

**Task Agreement P13AC00907
Against
Cooperative Agreement
P09AC00212 (formerly H4503090700)
between
The United States Department of the Interior
National Park Service
and
Rutgers University**

Project Title: Impacts of Superstorm Sandy: Mapping and Quantification of Geomorphological Change GATE, FIIS, ASIS

CFDA: 15.945, Cooperative Research and Training Programs – Resources of the National Park System (CESU)

This Task Agreement is entered into by and between the Rutgers University and the United States Department of the Interior, National Park Service, hereinafter called “NPS.”

ARTICLE I – BACKGROUND AND OBJECTIVES

Cooperative Agreement Number P09AC00212 (formerly H4503090700) dated June 19, 2009, was entered into by and between the Department of the Interior, National Park Service (NPS), Northeast Region and the University of Rhode Island. The purpose of this cooperative agreement is to support coastal national parks in the Northeast Region of the National Park Service, and Servicewide, by providing research, technical assistance, and education through the cooperative relationship with partners of the North Atlantic Coast Cooperative Ecosystem Studies Unit (CESU), including the Rutgers University. Unless otherwise specified herein, the terms and conditions as stated in the Cooperative Agreement will apply to this Task Agreement.

The occurrence of Superstorm Sandy in late October 2012 caused a stepwise change in the physical basis of several of the NPS holdings in the northeastern portion of the US, specifically Fire Island National Seashore, Gateway National Recreation Areas, and Assateague Island National Seashore. Major displacement of beaches and dunes altered the landscape, washovers and breaches segmented many of the shore parallel features and modified both the ocean and bay sides of the coastal barriers. Many elements of the developed landscape and its cultural heritage were damaged or are now more exposed to future storm effects. Managers are currently looking at a new landscape that has undergone a stepwise change.

With the impacts caused by Hurricane Sandy, there is an opportunity to establish some of the dimensions of change that are ongoing. There is an opportunity to quantify the vectors of change, and to eventually bring those vectors to bear on an understanding of the spatial and temporal responses to the major storm events, and to incorporate that understanding into resource

management objectives. Ongoing research originated through the Geological Resources Division of the NPS has produced and is producing very detailed geomorphological maps of Fire Island National Seashore (Psuty, et al., 2013), Gateway National Recreation Area (Psuty, et al., in prep) and Assateague Island National Seashore (Krantz, 2010). These maps/studies establish the pre-Sandy distribution of geomorphological features and provide a basis to quantify the dimensions of changes caused by Sandy. A re-mapping of the geomorphological features will permit the calculation of the linear displacements and areal modifications in a spatial matrix. Further, creation of digital elevation models using LiDAR collected before and after Sandy will add the volumetric changes to the comparisons. Together, the 1D, 2D, and 3D data sets will contribute to a comparative analysis of the geomorphological configuration of the three parks and lead to an understanding of the dimensions of change associated with a stepwise response to a major event.

ARTICLE II – AUTHORITIES

Authorities for this task agreement under Cooperative Agreement **are:**

- Pursuant to 16 U.S.C. Section 1g, the National Park Service may in fiscal year 1997 and thereafter enter into cooperative agreement that involve the transfer of National Park Service appropriated funds to State, local and tribal governments, other public entities, educational institutions, and private nonprofit organizations for the public purpose of carrying out National Park Service programs pursuant to 31 U.S.C. 6305 to carry out public purposes of National Park Service programs.
- Pursuant to 16 U.S.C. Section 1a-2(j), also known as " The Omnibus Parks and Public Lands Management Act of 1996" the National Park Service may "enter into cooperative agreements with public or private educational institutions, States, and their political subdivisions, for the purpose of developing adequate, coordinated, cooperative research and training programs concerning the resources of the National Park System, and, pursuant to any such agreements, to accept from and make available to the cooperator such technical and support staff, financial assistance for mutually agreed upon research projects, supplies and equipment, facilities, and administrative services relating to cooperative research units as the Secretary deems appropriate; except that this paragraph shall not waive any requirements for research projects that are subject to the Federal procurement regulations."
- 16 U.S.C. Section 5933, Cooperative Study Units, authorizes and directs the Secretary to enter into cooperative agreements with colleges and universities, including but not limited to land grants schools, in partnership with other federal and state agencies, to establish cooperative study units to conduct multi-disciplinary research and develop integrated information products on the resources of the national park system, or the large region of which parks are a part.

ARTICLE III – STATEMENT OF WORK

- A. Rutgers University agrees to implement the attached study proposal/work plan (ATTACHMENT A).

- B. The NPS agrees to the tasks presented in ATTACHMENT B.

ARTICLE IV – TERM OF AGREEMENT

This Agreement will become effective upon signature by the NPS Agreements Officer and extend through December 31, 2016.

ARTICLE V – KEY OFFICIALS

The personnel specified below are considered to be essential to ensure maximum coordination and communication between the parties and the work being performed hereunder. Either party, on notice to the other party, may designate another person or persons to act in his/her place for point of contact positions that do not require specific designation.

The NPS Agreements Technical Representative (ATR) will be designated in writing by the Agreements Officer. Authorities and limitations of authority will be explained in the designation letter.

The Cooperator/Recipient may change its Key Officials by notifying the NPS Agreements Officer in writing. The Cooperator/Recipient will address any communication regarding this Agreement to the NPS ATR.

1. For the National Park Service:

Signatory Agreements Officer

NER Agreements Officer
National Park Service
US Custom House
200 Chestnut Street-3rd Floor
Philadelphia, PA 19106
Telephone: 215-597-6476

Agreements Technical Representative

Charles Roman – Agreements Technical Representative (ATR)
National Park Service
URI Graduate School of Oceanography
Room 335, Coastal Institute
Narragansett, RI 02882
401-874-6886
Charles_Roman@nps.gov

Project Technical Contact

Sara Stevens
National Park Service
University of Rhode Island
1 Greenhouse Rd

Kingston, RI 02881
401-874-4548
Sara_stevens@nps.gov

2. For Rutgers University:

Signatory

Office of Research and Sponsored Programs
Rutgers, The State University of New Jersey
3 Rutgers Plaza
New Brunswick, New Jersey 08901
732/932-0150 . FAX: 732/932-0162/3 Web Site: <http://orsp.rutgers.edu>

Principal Investigator

Dr. Michael Deluca and Dr. Norbert Psuty
Institute of Marine and Coastal Sciences
Rutgers University, The State University of New Jersey
3 Rutgers Plaza
New Brunswick, New Jersey 08901

ARTICLE VI – AWARD AND PAYMENT

- A. The NPS has approved this project and the following documents have been submitted by Rutgers University prior to award:
1. SF-424, Request for Federal Financial Assistance
 2. SF-424A, Budget Information, Non-construction Programs
 3. SF-424B, Assurances, Non-construction Programs
- Budget Information from the SF-424A is summarized later in this Article.
- B. Financial Assistance: NPS will provide funding to the Rutgers University in an amount not to exceed \$253,310 in fiscal year 2013 for the work described in Article III and in accordance with the approved budget. Any award beyond the current fiscal year is subject to availability of funds.

Appropriation Data: The chargeable appropriation for this Modification is:

\$173,310 Cost Center: PPNENEROJ0, WBS: PX.P0195575A.00.1, Functional Area Code: PLCLISD5S.CN0000

\$80,000 Cost Center: PPNEASIS00, WBS: PX.P0195540A.00.1, Functional Area Code: PLCLISD5S.CN0000

- C. Rutgers University shall request payment in accordance with the following:

1. **Method of Payment.** Payment will be made by advance and/or reimbursement through the Department of Treasury's ASAP system.
2. **Requesting Advances.** Requests for advances must be made submitted via the ASAP system. Requests may be submitted as frequently as required to meet the needs of the Cooperator/Recipient to disburse funds for the Federal share of project costs. If feasible, each request should be timed so that payment is received on the same day that the funds are dispersed for direct project costs and/or the proportionate share of any allowable indirect costs. If same-day transfers are not feasible, advance payments must be as close to actual disbursements as administratively feasible.
3. **Requesting Reimbursement.** Requests for reimbursements must be submitted via the ASAP system. Requests for reimbursement should coincide with normal billing patterns. Each request must be limited to the amount of disbursements made for the Federal share of direct project costs and the proportionate share of allowable indirect costs incurred during that billing period.
4. **Adjusting payment requests for available cash.** Funds that are available from repayments to, and interest earned on, a revolving fund, program income, rebates, refunds, contract settlements, audit recoveries, credits, discounts, and interest earned on any of those funds must be disbursed before requesting additional cash payments.
5. **Bank Accounts.** All payments are made through electronic funds transfer to the bank account identified in the U.S Treasury ASAP system by the Cooperator/Recipient.
6. **Supporting Documents and Agency Approval of Payments.** Additional supporting documentation and prior Agency (NPS) approval of payments may be required when/if a Cooperator/Recipient is determined to be "high risk" or has performance issues. If prior Agency payment approval is in effect for an award, the ASAP system will notify the Cooperator/Recipient when they submit a request for payment. The Recipient must then notify the NPS Awarding Officer identified on the Assistance Agreement that a payment request has been submitted. The NPS Awarding Officer may request additional information from the recipient to support the payment request prior to approving the release of funds, as deemed necessary. The Cooperator/Recipient is required to comply with these requests. Supporting documents may include invoices, copies of contracts, vendor quotes, and other expenditure explanations that justify the reimbursement requests.

D. Nothing contained in this Agreement will be construed as binding the NPS to expend in any one fiscal year any sum in excess of the appropriation made by Congress or administratively allocated for purposes of this Agreement in that fiscal year.

ARTICLE VII – PRIOR APPROVAL

Provisions as set forth in the Cooperative Agreement shall apply to this Task Agreement.

ARTICLE VIII – LIABILITY

Provisions as set forth in the Cooperative Agreement shall apply to this Task Agreement.

ARTICLE IX – REPORTS AND/OR DELIVERABLES:

- A. **Where to Submit** – In accordance with 43 CFR Part 12, the Cooperator/Recipient will submit reports to the NPS Agreements Officer at the address specified in Article V. The Cooperator/Recipient will also submit a copy of each report to the ATR at the address specified in Article V.
- B. **What and When to Submit** – The Cooperator/Recipient will submit to the NPS the following reports at the specified times:
1. Federal Financial Report (FFR), SF425, submitted quarterly, no more than 30 days after the end of the reporting period. The following reporting period end dates will be used for quarterly reports: 3/31, 6/30, 9/30 or 12/31. Upon completion of the project a final FFR will be submitted no more than 90 days after the final project end date.
 2. FFR reports will be submitted for this agreement for any period of time within the quarterly report period.
 3. Performance Reports - In accordance with 2 CFR 215.51 or OMB Circular A-102, **Cooperator/Recipient** will provide quarterly performance reports describing the accomplishments of the Cooperator/Recipient, the expenses and income of the Cooperator/Recipient, and each entity to which the Cooperator/Recipient made any grant during the fiscal year. Quarterly reports shall be due 30 days after the end of the reporting period. Annual reports shall be due 90 days after the grant year. The final performance report is due 90 days after the end of the award.
- C. **Recordkeeping** – The Cooperator/Recipient will keep records concerning this Agreement in accordance with the requirements of the General Provisions, CFR and applicable Office of Management and Budget Circulars.
- D. The Secretary of the Interior and the Comptroller General of the United States, or their duly authorized representatives, will have access, for the purpose of financial or programmatic review and examination, to any books, documents, papers, and records that are pertinent to the Agreement at all reasonable times during the period of retention in accordance with 2 CFR 215.53 or OMB Circular A102.
- E. **Specific Deliverables**
- A list of project deliverables and due dates for this Agreement include:
- July – Sept 2013, accumulating data from sources, organization of resources, creation of product outlines
 - Oct – Dec 2013, production of post-Sandy geomorphological maps of Gateway NRA

- Jan- Mar 2014, quantification of the changes created by Sandy at Gateway NRA
- April 2014, production of Report on Changes at Gateway NRA
- May – July 2014, production of post-Sandy geomorphological maps of Fire Island NS
- Aug – Oct 2014, quantification of the changes created by Sandy at Fire Island NS
- Nov 2014, production of Report on Changes at Fire Island NS
- Dec 2014 – Feb 2015, production of post-Sandy geomorphological maps at Assateague Island NS
- Mar – May 2015, quantification of changes created by Sandy at Assateague Island NS
- Jun 2015, production of Report on Changes at Assateague Island NS
- Jul – Sept 2015, production of final reports.
- Sept 2016, completion of reports, completion of publications related to reports

ARTICLE X – PROPERTY UTILIZATION

Provisions as set forth in the Cooperative Agreement shall apply to this Task Agreement.

ARTICLE XI – MODIFICATION AND TERMINATION

Provisions as set forth in the Cooperative Agreement shall apply to this Task Agreement.

ARTICLE XII – GENERAL AND SPECIAL PROVISIONS

1. Provisions as set forth in the Cooperative Agreement shall apply to this Task Agreement.
2. **Certifications** – The following certification is required in accordance with the provisions of this Agreement: Certification in Regards to Lobbying, on individual awards made under this Agreement that are \$100,000 or over.

ARTICLE XIII – ATTACHMENTS

The following documents are attached and made part of this Task Agreement:

- A. Rutgers University study proposal and budget, titled “Impacts of Superstorm Sandy: Mapping and Quantification of Geomorphological Change GATE, FIIS, ASIS”
- B. Statement of work for which the National Park Service agrees to perform.

ARTICLE XIV – SIGNATURES

IN WITNESS WHEREOF, the parties hereto have executed this Task Agreement on the date(s) set forth below:

FOR RUTGERS UNIVERSITY:

Date

FOR THE NATIONAL PARK SERVICE

Agreements Officer
Northeast Region

Date

ATTACHMENT A: Rutgers University Study Proposal



Office of Research and Sponsored Programs
Rutgers, The State University of New Jersey
3 Rutgers Plaza . New Brunswick . New Jersey 08901
732/932-0150 . FAX: 732/932-0162/3 . Web Site: <http://orsp.rutgers.edu>

Project Title: **Impacts of Superstorm Sandy: Mapping and Quantification of Geomorphological Change GATE, FIIS, ASIS**

Submitted By: **Michael P. DeLuca, Co-Principal Investigator**
 Senior Associate Director, Institute of Marine and Coastal Sciences
 Rutgers University
 and
 Norbert P. Psuty, Co-Principal Investigator
 Professor Emeritus, Institute of Marine and Coastal Sciences
 Rutgers University

Cost/Duration: **\$253,310, Through September 30, 2016**

Objectives: To produce post-Sandy Geomorphological Maps of FIIS, GATE, and ASIS , and to quantify the dimensions of change to the variety of landform features in the three parks caused by the storm.

Background

The geomorphological evolution of coastal features is often considered to be a series of steps rather than a linear transition from one stage of development to another. Geomorphologists speculate that infrequent and severe coastal events such as Katrina in 2005 cause large displacements of sediment to create new forms that establish a new surface topography that will persist until the next major displacement. This stepwise erosion and redevelopment is of great interest to the scientific community as part of the understanding of the function of the natural coastal system, but it is also of considerable interest to the managers of coastal areas that are undergoing the episodic changes because of the impact to the spatial distribution of and recovery of ecological habitats as well as to the geomorphological features. Further, the episodic changes are affecting land use and cultural resources in the managed areas and causing periodic re-evaluations of the exposure and vulnerability of the resources at risk.

The occurrence of Superstorm Sandy in late October 2012 caused a stepwise change in the physical basis of several of the NPS holdings in the northeastern portion of the US, specifically Fire Island National Seashore, Gateway National Recreation Areas, and Assateague Island National Seashore. Major displacement of beaches and dunes altered the landscape, washovers and breaches segmented many of the shore parallel features and modified both the ocean and bay sides of the coastal barriers. Many elements of the developed landscape and its cultural heritage were damaged or are now more exposed to future storm effects. Managers are currently looking at a new landscape that has undergone a stepwise change.

As described in recent reports produced by the Intergovernmental Panel on Climate Change (2012), the US National Research Council (2012), and many other scientific bodies, the coastal system is dynamic and is undergoing a continuing adaptation to the influences of a rising sea level and a decreasing supply of sediment available to support the coastal forms. With the impacts caused by Sandy, there is an opportunity to establish some of the dimensions of change

that are ongoing. There is an opportunity to quantify the vectors of change, and to eventually bring those vectors to bear on an understanding of the spatial and temporal responses to the major storm events, and to incorporate that understanding into resource management objectives. The measurement of the magnitude and direction of change in a geotemporal context is central to the Coastal I&M Program of the Northeast Coastal and Barrier Network (NCBN) of the NPS (Stevens, et al., 2005). It is part of the foundation of the rigorous collection of data sets crucial to informed decision making. Using the extensive background gained by Dr. Norbert Psuty in his decades of research and publication in these parks, see examples in Psuty et al. (2005, 2008; 2010) and the regional application of the NPS monitoring protocols developed by Psuty, et al. (2010; 2012), this project is a direct utilization of NCBN I & M program and the exceptional local expertise available to assist in the post-Sandy analysis and recovery in the affected parks.

Ongoing research originated through the Geological Resources Division of the NPS has produced and is producing very detailed geomorphological maps of Fire Island National Seashore (Psuty, et al., 2013), Gateway National Recreation Area (Psuty, et al., in prep) and Assateague Island National Seashore (Krantz, 2010). These maps/studies establish the pre-Sandy distribution of geomorphological features and provide a basis to quantify the dimensions of changes caused by Sandy. A re-mapping of the geomorphological features will permit the calculation of the linear displacements and areal modifications in a spatial matrix. Further, creation of digital elevation models using LiDAR collected before and after Sandy will add the volumetric changes to the comparisons. Together, the 1D, 2D, and 3D data sets will contribute to a comparative analysis of the geomorphological configuration of the three parks and lead to an understanding of the dimensions of change associated with a stepwise response to a major event. Further, this project will be a laboratory for two students from the joint NPS/Geological Society of America GeoCorps internship program. One student has been retained from the past summer's GeoCorps interns. Two students have been selected for this summer, and two students will be selected for succeeding summers. It will be an opportunity for these highly-qualified interns to conduct data gathering and to participate in the production and presentation of the geomorphological maps and their quantification of change.

Compared to shoreline position, landscape features and patterns at the inland reach of wave action (upper beach, dunes, and cliffs) are less variable indicators of changes in coastal morphology. As a result, significant changes and trends associated with these features are more easily detected and applied to park management decision making. Beach, dune, cliff, and bluff erosion and migration often involve direct threats to natural and cultural resources, park infrastructure, and even to human safety, and are a major management issue in these parks. This project will provide crucial information to the scientific understanding of the evolution of park coastal geomorphology, and it will contribute to the scientific foundation for resource-management decision-making.

The Post-Sandy geomorphological map will represent the condition of the landform surface as a product of alterations caused by Superstorm Sandy. It will be the basis for comparisons of the pre-Sandy situation and for analyses of rates and conditions of recovery. Further, all of the changes will be quantified in a variety of ways. Simple 1D shoreline and other features that are subject to displacement will be analyzed and portrayed in a Digital Shoreline Analysis System (DSAS) context to depict the spatial dimensions of the changes, following the protocol described in Psuty, et al. (2010). Other measures of 2D and 3D variations will be applied and generated as tabular, graphical, and cartographical presentations.

Timetable and Deliverables

Presuming that Funding is awarded in June 2013

July – Sept, accumulating data from sources, organization of resources, creation of product outline

Oct – Dec 2013, production of post-Sandy geomorphological maps of GATE

Jan- Mar 2014, quantification of the changes created by Sandy at GATE

April 2014, production of Report on Changes at GATE

May – July 2014, production of post-Sandy geomorphological maps of FIIS

Aug – Oct 2014, quantification of the changes created by Sandy at FIIS

Nov 2014, production of Report on Changes at FIIS

Dec 2014 – Feb 2015, production of post-Sandy geomorphological maps at ASIS

Mar – May 2015, quantification of changes created by Sandy at ASIS

Jun 2015, production of Report on Changes at ASIS

Jul – Sept 2015, production of final reports.
Sept 2016, completion of reports, completion of publications related to reports, completion of administrative accounting

Proposed Budget –

Personnel	<u>Total</u>
Dr. Norbert P. Psuty, Project Leader	36,000
GIS technician and analyst	71,000
Coordination & GIS specialist	18,000
Hourly help	<u>22,000</u>
Total Personnel	147,000
 Fringe Benefits on wages	 43,483
 Computer Supplies	 4,100
Computer Software	5,700
Project Supplies	3,500
Equipment less than \$5,000	<u>3,400</u>
Total supplies	16,700
 Travel, Domestic	 7,000
Conference Registration	<u>1,400</u>
 Total Direct Costs	 215,583
 Indirect Costs @ 1.75%	 <u>37,727</u>
Total Costs	253,310

Budget Justification

Personnel

Norbert Psuty will oversee the project and develop and apply the geomorphological information in all three components. He will be available throughout the project. His compensation will be \$1,250 per month.

The GIS technician and analyst will maintain the datasets construct appropriate DEMs, create graphics and visuals for products and reports. Effort will be about 4.5 days per week the first year, decreasing to 4 days per week the second year.

Coordinator and GIS specialist will lead project organization and conduct DSAS calculations and figure production to quantify vectors of change, effort on the order of 2 days per week during first year, decreasing to about 0.75 days per week thereafter.

Houly help will assist in creation of post-Sandy geomorphological maps and calculations of changes relative to pre-Sandy geomorphological feature distribution and dimension.

Fringe Benefits

Established under Union/University contract for University appointments, all personnel will be at some level of University employment.

Supplies

All items are related to computer software annual lease and license fees, hardware and software upgrades, and office and computer supplies.

Travel

Several visits will be made to each park to review and document areas of major changes and to gather latest information on LiDAR data, orthophotos, and any change information. Travel will also support professional presentations at meetings (registration fee) within the region and within the country.

Indirect Cost Rate

Indirect Costs are calculated at 17.5% of total direct costs, as per CESU agreement between NPS and Rutgers University.

References

- IPCC, 2012: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 p.
- Krantz, D. E. 2010. A hydrogeomorphic map of Assateague Island National Seashore, Maryland and Virginia. Natural Resource Report NPS/NRPC/GRD/NRR—2010/215. National Park Service, Fort Collins, Colorado, 80 p.
- National Research Council, 2012. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future. The National Academies Press, Washington, D.C., 201 p.
- Psuty, N. P., P. Dennehy, T. Silveira, and N. Apostolou. 2010. *Coastal geomorphology of the ocean shoreline, Gateway National Recreation Area: natural evolution and cultural modifications, a synthesis*. Natural Resource Report NPS/NERO/NRR—2010/184. Fort Collins, Colorado, 42 p.
- Psuty, N. P., M. Duffy, J. F. Pace, D. E. Skidds, and T. M. Silveira. 2010. *Northeast Coastal and Barrier Network geomorphological monitoring protocol: part I—ocean shoreline position*. Natural Resource Report NPS/NCBN/NRR—2010/185. National Park Service, Fort Collins, Colorado, 146 p.
- Psuty, N. P., Grace, M., and Pace, J. P., 2005. *The Coastal Geomorphology of Fire Island: A Portrait of Continuity and Change* (Fire Island National Seashore Science Synthesis Paper). Technical Report NPS/NER/NRTR-2005/021. U.S. Dept. of the Interior, National Park Service, Northeast Region, Boston, 70 p.
- Psuty, N. P., J. S. McLoughlin, W. Schmelz, and A. Spahn, in progress. Development of the Geomorphological Map for Gateway National Recreation Area: Principal Characteristics and Components. Natural Resource Report NPS/NRPC/GRD/NRR—2013/____. National Park Service, Ft. Collins, Colorado.
- Psuty, N. P., M. Patel, J. Freeman, W. Schmelz, W. Robertson, and A. Spahn, 2013. Development of the Geomorphological Map for Fire Island National Seashore: Principal Characteristics and Components. Natural Resource Report NPS/NRPC/GRD/NRR—2013/____. National Park Service, Ft. Collins, Colorado, 68 p.
- Psuty, N.P. and T.M. Silveira, 2008. *Human Interaction with the Coastal Geomorphology of Fire Island*. (Fire Island National Seashore Science Synthesis Paper), Technical Report NPS/NER/NRTR-2008/132, U.S. Dept. of the Interior, National Park Service, Northeast Region, Boston, 30 p.
- Psuty, N.P., T.M Silveira, A. Spahn, and D. Skidds, 2012. *Northeast Coastal and Barrier Network Geomorphological Monitoring Protocol: Part II – Coastal Topography*. Natural Resource Report NPS/NCBN/NRR —2012/591. National Park Service, Fort Collins, Colorado, 162 p.

Stevens, S., B. Milstead, M. Albert, G. Entsminger. September 2005. Northeast Coastal and Barrier Network Vital Signs Monitoring Plan. Technical Report NPS/NER/NRTR--2005/025. National Park Service. Boston, Massachusetts.

ATTACHMENT B

The National Park Service agrees to;

- The NPS assigns a Northeast Coastal and Barrier Network (NCBN) Program Manager as the Science Technical Advisor on this project. The Program Manager and the NCBN Data Manager will actively collaborate with the Rutgers's University investigator, graduate students and GeoCorp America interns on the project study design, data collection, and data interpretation, and production of final deliverables including data formats.
- NPS NCBN and associated parks will provide the cooperator will all relevant GIS and LiDAR data sets and elevation monitoring data that may be important to the study design and data interpretation. Such data sets may include, but not be limited to, park boundary maps, and previous elevation, GPS, and LiDAR data and reports from the three parks.
- During visits to the parks for data collection, logistical support will be provided, including access and potential assistance by both Park and NCBN staff.
- Handling and completion of draft report reviews and external peer reviews will be conducted by the NPS.