the Comprehensive Assessment (Months 6-18)

- *PAC review of survey and map.*
- *Completion of 3-6 case studies, with final drafts reviewed by PAC.*
- *Completion of the courses with above average class evaluations submitted by students.*
- *PAC's review of second draft of the conceptual map.*
- *Continued 50 percent participation in PAC meetings.*
- *Completion of project reporting requirements on time.*

Phase III: Outreach, Technology Transfer & Professional Development (Months 18-24)

- *Three or more special stakeholder meetings held with over 50 attendees.*
- *Two or more national conference sessions held with over 200 total attendees.*
- *Two or more webinars held with over 200 total attendees.*
- *Web presence successfully established by 12th month of project.*
- *PAC, USFS, and NUCFAC review of the final report, 500 copies of executive summary printed and distributed, and full copies made available online.*

9. Experience/Personnel/Adequacy of Resources

Three of the project staff are active members of the GI CoP and all staff have extensive experience in green infrastructure planning at the local, county, regional, state and federal level. Brief descriptions of each member of the project leadership team and their expertise and experience relevant to this project are below. Adequate resources are available to carry out the project as described in more detail in Section 4 and Section 10.

Dr. David Robertson is a sustainability consultant and serves on the graduate faculty in the College of Natural Resources at Virginia Tech where he teaches courses on Urban Ecology and Public Ecology, and conducts research and outreach projects focusing on the human dimensions of natural resource management. Dr. Robertson has had management responsibility for more than $1 million in federal grants and contracts, and is author of more than 30 publications in the popular, professional and academic press. Dr. Robertson serves on the Steering Committee of the Green Infrastructure Community of Practice and chairs the Landcare Working Group. He has served on the Technical Advisory Committee for the New River Valley Green Infrastructure Initiative and the Advisory Team for NARC's recent Green Infrastructure and Landcare Project.

Dr. Bruce Hull is a professor in the Department of Forest Resources and Environmental Conservation at Virginia Tech. His scholarship and engagement focus on innovative conservation strategies that heal forests fractured by pressures of urbanization and globalization. He was a lead author of the acclaimed "changing roles" program that helps state and national forestry professionals respond to 21st century opportunities such as green infrastructure planning. He advises organizations such as green infrastructure planning efforts, Landcare Central, Chesapeake Watershed Alliance, and Centers for Urban and Interface Forestry, and is author and editor of over 100 publications, including two books: *Infinite Nature* (Chicago 2006) and *Restoring Nature* (Island 2000).

Dr. Michael Mortimer, Director of Virginia Tech's Natural Resources Graduate Programs, has an extensive background in private land conservation planning, including supervising the only national-scale survey and analysis of forest-related conservation easements, an empirical policy examination of the intersection of local government ordinances and working forests, and publishing on the implications of private property rights on biodiversity conservation in the U.S. He also has practical experience providing legal counsel to state government in the areas of habitat conservation, land acquisition and transfer, and commercial development of public lands. He received his PhD in forest resource policy from the University of Montana and his law degree from Pennsylvania State University.

Dr. Kris Wernstedt is an Associate Professor in Urban Affairs and Planning in the School of Public and International Affairs at Virginia Tech. Dr. Wernstedt has produced more than three dozen peer-reviewed and popular publications, covering a variety of issues surrounding natural resources and environmental policy and using both qualitative and quantitative approaches. His recent projects in the green infrastructure realm have examined the conversion of contaminated properties to greenspace; the recovery of mine-scarred lands in the western U.S.; climate action planning among local governments; and regional-level stormwater management through low impact development and other approaches. He has served as the lead or co-lead investigator on more than $1.5 million of externally-funded projects, with sponsors including the U.S. EPA, NOAA, USGS, Lincoln Institute of Land Policy, and the Mellon Foundation.

Ms. Naomi Friedman is NARC's Deputy Director bringing over 15 years of experience in environmental and urban policy and planning, most recently serving as the Assistant Executive Director of the Metropolitan Washington Council of Governments (MWCOG). At MWCOG, Ms. Friedman co-developed a regional climate change initiative and a smart growth effort. Prior to coming to MWCOG, Ms. Friedman directed energy projects at the Center for a New American Dream and initiated and managed several projects at the National Association of Counties (NACo), including a nonpoint source water pollution prevention effort and a smart growth program. Naomi started one of the nation's first efforts to link urban planning and climate change/energy as a consultant to the Environmental and Energy Study Institute.

Ms. Jenee Kresge is a NARC Program Analyst, bringing skills in research, program management and organization to the project. She has a background in community development and previously served as a program manager at a nonprofit community development financial institution. At NARC, Ms. Kresge manages the transportation, environment, homeland security and economic and community development grant work, organizes focus groups, and researches and writes various reports and articles. She is an active participant in the GI CoP and has previously worked on two green infrastructure-projects with the U.S. Forest Service, featuring NARC's *Regional Centers of Excellence* mini-grant program to build capacity and enhance peer-to-peer learning about regional green infrastructure planning.

10. Budget Justification (see Budget Narrative Table)
Resources are needed to do the following:

1) Resources to administer, guide and analyze the numerous data collection efforts
2) Resources to coordinate the advisory council and overall project
3) Expertise in local and regional land use planning efforts related to green infrastructure
4) Expertise in federal government structure and cooperation related to green infrastructure
5) Resources to coordinate and distribute information: websites, conferences, publications.

List of Literature Reviewed and Cited

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DEPARTMENT OF THE NAVY
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SUITE 1425
ARLINGTON, VA 22203-1995

IN REPLY REFER TO:

Agreement Date: July 10, 2009

NEGOTIATION AGREEMENT

Institution: **VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY**
BLACKSBURG, VIRGINIA 24061

The Facility and Administrative Cost rates contained herein are for use on grants, contracts and/or other agreements issued or awarded to Virginia Polytechnic Institute and State University by all Federal Agencies of the United States of America, in accordance with the provisions and cost principles mandated by 2 CFR 220 (formerly Office of Management and Budget Circular A-21). These rates shall be used for forward pricing and billing purposes at Virginia Polytechnic Institute and State University for Fiscal Year 2010. This rate agreement supersedes all previous rate agreements/determinations for Fiscal Year 2010.

SECTION I: RATES - TYPE: PROVISIONAL (PROV)

Facility and Administrative Cost Rates:

Type	From	To	Rate	Base	Applicable To	Location
PROV	7/1/09	Until Amended	58.60%	(a)	Organized Research (1)	On Campus
PROV	7/1/09	Until Amended	61.00%	(a)	Organized Research (2)	On Campus
PROV	7/1/09	Until Amended	27.30%	(a)	Organized Research (1)	Off Campus Adjacent*
PROV	7/1/09	Until Amended	31.00%	(a)	Organized Research (2)	Off Campus Adjacent
PROV	7/1/09	Until Amended	26.00%	(a)	Organized Research (1)	Off Campus Remote**
PROV	7/1/09	Until Amended	29.00%	(a)	Organized Research (2)	Off Campus Remote
PROV	7/1/09	Until Amended	51.70%	(a)	Instruction	On Campus
PROV	7/1/09	Until Amended	26.00%	(a)	Instruction	Off Campus

Type	From	To	Rate	Base	Applicable To	Location
PROV	7/1/09	Until Amended	32.60%	(a)	Other Sponsored Activities	On Campus
PROV	7/1/09	Until Amended	22.70%	(a)	Other Sponsored Activities	Off Campus
PROV	7/1/09	Until Amended	42.30%	(a)	Agricultural Exp Station	On Campus
PROV	7/1/09	Until Amended	21.50%	(a)	Agricultural Exp Station	Off Campus

* Off Campus - Adjacent: Activities performed within the commuting area of Blacksburg, VA

** Off Campus - Remote: Activities performed outside the commuting area of Blacksburg, VA

DISTRIBUTION BASES:

(a) Modified Total Direct Cost (MTDC), consisting of salaries and wages, fringe benefits, materials and supplies, services, travel and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract. Equipment, capital expenditures, charges for patient care and tuition remission, rental costs, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000 shall be excluded from modified total direct costs. Equipment is defined as having an acquisition cost which equals or exceeds $2,000 and a useful life of more than one year.

APPLICABLE TO:

(1) Applies to all DoD contracts and subcontracts awarded or issued before November 30, 1993, all Non-DoD instruments, and all DoD grants. See Section II, Part E hereof. (Capped Rate)

(2) Applies to all DoD contracts awarded or issued on or after November 30, 1993 in accordance with and under the authority of DFARS 231.303(1). See Section II, Part E hereof. (Uncapped Rate)

SECTION II - GENERAL TERMS AND CONDITIONS

A. **LIMITATIONS:** Use of the rates set forth under Section I is subject to any statutory or administrative limitations, and is applicable to a given grant, contract or other agreement only to the extent that funds are available and consistent with any and all limitations of cost clauses or provisions, if any, contained therein. Acceptance of the rates agreed to herein is predicated upon all the following conditions: (1) that no costs other than those incurred by the grantee/contractor were included in the indirect cost pool as finally accepted and that all such costs are legal obligations of

the grantee/contractor and allowable under governing cost principles; (2) that the same costs that have been treated as indirect costs are not claimed as direct costs; (3) that similar types of costs have been accorded consistent accounting treatment; and (4) that the information provided by the contractor/grantee, which was used as the basis for the acceptance of the rates agreed to herein and expressly relied upon by the Government in negotiating and accepting the said rates, is not subsequently found to be materially incomplete or inaccurate.

B. **ACCOUNTING CHANGES:** The rates contained in Section I of this agreement are based on the accounting system in effect at the time this agreement was negotiated. Changes to the method(s) of accounting for costs which affects the amount of reimbursement resulting from the use of these rates require the written approval of the authorized representative of the cognizant negotiating agency. Such changes include but are not limited to changes in the charging of a particular type of cost from indirect to direct. Failure to obtain such approval may result in subsequent cost disallowances.

C. **PROVISIONAL RATES**: The provisional rates contained in this agreement are subject to unilateral amendment by the Government or bilateral amendment by the contracting parties at any time.

D. **USE BY OTHER FEDERAL AGENCIES**: The rates set forth in Section I hereof were negotiated in accordance with and under the authority set forth in 2 CFR 220. Accordingly, such rates shall be applied to the extent provided in such regulations to grants, contracts and other transactions to which 2 CFR 220 is applicable, subject to any limitations in part A of this section. Copies of this document may be provided by either party to other Federal agencies which have or intend to issue or award grants and contracts using these rates or to otherwise provide such agencies with documentary notice of this agreement and its terms and conditions.

E. **APPLICATION OF INDIRECT COST RATES TO DOD CONTRACTS /SUBCONTRACTS:** In accordance with DFARS 231.303, no limitation (unless waived by the institution) may be placed on the reimbursement of otherwise allowable indirect costs incurred by an institution of higher education under a DoD contract awarded on or after November 30, 1993, unless the same limitation is applied uniformly to all other organizations performing similar work. It has been determined by the Department of Defense that such limitation is not being uniformly applied. Accordingly, the rates cited (2) of Section I, as explained under title "APPLICABLE TO" (2), do not reflect the application of the 26% limitation on administrative indirect costs imposed by 2 CFR 220, whereas (1) do so.

Accepted:

FOR VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY:

M. DWIGHT SHELTON Jr.
Vice President for Finance and Chief Financial Officer

July 15, 2009
Date

FOR THE U.S. GOVERNMENT:

DEBORAH K. RAFI
Contracting Officer

7/22/09
Date

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