National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science

Adapting To Climate Change in Coastal Parks

Estimating the Exposure of Park Assets to 1 m of Sea-Level Rise

Natural Resource Report NPS/NRSS/GRD/NRR—2015/961

ON THIS PAGE
Fire Island Lighthouse, Fire Island National Seashore
Photograph by: Katie McDowell Peek, Program for the Study of Developed Shorelines

ON THE COVER
Fort Wadsworth, Gateway National Recreation Area
Photograph by: Katie McDowell Peek, Program for the Study of Developed Shorelines

Adapting To Climate Change in Coastal Parks

Estimating the Exposure of Park Assets to 1 m of Sea-Level Rise

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Glossary

NER- Northeast Region code for NPS
SER- Southeast Region code for NPS
IMR- Intermountain Region code for NPS
PWR- Pacific West Region code for NPS

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Executive Summary

Over the next century, warming global temperatures will present many challenges for the National Park Service (NPS) and public land managers. Rising sea level will be one of the most obvious and most challenging impacts of this warming. Even a minor increase in sea level will have significant effects on coastal hazards, natural resources and assets within national parks. To begin addressing these issues, the Program for the Study of Developed Shorelines (PSDS) at Western Carolina University (WCU) has partnered with NPS to begin an assessment of the level of exposure that park owned assets will face during a period of rising sea level.

The first phase of this collaborative project between WCU and NPS has focused on identifying NPS assets that may be threatened by a future 1 m rise in sea level within 40 coastal units. A 1 m rise in sea level can be expected to occur in the next 100 to 150 years. Many of the assets identified are already vulnerable to existing coastal hazards (erosion and storms).

This project utilized an existing database (Facilities Management Software System; FMSS) containing a comprehensive list of assets within each unit. The primary objective of this analysis was to locate each asset geospatially and identify its approximate elevation. Although this seems relatively straightforward, there are over 10,000 assets within these 40 coastal units. Therefore, a variety of methods has been used to complete the work, including the acquisition of numerous existing datasets, collaboration with park staff and field visits to locate assets.

Assets were characterized based on their overall exposure to long-term (1 m) sea-level rise and associated storm vulnerability. Therefore, each asset was placed into one of two categories based on exposure or risk: 1) high exposure or 2) limited exposure. Results from this group of coastal parks yielded over 39% of the assets designated as high exposure, with a cumulative value of over $40 billion. The majority of the high risk assets were from the SER low-lying barrier island parks; however, the NER also had over one-third of its assets designated as high exposure, many of which are historically and culturally significant to NPS. These results show that a significant portion of the assets within coastal national parks are at risk to impacts from future SLR. In fact, many of these assets are already at an extremely high risk to storm impacts, which was made evident during Hurricane Sandy. A quick reassessment of the methodology contained within this report following Hurricane Sandy suggests that we have been conservative in labeling an asset as high exposure. In other words, the assets identified in this study as being vulnerable are most certainly vulnerable, and the total is likely to be an underestimate.

Finally, this study is intended to present a broad overview of the level of exposure that NPS faces in light of rising sea level. The study paints a picture of the kinds of assets that are vulnerable and the monetary value of NPS exposure. These data are not intended to be used directly for decision making at the unit level. It is worth noting that accurate elevation data is unavailable for the vast majority of FMSS-listed assets. Collection of this data should be a future NPS priority. Efforts to complete an analysis of the remaining SLR vulnerable parks are underway.

Introduction

National Park Service (NPS) coastal units contain the last remaining large stretches of relatively undeveloped shorelines in the nation. These parks contain a wide range of natural resources, cultural resources and recreational facilities. The parks also contain infrastructure providing access to each unit. Much of this infrastructure, such as roads and trails, helps to fulfill the NPS guiding principle of excellent service to visitors and partners. Other types of infrastructure, such as lighthouses and fortifications, provide heritage education to the public, while preserving important historical landmarks. A few of these units are made up almost entirely of historic structures.

Over the next century (and beyond), more NPS resources will be exposed to and threatened by rising ocean waters. Numerous coastal units, particularly low-lying barrier parks, are already dealing with sea-level rise (SLR) threats to resources and assets, particularly roads, buildings and parking lots. Much of this infrastructure is essential to the day-to-day function of the units, including bridges, water systems, tunnels and parking lots. Also at risk to SLR are historical and cultural resources, such as lighthouses, fortifications, and archaeological sites.

To address the SLR threats within NPS, the Program for the Study of Developed Shorelines (PSDS) at Western Carolina University (WCU) has partnered with NPS to identify resources and infrastructure at risk. To complete this task, 40 coastal units within the contiguous U.S. were chosen by NPS (Figure 1, Table 1) for analysis. The primary goal of this task was to determine the long-term SLR (1 m) exposure level of NPS assets within these units. Assets were identified from an existing NPS database (Facilities Management Software System; FMSS) and a variety of methods were used to examine the relative exposure of these assets to SLR threats.

This project was initiated with the recognition that it is important to determine the exposure of coastal park assets to climate change impacts such as SLR. The 40 parks selected for this study were covered by the USGS Coastal Vulnerability Index (http://woodshole.er.usgs.gov/project-pages/cvi/).These 40 parks were also initially included in a Sustainable Operations and Climate Change funded project that treated all assets within a park with the same level of exposure. For most parks, this is an inaccurate assumption. This study was able to determine that assets within these parks have widely varying degrees of exposure. These first 40 parks were chosen as a starting point and represent a wide range of unit sizes, habitats, natural environments, local SLR rates and unit types. A second study of an additional 30 parks is currently underway.

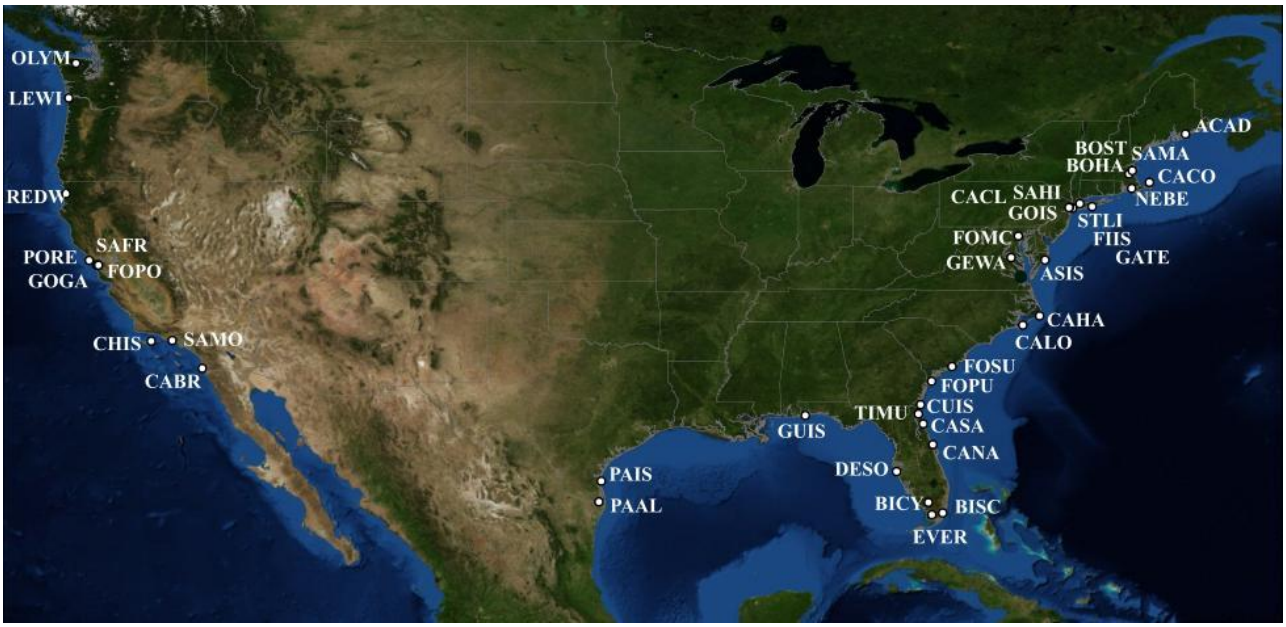

Figure 1. Location of all 40 NPS units analyzed as part of the WCU/NPS sea-level rise study.

Methods

The 40 coastal parks analyzed and the corresponding NPS unit code designations can be seen in Table 1. These four letter codes will be used throughout the rest of this document. NPS regions will also be abbreviated to their appropriate three letter code (see Glossary).

Analyses for exposure to long-term SLR within the 40 coastal units included a variety of methods ranging from field observations of specific assets to blanket categorization of entire NPS units. The following section will describe the methods used for the exposure analyses; a combination of these methods was used in most cases. The methods utilized for each unit are described in detail in Appendices B-F.

Broad Categorization of Extremely Low Elevation Units

During discussions with NPS staff, it was determined that a number of units, primarily barrier island, south Atlantic and Gulf coast parks, are already extremely exposed to coastal hazards such as storms and SLR. Even if there are areas above 1 m in elevation, it was determined that a 1 m rise in sea level would reduce the integrity and the continuity of the park lands to a degree that all assets would be vulnerable or lost. Therefore, all assets within a number of these units were placed into the high exposure category.

Table 1. NPS unit codes and regions for the 40 coastal parks analyzed, with date visited.

Region	Unit	Unit Description	Date of Visit by WCU
NER	ACAD	Acadia National Park	
	ASIS	Assateague Island National Seashore	Oct 2012
	BOHA	Boston Harbor Islands National Recreation Area	Oct 2012
	BOST	Boston National Historical Park	
	CACL	Castle Clinton National Monument	
	CACO	Cape Cod National Seashore	Oct 2012
	FIIS	Fire Island National Seashore	Oct 2012
	FOMC	Fort McHenry National Monument and Historic Shrine	
	GATE	Gateway National Recreation Area	July 2012
	GEWA	George Washington Birthplace National Monument	
	GOIS	Governors Island National Monument	
	NEBE	New Bedford Whaling National Historical Park	
	SAHI	Sagamore Hill National Historic Site	
	SAMA	Salem Maritime National Historic Site	
	STLI	Statue of Liberty National Monument	
SER	BICY	Big Cypress National Preserve	
	BISC	Biscayne National Park	
	CAHA	Cape Hatteras National Seashore	
	CALO	Cape Lookout National Seashore	
	CANA	Canaveral National Seashore	
	CASA	Castillo de San Marcos National Monument	
	CUIS	Cumberland Island National Seashore	April 2012
	DESO	De Soto National Memorial	
	EVER	Everglades National Park	
	FOPU	Fort Pulaski National Monument	
	FOSU	Fort Sumter National Monument	June 2012
	GUIS	Gulf Islands National Seashore	
	TIMU	Timucuan Ecological and Historic Preserve	
PWR	CABR	Cabrillo National Monument	
	CHIS	Channel Islands National Park	
	FOPO	Fort Point National Historic Site	
	GOGA	Golden Gate National Recreation Area	April 2012
	LEWI	Lewis and Clark National Historical Park	
	OLYM	Olympic National Park	July 2012
	PORE	Point Reyes National Seashore	April 2012
	REDW	Redwood National Park	
	SAFR	San Francisco Maritime National Historical Park	
	SAMO	Santa Monica Mountains National Recreation Area	
IMR	PAAL	Palo Alto Battlefield National Historical Park	
	PAIS	Padre Island National Seashore	March 2012

Eight units were initially included in this broad categorization: FOSU, CALO, CAHA, CANA, BISC, DESO, EVER, and FOPU. One unit, GUIS, was initially included in this broad categorization, but upon further discussion it was determined that the mainland assets for this unit should be excluded from the high exposure designation and further review was necessary. Three other units, BICY, CASA and TIMU were also initially included in this designation, but park review noted assets within these parks at higher elevations that we estimate could sustain a 1 m rise of sea level.

"First-Cut" of Assets in High Elevation Units

A number of the 40 coastal units have assets located within high elevation areas or a considerable distance from the shoreline. In these cases, a "first-cut" of assets was performed prior to the park visit or detailed analysis. The NPS FMSS location hierarchy report was the primary tool used to apply this cut to each unit. These unit specific reports group assets based on general location. For example, Table 2 is a portion of the location hierarchy report for OLYM. The field labeled "Level" is the hierarchy system for the assets. "Level 1" is a general area of the park (Area Hurricane Ridge) and all of the assets below this top level (Levels 2, 3, 4, etc.) are within the Hurricane Ridge area of the park. OLYM has 19 "areas" in the location hierarchy report and only three of these areas are near the coast (Lake Ozette, Mora and Kalaloch, Figure 2). In fact, a number of the assets, including those in the Hurricane Ridge area, have elevations over 5,000 feet (above MSL). Therefore, over 80% of the assets in OLYM, including all those in non-coastal areas, were placed into the limited exposure category using only the hierarchy reports and park maps (Figure 2). This initial reduction of assets (primarily units along the west coast) significantly reduced the number of assets that need to be analyzed in the field.

This "first cut" method was utilized on numerous units, including many within the PWR, including CHIS, REDW, OLYM, CABR, GOGA, PORE, and a few from other regions, such as ACAD in the NER. Using the geographic location of these areas within the reports, in combination with other tools such as geographic information systems (GIS, ArcGIS software), light detection and ranging digital elevation maps (LiDAR DEMs), contour maps and NPS input, a large percentage of assets were cut from the analysis and designated as having a limited exposure to SLR.

Table 2. Example of FMSS location hierarchy report for Olympic National Park

Level	Asset Location Code	Description
1	20152	Area Hurricane Ridge
2	20846	4100 Hurricane Ridge – Area Buildings
3	111269	Bldg Hurricane Ridge Hydrant Building #1
3	111271	Bldg Hurricane Ridge Hydrant Building # 2
3	114554	Bldg Hurricane Ridge Ski Shed
3	21569	Bldg 711 Hurricane Ridge Visitor Center
3	21570	Bldg 961 Hurricane Ridge Picnic Area A Comfort Station
3	21571	Bldg 962 Hurricane Ridge Picnic Area B Comfort Station
3	21572	Bldg 1248 Hurricane Ridge Water Pumphouse
3	21573	Bldg 874 Hurricane Ridge Generator/Radio
3	95823	Bldg Hurricane Ridge Obstruction Point Trail head CXT Vault Toilet

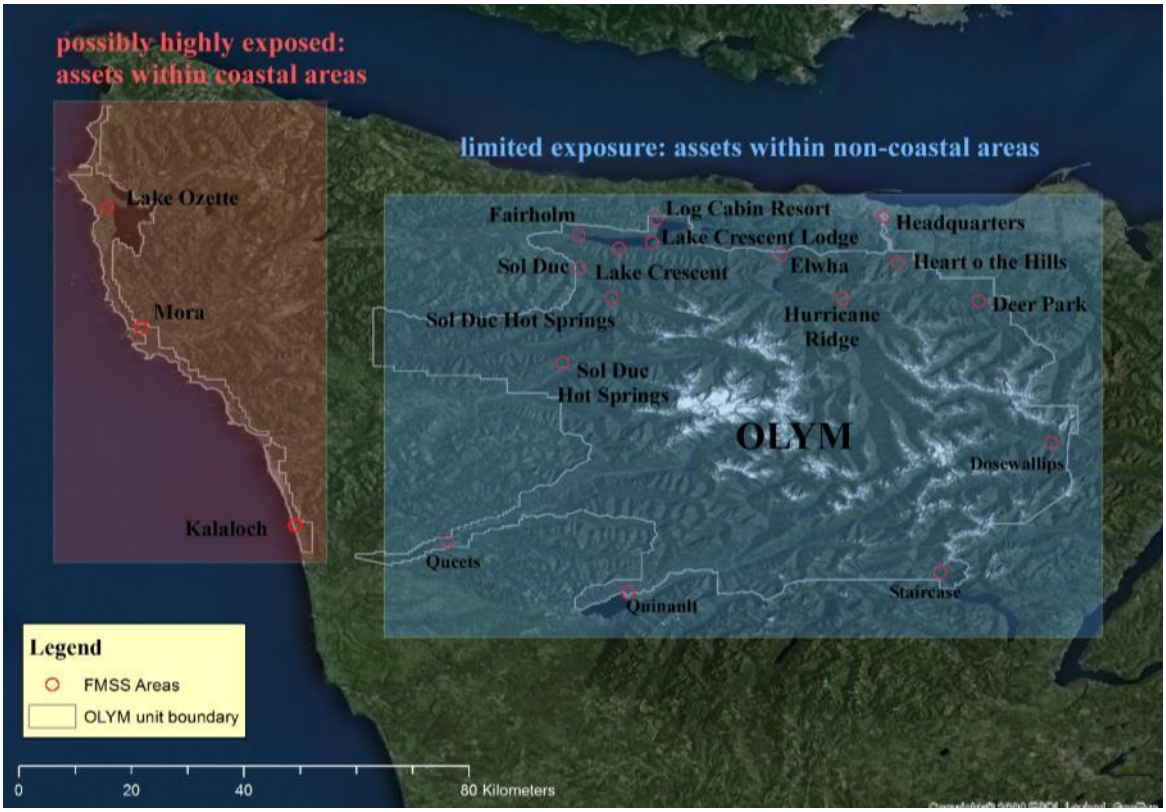

Figure 2. Location of FMSS location hierarchy areas and park boundary for OLYM. Only three areas from the hierarchy report are near the coast (in red shading). All other areas and corresponding assets were automatically considered as having a limited exposure to sea-level rise due to elevation and distance from the shoreline.

Park Visits

Eleven NPS units were visited for field analysis of the assets listed in FMSS. Most commonly, these parks were partially analyzed prior to the scheduled visit, using a combination of tools and methods. This included eliminating assets based on the location hierarchy report, or other data collected and compiled for this study, including LiDAR DEMs, contour data (including topographic maps), or geographic location data. These data were commonly retrieved from the NPS Integrated Resource Management Applications (IRMA) data download portal. This integrated approach reduced the assets that needed to be located in the field during each park visit.

During each park visit, WCU staff met with appropriate NPS personnel to discuss the exposure of assets to SLR. These NPS discussions included a variety of participants, including superintendents, natural resources, cultural resources, and facilities personnel as well as GIS analysts and FMSS coordinators. Additional GIS data, such as recent LiDAR or other elevation data, were often obtained from NPS staff during these meetings.

Field analysis for each unit consisted of visiting the “areas” from the location hierarchy report and as many specific assets as possible. GPS (geographic positioning system) coordinates were taken for the

assets visited and an initial estimate of exposure was also assigned to assets based on discussion with NPS staff and field observations.

GIS Analysis of Assets

For each applicable unit, GIS analysis (using ArcMap 10.1) was performed on data obtained from one or more of the methods previously discussed. Geospatial data (GPS data obtained during the field visits or location data obtained from each unit) were used to map each asset (when possible) and elevation data (commonly LiDAR DEMs or contour shapefiles) were used to determine approximate elevation of each asset (Figure 3).

Final WCU Categorization of Assets: High or Limited Exposure to SLR

The final step in the exposure analysis for each of the 40 coastal units was to place each asset into one of two categories based on relative exposure to long-term SLR: 1) high exposure or 2) limited exposure. These two simple categories were recommended by personnel in the Climate Change Response Program in order to reach the ultimate goal of the study: describing the degree to which NPS is exposed to the hazard of long-term SLR. The final decision on the exposure of a particular asset or group of assets was dependent on multiple factors and a wide variety of data sources. Table 3 illustrates the general data types available for each unit, and Table 4 summarizes the sources for each data type. The specific GIS data sources used for each unit are listed in Appendix B. Results for each of the 40 coastal units, including a detailed breakdown of the method, data sources and assets determined to be high exposure, can be found in Appendices C-F. Characterization of some assets was obvious; for example, any assets located below 1 m or on the active oceanfront were classified as high exposure. Other assets were put into the high exposure category because a 1 m rise in sea level would make them storm vulnerable or because of geomorphological changes that would follow the SLR. Some of this was based on the opinion and expertise of the authors. Even so, we have a high level of confidence in the fact that those assets listed in the high exposure category are at risk. To some degree, we have used our extensive experience as coastal hazards specialists to make the final exposure determination, given the fact that we were limited by the resources available for analysis.

Park Review

After the categorization of SLR exposure for the assets in each park, the lists were distributed to the regions, and in some cases to each unit for review. The parks that were visited, as well as several parks that WCU was in direct communication with, were sent the preliminary results and given the opportunity to comment. A few of the parks returned revised exposure lists based on internal analysis and discussion (e.g., ACAD). Further review (by the units and regions) of the assets determined to be high exposure was planned as part of this document, and as of June 2014 final review from all regions was completed. The comments and recommendations from the units have been addressed and changes were made when appropriate and feasible within the scope of this project.

FMSS Limitations and Asset Exclusions

Certain types of assets were not included in the analysis of any of the 40 parks. Examples include: 1) assets that location or elevation could not be assigned easily, such as some large general areas (e.g., landscapes, grounds, beaches or dunes) or assets that represent systems likely distributed park wide (IT, radio, water, wastewater, etc.) and 2) assets with a FMSS status of "planned" or "removed." Any of these assets can be placed onto the high exposure or limited exposure lists if so desired by NPS. During review some parks requested these type of assets (like a waterfront system) be included in the high exposure category. Also, some of these exclusions did not apply to all units. If a decision could be made about that particular asset (e.g., a landscape that is clearly at risk), that asset was included in the analysis.

There are also a number of park assets that may not be included in this version of FMSS but are likely to be at risk to SLR. This includes numerous archaeological assets and maintained cultural landscapes that are not currently part of the FMSS database, but are extremely valuable and preserving these resources is part of the mission of NPS. Also, during the review of this document it was noted that numerous assets have been added and updated in FMSS that are not part of this document, and could increase the number of assets listed as high exposure to SLR.

In addition, many of the assets listed in this report may have changed in location, condition, or status (some may have been relocated, removed, salvaged, some may have been rebuilt, etc.) and therefore, all the quantitative values (FCI, CRV, API, etc.) and assets presented in this document represent a snapshot of a particular time. Many of the reviewers suggested that FMSS has been updated recently and the quality of the data has increased significantly. However, the data utilized for analysis in this study is from spring of 2012, when NPS provided the FMSS data to WCU. Some edits to the FMSS were made to specific assets if the unit or region provided these changes during the review process (i.e., a few reviewers actually changed the Optimizer Band values in the asset list provided).

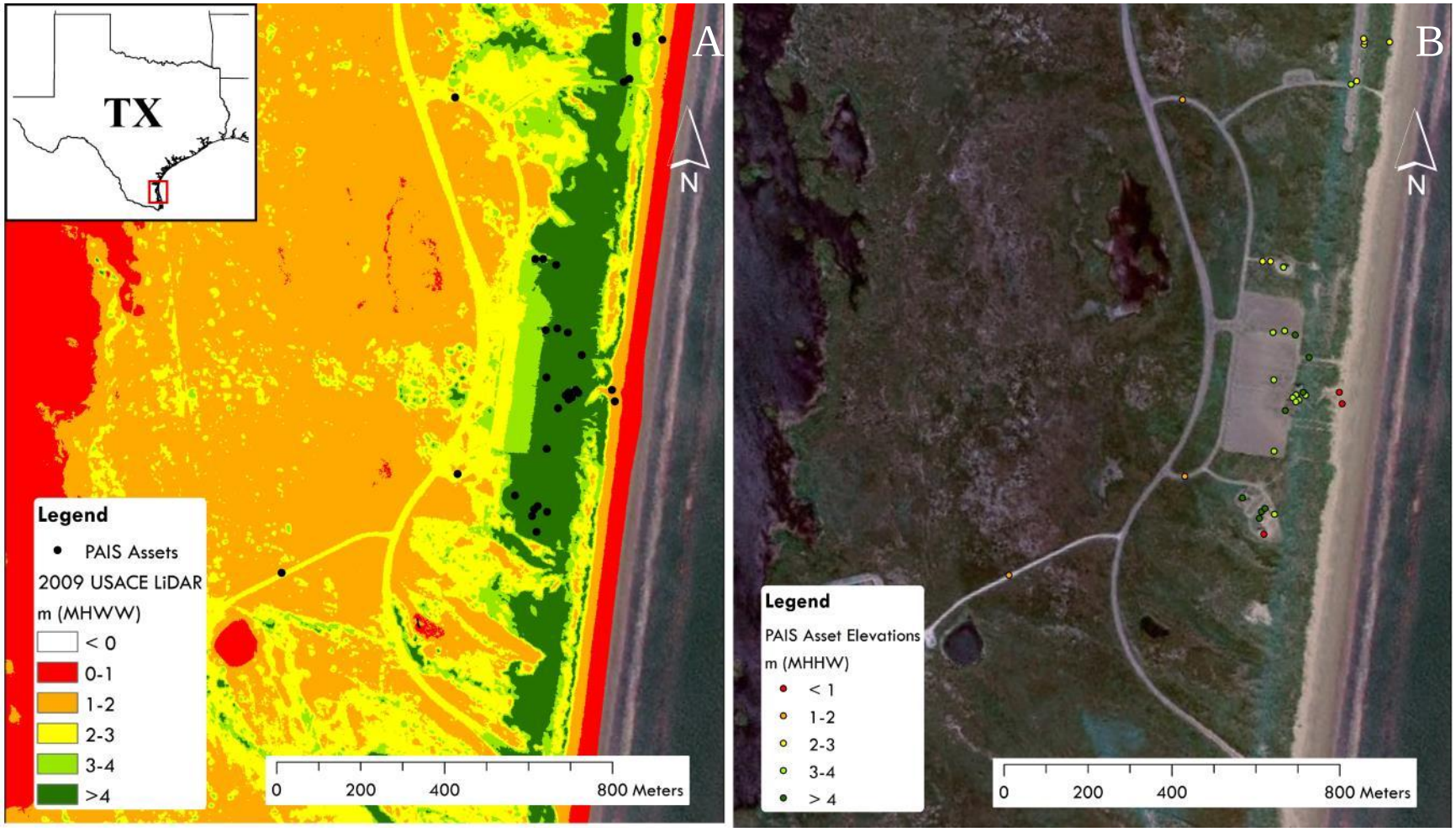

Figure 3. PAIS exposure analysis example. A) LiDAR DEM of a portion of PAIS and asset locations. B) Color coded assets for the same area based on elevations obtained from the LiDAR DEM.

Table 3. General summary of data types available for each unit. Quality and quantity of each data type varies between units. Specific data sources can be found in Appendices A-F.

Unit	Asset Geographic Data	GIS Elevation Data		Field Visit	Park Review	Broad Categorization: All Assets High Exposure
		Contour	LiDAR			
ACAD	○	○			○	
ASIS	○		○	○	○	
BOHA	○		○	○		
BOST	○		○		○	
CACL			○		○	○
CACO	○		○	○		
FIIS	○		○	○		
FOMC			○		○	
GATE	○		○	○	○	
GEWA			○			
GOIS			○		○	
NEBE			○			
SAHI	○		○		○	
SAMA			○		○	
STLI			○			○
BICY					○	
BISC	○	○	○			○
CAHA	○		○			○
CALO	○		○		○	○
CANA	○		○		○	○
CASA			○		○	○
CUIS	○		○	○		
DESO						○
EVER	○				○	○
FOPU						○
FOSU				○		○
GUIS	○		○			
TIMU	○				○	
CABR	○		○			
CHIS	○		○		○	
FOPO	○		○		○	
GOGA	○		○	○	○	
LEWI	○					
OLYM	○		○	○	○	
PORE	○				○	
REDW	○		○			
SAFR	○		○			
SAMO	○				○	
PAAL					○	
PAIS	○		○	○	○	

Table 4. Primary data types and common sources used in the SLR exposure analysis.

Data Type	Common Source(s)
LiDAR DEM	NOAA, USGS, USACE, city and county
Contour Data	NPS-IRMA
GPS data	WCU- Park visits
Asset geospatial data (e.g., roads, trails)	NPS-IRMA
Geospatial buildings data	NPS- Facilities Management GIS Data Manager
Specific asset exposure	NPS staff discussions

Results & Discussion

Overview & Exposure Breakdown

The following section describes the overall results of the exposure analysis by grouping the units into three classes based on percent of assets listed as high exposure (Table 5). Unit specific analysis and results can be found in Appendices C-F.

Low Exposure Group:
  < 25 % of assets high exposure
Intermediate Exposure Group:
  26-75 % of assets high exposure
High Exposure Group:
  > 75% of assets high exposure

Low Exposure Group

Sixteen of the 40 coastal units fell into the Low Exposure Group, three of which had no assets (0%) listed as high exposure (Table 5). SAMO is a national recreation area encompassing many state and county beaches and parks, but no NPS owned assets are situated on the coast. Instead, the NPS assets are located in the northern mountainous region of the park. CABR is situated on the rocky, high elevation (several hundred feet) Point Loma shoreline in southern California and has few assets near sea level. PAAL is a national battlefield in southern Texas that is situated several miles inland,

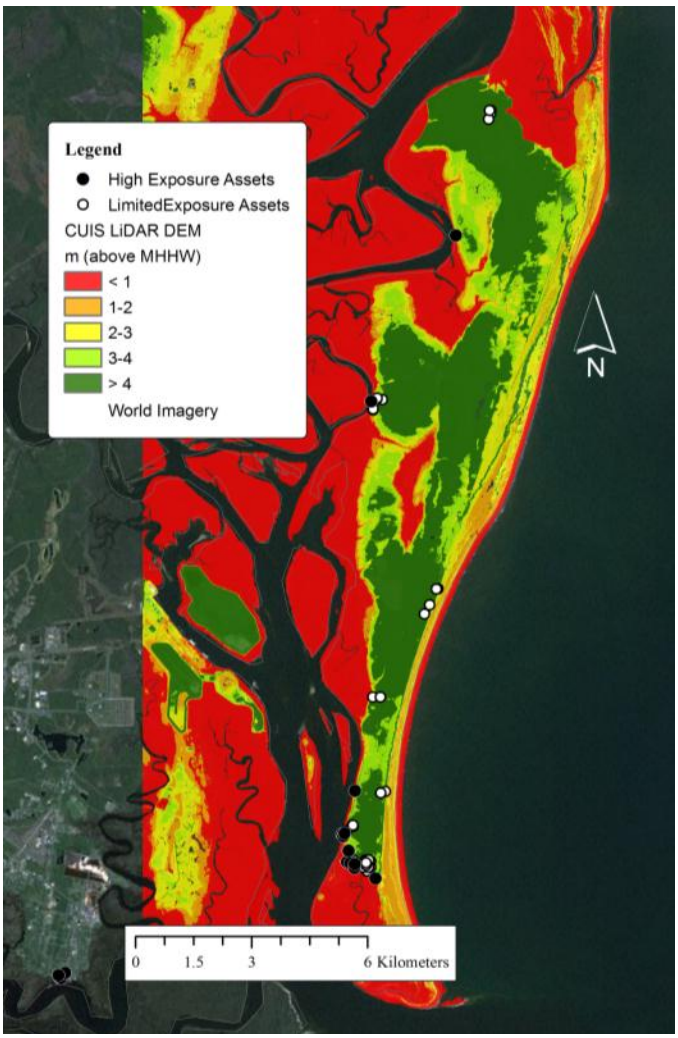

Figure 4. CUIS map with LiDAR DEM and asset locations. Notice the relatively high elevations (green shades) and the overall width of the island.

with elevations above 1 m. These geomorphologic factors led to the conclusion that all assets within these three units (SAMO, CABR and PAAL) should have all assets designated as having a limited exposure to long-term SLR.

The thirteen remaining units in the Low Exposure Group are primarily high elevation NER and PWR units. The exceptions are CUIS and PAIS, two barrier island parks which are geomorphologically different from the other island units in this study. Both have higher elevations (> 3 m) and overall widths (> 4 km) than most barrier islands, and most of the NPS assets are located within these wider, higher elevation zones (Figures 3 and 4). Also important to note is that unlike most coastal parks, a large portion of these islands are accreting (information via personal communications with park staff).

Intermediate Exposure Group

The Intermediate Exposure Group contains four units from the NER, three from the PWR and one from the SER (Table 5). FIIS and LEWI fall within the higher end of this percentage range, with 58% and 70%, respectively. A number of units within this exposure group, such as FIIS and GATE, were severely affected by Hurricane Sandy in October 2012. It is important to note that this storm occurred after the initial visits and analyses were completed for this project. Therefore, it is likely that a number of NER units would have different results if completed post-storm. Many assets within GATE that were well over the 1 m elevation threshold for this project were severely affected, some even destroyed, during Hurricane Sandy. Therefore, the percentage of high exposure assets within many units may have dramatically different results if analyzed today. Because of this recognition, the results from GATE were reviewed in detail with park staff and compared to new post-Sandy flood data. The results of this case study will be discussed in a later section of this document.

High Exposure Group

A total of 16 units fell into the High Exposure Group; 11 of these had all NPS assets (100%) designated as high exposure. These 100% exposed units include most of the SER, as well as the NER units of CACL and STLI (Table 5). The SER units that have 100% of assets designated as high exposure were included in the broad categorization of low-lying units that was established during discussions with NPS staff (Table 3). The majority of the assets within these units are already threatened by coastal hazards (i.e., tropical storms) and have extremely low elevations and, therefore, an additional 1 m of SLR would likely affect all assets within these units. The NER units with 100% of assets designated as high exposure are relatively small units with low elevations, situated directly on or within New York Harbor. The combination of these units being exposed to storms and having extremely low elevations yielded the result of all assets being designated as high exposure to long-term SLR (Table 4).

The five remaining units in the High Exposure Group include three units from the NER (ASIS, BOST, and SAMA) and two units from the SER (BICY and GUIS). Two of these units, ASIS and GUIS, are low-lying barrier islands with a few assets on the mainland. BICY is a unit on the west coast of Florida with large sections of NPS property situated far inland from the coast. The other two, SAMA and BOST, are historic units situated directly on the water within low elevation, highly developed coastal cities (Salem and Boston, MA).

Table 5. Exposure results for all 40 coastal NPS units.

Region	Unit	All Analyzed Assets		High Exposure Results				
		# Assets	CRV	# Assets	% Assets	CRV	% CRV	Exposure Range
NER	ACAD	584	$741,643,375	69	12%	$49,065,405	7%	Low
	ASIS	188	$141,894,898	179	95%	$135,180,045	95%	High
	BOHA	143	$121,763,441	54	38%	$55,498,822	46%	Intermediate
	BOST	77	$608,380,029	65	84%	$408,185,040	67%	High
	CACL	5	$23,606,659	5	100%	$23,606,659	100%	High
	CACO	414	$248,946,088	70	17%	$51,385,721	21%	Low
	FIIS	228	$98,806,696	132	58%	$56,036,479	57%	Intermediate
	FOMC	44	$183,243,495	4	9%	$77,494,234	42%	Low
	GATE	1089	$6,594,927,986	302	28%	$2,672,440,355	41%	Intermediate
	GEWA	56	$37,708,870	2	4%	$4,984,022.67	13%	Low
	GOIS	32	$153,484,095	11	34%	$71,223,382	46%	Intermediate
	NEBE	20	n/a	5	25%	n/a	n/a	Low
	SAHI	43	$41,787,745	1	2%	$1,122,038	3%	Low
	SAMA	32	$41,641,700	27	84%	$30,948,717	74%	High
	STLI	104	$1,512,459,244	104	100%	$1,512,459,244	100%	High
SER	BICY	254	$1,030,477,750	210	83%	$414,159,499	40%	High
	BISC	68	$67,913,211	68	100%	$67,913,211	100%	High
	CAHA	559	$1,173,309,846	559	100%	$1,173,309,846	100%	High
	CALO	289	$878,717,414	289	100%	$878,717,414	100%	High
	CANA	167	$88,404,508	167	100%	$88,404,508	100%	High
	CASA	54	$26,571,807,938	54	100%	$26,571,807,938	100%	High
	CUIS	204	$112,431,019	33	16%	$19,361,490	17%	Low
	DESO	10	$3,366,160	10	100%	$3,366,160	100%	High
	EVER	493	$657,087,096	493	100%	$657,087,096	100%	High
	FOPU	52	$286,318,757	52	100%	$286,318,757	100%	High
	FOSU	38	$1,230,735,376	38	100%	$1,230,735,376	100%	High
	GUIS	436	$4,938,540,247	355	81%	$3,930,189,186	80%	High
	TIMU	111	$28,262,535	42	38%	$9,941,883	35%	Intermediate
PWR	CABR	55	$41,741,304	0	0%	$0	0%	Low
	CHIS	166	$160,239,240	23	14%	$46,691,845	29%	Low
	FOPO	17	$208,178,640	5	29%	$191,161,089	92%	Intermediate
	GOGA	1049	$4,934,700,016	114	11%	$617,570,959	13%	Low
	LEWI	50	$33,397,041	35	70%	$18,047,865	54%	Intermediate
	OLYM	873	$973,129,278	72	8%	$37,500,350	4%	Low
	PORE	639	$739,325,357	25	4%	$34,929,157	5%	Low
	REDW	490	$367,895,176	20	4%	$7,871,075	2%	Low
	SAFR	49	$901,209,688	21	43%	$262,743,226	29%	Intermediate
	SAMO	270	$163,605,010	0	0%	$0	0%	Low
IMR	PAAL	26	$9,366,512	0	0%	$0	0%	Low
	PAIS	78	$77,165,636	14	18%	$40,920,359	53%	Low

Service-Wide Exposure & Risk

Within the 40 coastal NPS units in this study, almost 10,000 assets with over $56 billion in current replacement value (CRV; from FMSS) were analyzed for exposure to long-term SLR (Table 6). Approximately 39% of NPS assets were designated as high exposure; these assets combined have a CRV of over $41 billion. The SER has the highest percentage of assets at risk (87%) and these assets make up over 85% ($35 billion) of the total value (CRV) at risk in all 40 units. The PWR and IMR have the lowest percentage of high exposure assets, with 9% and 13%, respectively. This sharp divide between the regions is primarily a function of elevation differences between the Atlantic and Pacific coasts. The NER has the highest percentage of assets at risk that are considered historic (in FMSS; Table 6).

Table 6. National and regional SLR exposure data results.

Region	Total Assets Analyzed		High Exposure Results				
	# Assets	CRV	# Assets	% Assets	CRV	% of CRV	% Historic
NER	3059	$10,550,294,321	1030	34%	$5,149,630,164	49%	21%
SER	2735	$37,067,371,857	2370	87%	$35,331,312,364	95%	13%
PWR	3658	$8,523,420,750	315	9%	$1,216,515,566	14%	12%
IMR	104	$86,532,148	14	13%	$40,920,359	47%	0%
All Units	9556	$56,227,619,076	3729	39%	$41,738,378,453	74%	15%

In terms of Asset Type (as coded by FMSS), buildings and parking make up the majority of the high exposure assets, with 42% and 11%, respectively (Table 7). However, fortifications make up most (over 80 %) of the total value (CRV) of the threatened assets (Table 7). This is a function of the extremely high CRV of these historic features in FMSS; the fortification at CASA alone has a CRV of over $25 billion. The CRVs assigned for these fortifications are exceptionally high compared to other asset types and make it difficult to evaluate the relative exposure of the other asset categories.

Removing the fortifications from the analysis gives a clearer picture of how the other asset types compare. Table 8 shows the top five high exposure asset types based on percentage of CRV, with fortifications removed from the analysis. In this revised analysis, buildings make up over 37% of the CRV of the high exposure asset types. While this type of analysis is useful, it is important to note that removing fortifications from the analysis should only be used as a way to compare the other asset types. The fortifications have a high CRV because they represent unique and irreplaceable resources and, therefore, must be included to get a complete representation of the scale and value of assets at risk.

Table 7. High exposure results listed by asset type. Historic is defined in FMSS as any asset greater than 50 years old.

Asset Code	Asset Description	# Assets	% Assets	CRV	% CRV	% Historic
1100	Road	371	10.04%	$809,950,504.27	1.94%	7%
1300	Parking	403	10.90%	$225,691,765.10	0.54%	4%
1700	Road Bridge	53	1.43%	$122,342,193.83	0.29%	9%
2100	Trail	313	8.47%	$452,381,156.18	1.08%	5%
2200	Trail Bridge	12	0.32%	$3,371,097.00	0.01%	17%
2300	Trail Tunnel	1	0.03%	$2,531,243.95	0.01%	100%
3100	Maintained Landscape	210	5.68%	$1,668,010,936.21	4.00%	6%
3800	Boundary	4	0.11%	$3,966,740.00	0.01%	75%
4100	Building	1576	42.64%	$2,816,396,622.25	6.75%	18%
4300	Quarters	48	1.30%	$17,443,425.00	0.04%	21%
5100	Water System	21	0.57%	$34,551,477.97	0.08%	24%
5200	Waste Water System	54	1.46%	$839,129.00	0.00%	0%
5300	Heating & Cooling	1	0.03%	$500,159.81	0.00%	0%
5400	Electrical System	3	0.08%	$2,711,957.01	0.01%	0%
5700	Fuel System	14	0.38%	$3,440,619.98	0.01%	7%
6100	Dam/Levee/Dike	10	0.27%	$39,266,722.33	0.09%	30%
6200	Constructed Waterway	23	0.62%	$142,133,363.00	0.34%	13%
6300	Marina/Waterfront System	166	4.49%	$1,041,180,713.61	2.49%	12%
6400	Aviation	4	0.11%	$18,773,580.96	0.04%	25%
7100	Monuments	35	0.95%	$33,921,706.46	0.08%	26%
7200	Maintained Archaeological	136	3.68%	$63,690,858.24	0.15%	71%
7300	Fortification	56	1.52%	$34,161,004,760.69	81.85%	88%
7400	Towers/Missile Silos	7	0.19%	$1,502,070.99	0.00%	57%
7500	Interpretive Media	167	4.52%	$57,713,570.14	0.14%	0%
7900	Amphitheaters	8	0.22%	$14,688,398.90	0.04%	0%

Table 8. Top five high exposure asset types based on % of total CRV, with fortifications removed from analysis.

Asset Code	Asset Description	CRV	% CRV	% Historic
4100	Building	$2,816,396,622.25	37.17%	18%
3100	Maintained Landscape	$1,668,010,936.21	22.01%	6%
6300	Marina/Waterfront System	$1,041,180,713.61	13.74%	12%
1100	Road	$809,950,504.27	10.69%	7%
2100	Trail	$452,381,156.18	5.97%	5%

FMSS, NPS Resources and Adaptation

Cultural resource conservation and history and heritage education are primary functions of NPS. One way that NPS fulfills these functions is by maintaining, protecting and exhibiting historic and cultural resources, such as buildings, landscapes, fortifications and archaeological sites. These resources are often the back-bone of public education regarding national, regional and local heritage. Therefore, when an asset is at risk to SLR, it may be important to consider if it is listed as historic within FMSS (greater than 50 years old, as defined in FMSS). For example, a historic building vulnerable to SLR will be evaluated differently in terms of potential restoration, protection, relocation or demolition than a non-historic building, as preservation of these assets are a tenant of the NPS mission statement.

Within these 40 coastal units, there are 1,576 buildings designated as high exposure to SLR (Table 7). This is an average of 39 buildings per unit that will likely need a plan for adaptation in the next 100+ years. However, only 280 of the high exposure buildings are listed as historic in FMSS. Although these historic buildings make up a smaller percent (18%) of the total buildings at risk, it is important to note that these structures have the highest CRVs (over two-thirds of the total value for buildings). During the review process, the accuracy of FMSS was mentioned numerous times. For example, it was noted that many assets are erroneously listed as non-historic within FMSS (at the time the data was obtained). This is especially true for assets types such as maintained archaeological sites, of which only 71% are listed as historic (this number should likely be 100%). Also, many cultural resources, including most archaeological sites, are not currently part of the FMSS database. Therefore, the total risk to these types of resources is not encompassed within this particular study.

The age and the value of an asset are just a few pieces of information that can be used as tools when considering climate change adaptation strategies. Assets within FMSS have additional properties that may be helpful for evaluating adaptation options, including the priority of an asset to the park's mission (Asset Priority Index, API) and the relative condition of the asset (Facilities Condition Index, FCI). For example, a historic building in poor condition with a low priority to the unit would not likely need the same adaptation strategy as a historic building in good condition and of high priority. The relationship between the condition and priority of an asset has recently been a focus for decision making within NPS facilities management. For example, NPS is currently in the process of updating FMSS with more accurate Optimizer Band (OB) scores. OB scores are a banding of assets found in FMSS that is based on the API and FCI. The scores are meant to help guide the priority of funding and investment for a particular asset and will be another important piece of data to review when considering adaptation options.

NPS is also committed to natural resource preservation. One major hurdle that NPS faces in the future as SLR threatens an increasing number of assets is the balance between protecting cultural resources and infrastructure, and preserving natural resources. In many cases, protection of assets in place (e.g., by adding a seawall) can damage or remove the surrounding natural environment. Therefore, not only should the FMSS properties (i.e., API, FCI, and CRV) be considered when discussing adaptation strategies, but also the possible risk of damage to other NPS resources.

Each unit also has its own unique enabling legislation and general management plan to follow when developing adaptation options. For example, ASIS, which is a national seashore containing wilderness area, is required to preserve natural resources and provide compatible recreation, whereas FOSU, which is almost entirely composed of cultural resources (a fortification), faces different management challenges to protect non-renewable cultural resources along an eroding shore. Complex decisions about how best to protect assets from SLR and other impacts of climate change will increase as climate change continues to affect our coastlines, requiring significant financial commitment and staffing. It is important that NPS begin to put together national and regional plans for climate change adaptation.

Case Study: Hurricane Sandy and GATE

Hurricane Sandy made landfall in October 2012 and had significant impacts within several NER units, including GATE. The SLR exposure analysis for this project was completed prior to Sandy, which brought unprecedented storm surge and flooding to many portions of these units. After the storm, it was clear that many areas of GATE were at a higher risk from coastal hazards (i.e., storm surge and erosion) than previously acknowledged.

Many states affected by Sandy have since collected new pertinent coastal data, such as LiDAR-derived elevation maps, and have also updated out-of-date coastal hazard maps, such as flood hazard and flood zone maps. This new wealth of data is an important tool for understanding the exposure of NPS assets to storms and flooding. Therefore, the assets at GATE were analyzed as a case study to illustrate how units will not only be affected by SLR over the long term, but are also severely at risk to storm hazards.

As part of this case study, we compared the georeferenced assets at GATE with the new Federal Emergency Management Agency (FEMA) Flood Hazard Maps. Using ArcGIS, we determined which assets within the unit were located within one of two FEMA flood hazard zones, the Special Flood Hazard Risk Areas (AE zone) and the Coastal High Hazard Areas (VE zone). Table 9 shows the results of this analysis and Table 10 shows the results of our initial SLR exposure analysis for GATE.

Table 9. Results from FEMA flood zone analysis within GATE. The total number of assets analyzed differs from the total number of assets analyzed in the SLR exposure analysis due to availability of geographic data. Only assets with known specific location data were included in this analysis.

Location	# Assets	% Assets	Total CRV	% CRV
Total Analyzed	986	n/a	$6,054,494,902.78	n/a
VE Zone	49	5%	$127,545,541	2%
AE Zone	515	52%	$2,268,983,336.46	37%
AE + VE Combined	564	57%	$2,396,528,877	40%

Table 10. Summarized results from the SLR exposure analysis within this study.

	# Assets	% Assets	Total CRV	% CRV
Total Analyzed	1089	n/a	$6,594,852,975	n/a
High Exposure	302	28%	$2,672,440,355	41%

Hurricane Sandy Lessons

The results from our exposure designation for GATE yielded 28% of the assets having a high exposure to SLR over the next 100 years (Table 10). However, the post-Sandy FEMA flood zones analysis shows that 57% of the assets within GATE are within the high flood risk and coastal high hazard areas (the AE and VE zones, Table 9). These results confirm our initial speculation that the results from the SLR exposure designation were likely conservative, especially for units with narrow barrier island sections such as GATE. The case study analysis of GATE and the FEMA flood zones shows that almost two-thirds of the assets are within high coastal risk areas; however, this percentage is considerably higher for some areas of the park. For example, 82% of the assets located on Sandy Hook were in one of the FEMA high risk flood zones (Table 11), compared to 30% that were considered high exposure to long-term SLR (Figure 5).

The different results yielded by these two methods of risk analysis are primarily due to the nature of the data and the hazard in question. The new post-Sandy FEMA flood zones (Figure 5A) are meant to include the land area that is at risk to a 1-percent-annual-chance flood and comprises a very large area of the coastal zone. Therefore, the assets in these zones are those vulnerable to flood hazards, such as storm surge. Our SLR exposure analysis, however, categorized assets as high exposure that were at or near 1 m elevation above mean higher high water (red shades in Figure 5B). This analysis determined the asset risk related to long-term rise in sea level, and not flooding risk associated with storms. Therefore, a much greater number of assets were determined to be at risk according to the FEMA flood zone analysis. Many assets within the high risk FEMA flood zones may be at elevations much higher than 1 meter; in fact, storms (such as Sandy) produced surge flooding above 3 meters in this region.

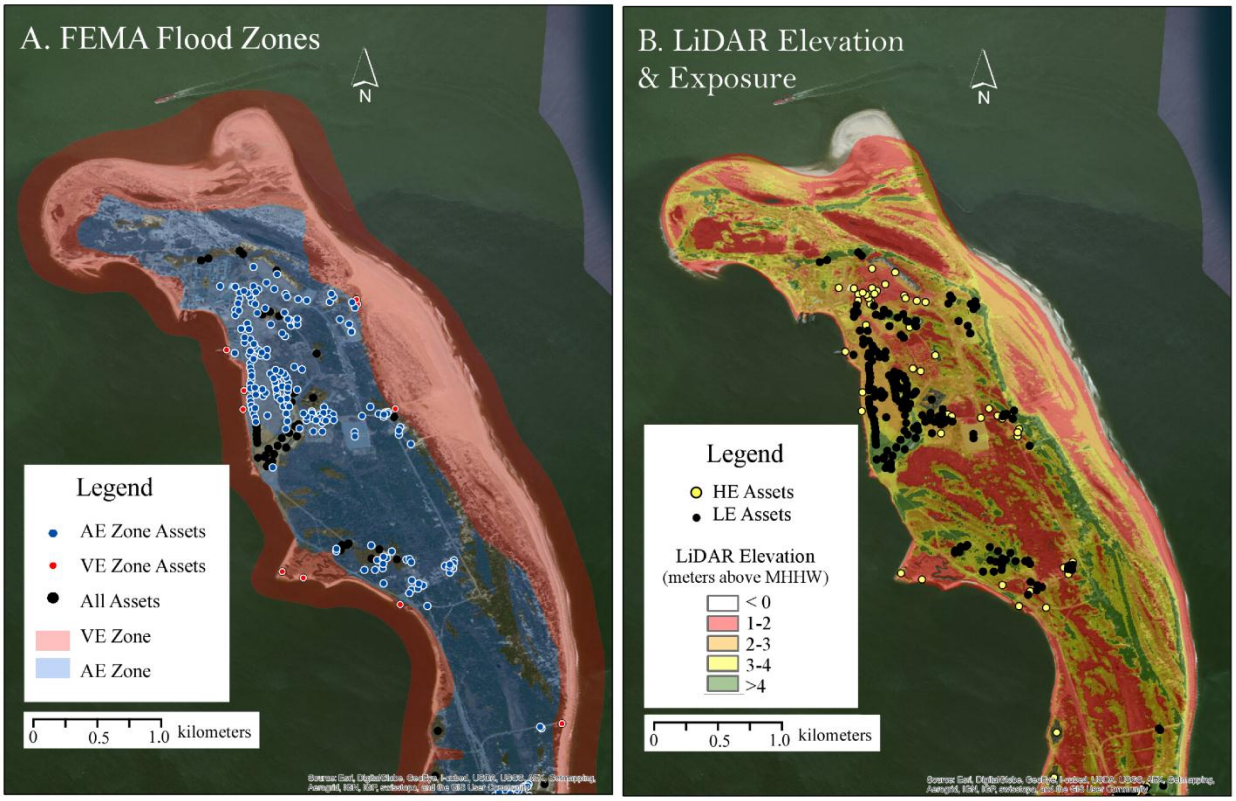

Figure 5. Comparison map of the results from the Sandy Hook portion of GATE, including the FEMA flood zone analysis (A) and the SLR exposure analysis (B) for assets within the area (HE = high exposure, LE = limited exposure).

The findings from this case study at GATE have proven that while it is essential to determine NPS assets at risk to long-term SLR, it is also extremely vital to understand and consider other hazards that may impact these assets in the short term. **Additionally, the SLR exposure analysis is likely a fairly conservative estimate of the number of assets at risk over the next 100 years, as storm impacts (especially within the units along the east coast) may be a more imminent threat to NPS property**. As more parks continue to georeference their assets and define the relation of their assets to available flood hazard zones, the overall exposure of NPS assets to rising sea level can be better characterized. Hopefully, this type of data will eventually be incorporated into FMSS.

Conclusions and Next Steps

Results from this study show that well over one-third of the FMSS-listed assets within 40 coastal NPS units are at risk to long-term SLR. These assets have combined value of over $40 billion and many of the high exposure assets provide essential day-to-day functions, such as visitor access. The Hurricane Sandy case study highlighted that the results from this analysis are likely conservative and that many of the assets listed are already at risk to other coastal hazards such as storms.

Overall, this study provides a broad overview of the high level of exposure to SLR faced by NPS assets. It is not meant to be used directly for decision making at the unit level, as much of the data needed for a more detailed asset specific analysis is not available for many units. FMSS does contain several pieces of data that can be used for decision making, including an asset's historical nature, priority to the unit and overall condition.

Hopefully, this project will help to bring attention to the serious need for broader guidance related to climate change adaptation, not only at the park level, but also by the NPS regional and national levels.

Two additional projects are currently underway that will continue to build upon this analysis. The first is a series of case studies related to climate change vulnerability and adaptation from NPS coastal parks, which will provide park managers with a suite of adaptation strategies that are currently being implemented to protect vulnerable coastal assets. Also underway is an extension of this project to analyze the exposure of another 30 coastal units to SLR.

Appendix A: GIS Data Sources by Unit

Unit	Data Name	Data Source
ACAD	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	5-foot interval topographic contours for the Town of Bar Harbor, Maine, 2004	IRMA, NPS: https://irma.nps.gov/App/
	Topographic contour lines from USGS 1:24,000 vicinity of Acadia National Park, Maine, 2000	
	Carriage Road Bridges of Acadia National Park, 2003	
	Hiking Trails of Acadia National Park, 2012	
	Miscellaneous roads mapped on Long Island, Blue Hill Bay, Maine during initial easement inventory 1995-96	
ASIS	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	EAARL Coastal Topography, Assateague Island National Seashore, Maryland and Virginia, 2010	USGS: http://pubs.usgs.gov/ds/628/
	WFDSS_NPS_Buildings_ASIS_Clip	GIS staff, ASIS: Neil Winn
	Roads_current	
	LowExposureAssets_FromASIS_IshEnnis	Facilities staff, ASIS, Ish Ennis
BICY	2007-08 Inland Monroe 10-ft DEM in NAVD 1988	South Florida Water Management District: http://my.sfwmd.gov/gisapps/sfwmdxwebdc/dataview.asp
	BICY Trails (converted from KML files)	NPS Website: http://www.nps.gov/bicy/planyourvisit/things2do.htm
BISC	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	MIAMI-DADE COUNTY 2FT CONTOUR LINES	FDEM: http://www.floridadisaster.org/gis
	2007 - 2008 Florida Division of Emergency Management (FDEM) LiDAR Project	
BOHA	2002 Boston Area LiDAR	Office of Geographic Information (MassGIS): http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/
	2011 LiDAR for the North East	NOAA: http://www.csc.noaa.gov/dataviewer/#
BOST	2002 Boston Area LiDAR	Office of Geographic Information (MassGIS): http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/

Unit	Data Name	Data Source
CABR	2009 - 2011 CA Coastal Conservancy Coastal LiDAR Project	NOAA: http://www.csc.noaa.gov/dataviewer/#
CACL	NYC 2010 LiDAR 3-foot Digital Elevation Model	GIS Staff, GATE
CACO	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	2010 USACE JALBTCX LiDAR: Northeast (Topo)	NOAA: http://www.csc.noaa.gov/dataviewer/#
	EAARL Topography-Cape Cod National Seashore 2007	
CAHA	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	2009 USGS/NPS EAARL: Cape Hatteras National Seashore - Post-Nor'easter Ida	NOAA: http://www.csc.noaa.gov/dataviewer/#
CALO	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	2005 USACE National Coastal Mapping Program Topo/Bathy LiDAR: Delaware, Maryland, New Jersey, New York, North Carolina and Virginia	NOAA: http://www.csc.noaa.gov/dataviewer/#
	2010 USACE JALBTCX Southeast LiDAR: Florida, Georgia, South Carolina, North Carolina	
CANA	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	2010 USACE JALBTCX Southeast LiDAR: Florida, Georgia, South Carolina, North Carolina	NOAA: http://www.csc.noaa.gov/dataviewer/#
	2007 Florida Division of Emergency Management (FDEM) LiDAR Project: Brevard County	
CASA	2008 St. Johns County, FL Countywide LiDAR	NOAA: http://www.csc.noaa.gov/dataviewer/#
CHIS	2002/2003 IfSAR data for Southern California: Digital Elevation Model (NAVD88)	NOAA: http://www.csc.noaa.gov/dataviewer/#
	2009 - 2011 CA Coastal Conservancy Coastal LiDAR Project	
	2009 USACE JALBTCX Bathymetric LiDAR: Southern California	
	Road Density Metric Product (RDD), 2009, NPS Natural Resource Inventory and Monitoring Division	IRMA, NPS: https://irma.nps.gov/App/

Unit	Data Name	Data Source
CUIS	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	CUIS LiDAR, meters, NAVD88	Chester Jackson, Department of Geology & Geography Georgia, Southern University
	Cumberland Island National Seashore Small-Scale Base GIS Data	IRMA, NPS: https://irma.nps.gov/App/
EVER	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
FIIS	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	EAARL Coastal Topography and Imagery 2009	USGS: http://pubs.usgs.gov/ds/558/index.html
	Long Island, NY LiDAR USGS 2011	FIIS Staff
	Facilities GIS Data, FIIS	
FOMC	2008 City of Baltimore LiDAR	NOAA: http://www.csc.noaa.gov/dataviewer/#
	Fort McHenry NM & HS Topographic Site Plan Elevations	
FOPO	2010 Northern San Francisco Bay Area LiDAR: Portions of Alameda, Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties	NOAA: http://www.csc.noaa.gov/dataviewer/#
GATE	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	EAARL Coastal Topography, GATE, NJ & NY, 2009	USGS: http://pubs.usgs.gov/ds/525/
	NYC 2010 LiDAR 3-foot Digital Elevation Model	GATE Staff
	GATE Trails, Roads 2006	
	2010 USACE JALBTCX LiDAR: New York (Topo)	NOAA: http://www.csc.noaa.gov/dataviewer/#
	2007 USGS/NASA Experimental Advanced Airborne Research LiDAR (EAARL): Fire Island National Seashore, NY and Sandy Hook, NJ	
	2010 USACE JALBTCX LiDAR: New Jersey (Topo)	
	Jamaica Bay USACE 2005 LiDAR (meters)	
GEWA	EAARL Topography--George Washington Birthplace National Monument 2008	USGS: http://pubs.usgs.gov/ds/401/

Unit	Data Name	Data Source
GOGA	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	San Francisco Area LiDAR	GOGA GIS Staff, Stephen Skartvedt
	GIS Data for GOGA	
GOIS	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	NYC 2010 LiDAR 3-foot Digital Elevation Model	GIS Staff, GATE
GUIS	2010 USACE JALBTCX Topobathy LiDAR: Alabama Coast and Florida Gulf Coast	NOAA: http://www.csc.noaa.gov/dataviewer/#
	EAARL Coastal Topography and Imagery--Naval Live Oaks Area, Gulf Islands National Seashore, Florida, 2007	
NEBE	2006 Bristol Co. Mass LiDAR	Office of Geographic Information (MassGIS): http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/
OLYM	Olympic National Park Small-Scale Base GIS Data	IRMA, NPS:https://irma.nps.gov/App/
	2010-2011 US Army Corps of Engineers (USACE) JALBTCX Topobathy LiDAR: Oregon and Washington	NOAA: http://www.csc.noaa.gov/dataviewer/#
PAIS	2009 USACE JALBTCX Topographic LiDAR: South Texas Coast	NOAA: http://www.csc.noaa.gov/dataviewer/#
	EAARL Topography-Padre Island National Seashore 2007	PAIS Staff; Travis Klapp
	GIS Data for PAIS (roads, trails, infrastructure, etc)	
PORE	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	San Francisco Area LiDAR	GOGA GIS Staff, Stephen Skartvedt
	2009 - 2011 CA Coastal Conservancy Coastal LiDAR Project: Hydro-flattened Bare Earth DEM	NOAA: http://www.csc.noaa.gov/dataviewer/#
REDW	2002 NASA/USGS Airborne LiDAR Assessment of Coastal Erosion (ALACE) Project for California, Oregon, and Washington Coastlines	NOAA: http://www.csc.noaa.gov/dataviewer/#
	Redwood Transportation	IRMA, NPS: https://irma.nps.gov/App/

Unit	Data Name	Data Source
SAFR	2010 Northern San Francisco Bay Area LiDAR: Portions of Alameda, Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties	NOAA: http://www.csc.noaa.gov/dataviewer/#
SAHI	2011 - 2012 New York State Department of Environmental Conservation (NYSDEC) LiDAR: Coastal New York (Long Island and along the Hudson River)	NOAA: http://www.csc.noaa.gov/dataviewer/#
	NYC 2010 LiDAR 3-foot Digital Elevation Model	GATE GIS Staff
	Sagamore Hill NHS Buildings and Structures	IRMA, NPS: https://irma.nps.gov/App/
	Sagamore Hill NHS Small Scale Features (Polygons)	
SAMA	SAMA Boundary	IRMA, NPS: https://irma.nps.gov/App/
	2010 USACE JALBTCX LiDAR: Northeast (Topo)	NOAA: http://www.csc.noaa.gov/dataviewer/#
STLI	NYC 2010 LiDAR 3-foot Digital Elevation Model	GIS Staff, GATE
TIMU	GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
	FL Division of Emergency Management: Duval County LiDAR	NOAA: http://www.csc.noaa.gov/dataviewer/#

Appendix B: Summary and Description of Results and Asset Fields

Summary

The following section displays the specific results for each of the 40 NPS units analyzed in this study. Results include a final list of the assets determined to have a high exposure to long-term SLR (1 m).

Asset Exclusions

Certain types of assets were not included in the analysis of the 40 parks. Examples include: 1) assets that location or elevation could not be assigned easily, such as some large general areas (e.g., landscapes, grounds, beaches or dunes) or assets that represent systems likely distributed park wide (IT, radio, water, wastewater, etc) 2) assets with a FMSS status of "planned" or "removed."

There are also a number of park assets that may not be included in the utilized version of FMSS but are likely to be at risk to SLR. This includes numerous archaeological assets such as midden mounds that are not currently part of the FMSS database. In the review of this document park staff have noted that numerous assets have been added and updated in FMSS that are not part of this document.

*Notes Pertaining to Asset Lists

1) Some exclusions did not apply to all units. If an exposure decision could be made about that particular asset (like a landscape that clearly has a high exposure) than the asset was included in the analysis.

2) Any assets can be placed onto the high exposure or limited exposure lists if so desired by NPS.

3) The original FMSS asset lists and location hierarchy reports were obtained from NPS in the Spring of 2012. Any updates that have been performed on the database since this time are not represented in this report.

4) If more than 100 assets were included in the high exposure list, only the first 100 are listed in this report. Further information can be obtained by contacting WCU or NPS.

Table B1. Asset Field Key

Field Name	Descriptions
Asset Code	FMSS code for asset type (i.e., building, road, etc), directly from FMSS, see table below. NPS definition: Identifies eight primary asset categories to track and report resource expenditures: Site Area, Road, Trail, Grounds, Buildings, Utilities, Marine/Waterway, and Unique Assets. The categories are further defined by asset codes (example: Paved Road, Unpaved Road, Paved Parking Area, Unpaved Parking Area, Bridge and Tunnel).
Location Code (Description)	Code for location; description of the asset, directly from FMSS location hierarchy
CRV Current Replacement Value	NPS definition: Standard industry costs and engineering estimates of materials, supplies, and labor required to replace facility at existing size and functional capability. This cost includes current costs for planning/design, construction, and construction management *FMAR.*
API Asset Priority Index	NPS definition: An asset evaluation process that quantifies the value of an asset in relation to the mission of the park. The API ranks assets according to a numeric rating system.
OptimizBand Optimizer Band	Banding by score of assets in the Optimizer tool based on higher priority assets receiving higher priority funding, assets in the best condition receiving the top priority of funding, and minimal investments are made in assets in poor condition of minimal importance. API/FCI is the basis for determination. Highest = Most Important Assets: Best Condition, High = Important Assets:, Best/Good Condition, Medium = Supporting Assets: Best/Good/Fair Condition Low = Lower Priority Assets, Lowest = Minimal Investment (API<21) & Disposal
FCI Facilities Condition Index	NPS definition: A measure of a facility's relative condition at a particular point in time compared to similar facilities. The FCI rating is a ratio of the cost of repair of an asset's deficiencies (deferred maintenance, recurring maintenance that has been deferred, component renewal that has been deferred, and immediate personnel hazard life safety repairs) divided by the current replacement value for the asset. FCI = FM sub –worktypes: DM + RM –DM + CR –DM + IPH/ CRV

Table B2. Asset Codes and Descriptions

Asset Code	Asset Description
1100	Road
1300	Parking
1700	Road Bridge
2100	Trail
2200	Trail Bridge
2300	Trail Tunnel
3100	Maintained Landscape
3800	Boundary
4100	Building
4300	Quarters
5100	Water System
5200	Waste Water System
5400	Electrical System
5700	Fuel System
6100	Dam/Levee/Dike
6200	Constructed Waterway
6300	Marina/Waterfront System
6400	Aviation
7100	Monuments
7200	Maintained Archaeological
7300	Fortification
7400	Towers/Missile Silos
7500	Interpretive Media
7900	Amphitheaters

Appendix C: Northeast Region Results

Figure C1. Boston Harbor Lighthouse in BOHA, a Northeast Region park unit.

Acadia National Park (ACAD)

Table C1. Summary of Findings for ACAD.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	69	12%	$49,065,405	7%
Limited Exposure	515	88%	$692,577,970	93%
TOTALS	**584**	**100%**	**$741,643,375**	**100%**

Park contacts
Rebecca Cole-Will

Primary data utilized
NPS FMSS location hierarchy report, discussion and review by park staff

Process/methods for exposure determination
WCU performed initial cut of assets using location hierarchy report and prior knowledge of the area. These newly revised exposure asset lists were sent to and reviewed by park personnel at ACAD. Using the comments from ACAD, a final list of assets considered high exposure to 1 m of SLR was compiled. *Note about asset list: a group of assets listed at the bottom of the ACAD high exposure asset table are not in FMSS, but added during park review.

ACAD Documents
Map of high exposure assets & GIS data
Complete list of high exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

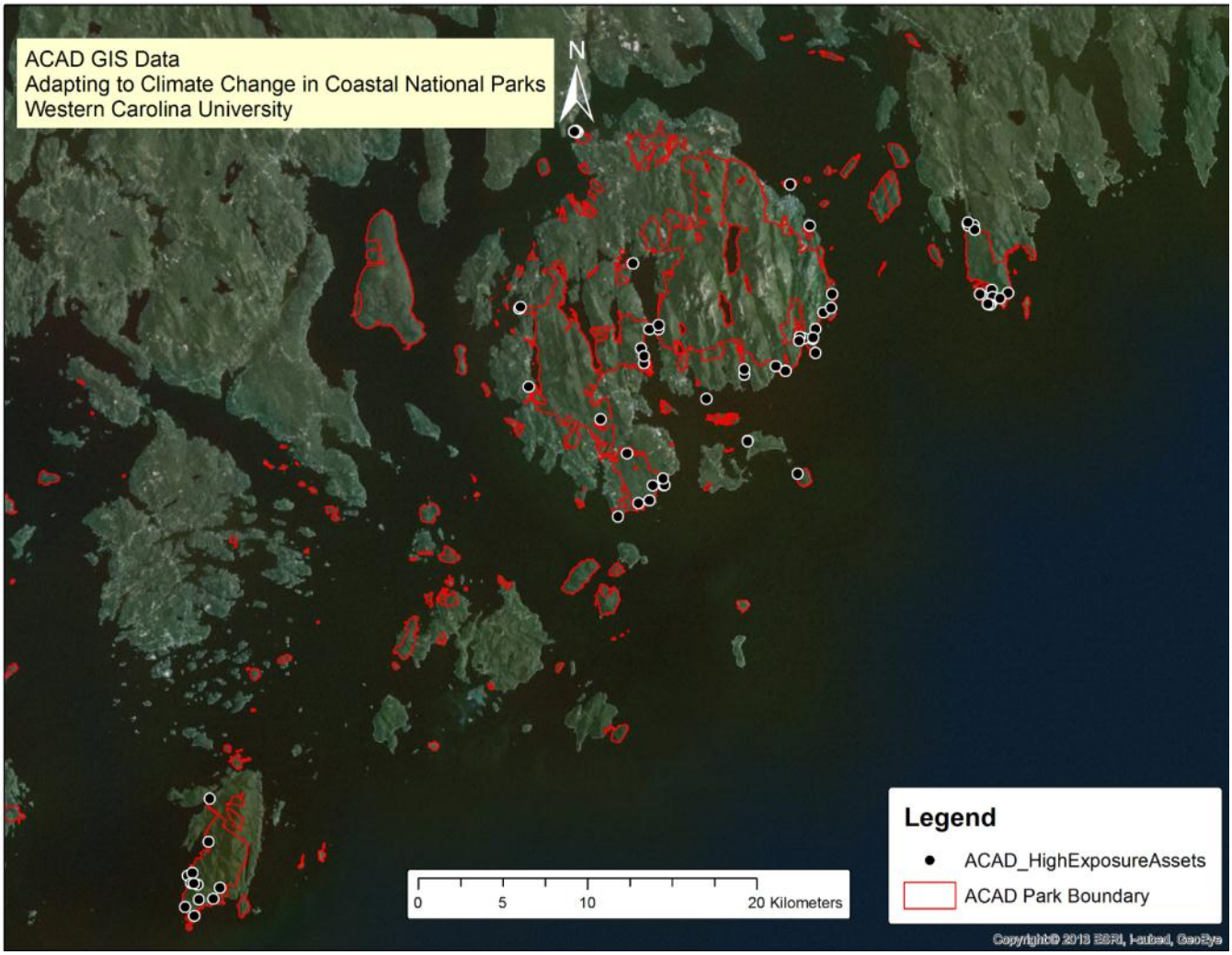

Figure C2. ACAD GIS Map of park boundary and high-exposure assets.

Table C2. Complete list of GIS Data utilized for ACAD.

Data Name	**Data Source**
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
5-foot interval topographic contours for the Town of Bar Harbor, Maine, 2004	IRMA, NPS: https://irma.nps.gov/App/
Topographic contour lines from USGS 1:24,000 scale topographic quadrangles, vicinity of Acadia National Park, Maine, 2000	
Carriage Road Bridges of Acadia National Park, 2003	
Hiking Trails of Acadia National Park, 2012	
Miscellaneous roads mapped on Long Island, Blue Hill Bay, Maine during initial easement inventory 1995-96	

Table C3. ACAD High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	n/a	227436 (Sundew Trail (SD))	$141,175	0	73	0.00
2	2100	81082 (BLACKWOODS TRAIL (79))	$895,617	0	57	0.00
3	2100	81086 (SEAWALL TRAIL (131))	$3,833,581	0	36	0.00
4	1100	61726 (MDI-East,(P) Stanley Brook Road, Rt 014)	$2,380,193	1	100	0.04
5	1700	62064 (MDI - Little Hunters Brook Bridge, #1700-008P)	$887,609	1	100	0.03
6	1700	62067 (MDI - Otter Cove Creek Causeway Bridge, #1700-019P)	$2,270,230	1	100	0.04
7	1100	62763 (SD -Schoodic Point Road,(P) RT 249)	$979,014	1	100	0.01
8	1100	62764 (SD- Schoodic Loop Road, (P)RT 301)	$11,172,277	1	100	0.01
9	5800	Schoodic Waste Water SERC	$2,230,933	1	88	0.35
10	2100	62122 (OCEAN PATH (3))	$1,374,053	1	81	0.15
11	2100	62257 (BASS HARBOR HEAD LIGHT (129))	$102,517	1	70	0.03
12	4100	99839 (B-351 Seawall Picnic Area Restroom)	$265,861	1	65	0.00
13	1700	62070 (MDI - Frazer Creek Bridge, #1700-025P)	$699,995	1	65	0.09
14	2100	62702 (CAMPGROUND ACCESS, IAH (213))	$32,856	1	39	1.03
15	1300	62766 (SD - Schoodic Point Parking, (P)RT 944)	$581,102	2	100	0.00
16	1300	62767 (Blue Berry Hill Parking, RT 945)	$117,654	2	100	0.00
17	2100	109726 (VALLEY COVE TRAIL (121))	$1,448,727	2	85	0.16
18	4100	62418 (B-35 Islesford Historical Museum)	$1,688,034	2	73	0.06
19	4100	62421 (B-36 Islesford Blue Duck (Hadlock) Ships Store)	$1,377,755	2	73	0.51
20	2100	62256 (PRETTY MARSH PICNIC AREA (128))	$56,560	2	70	0.00
21	2100	62255 (SHIP HARBOR NATURE TRAIL (127))	$680,186	2	70	0.19
22	1300	103271 (Rt 301 Schoodic Loop Parking(P))	$45,894	2	69	0.31
23	4100	59988 (B-210 Thompson Island info cntr rstrm)	$282,035	2	65	0.00
24	4100	59989 (B-328 Thompson Island Picnic Area Restroom)	$274,454	2	65	0.00
25	4100	62732 (B-106-SD Schoodic Point Restroom)	$226,751	2	65	0.00
26	3100	99629 (Thunder Hole Viewing Platform)	$979,014	2	64	0.00
27	5800	62734 (Schoodic Point Restroom wastewater system)	$15,757	2	60	0.04
28	6300	62681 (Isle Au Haut Duck Harbor CG Pier)	$279,307	2	53	0.27
29	3100	59971 (Sand Beach Swimming Area)	$118,058	2	45	0.09
30	4100	62678 (B-330 Isle Au Haut CG Trailhead Composting Toilet)	$32,753	2	40	0.00
31	1100	61740 (MDI-East, (P)Thompson Island Picnic Area, RT 219)	$503,130	3	88	0.00
32	1700	62112 (MDI - Stanley Brook Bridge #6, #1700-033P)	$693,280	3	88	0.01
33	4100	59986 (B-281A Thompson Island Info Station)	$275,255	3	88	0.17
34	1100	61791 (MDI-West, (P)Seawall Campground Loop B, RT 234)	$541,833	3	81	0.06
35	1300	103185 (SD-Entrance Parking(P) Rt 961)	$161,080	3	78	0.00
36	2100	62120 (GREAT HEAD TRAIL (2))	$390,054	3	73	0.03
37	2100	62234 (FLYING MTN TRAIL (105))	$317,334	3	73	0.13
38	2100	62118 (BAR ISLAND TRAIL (1))	$35,881	3	73	0.16

Table C3 (continued). ACAD High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
39	1300	103302 (Parking on Rte 300, MP 7.0 on right, Rte 924)	$90,188	3	69	0.00
40	3100	62745 (Frazer Point Picnic Area)	$953,291	3	67	0.41
41	2100	81007 (LITTLE HUNTERS BEACH TRAIL (74))	$26,353	3	63	0.00
42	2100	62228 (HUNTERS BEACH TRAIL (67))	$56,385	3	63	0.23
43	1100	61786 (MDI-West, (P)Seawall Picnic Area and Vista, RT 231)	$638,588	3	62	0.08
44	2100	71266 (ANENOME CAVE (83))	$22,131	3	62	0.00
45	4100	60074 (B-110 Pretty Marsh Picnic Shelter(water side))	$38,590	3	60	0.00
46	1100	62762 (SD- Frazier Point Picnic Area (P) Rt 243)	$450,346	3	58	0.00
47	1300	61765 (MDI-East, Thompson Island Info. Center Parking,(P) RT 943)	$253,821	3	58	0.34
48	2100	101722 (WONDERLAND TRAIL (132))	$166,022	3	52	0.00
49	1100	78870 (Isle Au Haut Loop Rd (U) Rt 241)	$1,292,135	3	48	0.56
50	3100	59992 (Thompson Island Picnic Area)	$1,086,130	3	47	0.09
51	3100	60032 (Seawall Picnic Area)	$513,310	3	47	0.01
52	4100	62670 (B-285 Isle Au Haut CG Shelter #4)	$13,165	3	40	0.17
53	1100	81012 (MDI-West Hio Fire Rd (U) RT 418)	$489,519	4	83	0.04
54	1100	80994 (SD - (U) Schoodic Powerline Rd rt419-Fire Rd)	$465,836	4	73	0.01
55	1100	60128 (MDI-East,(P) Fish House Road, RT 214)	$287,945	4	58	0.00
56	1100	80991 (Isle Au Haut Fire Rd (U)Rt 421)	$531,763	4	48	0.27
57	1100	79270 (MDI -West (U)Marshall Brook Fire Road RT 417)	$323,034	4	47	0.06
58	2100	62691 (DUCK HARBOR, IAH (204))	$289,770	4	39	0.32
59	1100	61796 (MDI-West, (U)Valley Cove Road, RT 239)	$215,554	4	35	1.54
60	2100	62692 (DUCK HARBOR MTN, IAH (205))	$56,937	4	30	0.08
61	2100	62693 (EBEN S HEAD, IAH (206))	$42,860	4	30	0.36
62	2100	62696 (GOAT, IAH (208))	$98,578	4	30	0.15
63	2100	62701 (WESTERN HEAD, IAH (212))	$81,715	4	30	0.22
64	2100	62698 (MEDIAN RIDGE, IAH (210))	$87,036	4	30	0.24
65	2100	62688 (CLIFF, IAH (202))	$38,942	4	30	0.80
66	4100	62411 (B-299C Bear Island Light Station - Boat House)	$39,496	5	71	0.00
67	6300	95729 (Isle au Haut Town Dock)	$1,620,892	5	69	0.24
68	0	239321 (Islesford Museum Interpretive Media)	$248,190	n/a	n/a	n/a
69	0	239174 (B-1009-SD Gate House)	$159,085	n/a	n/a	n/a
Added during park review—not in FMSS						
Sargent Drive						
Pryor-Buckley Pine Monument Bar Island						
John Godfrey Moore Memorial Plaque (Schoodic Pt)						
Dorr Point Granite wharf ruins						
John D. Rockefeller, Jr. memorial plaque						
Acadia Mountain Memorial plaque (Smith & Wheeler)						

Table C3 (continued). ACAD High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
Samuel Duncan Sargeant Memorial Plaque						
Seal Cove Pond Dam						
Baker Island Cemetary (inholding)						
LITTLE MOOSE ISLAND TRAIL - Administrative Use, SCH						

Assateague Island National Seashore (ASIS)

Table C4. Summary of Findings for ASIS.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	179	95%	$135,180,045	95%
Limited Exposure	9	5%	$6,714,853	5%
TOTALS	**188**	**100%**	**$141,894,898**	**100%**

Park visit

October 2012; tour of key locations was conducted prior to NPS Climate Change Facilities Adaptation Workshop.

Park contacts

Trish Kicklighter, Ish Ennis, Neil Winn

Primary data utilized

1) NPS FMSS location hierarchy report: some locations (lat/longs) determined by PSDS, additional location data provided by park staff (Neil Winn and others).

2) LiDAR: EAARL Coastal Topography–Assateague Island National Seashore, Maryland and Virginia, 2010

Process/methods for exposure determination

Discussion directly with park staff on several occasions yielded the result that all assets on the island portion of the park should be considered high exposure. Additional discussion allowed WCU and NPS to determine that a portion of the mainland sites (those on the Maryland portion) should also be listed as high exposure. The attached lists of FMSS assets represent those discussions. Draft was sent to park for review in November of 2012. Final review was received January 2014.

ASIS Documents

Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

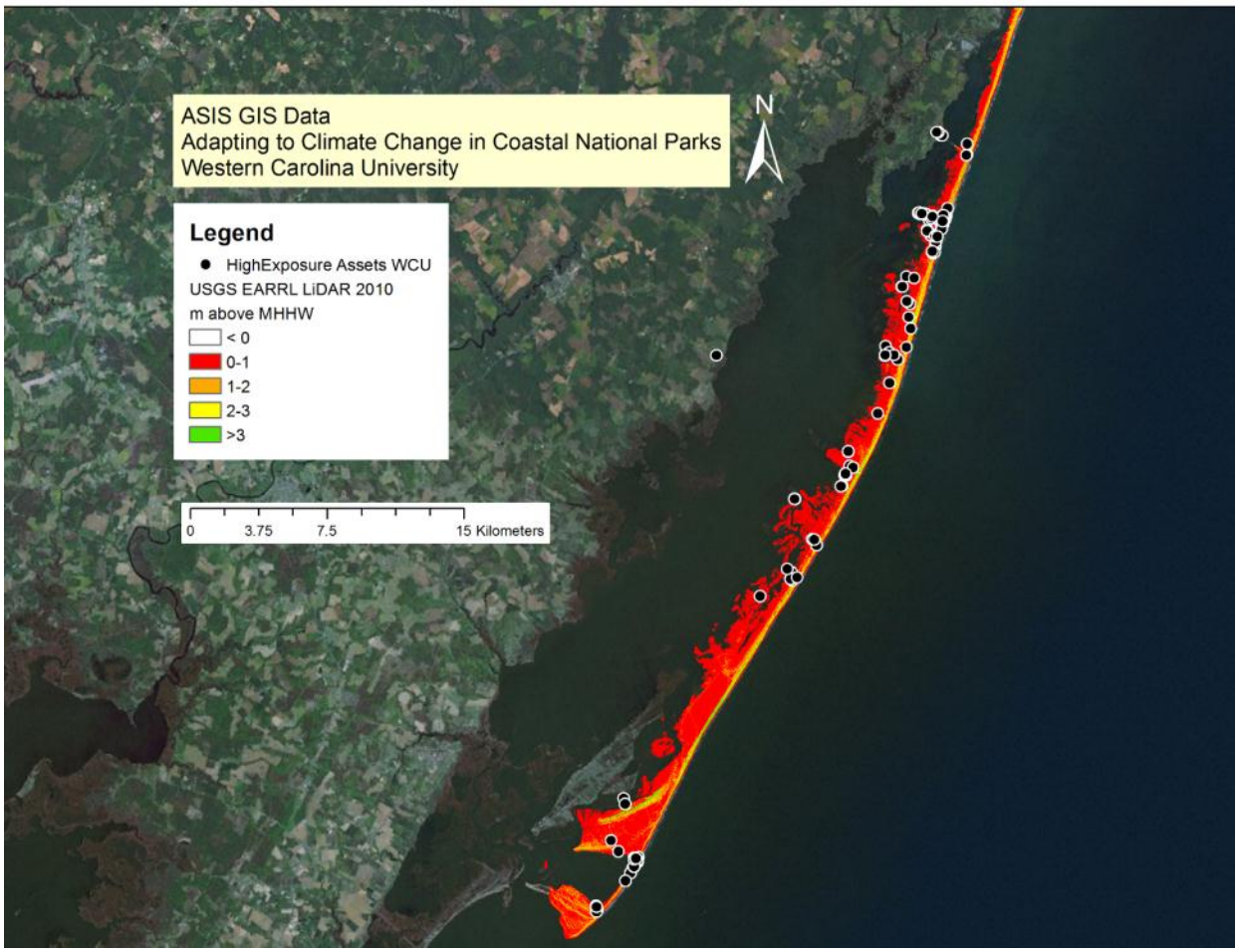

Figure C3. ASIS GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (+0.48 m above NAVD88), for ASIS used Ocean City, MD station: http://tidesandcurrents.noaa.gov/datums.html?id=8570280.

Table C5. Complete list of GIS Data utilized for ASIS.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
EAARL Coastal Topography, Assateague Island National Seashore, Maryland and Virginia, 2010	USGS: http://pubs.usgs.gov/ds/628/
WFDSS_NPS_Buildings_ASIS_Clip	GIS staff, ASIS: Neil Winn
Roads_current	
LowExposureAssets_FromASIS_IshEnnis	Facilities staff, ASIS, Ish Ennis

Table C6. ASIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	235351 (MD Visitor Contact Station)	$827,252	0	78	0.000
2	4100	106724 (MD Marsh View Lane)	$2,232,075	0	77	0.000
3	1100	47250 (MD Ferry Landing Road RT 0926)	$644,550	0	77	0.226
4	1100	47237 (MD Bayberry Drive Rt 0010)	$5,151,672	0	77	1.014
5	1100	47246 (MD Bayside Drive FED RT 0202)	$1,194,591	0	77	2.316
6	1100	47525 (VA Rt. 11 Park Entrance Access Road RT 0011)	$418,107	0	77	4.918
7	4100	114767 (MD Day Use Bathhouse #1)	$151,128	0	68	0.000
8	4100	114769 (MD Day Use Bathhouse #2)	$151,127	0	68	0.000
9	4100	114785 (MD Day Use Bathhouse #3)	$151,128	0	68	0.000
10	4100	114843 (MD Bayside Campground Restroom/Shower Loop A)	$104,440	0	68	0.000
11	4100	114847 (MD Bayside Picnic Restroom Complex)	$41,017	0	68	0.000
12	4100	114845 (MD Bayside Campground Restroom/Shower Loop B)	$104,440	0	68	0.000
13	4100	114846 (MD Bayside Campground Restroom/Shower Loop C)	$104,440	0	68	0.000
14	4100	114788 (MD Group Camping South Restroom/Shower Complex)	$104,440	0	68	0.000
15	1100	81024 (MD Bayside Campground Road Loop A, RT 0906)	$823,587	0	65	0.275
16	4100	114859 (MD Group Camping North Restroom/Shower Complex)	$104,440	0	61	0.000
17	1100	106516 (MD Shell Road)	$130,884	0	61	0.000
18	1100	81017 (VA Beach Road Toms Cove RT 0210)	$816,370	0	60	0.000
19	1100	102619 (MD Bayside Campground Road Loop B, RT 0907)	$392,011	0	60	0.227
20	1100	102687 (MD Oceanside Campground Loop 2, RT 0916)	$506,387	0	60	0.229
21	1100	102620 (MD Bayside Campground Road Loop C, RT 0908)	$418,414	0	60	0.243
22	1100	81018 (MD Oceanside Drive RT 0200)	$1,493,238	0	60	0.258
23	1100	81025 (MD Oceanside Campground Loop 1, RT 0915)	$463,935	0	60	0.277
24	1100	92330 (MD NATURAL ZONE Tingles Road)	$408,167	0	43	0.000
25	1100	92711 (MD NATURAL ZONE Buntings Road)	$233,238	0	43	0.000
26	1100	92720 (MD NATURAL ZONE Valentines Road)	$932,951	0	43	0.000
27	1100	92722 (MD NATURAL ZONE Green Run Road)	$233,238	0	43	0.000
28	1100	92723 (MD NATURAL ZONE Pope Bay Road)	$408,167	0	43	0.000
29	1100	92733 (MD NATURAL ZONE Clements's Boathouse Road)	$466,475	0	43	0.965
30	1100	102689 (MD Oceanside Drive In Exit Road RT 0917)	$127,976	0	42	0.184
31	1100	92708 (MD NATURAL ZONE Pine Tree Road)	$641,403	0	37	0.000
32	1100	92714 (MD NATURAL ZONE Big Levels Road)	$349,856	0	37	0.000
33	1100	92703 (MD NATURAL ZONE Hungerfords Road)	$291,546	0	36	0.000
34	1100	92726 (MD NATURAL ZONE Boat Launch Road)	$291,546	0	31	0.000
35	4100	114911 (MD Ranger Station Storage Shed #2A)	$18,221	0	27	0.000
36	1100	92712 (MD NATURAL ZONE Fox Hill Road)	$349,856	0	27	0.000
37	1100	92724 (MD NATURAL ZONE Blinds 12 &13 Road)	$349,856	0	27	0.000
38	1100	102720 (MD Boneyard Access Road RT 0913)	$63,444	0	25	0.602
39	4100	47217 (MD Sewage Treatment Plant)	$1,850,620	1	82	0.055
40	4100	47218 (MD Resource Management Building)	$412,391	1	73	0.243
41	4100	47213 (MD Administration Building)	$1,443,746	1	61	0.888
42	4100	47520 (VA Air Station)	$14,478	1	24	0.000
43	4100	47518 (VA Visitor Center)	$12,133,911	2	78	0.012
44	4100	80990 (MD South Ocean Beach Restroom)	$159,042	2	54	0.000

Table C6 (continued). ASIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
45	2100	47238 (MD Bike Trail)	$1,470,734	2	54	0.329
46	4100	47214 (MD Maintenance Shop)	$868,192	2	53	0.011
47	3100	47252 (MD Bayside Campground)	$973,255	2	47	0.122
48	3100	47254 (MD Oceanside Campground)	$2,170,021	2	47	0.533
49	4100	87697 (MD Radio Repeater Station)	$54,711	3	82	0.000
50	4100	47233 (MD Developed Zone Pump House)	$117,272	3	67	0.000
51	1300	47243 (MD North Ocean Beach Parking Area RT 0911)	$2,788,213	3	67	0.617
52	4100	47236 (MD Historic Boathouse)	$324,931	3	63	0.058
53	2100	47239 (MD Life of the Marsh Trail)	$970,991	3	61	0.030
54	2100	47240 (MD Life of the Dunes Trail)	$140,287	3	61	0.151
55	1300	102777 (VA Toms Cove Parking Area 2 RT 0932)	$463,863	3	60	0.000
56	1300	102778 (VA Toms Cove Parking Area 3 RT 0933)	$621,458	3	60	0.000
57	1300	102788 (VA Toms Cove Parking Area 4 RT 0934)	$520,043	3	60	0.000
58	1300	47522 (VA Toms Cove Parking Area 1 RT 0931)	$681,699	3	60	0.000
59	1300	47219 (MD Bicyclists Parking Area at State Bridge RT 0903)	$533,688	3	57	0.325
60	4300	47228 (MD Candleberry Dorm)	$673,152	3	54	0.037
61	4300	47223 (MD Hudsonia Dorm)	$20,849	3	54	0.040
62	4300	47227 (MD Greenbriar House)	$1,502,327	3	54	0.051
63	4300	47226 (MD Loblolly House)	$475,906	3	54	0.062
64	4300	47225 (MD Bayberry Duplex)	$454,208	3	54	0.066
65	4100	47229 (MD Spartina Fire Cache)	$673,152	3	53	0.004
66	5200	92439 (MD Bayside Campground Sewage Dump Station)	$45,592	3	37	0.000
67	5200	92442 (MD Oceanside Campground Sewage Dump Station)	$19,377	3	37	2.644
68	2100	81101 (VA Toms Cove VC Trail)	$818,417	3	36	0.246
69	2100	106845 (VA Paved Bike Trail)	$112,603	3	35	1.706
70	4100	47260 (MD Air Pumping Station)	$28,956	3	30	0.000
71	2100	81034 (MD Mainland Bike Trail)	$179,446	3	29	0.000
72	3100	47247 (MD Bayside Picnic Area)	$227,307	3	29	0.021
73	3100	81035 (MD Tingles Campground)	$99,311	3	20	0.000
74	3100	47257 (MD Little Levels Campground)	$99,311	3	20	0.075
75	3100	81036 (MD Pine Tree Campground)	$99,311	3	20	0.075
76	3100	81037 (MD Green Run Campground)	$131,041	3	20	0.163
77	3100	81038 (MD Pope Bay Campground)	$127,524	3	20	0.168
78	4100	47260 (MD Air Pumping Station)	$28,956	3	30	0.000
79	2100	81034 (MD Mainland Bike Trail)	$179,446	3	29	0.000
80	3100	47247 (MD Bayside Picnic Area)	$227,307	3	29	0.021
81	3100	81035 (MD Tingles Campground)	$99,311	3	20	0.000
82	3100	47257 (MD Little Levels Campground)	$99,311	3	20	0.075
83	3100	81036 (MD Pine Tree Campground)	$99,311	3	20	0.075
84	3100	81037 (MD Green Run Campground)	$131,041	3	20	0.163
85	3100	81038 (MD Pope Bay Campground)	$127,524	3	20	0.168
86	3100	81039 (MD State Line Campground)	$99,311	3	20	0.467
87	4100	47235 (MD Entrance Station #1)	$32,113	4	78	0.647
88	1700	47524 (VA Assateague Channel Bridge)	$13,282,159	4	77	0.107
89	1300	102742 (MD Air Pump Station Paved Parking Area RT 0923)	$102,441	4	77	0.422

Table C6 (continued). ASIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
90	1700	47523 (VA Sheepshead Creek Bridge)	$1,243,691	4	77	0.441
91	1300	102731 (MD OSV Zone Access Road RT 0922)	$293,115	4	77	0.560
92	1100	100675 (MD Fire Pump and Generator Building)	$563,013	4	70	0.000
93	4100	47224 (MD Lift Station Building)	$1,160,256	4	70	0.000
94	4100	81064 (MD Entrance Station #2)	$98,529	4	67	0.000
95	4100	47519 (VA Lifeguard Office)	$48,836	4	67	0.000
96	4100	47532 (VA USCG Boathouse)	$2,194,303	4	64	0.011
97	4100	47534 (VA USCG Station)	$1,895,265	4	64	0.105
98	4100	47533 (VA USCG Tower)	$73,108	4	64	0.277
99	4100	47531 (VA USCG Generator Building)	$73,108	4	64	1.832
100	2100	47241 (MD Life of the Forest Trail)	$632,898	4	61	0.239
101	1300	88476 (MD Bayside Parking AreaRT 0905)	$711,221	4	60	0.274
102	1300	47220 (MD Visitor Center Access Parking RT 0900)	$286,709	4	60	2.495
103	1300	47249 (MD South Ocean Beach Parking Area RT 0921)	$545,759	4	54	0.225
104	1300	102789 (MD Entrance Station Road Spur RT 0935)	$344,689	4	54	0.343
105	1700	92268 (MD Bunting Bridge)	$455,922	4	53	0.000
106	1700	92264 (MD Valentine's Bridge)	$398,932	4	53	0.000
107	1300	102569 (MD Housing Access Road and Parking Area RT 0901)	$992,942	4	53	0.184
108	4100	81033 (MD Headquarters Parking Area RT 0902)	$30,146	4	53	2.074
109	4100	47535 (VA USCG Garage)	$695,048	4	51	0.062
110	4100	81062 (MD Hugerfords Lodge)	$223,233	4	50	0.000
111	1300	102791 (MD Oceanside Dump Station Paved Spur RT 0936)	$25,623	4	48	0.219
112	1300	102722 (MD Walk-In Campground 66-85 Parking RT 0919)	$84,302	4	47	0.215
113	1300	102723 (MD Walk-In Campground 86-104 Parking RT 0920)	$80,576	4	47	0.216
114	1300	102721 (MD Walk-In Campground 42-65 Parking RT 0918)	$94,663	4	47	0.221
115	1300	81022 (MD Life of the Marsh Trail Parking Area RT 0909)	$251,217	4	46	0.000
116	1300	81023 (MD Oceanside Group Campsite Parking RT 0914)	$405,350	4	46	0.323
117	1300	81019 (MD Life of the Dunes Parking RT 0924)	$343,736	4	46	0.368
118	1300	81021 (MD Historic Boathouse Exhibit Parking Area RT 0927)	$205,936	4	46	0.468
119	1300	81020 (MD Life of the Forest Trail Parking Area RT 0925)	$186,025	4	46	0.470
120	3100	47245 (MD Boneyard)	$101,116	4	35	0.000
121	4100	47212 (MD Educational Training Center (old Visitor Center))	$1,307,644	4	33	0.008
122	1300	106525 (MD Shell Road Parking Area)	$88,042	4	33	0.864
123	1300	47244 (MD North Beach Overflow Parking Area RT 0910)	$589,227	4	32	0.184
124	4100	47259 (MD Valentine s Lodge)	$267,132	4	32	0.251
125	4100	81102 (VA Handicap WheelChair Storage Building)	$153,742	4	31	0.000
126	4100	47255 (MD Ferry Landing Naturalist Shack)	$200,806	4	30	0.064
127	4100	81046 (MD Storage Shed #4)	$30,146	4	30	0.862
128	4100	81047 (MD Storage Shed #5)	$30,146	4	30	0.862
129	4100	81048 (MD Storage Shed #6)	30,145.57	4	30	0.862
130	1300	81031 (MD Fuel Dispensing Area)	$494,120	4	25	0.000
131	4100	47527 (VA Naturalist Shack)	$32,129	4	21	0.000
132	3100	47261 (MD Bull Pen Campground)	$26,083	4	20	0.000
133	4100	47529 (VA OSV Booth)	$6,980	4	20	0.000
134	4100	81065 (MD Ranger Station Storage Shed #1)	$173,638	4	7	0.000

Table C6 (continued). ASIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
135	4100	81066 (MD Ranger Station Storage Shed #2)	$115,759	4	7	0.000
136	4100	81044 (MD Storage Shed #2)	$30,146	4	7	0.862
137	4100	81045 (MD Storage Shed #3)	$30,146	4	7	0.862
138	4100	81043 (MD Storage Shed #1)	$30,146	4	7	0.864
139	4100	98453 (MD Barrier Island Visitor Center (New VC))	$24,195,790	5	90	0.000
140	1300	106725 (MD Barrier Island Visitor Center Access and Parking)	$2,022,319	5	78	0.000
141	4100	47232 (MD AIA Building (Old Day Use Bathhouse))	$206,441	5	67	0.000
142	3100	47528 (VA OSV Zone)	$5,987,307	5	63	0.009
143	6300	78880 (VA USCG Dock)	$2,520,869	5	51	0.588
144	4100	47215 (MD Maintenance Storage Pole Shed)	$1,158,241	5	50	0.050
145	1300	102616 (MD Bayside Dump Station Paved Spur RT 0904)	$16,880	5	48	0.227
146	5700	47221 (MD Boat Shed)	$89,311	5	46	0.000
147	4100	109566 (MD Viewing Platform)	$48,322	5	44	0.450
148	4100	112963 (MD Green Run Lodge)	$1,361,531	5	38	0.000
149	4100	81059 (MD Clements Boat House)	$319,305	5	38	0.000
150	6300	112967 (MD Green Run Dock/Pier)	$363,075	5	32	0.000
151	4100	92812 (MD Valentine Storage Shed)	$3,390	5	32	0.000
152	4100	81053 (MD High Winds Lodge)	$638,610	5	32	0.000
153	4100	92790 (MD High Winds Generator Building)	$33,902	5	32	0.000
154	4100	92791 (MD High Winds Storage Shed No. 1)	$42,378	5	32	0.000
155	4100	92792 (MD High Winds Storage Shed No. 2)	$42,378	5	32	0.000
156	4100	92793 (MD High Winds Boathouse)	$211,890	5	32	0.000
157	4100	81054 (MD Peoples & Lynch Lodge)	$478,958	5	32	0.000
150	7200	92819 (MD Peoples & Lynch Shed Ruins)	$27,123	5	32	0.000
151	4100	92820 (MD Peoples & Lynch Sheds Ruins)	$50,835	5	32	0.000
152	4100	92821 (MD Peoples & Lynch Boardwalk Ruins)	$53,936	5	32	0.000
153	4100	81055 (MD Mussers Lodge)	$478,958	5	32	0.000
154	7200	92830 (MD Mussers Pier Ruins)	$136,777	5	32	0.000
155	4100	81056 (MD Jacksons Lodge)	$957,915	5	32	0.000
156	4100	92815 (MD Jacksons Storage Shed)	$40,682	5	32	0.000
157	4100	92816 (MD Jacksons Dock Storage Shed)	$61,025	5	32	0.000
158	6300	92817 (MD Jacksons Dock)	$206,544	5	32	0.000
159	4100	81057 (MD Buntings Lodge)	$638,610	5	32	0.000
160	4100	92798 (MD Buntings Storages Sheds and Dog Kennel)	$57,633	5	32	0.000
161	7200	92799 (MD Buntings Shed Ruins)	$13,561	5	32	0.000
162	4100	81058 (MD Clements Beach House)	$638,610	5	32	0.000
163	4100	81060 (MD Bobodells Lodge)	$638,610	5	32	0.000
164	4100	92823 (MD Bobodells Boat Storage Shed)	$27,123	5	32	0.000
165	4100	92824 (MD Bobodells Storage Shed)	$10,596	5	32	0.000
166	4100	92825 (MD Bobodells Decoy Shed)	$33,902	5	32	0.000
167	4100	81061 (VA Black Duck Lodge)	$957,915	5	32	0.000
168	4100	109564 (MD Hunting Blind)	$12,564	5	27	0.000
169	4100	112964 (MD Green Run Boat Shed 1)	$1,815	5	22	0.000
170	4100	112966 (MD Green Run Boat Shed 2)	$1,815	5	22	0.000
171	1300	102636 (MD Ranger Station Parking Area RT 0912)	$553,824	5	20	0.000

Table C6 (continued). ASIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
172	4100	92795 (MD Hugerfords Storage Bin)	$3,647	5	19	0.000
173	2100	112968 (Green Run Boardwalk)	$3,631	5	12	0.000
174	2100	92813 (MD Valentine Boardwalk)	$134,839	5	12	0.000
175	2100	92800 (MD Buntings Boardwalk)	$107,871	5	12	0.000
176	2100	92826 (MD Bobodells Boardwalk)	$129,445	5	12	0.000
177	n/a	237967 (MD Ferry Landing Naturalist Trail)	n/a	n/a	n/a	n/a
178	4100	47211 (MD Headquarters)	$911,844	n/a	n/a	n/a
179	4100	95803 (MD Storage Building and Vehicle Wash Bay)	$459,080	n/a	n/a	n/a

Boston Harbor Islands National Recreation Area (BOHA)

Table C7. Summary of Findings for BOHA.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	54	38%	$55,498,822	46%
Limited Exposure	89	62%	$66,264,619	54%
TOTALS	**143**	**100%**	**$121,763,441**	**100%**

Park visit
October 2012

Park contacts
Marc Albert

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2002 Boston Area LiDAR
3) 2011 Northeast USGS LiDAR

Process/methods for exposure determination
Combination of several methods including park visit to multiple islands, discussion with park staff, analysis of asset locations and elevations using LiDAR. Note that FMSS data for park was incomplete and many assets were not listed. After park visit and discussion with park staff several other assets were added to the list (see end of asset list). Because of the incompleteness and inconsistency in the data within in FMSS, as well as the complicated nature of asset ownership in the park, many of the islands did not have any actual assets listed, but instead the island itself was the only entry. Therefore, it should be noted that these lists do not fully represent the exposure of the assets within BOHA.

BOHA Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

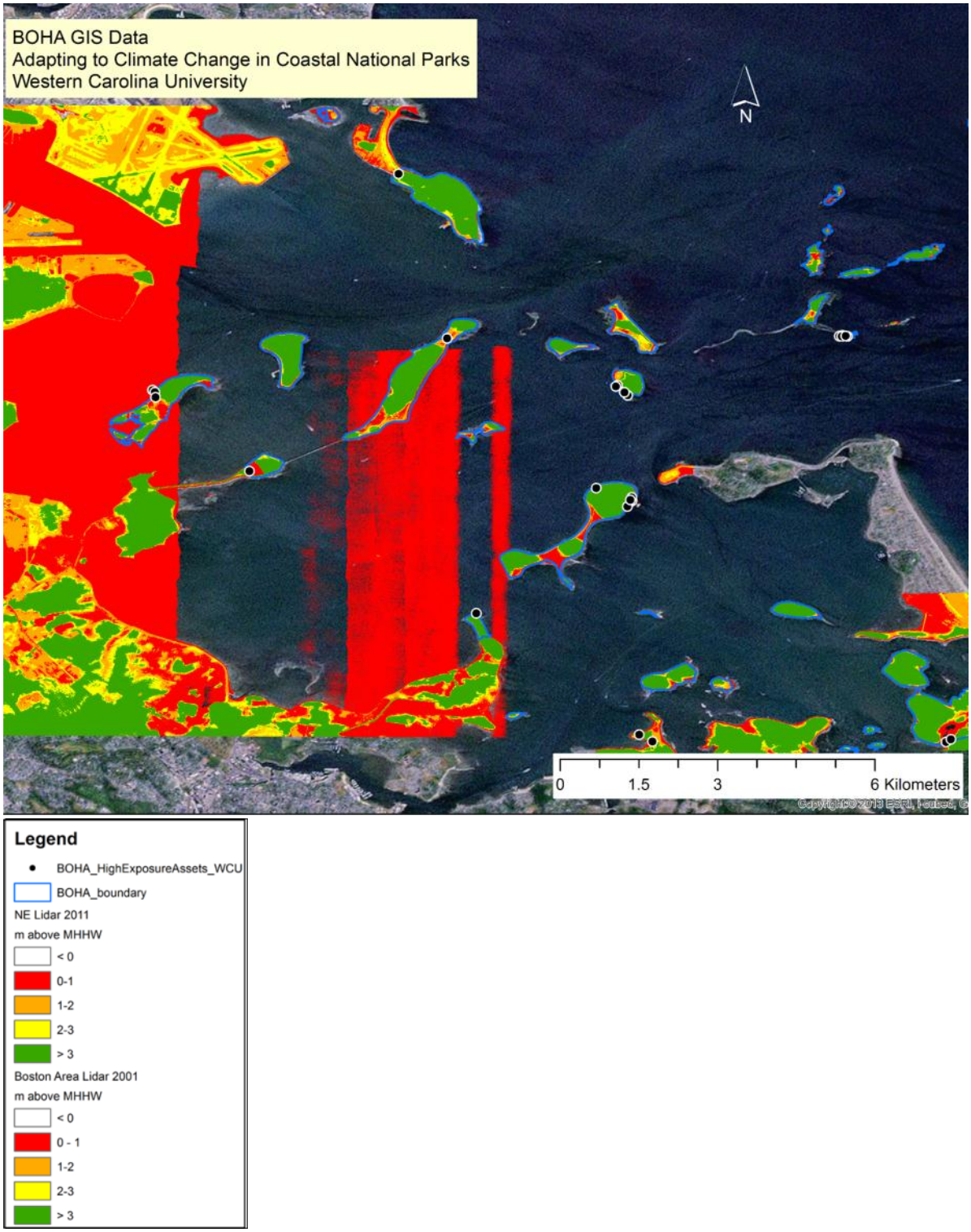

Figure C4. BOHA GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.45 m above NAVD88), for BOHA used Boston, MA station: http://tidesandcurrents.noaa.gov/datums.html?id=8443970.

Table C8. Complete list of GIS Data utilized for BOHA.

Data Name	Data Source
2002 Boston Area LiDAR	Office of Geographic Information (MassGIS): http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/
2011 Lidar for the North East	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table C9. BOHA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	76380 (Ft. Warren: Administration/Mine Storage Building)	$9,454,002	1	100	0
2	7300	82271 (Ft. Warren: Bastion B)	$112,620	1	100	0
3	7300	82272 (Ft. Warren: Bastion C)	$135,097	1	100	0
4	7300	82277 (Ft. Warren: Battery Lowell)	$127,147	1	100	0
5	4100	76454 (Boston Light: Principal Keepers House)	$1,482,878	1	100	0.009
6	7100	79253 (Historic Sewage Settling Tank, Moon Is)	$284,580	1	92	0
7	4100	76499 (Spectacle Is Visitors Center)	$3,201,049	1	88	0
8	4100	76474 (Boston Light: Boat House)	$989,846	2	100	0.086
9	4100	76213 (E. Head: Bldg 31: New Guardhouse)	$2,800,830	2	100	0.125
10	7300	83119 (Great Brewster Fortification Battery)	$119,637	2	81	0
11	4100	76224 (E. Head: Bldg 36: Storehouse)	$6,585,645	2	81	0.087
12	2100	79233 (Georges Is: Exterior Walkways)	$44,124	2	80	0
13	2100	82297 (Boston Light Station Concrete Walks)	$4,676,380	2	80	0
14	2200	82298 (Boston Light Station Wooden Walkway)	$32,357	2	80	0
15	2100	79514 (Grape Is: Trails)	$187,969	2	80	0
16	3100	82374 (Long Is Historic/Visitor Area: Fort Strong Parade Grounds)	$7,731	2	80	0
17	2100	79673 (Deer Is: Walkways)	$187,969	2	80	0
18	2100	79578 (Worlds End: Trails)	$732,684	2	80	0
19	2100	79575 (Webb: Trails)	$265,477	2	80	0
20	2100	79531 (Lovells Is: Trail)	$124,300	2	80	0.013
21	2100	83118 (Long Is: Trails)	$48,415	2	80	0.03
22	6300	76243 (Peddocks Is: Marina)	$3,309,995	2	77	0
23	6300	76495 (Spectacle Island, Marina)	$284,580	2	77	0
24	6300	76383 (Bumpkin Island, Marina)	$1,025,825	2	77	0
25	6300	76701 (Gallops Island, Marina & Waterfront System)	$284,580	2	77	0
26	6300	76857 (Deer Island, Docks)	$1,686,775	2	77	0
27	6300	77018 (Nut Island, Waterfront/marina)	$284,580	2	77	0
28	6300	76488 (Lovells Island, Marina)	$1,949,067	2	77	0.051
29	6300	77016 (Thompson Island - Marina)	$5,636,351	2	77	0.313

Table C9 (continued). BOHA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
30	4100	76462 (Boston Light: Oil House)	$23,641	3	100	0.369
31	6300	82660 (Georges Island, Waterfront Seawall)	$2,170,300	3	77	6.4
32	4100	79580 (Worlds End: Contact Station)	$113,920	3	71	0
33	4100	79582 (Worlds End: Rest Rooms)	$10,679	3	69	0
34	7100	79258 (Nixes Mate: Day Marker)	$116,196	3	67	0
35	4100	77006 (The Graves Light Station)	$81,556	3	67	0
36	6300	79528 (Little Brewster Is: Boston Light Station, Docks)	$75,227	3	55	0
37	1300	79676 (Deer Is: Parking Area)	$76,689	3	52	0
38	1300	79574 (Web: Parking Lot)	$76,689	3	52	0
39	7300	79264 (Great Brewster Fortification)	$90,564	3	50	0
40	4100	76214 (E. Head: Bldg 39: Chapel)	$4,184,946	4	88	0.399
41	4100	76248 (E. Head: Bldg 7: Carpenter Shop)	$541,706	4	81	0.5
42	6300	76478 (Little Brewster Is: Marina)	$108,245	4	77	0.382
43	4100	83126 (Outer Brewster Is - Desalinazation Plant)	$124,054	4	47	0
44	4100	98924 (Information KIOSK)	$15,387	4	45	0
45	3100	79530 (Lovells Is: Campgrounds)	$7,731	4	42	0
46	3100	79236 (Bumplin Is: Camp Sites)	$7,731	4	42	0
47	7300	76848 (Lovells Is: Fort Standish)	$103,081	4	41	0
48	4100	79509 (Georges Is: Shade Shelter)	$255,900	4	38	0
49	4100	76217 (E. Head: Bldg 4: Stable)	$662,911	5	80	1.072
50	6300	76482 (Grape Island, Marina)	$589,179	5	77	1.024
High exposure assets that were not listed in FMSS at the time of visit						
51	n/a	Little Brewster Island: Walks	n/a	n/a	n/a	n/a
52	n/a	Thompson Island: Boathouse	n/a	n/a	n/a	n/a
53	n/a	Thompson Island: Pavillion	n/a	n/a	n/a	n/a
54	n/a	Webb Memorial: Picnic Shelter	n/a	n/a	n/a	n/a

Boston National Historical Park (BOST)

Table C10. Summary of Findings for BOST.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	65	84%	$408,185,040	67%
Limited Exposure	12	16%	$200,194,992	33%
TOTALS	**77**	**100%**	**$608,380,029**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2002 Boston Area LiDAR

Process/methods for exposure determination
Used the location hierarchy report and the FMSS areas (i.e., "Downtown Area," "Bunker Hill Area," etc.) to group assets into high exposure and limited exposure. Also manually located a number of assets and compared to area LiDAR. For example, the "Bunker Hill Area" and "Dorchester Heights" assets are located further from the coast and within higher elevation zones. Final park review received January 2014.

BOST Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

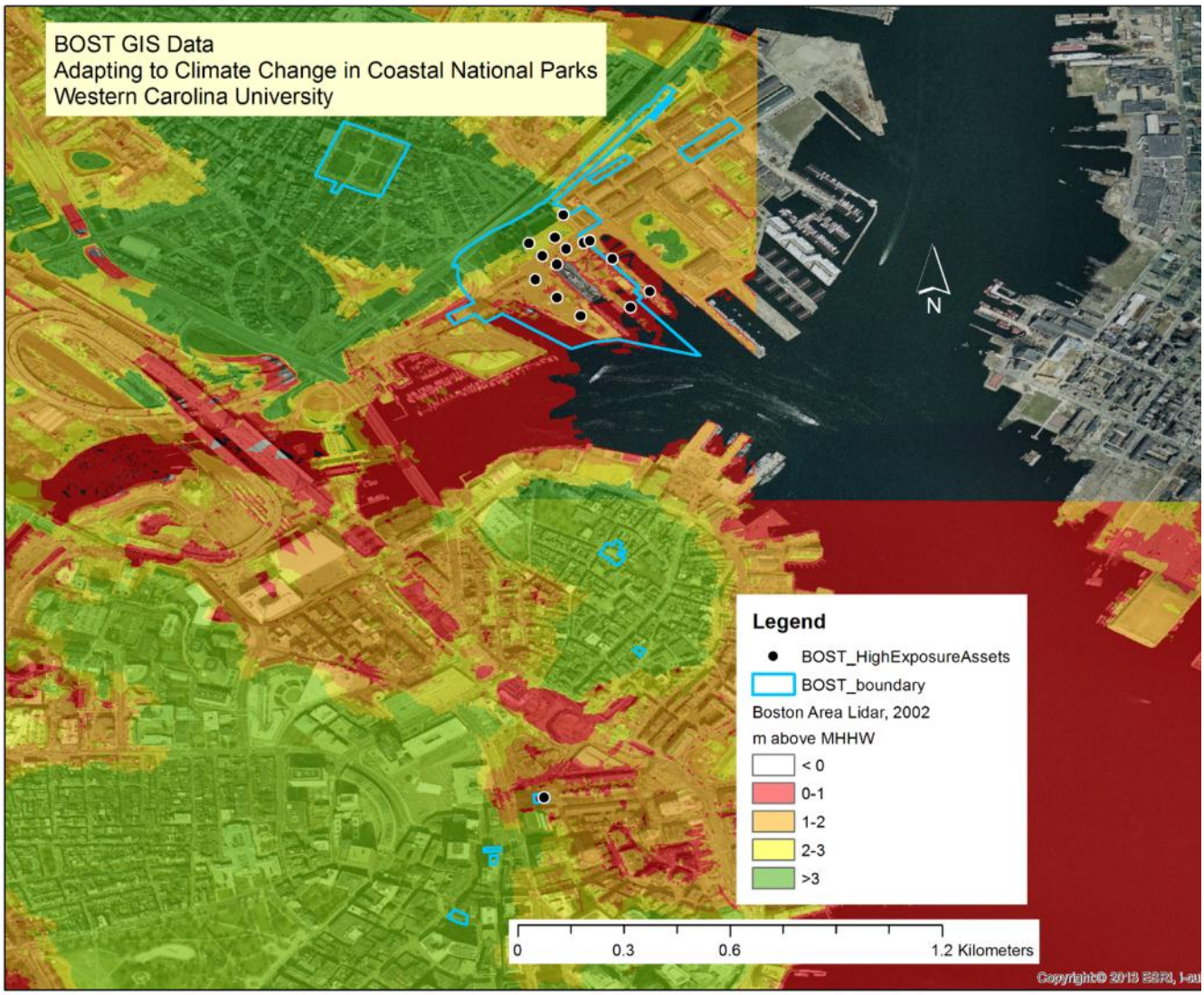

Figure C5. BOST GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.45 feet above NAVD88), for BOST used Boston, MA station: http://tidesandcurrents.noaa.gov/datums.html?id=8443970

Table C11. Complete list of GIS Data utilized for BOST.

Data Name	Data Source
2002 Boston Area LiDAR	Office of Geographic Information (MassGIS): http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/

Table C12. BOST High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
	6300	60383 (Pier 1)	$82,880,727	0	100	0.04
	6200	60389 (Dry Dock 1)	$32,375,995	0	100	0.19
	6300	60386 (Pier 3 Auxiliary)	$1,209,005	0	68	0
	6300	60385 (Pier 2)	$16,331,791	0	68	0.33
	1100	60349 (Lincoln Ave Rt 11)	$654,862	1	100	0.04
	1300	60384 (Lincoln Ave Parking, Rte 902)	$723,794	1	100	0.09
	1100	60362 (First Avenue, Rt 10)	$1,964,585	1	100	0.13
	1100	60364 (Second Avenue, Rte 12)	$1,702,640	1	92	0.04
	1100	60382 (Third Street/Pier 1 Rt 13)	$1,964,585	1	90	0.06
	1300	81721 (Third Street /Pier One Parking ,Rte. 904)	$3,970,687	1	90	0.09
	1300	60371 (Tour Bus Parking Rte 0911)	$469,102	1	78	0
	4100	**60496 (Faneuil Hall)	$14,085,970	2	100	0.11
	4100	60331 (Quarters G Commandants House)	$7,271,231	2	100	0.16
	4100	60329 (Bldg #10 Shipyard Galley)	$2,668,032	2	100	0.2
	1100	60370 (Baxter Road, Rt 103)	$523,889	2	92	0.06
	1100	60367 (Fourth Street Rt 100)	$261,945	2	92	0.08
	4100	60341 (Bldg #265 Row Houses)	$9,915,664	2	92	0.14
	4100	60332 (Bldg #24 Navy Maintainence Offices)	$25,606,909	2	92	0.17
	4100	60342 (Bldg #107 Yard Maintenance)	$21,302,049	2	92	0.25
	2100	88890 (2nd Ave Sidewalks)	$97,833	2	85	0
	2100	88891 (3rd Street Sidewalk)	$37,352	2	85	0.01
	1100	60500 (Qtrs G Driveway Rte 0402)	$654,862	2	85	0.06
	1100	60365 (Third Street Rt 101)	$261,945	2	85	0.11
	4100	60344 (Bldg #1 Gatehouse 2)	$643,628	2	85	0.28
	1100	60360 (Dry Dock 1-2 Connector Rd, Rte 0105)	$523,889	2	83	0.04
	1100	74846 (Dry Dock 1 East Bldg 24 Access Rd Rte 404)	$523,889	2	83	0.04
	1300	81736 (Marine Barracks Parking ,Rte. 908)	$1,911,186	2	82	0
	1100	60368 (Fifth Street, Rte 600)	$1,440,696	2	78	0.14
	1100	74845 (Dry Dock 1 East Rte 0104)	$523,889	2	75	0.04
	4100	60337 (Bldg #4&5 Visitors Center & Navy Barracks, Office)	$32,251,062	3	100	0.04
	2100	80714 (First Ave Sidewalks)	$7,576,938	3	100	0.15
	4100	60346 (Bldg I, Marine Barracks/Administrative Office)	$18,109,702	3	92	0.55
	4100	60328 (Bldg #109 Interpretation & Protection)	$2,633,235	3	92	0.73
	4100	60338 (Bldg #267 Gatehouse #1)	$94,747	3	87	0.97
	4100	60494 (Bldg #19 Scale House)	$138,935	3	76	0.27
	1300	81738 (Dry Dock 1 East Parking ,Rte. 909)	$394,553	3	73	0.25
	1300	81726 (Dry Dock 1 and 2 Connector Parking ,Rte. 907)	$204,021	3	72	0.09
	1100	60393 (Dry Dock West Rte 0014)	$2,226,530	3	65	0.03
	1300	81733 (Baxter Rd Parking ,Rte. 906)	$1,612,542	3	63	0.09

Table C12 (continued). BOST High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
	2100	88892 (5th Street Sidewalks)	$317,396	3	60	0
	2100	88893 (Water St Sidewalk)	$114,928	3	60	0.29
	1300	81735 (Bldg 1 and 269 Parking Rte. 910)	$2,030,170	3	58	0.06
	1300	81724 (Dry Dock 1 West Parking ,Rte. 905A)	$1,054,066	3	56	0.09
	1300	81725 (Dry Dock 1 West Parking ,Rte. 905B)	$188,710	3	50	0
	1300	60314 (Second Ave Parking C,Rte. 903C)	$39,735	3	50	0.09
	1300	60311 (Second Ave Parking B,Rte. 903B)	$279,116	3	50	0.09
	1300	60315 (Second Ave Parking D,Rte. 903D)	$144,054	3	50	0.09
	1300	60316 (Second Ave Parking E,Rte. 903E)	$126,738	3	50	0.09
	1300	60312 (First Ave Bus Parking A Rte.901A)	$143,629	3	50	0.1
	1300	60310 (First Ave Bus Parking B Rte.901B)	$76,189	3	50	0.1
	1300	60313 (Second Ave Parking A,Rte. 903A)	$61,911	3	50	0.1
	1300	60324 (Second Ave Parking F,Rte. 903F)	$58,387	3	50	0.1
	4100	60336 (Bldg #22 & 28 Constitution Museum)	$24,094,943	4	100	0.09
	3800	81710 (Chelsea Street Granite Wall)	$2,169,236	4	92	0.41
	4100	60334 (Bldg #125 Museum /Office Space)	$4,314,061	4	85	0.49
	4100	60335 (Bldg #32 Marine Society)	$4,293,406	4	79	0.23
	4100	60345 (Bldg #245 Garden Shack)	$47,887	5	70	0.25
	4100	**** 60356 (Bldg #58 Ropewalk)	$38,201,226	5	70	0.27
	4100	60353 (Bldg #21 Carriage House)	$301,466	5	70	0.31
	4100	****60691 (Bldg #105 Chain Forge)	$16,213,717	5	70	0.36
	4100	60340 (Bldg #124 Paint Locker)	$343,323	5	70	0.43
	4100	60339 (Bldg #110 Blacksmith Shop)	$70,616	5	70	0.58
	4100	60350 (Bldg #269 Garages)	$159,868	5	62	0.46
	4100	60351 (Hoosac Stores 1 & 2)	$14,939,195	5	48	0.86
	1300	60391 (Hoosac Parking Rte 900)	$656,171	5	27	0.3

** Assets were listed as non-NPS owned by unit during review, but were included for this analysis.

Castle Clinton National Monument (CACL)

Table C13. Summary of Findings for CACL.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	5	100%	$23,606,659	100%
Limited Exposure	0	0	0	0
TOTALS	**5**	**100%**	**$23,606,659**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
NY City LiDAR, 2010

Process/methods for exposure determination
Used LiDAR DEM and maps to determine that all assets at CACL should be listed as having a high exposure to SLR. Most assets are right on the Hudson River/Upper Bay in NYC (within 100 m of water).

CACL Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

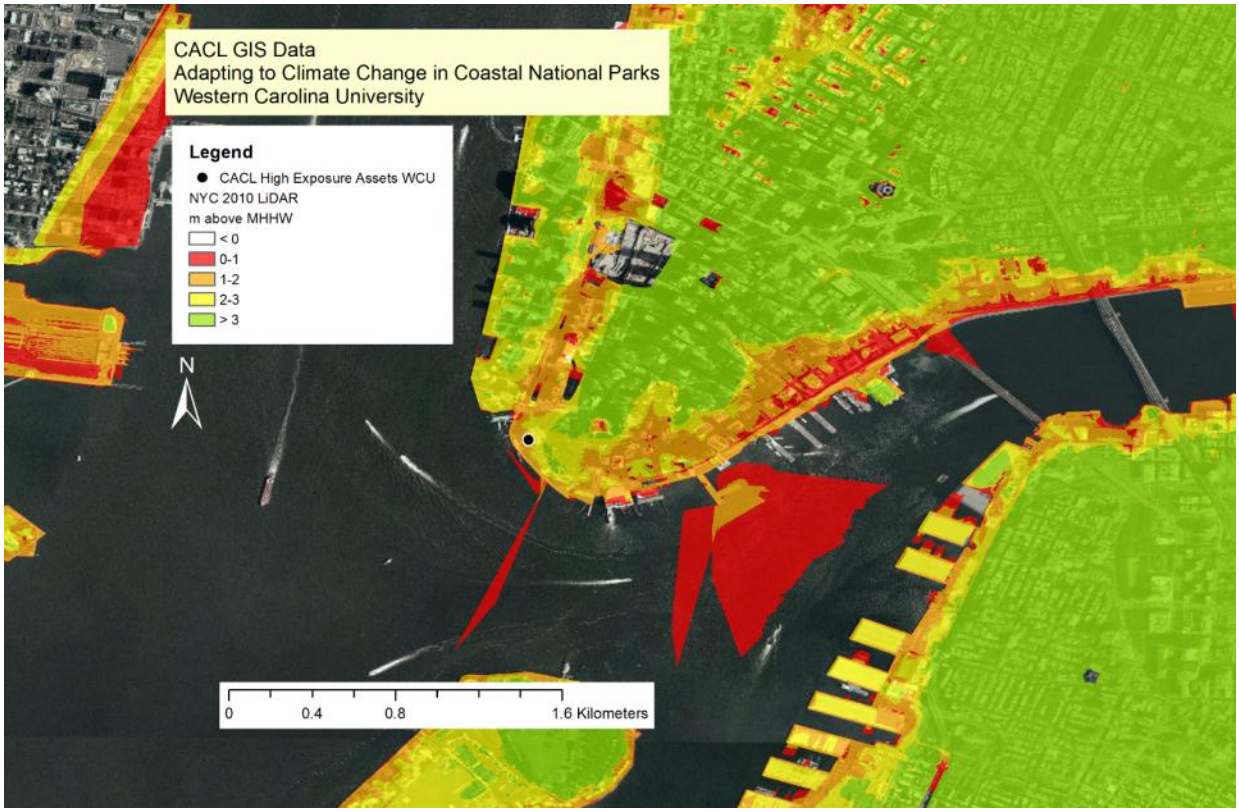

Figure C6. CACL GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.69 m above NAVD88), for CACL used The Battery, NY http://tidesandcurrents.noaa.gov/datums.html?id=8518750.

Table C14. Complete list of GIS Data utilized for CACL.

Data Name	Data Source
NYC 2010 LiDAR 3-foot Digital Elevation Model	GIS Staff, GATE

Table C15. CACL High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7300	80953 (Castle Clinton)	$4,876,194	2	100	1.183
2	4100	84597 (Castle Clinton Bookstore Pavilion)	$1,048,621	3	100	0
3	3100	83437 (Castle Clinton Grounds)	$16,138,550	3	100	0.024
4	4100	84599 (Castle Clinton Ticket Office)	$455,922	4	45	0.056
5	4100	84412 (Castle Clinton Ranger Station)	$1,087,372	4	7	0

Cape Cod National Seashore (CACO)

Table C16. Summary of Findings for CACO.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	70	17%	$51,385,721	21%
Limited Exposure	344	83%	$197,560,367	79%
TOTALS	**414**	**100%**	**$248,946,088**	**100%**

Park visit
October 2012

Park contacts
Mark Adams

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2010 USACE LiDAR NE

Process/methods for exposure determination
Combination of visit and discussion with park staff and LiDAR/geologic analysis; used buffer from eroding shoreline (as discussed during visit) to calculate additional high exposure assets affected by the actively eroding coastline (used 100 m buffer of shoreline to represent shoreline in approximately 100 years). At the end of the high exposure table is a list of the assets determined to be high exposure that are not in FMSS; these asset were discussed with park staff during visit to CACO.

CACO Documents
Map of high exposure assets & GIS data
High exposure assets
*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

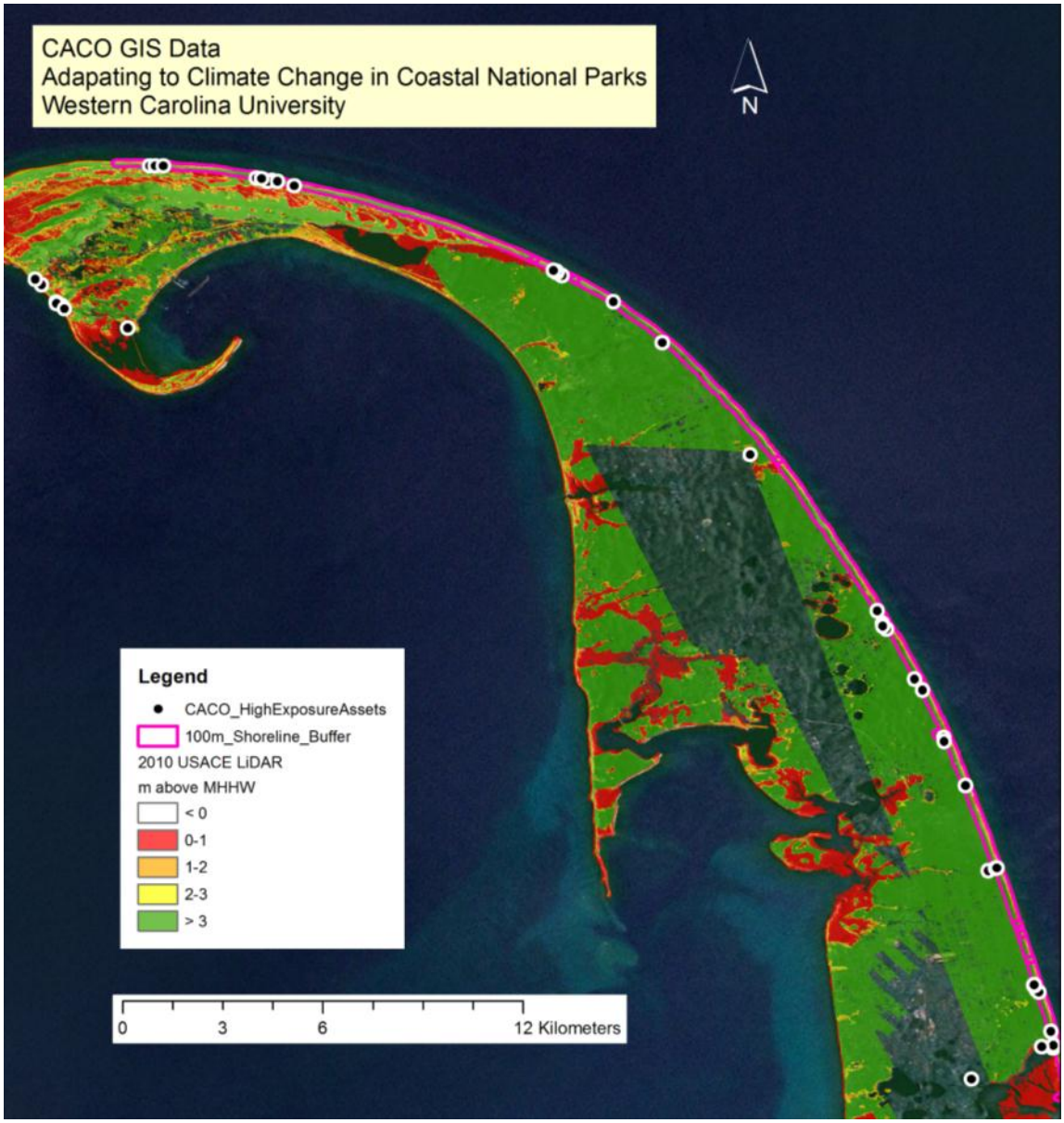

Figure C7. CACO GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.92 m above NAVD88), for CACO used Chatham, MA station: http://tidesandcurrents.noaa.gov/datums.html?id=8447435.

Table C17. Complete list of GIS Data utilized for CACO.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
2010 USACE JALBTCX Lidar: Northeast (Topo)	NOAA: http://www.csc.noaa.gov/dataviewer/#
EAARL Topography-Cape Cod National Seashore 2007	

Table C18. CACO High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7500	233823 (Nauset Light Beach Waysides)	$6,710	0	55	0
2	7500	233825 (Marconi Site Waysides)	$78,103	0	55	0
3	7500	233826 (Marconi Beach Waysides)	$4,793	0	55	0
4	7500	233831 (Head of the Meadow Waysides)	$3,834	0	55	0
5	7500	233829 (Highland Center Waysides)	$8,148	0	55	0
6	7500	233836 (Herring Cove Beach Waysides)	$1,438	0	55	0
7	4100	37972 (BU-E-182-Coast Guard Bathhouse)	$4,820,197	1	88	0.03
8	4100	112820 (BU-T-430-Head of the Meadow Vault Toilet)	$714,582	2	81	0
9	4100	95044 (BU-P-428-Herring Cove Vault Toilet North Lot)	$71,458	2	81	0
10	4100	37967 (BU-E-181-COAST GUARD N.E.E.D. FACILITY)	$2,648,888	2	81	0.03
11	4100	38521 (BU-T-1723-H-Bog House)	$1,027,763	2	80	0
12	4100	95047 (BU-P-429-Herring Cove Vault Toilet South Lot)	$71,458	2	80	0
13	4100	37983 (BU-E-278-Nauset Light Bathhouse)	$1,401,348	2	77	0
14	4100	38481 (BU-W-218-Marconi Beach Bathhouse)	$1,683,843	2	77	0
15	1700	32789 (R-E-1730-001P-Cst Grd Bch Accss Rd Brdg, 1730-001P)	$1,921,555	2	77	0.19
16	4100	38715 (BU-P-191-Herring Cove Bathhouse)	$4,732,152	2	77	0.34
17	4100	38475 (BU-W-198-Marconi Site Interp Shelter)	$88,013	2	75	0
18	1700	32797 (R-P-1730-003P-Province Lnds Rd Bridge 2, 1730-003P)	$640,518	2	65	0.09
19	1700	32792 (R-P-1730-002P-Province Lnds Rd Bridge 1, 1730-002P)	$382,967	2	65	0.18
20	4100	112829 (BU-T-431 Head of the Meadow Dressing & Lifeguard Rooms)	$161,946	2	57	0
21	5200	85751 (HCtr Leaching Field)	$151,239	2	45	0
22	2100	38748 (TR-T-14-HOM Bike Trail)	$1,905,314	3	80	0.58
23	1100	32490 (R-E-220-Coast Guard Bch Shuttle Access Rd.-RT-220)	$280,645	3	65	0
24	1100	32521 (R-E-225-Cst Grd Bch Bus Stp Access Rd. Pvd, Rt 225)	$280,645	3	65	0
25	1100	32489 (R-E-211-Nauset Light Beach Access Rd.-RT 211)	$73,854	3	65	0.06
26	1100	32463 (R-P-18-State Route 6, Paved, Rte 018)	$516,977	3	65	0.27
27	1300	32653 (R-P-929-Herring Cove Beach Parking, Paved, Rte 929)	$3,569,162	3	65	0.28
28	1100	32456 (R-P-15-Province Lands Rd., Paved, Rte 015)	$3,308,652	3	65	0.28
29	1100	32459 (R-P-17-Moors Rd., Paved, Rte 017)	$1,403,223	3	65	0.32
30	1100	32558 (R-E-405-Coast Grd Bch Shuttle P/U Rd., Pvd, Rt 405)	$280,645	3	65	0.4
31	2100	37978 (TR-E-T17-Coast Guard Beach Traill)	$286,978	3	63	0
32	2100	37985 (TR-E-23T-NLB Access Trail)	$224,973	3	58	0
33	2100	38484 (TR-W-16T-Marconi Beach Access Trail)	$735,218	3	58	0
34	2100	37934 (TR-E-5T-Nauset Marsh Trail)	$506,770	3	57	0
35	2100	38477 (TR-W-9T-Marconi Site Trail)	$85,361	3	57	0
36	2100	38479 (TR-W-11T-Atlantic White Cedar Swamp Trail)	$1,122,563	3	57	0.17
37	4100	37975 (BU-E-298-Coast Guard Beach Shelter)	$88,013	3	55	0

Table C18 (continued). CACO High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
38	2100	38606 (TR-T-4-Pilgrim Spring Trail)	$225,124	3	53	0
39	2100	38607 (TR-T-6-Smalls Swamp Trail)	$218,144	3	53	0
40	3100	112832 (GR-T-434 Overlook at HCtr)	$66,861	3	36	0
41	1300	32586 (R-W-906-Marconi Beach Parking, Paved, Rte 906)	$2,846,309	4	64	0.35
42	1300	32595 (R-E-912-Nauset Light Beach Parking, Paved, Rte 912)	$1,062,612	4	60	0.94
43	1300	32651 (R-T-927-Head of the Meadow Parking, Paved, Rte 927)	$2,190,077	4	54	0.46
44	4100	38532 (BU-T-346-HOM Lifeguard Storage)	$15,614	4	28	0
45	4300	39707 (HS-W-360-Cook Cottage)	$645,796	4	23	0
46	4300	39714 (HS-W-373-Pope House)	$326,226	4	23	0
47	4300	39706 (HS-W-359-Secrest Cottage)	$273,859	4	23	0.1
48	4300	39609 (HS-E-187-Bartlett House)	$262,578	4	23	0.11
49	4100	37998 (BU-E-357-Nauset Lighthouse)	$3,098,278	5	80	0
50	4100	37999 (BU-E-358-Nauset Keepers House)	$1,477,246	5	79	0
51	4100	38717 (BU-P-211-Herring Cove Food Concession)	$155,548	5	64	0
52	4300	41044 (BU-P-297-H-Leo Fleurant Cottage)	$125,423	5	32	0
53	4300	41046 (BU-P-317-H-Adams Guest Cottage)	$115,794	5	32	0
54	4300	41047 (BU-P-319-H-Champlin Cottage)	$236,398	5	32	0
55	4300	41049 (BU-P-321-H-Margo Cottage)	$140,477	5	32	0
56	4300	41050 (BU-P-322-H-Thalassa Cottage)	$124,420	5	32	0
57	4300	41052 (BU-P-325-H-Fearing Cottage)	$124,420	5	32	0
58	4300	41056 (BU-P-323-H-Harry Kemp Cottage)	$125,423	5	32	0
59	4300	41057 (BU-P-296-H-Watson-Schmid Cottage)	$115,794	5	32	0
60	4100	38442 (BU-E-376-Nauset Oil Recovery Station)	$230,264	5	30	0
61	4300	80466 (H-W-395-Brennan House)	$254,882	5	17	0
62	4300	41053 (BU-P-326-H-Jeanne "Frenchie" Chanel Beach Cottage)	$125,423	5	12	0
63	4300	80526 (B-T-399-Cudworth House)	$233,781	5	7	0
64	4300	80536 (B-W-401-Kohlberg House)	$624,001	5	0	0
65	4300	80540 (B-W-402-Porter House)	$252,572	5	0	0
66	4300	80541 (B-W-403-Tyson House)	$402,434	5	0	0
Not in FMSS but mentioned as high exposure during park visit.						
67	n/a	Head of the Meadow Parking Lot*	n/a	n/a	n/a	n/a
68	n/a	Hatches Harbor Dike and Culvert, near aiport*	n/a	n/a	n/a	n/a
69	n/a	Hatches Harbor Berms*	n/a	n/a	n/a	n/a
70	n/a	Oceanview Drive*	n/a	n/a	n/a	n/a

Fire Island National Seashore (FIIS)

Table C19. Summary of Findings for FIIS.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	132	58%	$56,036,479	57%
Limited Exposure	96	42%	$42,770,217	43%
TOTALS	**228**	**100%**	**$98,806,696**	**100%**

Park visit
October 2012

Park contacts
Chris Soller, Diane Abel, Mike Bilecki

Primary data utilized
1) NPS FMSS location hierarchy report
2) Long Island, NY LiDAR
3) USGS LiDAR (from FIIS staff)

Process/methods for exposure determination
Combination of visit/discussion with park staff and LiDAR/geologic analysis of assets.

FIIS Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

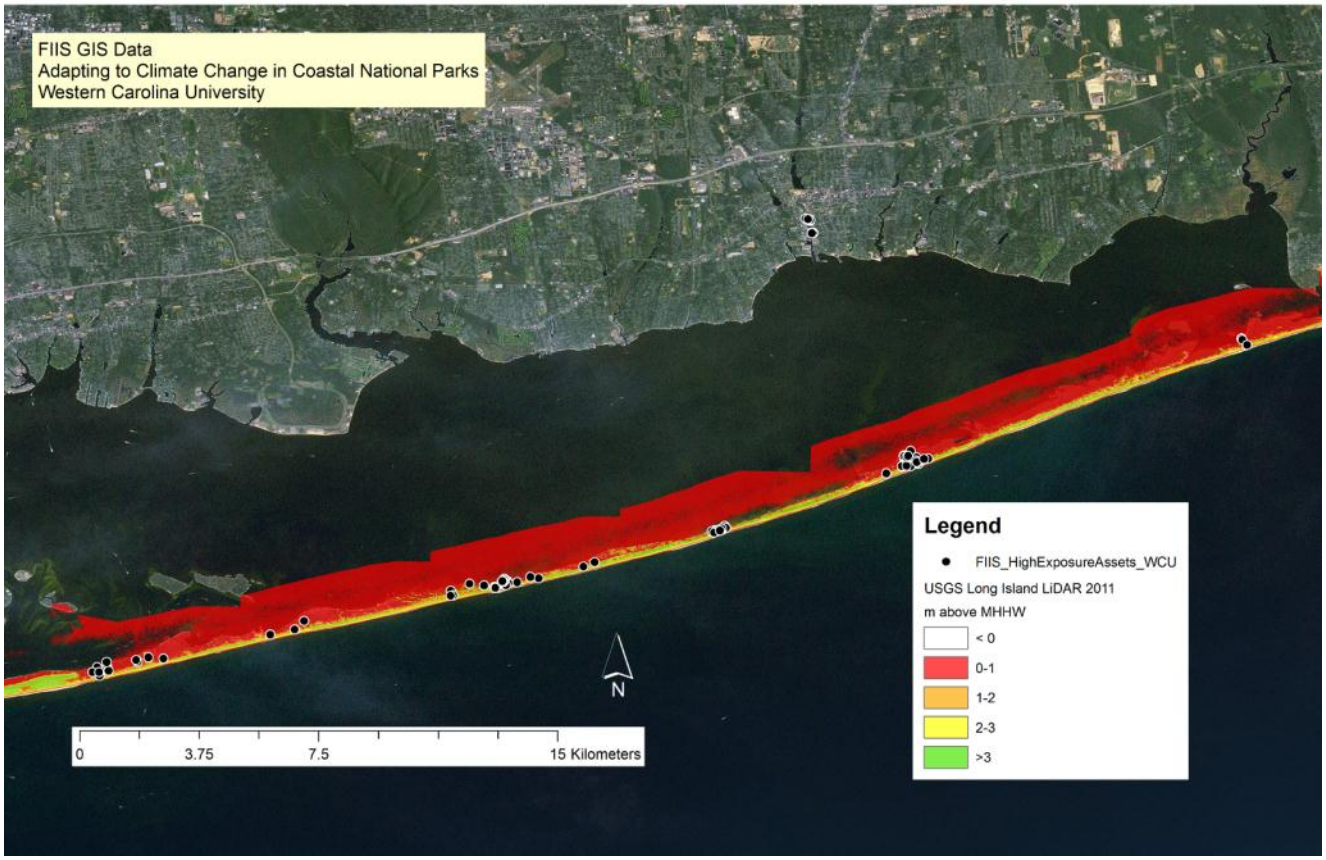

Figure C8. FIIS GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.73 m above NAVD88), for FIIS used Sandy Hook, NJ station: http://tidesandcurrents.noaa.gov/datums.html?id=8531680

Table C20. Complete list of GIS Data utilized for FIIS

Data Name	**Data Source**
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
EAARL Coastal Topography and Imagery 2009	USGS: http://pubs.usgs.gov/ds/558/index.html
Long Island, NY LiDAR USGS 2011	FIIS Staff
Facilities GIS Data, FIIS	

Table C21. FIIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	6300	116019 (Old Inlet Dock)	$547,683	0	88	0.12
2	6300	93787 (Bulkhead For Ferry Docking At Watch Hill)	$11,096	2	88	0
3	6300	93786 (Bulkhead For Docking At Patchogue)	$11,096	2	88	0
4	6300	93788 (SH-MA-Sailors Haven Ferry Dock)	$73,554	2	88	0
5	6300	38572 (Light Station Visitor Use Area, Docks)	$1,915,197	2	88	0.03
6	6300	63545 (MA-HQ-BH Ferry Terminal Bulkhead)	$1,814,570	2	88	0.61
7	6300	63557 (MA-HQ-BH PMF Basins Bulkheads)	$3,206,501	2	88	0.68
8	4100	106715 (BU-WH-Dune Station Visitor Station)	$267,248	2	78	0
9	4100	18791 (BU-SH-107 Comfort Station)	$601,051	2	78	0.03
10	4100	18979 (BU-WH-16 Visitor Center)	$412,326	2	78	0.13
11	4100	18216 (BU-HQ-76 Park Headquarters)	$1,086,126	3	90	1.51
12	6300	100721 (MA-TA/Barrett Beach-Marina)	$1,844,527	3	88	0.15
13	4100	18939 (BU-LS-94 Annex Garage)	$93,645	3	80	0.63
14	4100	18796 (BU-SH-104 Visitor Center)	$851,376	3	78	0.17
15	2100	23368 (BW-SH Sunken Forest 5)	$962,751	3	78	0.43
16	2100	27063 (BW-WH Nature Trail 5)	$904,722	3	78	0.47
17	2100	27076 (BW-LS Lighthouse Area Walks 5)	$83,087	3	78	0.69
18	2100	44103 (BW-WH Dune Station Platforms (lower))	$517,458	3	70	0
19	2100	110366 (BW-SH-Sunken Forest Bay Overlook)	$21,902	3	70	0
20	4100	19005 (BU-WH-26 Horse Barn)	$192,160	3	70	0.01
21	2100	27066 (BW-WH Main Beach Walk 10)	$184,637	3	70	0.42
22	2100	27098 (BW-SH Main Beach Walk 12)	$462,120	3	70	0.44
23	2100	28540 (BW-WH Dune Station Platforms (upper))	$227,895	3	70	0.44
24	4100	18944 (BU-WH-20 Maintenance Shop)	$640,750	3	70	0.56
25	2100	27067 (BW-WH Main Beach Walk 22)	$406,202	3	70	0.88
26	4100	18941 (BU-LS-97 Oil House)	$17,081	3	67	0.31
27	4300	18766 (Q-00000008-HO-WH-08 Qtrs #8)	$269,459	3	60	0.03
28	4300	18960 (Q-00SHBARN-HO-SH-105 Horse Barn)	$138,132	3	60	0.08
29	4300	18771 (Q-00000001-HO-WH-01 Qtrs#1)	$256,061	3	60	0.14
30	4300	18762 (Q-00000005-HO-WH-05 Qtrs #5)	$257,176	3	60	0.34
31	4300	18761 (Q-00000004-HO-WH-04 Qtrs #4)	$261,469	3	60	0.62
32	2100	27106 (BW-SH CG Bay Overlook 5)	$44,049	3	59	0
33	2100	27062 (BW-WH Housing to Beach 5)	$110,519	3	59	0.34
34	2100	27087 (BW-LS Lighthouse Beach Walk 5)	$236,072	3	59	0.68
35	2100	27049 (BW-TA Beach walk 10)	$172,504	3	59	1.15
36	2100	27105 (BW-SH CG Beach Access 5)	$70,162	3	59	1.48
37	2100	27075 (BW-LS Annex to Lighthouse 5)	$162,217	3	53	0
38	4100	18801 (BU-TA-157 Comfort Station)	$305,221	3	53	0.03
39	4300	18758 (Q-00000002-HO-WH-02 Qtrs #2)	$386,197	3	53	0.08

Table C21 (continued). FIIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	4300	18756 (Q-00000006-HO-WH-06 Qtrs #6)	$272,321	3	53	0.12
41	4300	18778 (Q-00000104-HO-SH-102 Qtrs#102)	$257,314	3	53	0.13
42	4300	18764 (Q-00000007-HO-WH-07 Qtrs #7)	$279,886	3	53	0.23
43	4300	18768 (Q-00000010-HO-WH-10 Qtrs #10)	$213,529	3	53	0.33
44	2100	27078 (BW-LS Lighthouse Area Walks 8)	$6,330	3	53	0.33
45	4300	18767 (Q-00000009-HO-WH-09 Qtrs #9)	$262,713	3	53	0.43
46	2100	27074 (BW-LS Annex to dock 5)	$201,782	3	53	0.59
47	2100	27084 (BW-LS Lighthouse to West Bay Walk 5)	$106,826	3	53	0.66
48	2100	27079 (BW-LS Lighthouse to Bay 5)	$97,594	3	53	0.68
49	4300	18750 (Q-00000103-HO-SH-103 Sailors Haven Housing Unit)	$289,904	3	47	0.38
50	6300	63560 (MA-SH-BH Bulkheads)	$2,607,875	4	88	0
51	6300	63558 (MA-HQ-BH Laurel Street Bulkheads)	$838,897	4	88	0.35
52	6300	63561 (MA-WH-BH Bulkheads)	$2,484,776	4	88	0.59
53	1300	60996 (PL-PA-905 Admin Parking, RT 905)	$61,052	4	80	0.08
54	1100	52428 (RO-LS-404 Lighthouse Road, RT404)	$28,843	4	80	0.22
55	1300	60993 (PL-LS-901 Annex Parking, RT 901)	$1,072,515	4	61	0.01
56	4100	18753 (BU-HQ-78 Vehicle Vessel Shop)	$71,511	4	61	2.95
57	4100	18942 (BU-LS-98 Tool House)	$21,351	4	58	1.61
58	4100	18765 (BU-HQ-81 River Room (Conference))	$242,439	4	53	0.02
59	4100	18969 (BU-SH-109 Maintenance Shop)	$563,041	4	47	0
60	4100	18805 (BU-TA-158 Pump House)	$62,841	4	47	0.04
61	4100	19007 (BU-WH-33 Electrical Panel Bldg)	$22,443	4	47	0.18
62	4100	18990 (BU-WH-34 Well House)	$4,448	4	47	9.26
63	4100	18945 (BU-WH-22 Flammable Storage Bldg.)	$12,633	4	43	3.25
64	2100	27039 (BW-SP Old Inlet 5)	$348,700	4	38	0
65	4100	18978 (BU-WH-15 Storage Bldg)	$96,258	4	38	0.37
66	2100	27058 (BW-WH Housing 6)	$169,022	4	37	0
67	2100	27059 (BW-WH Housing 10)	$48,533	4	37	0
68	4100	86152 (BU-OP-Old Inlet Composting Toilet)	$40,833	4	37	0
69	4100	18989 (BU-WH-21 First Aid Room)	$180,142	4	37	0.09
70	2100	27047 (BW-TA Motel to Dock 5)	$105,507	4	37	0.36
71	4100	19003 (BU-WH-25 Lifeguard Station)	$117,302	4	37	0.42
72	2100	27056 (BW-WH Housing 4)	$65,625	4	37	0.71
73	2100	27057 (BW-WH Housing 5)	$143,489	4	37	0.74
74	2100	27060 (BW-WH Housing 12)	$178,518	4	37	0.75
75	2100	27061 (BW-WH to Davis Pk 5)	$474,781	4	36	0
76	1300	60995 (PL-OP-904 Smith Point Parking, RT904)	$5,192	4	36	0
77	2100	27044 (BW-TA Talisman Picnic 5)	$251,370	4	36	0
78	2100	28542 (BW-SH Forest Cement walk 5)	$230,086	4	36	0
79	2100	27046 (BW-TA Picnic to Beach 5)	$180,681	4	36	0.39

Table C21 (continued). FIIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
80	2100	27048 (BW-TA West End Picnic 5 ft)	$46,159	4	36	1.14
81	4100	19000 (BU-WH-29 Laundry/Compressor Bldg)	$198,060	4	30	0.67
82	1100	18190 (RO-HQ-400 HQ Parking Access -RT400)	$49,377	4	24	0
83	2100	27123 (BW-HQ Patchogue Maintenance Fac Docks 5)	$59,348	4	24	0.77
84	4100	18751 (BU-HQ-73 Patchogue Boat House)	$273,294	4	13	0.3
85	5200	111855 (WWS - WH - Pump Out Tanks)	$22,534	5	88	0
86	6300	65000 (MA-SH-Marina)	$7,294,755	5	88	0.03
87	1100	108295 (RO-LS-Lighthouse Pond Road)	$148,634	5	71	0
88	1100	108296 (RO-LS-Lighthouse Pond Road Spur)	$7,432	5	71	0
89	1100	108300 (RO-Burma Road-Kismet to Saltaire)	$52,078	5	71	0
90	1100	108298 (RO-Seabay Beach-Cedar Court)	$29,699	5	71	0
91	1100	108301 (RO-Burma Road-Atlantique to Robbins Rest)	$148,634	5	71	0
92	1100	108302 (RO-Burma Road-Robbins Rest to Ocean Beach Dune Cut)	$17,791	5	71	0
93	1100	108304 (RO-Ocean Beach Dune Cut)	$155,953	5	71	0
94	1100	108305 (RO-Ocean Beach Dune Cut Spur)	$37,158	5	71	0
95	1100	108306 (RO-Ocean Beach Dune Cut to Robbins Rest Bay)	$44,478	5	71	0
96	1100	108312 (RO-Burma Road-Cherry Grove to Fire Island Pines)	$282,348	5	71	0
97	1100	108318 (RO-WH-Burma Road-Watch Hill)	$579,615	5	71	0
98	1100	108323 (RO-WH-Burma Road to East Side Channel)	$267,428	5	71	0
99	1100	108324 (RO-WH-Horse Barn Spur)	$66,857	5	71	0
100	1100	108325 (RO-WH-West Picnic Area Spur (Marina))	$74,317	5	71	0
101	1100	108314 (RO-TA-Burma Road-Talisman)	$750,487	5	71	0
102	1100	108307 (RO-SH-Burma Road-Point O'Woods to Cherry Grove)	$1,144,451	5	71	0
103	1100	108308 (RO-SH-Oakleyville Access Road)	$111,475	5	71	0
104	1100	108309 (RO-SH-Sunken Forest West Dune Cut)	$74,317	5	71	0
105	1100	108310 (RO-SH-Sunken Forest West Dune Cut Spur)	$22,239	5	71	0
106	1100	108311 (RO-SH-Burma Road-Cherry Grove Spur)	$44,478	5	71	0
107	1100	108322 (RO-SH-East Dock Spur)	$111,475	5	71	0
108	1100	108321 (RO-LS-Lighthouse Dune Cut)	$66,857	5	71	0
109	3100	111888 (GR-WH-Campgrounds (concessions))	$780,776	5	70	0
110	2100	105543 (BW-WH-Marina Area-Friends Platform)	$21,101	5	70	0
111	2100	105544 (BW-WH-Marina Area-Friends Platform Walkway)	$25,590	5	70	0
112	3100	111860 (GR - WH - Picnic Areas)	$94,933	5	70	0
113	3100	111858 (GR - SH - Picnic Areas)	$563,064	5	70	0
114	3100	111859 (GR - BB - Picnic Areas)	$94,933	5	70	0.03
115	2100	112395 (BW-WH Watch Hill Boardwalks (Concessions))	$2,678,399	5	70	0.05
116	4100	18984 (BU-WH-17 Marina Restroom)	$301,308	5	67	0.13
117	4100	19006 (BU-WH-32 Garbage Bldg)	$68,324	5	59	0
118	4100	18991 (BU-WH-24a Dune Station rest. (womens))	$813,923	5	59	0.01
119	4100	18999 (BU-WH-24b Dune Station rest. (Mens))	$813,923	5	59	0.02

Table C21 (continued). FIIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
120	4100	18970 (BU-SH-111 Garbage Bldg.)	$68,324	5	59	0.14
121	4100	18977 (BU-WH-14 Dockmaster Office)	$33,485	5	57	0.12
122	4100	105369 (BU-BB-Snack Bar)	$155,295	5	55	0
123	4100	18807 (BU-WH-13 Marina Store)	$186,354	5	55	0.09
124	4100	30492 (BU-WH-18 Restaurant)	$1,209,420	5	47	0
125	4100	18967 (BU-SH-106 Gift Shop & Snack Bar)	$434,826	5	47	0.06
126	4100	19009 (BU-WH-36 Campground Host Bldg)	$15,124	5	45	0.17
127	4300	18770 (Q-00000012-HO-WH-12 Qtrs #12)	$274,961	5	7	0.89
128	4300	30481 (BU-TA-153 Talisman Motel)	$1,780,795	5	0	0
129	1100	108299 (RO-Seabay Beach-Maple Court)	$29,699	n/a	n/a	0
130	1100	108297 (RO-LS-Lighthouse Parking Lot to Bay)	$126,339	n/a	n/a	0
131	4300	19539 (Q-00000155-HO-TA-155 VIP Qtrs)	$243,982	n/a	n/a	0.26
132	4300	18760 (Q-00000003-HO-WH-03 Qtrs #3)	$294,971	n/a	n/a	0.43

Fort McHenry National Monument and Historic Shrine (FOMC)

Table C22. Summary of Findings for FOMC.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	4	9%	$77,494,234	42%
Limited Exposure	40	91%	$105,749,261	58%
TOTALS	**44**	**100%**	**$183,243,495**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) LiDAR: City of Baltimore 2008

Process/methods for exposure determination
Used the location hierarchy report and the "areas" listed in report to group assets into high exposure and limited exposure. Also manually located a number of the assets and compared to LiDAR elevations. In the case of FOMC, only the assets on the very exterior of the monument (like the seawalls) were considered high exposure. Most of the park is over 2 m in elevation (above MHHW).

FOMC Documents
Map of high exposure assets & GIS Data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

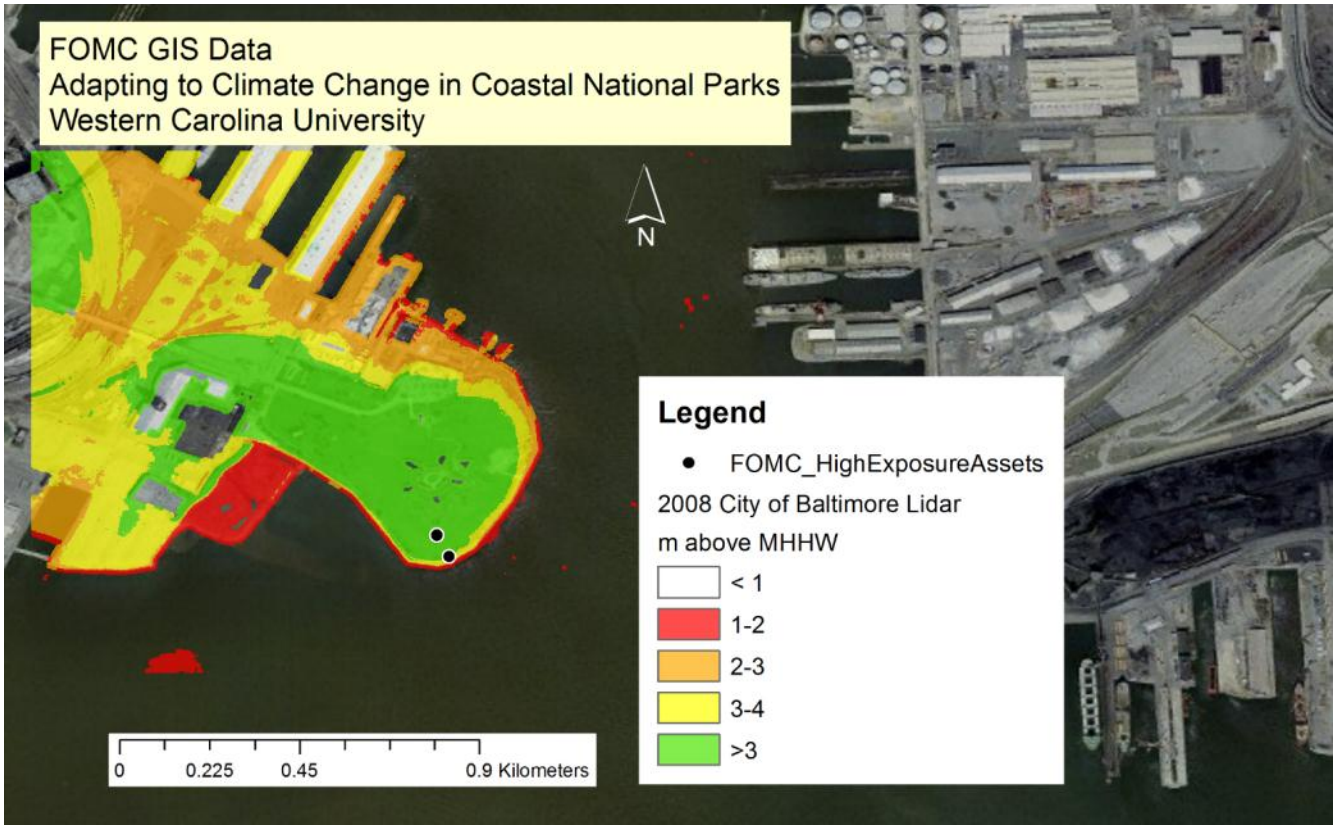

Figure C9. FOMC GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.82 m above NAVD88), for FOMC used Baltimore, MD station: http://tidesandcurrents.noaa.gov/datums.html?id=8574680.

Table C23. Complete list of GIS Data utilized for FOMC.

Data Name	Data Source
2008 City of Baltimore Lidar	NOAA: http://www.csc.noaa.gov/dataviewer/#
Fort McHenry NM & HS Topographic Site Plan Elevations	

Table C24. FOMC High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7300	232799 (FOMC Fortification Landscape)	$60,468,509	0	100	0.001
2	2100	27487 (FOMC Seawall Trail)	$339,733	3	92	0
3	1100	55615 (FOMC Seawall Road, RT 400)	$1,402,210	3	69	0.077
4	6300	27450 (FOMC Seawall)	$15,283,782	4	100	0.011

Gateway National Recreation Area (GATE)

Table C25. Summary of Findings for GATE.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	302	28%	$2,672,440,355	41%
Limited Exposure	787	72%	$3,922,412,620	59%
TOTALS	**1089**	**100%**	**$6,594,852,975**	**100%**

Park visit
July 2012

Park contacts
Mark Christiano

Primary data utilized
1) NPS FMSS location hierarchy report
2) NY City Lidar 2010
3) EAARL Coastal Topography GATE, NJ and NY 2009
4) 2005 USACE LiDAR
5) 2007 EAARL: FIIS, NY and Sandy Hook, NJ
6) 2010 USACE Joint Airborne Lidar Bathymetry Technical Center of eXpertise LiDAR

Process/methods for exposure determination
Combination of visit/discussion with park staff and LiDAR/geologic analysis of assets. Review with park completed May of 2014.

GATE Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

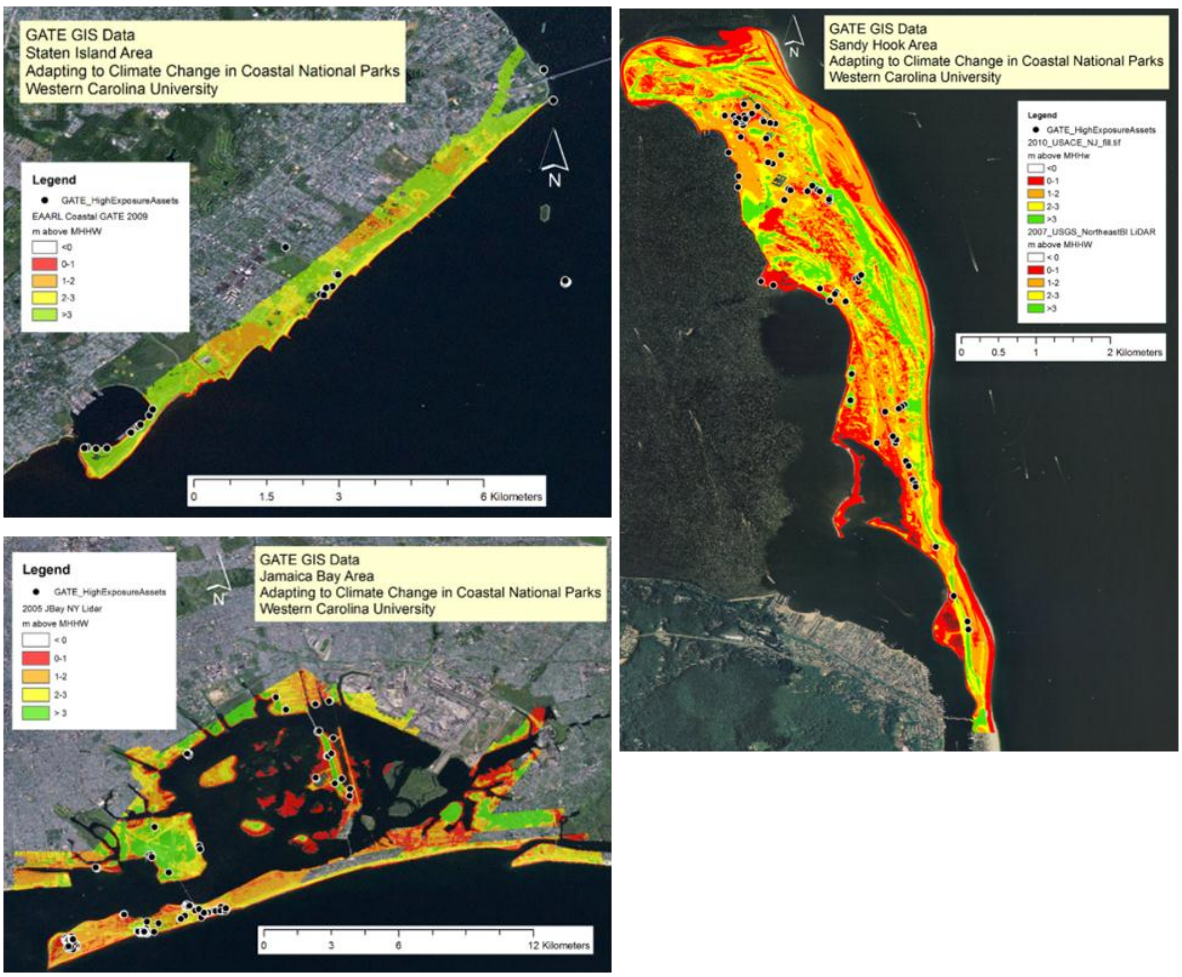

Figure C10. GATE GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.73 m above NAVD88), for GATE used Sandy Hook, NJ station: http://tidesandcurrents.noaa.gov/datums.html?id=8531680.

Table C26. Complete list of GIS Data utilized for GATE.

Data Name	**Data Source**
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
EAARL Coastal Topography, GATE, NJ & NY, 2009	USGS: http://pubs.usgs.gov/ds/525/
NYC 2010 LiDAR 3-foot Digital Elevation Model	GATE Staff
GATE Trails, Roads 2006	
2010 USACE JALBTCX Lidar: New York (Topo)	NOAA: http://www.csc.noaa.gov/dataviewer/#
2007 USGS/NASA Experimental Advanced Airborne Research Lidar (EAARL): Fire Island National Seashore, NY and Sandy Hook, NJ	
2010 USACE JALBTCX Lidar: New Jersey (Topo)	
Jamaica Bay USACE 2005 LiDAR (meters)	

Table C27. GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
1	3	6100	115325 (STIS - Hoffman Seawall 1912)	$5,346,013	0	75	0
2	4	1300	116079 (STIS PK-STIS-C GK Marina Parking Lot)	$2,510,059	0	57	0
3	3	4100	115329 (STIS Ward Building A)	$625,031	0	55	0
4	5	4100	92398 (JABA BU-BPRP-H-606.6 Bathhouse East Wing (USPP sub))	$4,972,650	1	100	0.05
5	5	4100	93110 (JABA BU-BPRP-H-606.1 Bathhouse Entrance Pavillion)	$8,148,305	1	100	0.01
6	5	4100	93112 (JABA BU-BPRP-H-606.2 Bathhouse West Wing (First Aid))	$4,963,073	1	100	0.035
7	3	1100	33647 (SAHO Hudson Road RT 661)	$1,719,456	1	100	0.1
8	5	4100	93111 (JABA BU-BPRP-H-606.7 Bathhouse Beach Pavillion)	$9,864,275	1	100	0.251
9	4	2100	36173 (JABA TR-BPRP-H-610.0 JRP Boardwalk)	$16,804,539	1	100	0.346
10	3	1100	29627 (SAHO SDR60 Hartshorne Drive Northbound RT 60)	$13,914,362	1	100	0.228
11	3	1100	29628 (SAHO SDR61 Hartshorne Drive Southbound RT 61)	$13,279,486	1	100	0.204
12	3	5100	28177 (SAHO NDSTWater Tower Ft. Hancock)	$14,556,456	1	90	0.006
13	3	4100	28157 (SAHO NDBZ311WastewaterTreatmentPlant(NEW))	$716,483	1	88	0.01
14	3	2100	89360 (SAHO SDT Multi Use Path Sandy Hook 5 miles)	$11,131	1	88	0
15	3	1100	21211 (STIS MFR130 Entrance Road RT 130)	$1,292,661	1	77	0.193
16	3	4100	18896 (SAHO SDB 604 Lot D Restrooms with Showers Kiosks)	$3,302,705	1	67	0.001
17	3	4100	83298 (SAHO NDZ9 Lift Station #9 (OR Lift #37 Bldg) Building)	$147,511	1	66	0
18	3	2100	28178 (SAHO NDST Gunnison Boardwalk)	$59,831	1	65	2.582
19	3	4100	18980 (SAHO SDZ Shower Kiosk Lot D)	$90,503	1	55	0
20	4	4100	42837 (JABA BU-NSCP Canarsie Pier Visitor Center)	$2,519,798	1	52	0.079
21	3	3100	21000 (SAHO CDBA Horseshoe Cove Seawall)	$7,731	1	50	0
22	3	2100	18988 (SAHO SDS Boardwalk Lot D Beach Plaza extension)	$4,464	1	44	1.643
23	3	4100	19103 (SAHO CDB Lot E shower kiosk)	$90,503	1	30	0
24	5	3100	101537 (JABA GR-BPRP-606.8 Bathhouse Courtyard)	$517,020	2	100	0.627
25	4	2100	31403 (JABA TR-WDWR-6 South Dike Trail)	$9,577	2	92	0
26	3	4100	19351 (SAHO CDHB470 Ranger Station)	$1,372,011	2	90	0.12
27	3	1300	28170 (SAHO DR LOT J Parking Lot J North Beach Extension gravel)	$1,264,876	2	88	0
28	3	1100	33658 (SAHO NDR672 Ford Road RT 672)	$264,532	2	88	0.15
29	3	1100	29629 (SAHO CDR160 Atlantic Drive RT 160)	$5,026,100	2	88	0.228
30	3	1300	33663 (SAHO CDR905 SH Visitor Center # 436 Parking Lot RT 905)	$544,535	2	88	0.157
31	2	1300	35209 (SAHO Area D Beach Center Parking Lot, RT 975P)	$6,369,846	2	88	0.157
32	3	2200	21003 (SAHO CDBR Horseshoe Cove Bridge)	$265,830	2	83	0
33	3	4100	21580 (SAHO NDHB102 Education Center #102)	$22,425,834	2	83	0.124
34	3	2100	19031 (SAHO CDT Holly Forest Boardwalk)	$239,920	2	75	0.016
35	3	4100	21595 (SAHO NDHB130 Maint Shop/Offices)	$4,755,010	2	75	0.176
36	3	1100	21208 (STIS GKR -00_460 Access to beach (Crooks Point))	$490,876	2	71	0
37	3	4100	21604 (SAHO NDHB157 Lot K Comfort Station)	$2,339,866	2	67	0.014
38	3	4100	28145 (SAHO NDHBZ12 Lift Sation #12 Bldg #306 Pump Station)	$331,030	2	66	0.128

Table C27. (continued). GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
39	4	1300	91897 (STIS MFR Picnic area parking)	$876,100	2	62	0
40	3	4100	21831 (SAHO NDB Observation Deck N. Beach)	$992,271	2	58	0
41	2	4100	36171 (JABA BU-BPRP-H-C607 East Concession Stand Bay 1)	$1,123,345	2	55	0.087
42	3	4100	92451 (SAHO NDB 626 Lifeguard First Aid North Beach Lot I)	$363,267	2	55	0
43	3	1300	25254 (STIS MFR STIS-00_38 Picnic Area Parking Lot E)	$5,385,756	2	34	0
44	3	1300	25244 (STIS PK-GK STIS-00-181 Crooks Point parking A)	$644,677	2	34	0
45	3	4100	21823 (SAHO NDHBZ358 Well 5A Pump House)	$80,725	2	30	0
46	3	1300	25240 (STIS PK-GK Area F parking RT 945P)	$629,901	2	30	0
47	3	1300	25239 (STIS PK-GK Area E parking RT 944P)	$858,643	2	30	0.272
48	3	2100	22187 (STIS GKT Promenade)	$1,049,667	2	15	0
49	4	2100	31397 (JABA TR-WDWR-1 West Pond Trail)	$596,083	3	100	0.009
50	4	2100	45691 (JABA TR-WDSC Spring Creek Trail)	$770,525	3	92	0
51	4	2100	31402 (JABA TR-WDWR-5 Fire Break Trail/Westside)	$87,647	3	92	0
52	4	2100	31409 (JABA TR-WDWR-8 Fire Break Trail/Eastside)	$283,333	3	92	0
53	4	2100	31414 (JABA TR-WDWR-9 Fire Break Trail Parallel to RR Tracks)	$762,820	3	92	0
54	4	2100	80780 (JABA TR-NSFB North 40 Trail)	$290,598	3	90	0
55	4	2100	80783 (JABA TR-NSFB Dead Horse Bay Trail)	$145,299	3	90	0
56	4	2100	31398 (JABA TR-WDWR-2 South Garden Trail)	$63,568	3	90	0
57	4	2100	31405 (JABA TR-WDWR-7 East Pond Trail)	$445,804	3	90	0
58	4	2100	31400 (JABA TR-WDWR-4 North Spur Trail)	$319,330	3	80	0
59	4	4100	28503 (JABA BU-BPRL-219 Maintenance Bldg)	$2,039,588	3	80	0.113
60	4	4100	28508 (JABA BU-BPRP-608 Toll Booth Bldgs A-F)	$58,037	3	78	0.102
61	4	2100	95911 (JABA TR-WDFC Walkways)	$1,971,707	3	77	0
62	3	2100	80987 (STIS MFT Swamp White Oak trail)	$181,502	3	75	0.003
63	3	2100	82615 (STIS GKP Orange Dot trail)	$94,112	3	75	0.004
64	3	2100	82617 (STIS GKP Yellow Dot trail)	$114,279	3	75	0.003
65	3	4100	21596 (SAHO NDHB131 N Maint Fitness Center)	$1,181,251	3	75	0.269
66	3	4100	21597 (SAHO NDHB132 N Maint Garages& Storage)	$2,908,773	3	75	0.157
67	3	7100	21578 (SAHO CDHS98 Halyburton Marker)	$6,570	3	72	0
68	3	7100	28159 (SAHO CDHS098 Halyburton Memorial Marker)	$97,630	3	72	0
69	3	1100	30000 (SAHO CDR476 Admin Road Lot L RT 476)	$378,280	3	70	0.128
70	3	4100	21603 (SAHO NDHB156 Warehouse)	$2,065,076	3	69	0
71	3	4100	20228 (SAHO CDHS413 Radar Sentry Box)	$8,372	3	69	0
72	3	4100	81778 (SAHO CDHB413 Ft. Hancock Radar Site Sentry Box)	$47,808	3	69	0
73	3	4100	81780 (SAHO CDHB423 Ft.Hancock Radar Sentry Box)	$10,921	3	69	0
74	3	4100	81785 (SAHO CDHB447 Ft Hancock Launch Site Sentry Box)	$14,763	3	69	0.021
75	3	2100	19019 (SAHO CDT Sandy Hook Trail (8.8 miles)includes old dune trail)	$1,889,569	3	65	0.012
76	3	7400	28152 (SAHO NDS Observation Deck Nine Gun Battery)	$452,975	3	65	0
77	4	4100	42394 (JABA BU-BPRP-609 Parking Lot Office)	$913,169	3	63	0.201
78	3	1100	33657 (SAHO NDR671 New Gunnison Road RT 671)	$740,688	3	60	0.11

Table C27. (continued). GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
79	4	2100	31415 (JABA TR-WDWR-10 First Road Trail/westside)	$116,239	3	59	0
80	3	1300	33665 (SAHO CDR908 Ranger Parking Lot B North RT 908)	$179,414	3	57	0.125
81	3	1300	33675 (SAHO CDR913 Lot "L" Radar Site Parking RT 913)	$524,112	3	57	0.16
82	3	1300	33673 (SAHO CDR911 Missle Parking Lot across from S Maint RT 911)	$215,200	3	57	0.513
83	3	4100	18895 (SAHO SDBC 603 Lot D Concession)	$4,216,638	3	55	0.044
84	3	4100	18897 (SAHO SDB 609 Lot D Rental Kiosk concession)	$70,911	3	55	0.006
85	3	1100	25201 (SAHO NDR Gunnison Rd)	$872,635	3	53	0
86	3	1300	33664 (SAHO CDR907 Ranger Station Parking Lot A East RT 907)	$130,113	3	53	0.124
87	3	1100	29987 (SAHO NDR460 NORTH Maint Area Access Road RT 460)	$529,063	3	53	0.377
88	3	1300	33678 (SAHO CDR915 Water Treatment Plant Parking RT 915)	$172,915	3	53	0.323
89	3	1300	21822 (SAHO NDR Parking Lot North Maint RT 928N -A)	$46,228	3	53	1.164
90	3	1300	33670 (SAHO CDR909d S Maint Gas Station Road #429 RT 909DN)	$105,309	3	53	0.515
91	2	1300	35213 (SAHO North Maint Employee Parking Lot, RT928N-B)	$148,793	3	53	0.515
92	3	7400	20409 (STIS MFHB308 Elm Tree Light)	$82,173	3	51	0
93	3	6100	18815 (SAHO SDBA Lot B Seawall)	$97,630	3	50	0
94	4	2100	93890 (JABA TR-WDHB-Walkway)	$6,572	3	35	0
95	3	1300	25255 (STIS MFR STIS-00_149 Beach entrance parking area)	$2,498,814	3	34	0
96	3	1300	25253 (STIS MFR STIS-00_246 Hanger 38 Overflow Parking)	$8,976,260	3	21	0
97	5	2300	97335 (JABA TR-BPRP-H-616 Pedestrian Tunnel (Bay3))	$2,531,244	4	100	0
98	4	1100	36015 (JABA RD-BPBP-Rt222 Breezy Point Surf Club Entr.Rd.)	$1,478,568	4	90	0.296
99	3	6300	113105 (JABA BA-NS PB Plumb Beach)	$61,026	4	88	15.48
100	3	4100	21593 (SAHO NDHB124A Electrical Shed)	$26,157	4	82	0
101	3	7300	21608 (SAHO NDHF181 9-Gun Battery)	$172,340,365	4	80	0.001
102	3	7300	21824 (SAHO NDHF266 Battery Granger)	$42,007,964	4	80	0
103	3	7300	19434 (SAHO CDHF441 Battery Kingman)	$221,198,858	4	80	0
104	3	7300	19435 (SAHO CDHF440 Battery Mills)	$221,198,858	4	80	0.002
105	4	1100	36033 (JABA RD-BPRP-Rt413 Boardwalk Access Road)	$211,625	4	78	0
106	4	1100	31602 (JABA RD-NSFB-H-Rt200 Floyd Bennett Field Entrance Road)	$5,136,080	4	78	0.265
107	4	1100	31597 (JABA RD-BPFT-Rt111 Shore Road)	$20,097,704	4	78	0.215
108	4	1100	31595 (JABA RD-BPFT-Rt2 Rockaway Beach Blvd)	$18,034,458	4	77	0
109	4	1100	36004 (JABA RD-NSCP-Rt204 Canarsie Pier Access Rd)	$714,236	4	77	0.558
110	4	1300	31394 (JABA PK-WDWR Rt.991b- North Channel Bridge Parking/westside)	$2,534,566	4	71	0.069
111	4	1300	31395 (JABA PK-WDWR Rt.991a -North Channel Bridge Parking/eastside)	$2,479,474	4	71	0.066
112	3	7400	20232 (SAHO CDHS419 Nike Radar Tower)	$20,960	4	69	0
113	3	7400	20236 (SAHO CDHS422 Nike Radar Tower)	$20,960	4	69	0
114	4	1300	36131 (JABA PK-BPFT-Rt987n Maintenance Area Parking (Riis Ldg))	$10,069,609	4	67	0.22
115	4	1100	31392 (JABA RD-WDWR-4 North Dike Road)	$1,833,151	4	66	0.022
116	4	1300	36135 (JABA PK-NSCP-Rt989 Canarsie Pier Parking)	$10,843,992	4	65	0.066
117	3	7300	21005 (SAHO CDHF348 Arrowsmith)	$51,702,110	4	63	0.003
118	3	7300	20134 (SAHO CDHF443 Igloo Magazine)	$8,441,796	4	63	0

Table C27. (continued). GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
119	3	6100	115328 (STIS Hoffman Island Piers)	$8,922,992	4	62	0
120	3	1100	21179 (STIS WR175 Dock Road)	$570,292	4	50	0
121	3	1100	33653 (SAHO NDR667 North Bragg Drive RT 667)	$687,782	4	47	0.108
122	3	1100	33661 (SAHO NDR678 Knox Road South RT 678)	$846,501	4	47	0.111
123	4	4100	20411 (STIS MFHB301 Hanger 38)	$8,009,984	4	46	0.399
124	4	1100	77685 (JABA RD-WDSC- Spring Creek Road)	$1,451,161	4	44	0.591
125	3	4100	21023 (SAHO CDHBW350 Generator House)	$106,993	4	43	0
126	3	4100	19431 (SAHO CDHB471 Kiosk Ranger Station)	$37,876	4	43	0.166
127	3	4100	21598 (SAHO NDHB134 N Maint Hazmat storage)	$71,327	4	42	0.049
128	3	4100	20143 (SAHO CDHB429 Generator Bldg S Maint)	$427,688	4	42	0.314
129	2	1300	35200 (SAHO Employee Pullout Gunnison Parking, RT 931P)	$147,070	4	40	0.124
130	3	1100	33207 (STIS RD-GK473 Harbor Rd., RT 473)	$339,226	4	38	0
131	4	4100	28500 (JABA BU-BPRL-216 Vehicle & Equipment Storage Bldg)	$893,577	4	35	0.304
132	4	4100	28501 (JABA BU-BPRL-217 Garage)	$1,083,621	4	35	0.21
133	2	1300	35201 (SAHO Visitor drop off Pullout B Parking, RT 932P Gunnison)	$118,936	4	32	0.322
134	3	1300	28171 (SAHO NDR LOT K Parking Lot K unpaved)	$3,343,542	4	29	0
135	2	4100	19342 (SAHO CDB610 Lot E Rental Kiosk concession)	$74,777	4	27	0.07
136	4	1300	93881 (JABA PK-WDHB Hamilton Beach Parking)	$23,765	4	27	0.158
137	3	4100	84057 (SAHO NDB 143 Gas Station/N.Maintenance)	$43,908	4	13	0
138	4	7300	27860 (STIS FWHF151 Battery Weed)	$1,430,341,183	5	93	0.003
139	3	6100	106631 (JABA D-WD East Pond Levee)	$745,068	5	92	0.385
140	3	6300	21616 (SAHO NDHS Officer Row Seawall)	$4,291,360	5	92	0.251
141	3	4100	28144 (SAHO NDHBP305FtHancockDispensary(MAST))	$709,851	5	82	0.004
142	3	4100	21592 (SAHO NDHB124 Storage)	$1,126,363	5	82	0.159
143	3	4100	21594 (SAHO NDHB125 Storage)	$3,227,385	5	82	0.994
144	2	4100	28505 (JABA BU-BPRP-C605 Clock Stand Bay 6)	$76,732	5	78	0.241
145	3	2100	110060 (JABA TR-WD Greenway Bicyle Path (Crossbay))	$2,941,911	5	77	0
146	3	2100	110061 (JABA TR-BPRP Greenway Bicyle Path (Beach Channel Drive))	$1,877,816	5	77	0.12
147	3	6100	115323 (STIS - Hoffman Seawall 1873)	$5,346,248	5	75	0
148	4	1300	77577 (JABA PK-NSPB Parking Lot)	$762,948	5	71	0.298
149	4	6300	46597 (JABA D-BPFT-P Riis Landing Docks)	$4,005,754	5	70	0
150	4	4100	42836 (JABA BU-NSCP- Canarsie Pier Restaurant)	$2,334,773	5	65	0.596
151	4	6300	97376 (JABA AS-NSFB-H Seaplane Ramp Coast Guard Air Station)	$1,658,310	5	63	0
152	4	4100	45635 (JABA BU-BPFT-221 Coast Guard Boat House)	$805,025	5	63	0.424
153	4	4100	45681 (JABA BU-BPRP JRP/Bay 5 Storage Bldg.)	$215,632	5	59	0
154	4	4100	45650 (JABA BU-BPRL-203 Ground Storage Bldg)	$93,440	5	59	0.303
155	5	4100	35957 (JABA BU-BPFT-H-411 Battery Harris - Bombshell Magazine)	$460,014	5	58	0
156	5	4100	35961 (JABA BU-BPFT-H-511 Mine Casemate & Plotting Room)	$718,772	5	58	0
157	3	6300	112713 (D-BP-P RPYC Rockaway Point Yacht Club Dock)	$336,759	5	57	0
158	3	1300	112715 (PK-BP-P RPYC Rockaway Point Yacht Club Parking Lot)	$114,871	5	57	0

Table C27. (continued). GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
159	3	4100	112166 (BU-BPSG-P SGBC Pool Pump Bldg-2 NEC1774-5300-B002-03)	$55,748	5	57	0
160	3	4100	115631 (BPSG-P Restroom Building)	$704,334	5	57	0.035
161	3	4100	115632 (BU-BPSG-P Outdoor Bar)	$62,722	5	57	0
162	3	4100	112048 (BU-BPSC-P A- 2 Bar NEC17745300-B001-03)	$7,366,910	5	57	0.028
163	3	4100	112049 (BU-BPSC-P A- 3 Restaurant NEC17745300-B001-03)	$16,025,419	5	57	0.035
164	3	4100	112070 (BU-BPSC-P C-1 Cabana Complex NEC17745300-B001-03)	$3,121,869	5	57	0.041
165	3	4100	112071 (BU-BPSC-P C-2 Cabana Complex NEC17745300-B001-03)	$3,468,744	5	57	0.044
166	3	4100	112072 (BU-BPSC-P C-3 Cabana Complex NEC17745300-B001-03)	$1,214,060	5	57	0.053
167	3	4100	112075 (BU-BPSC-P C-4 Cabana Complex NEC17745300-B001-03)	$3,121,869	5	57	0.048
168	3	4100	112076 (BU-BPSC-P C-5 Cabana Complex NEC17745300-B001-03)	$3,121,869	5	57	0.004
169	3	4100	112077 (BU-BPSC-P C-6 Cabana Complex NEC17745300-B001-03)	$3,121,869	5	57	0.003
170	3	4100	112078 (BU-BPSC-P C-7 Cabana Complex NEC17745300-B001-03)	$3,121,869	5	57	0.003
171	3	4100	112079 (BU-BPSC-P C-8 Cabana Complex NEC17745300-B001-03)	$3,121,869	5	57	0.003
172	3	4100	112080 (BU-BPSC-P C-9 Cabana Complex NEC17745300-B001-03)	$3,468,744	5	57	0.004
173	3	4100	112081 (BU-BPSC-P C-10 Cabana Complex NEC17745300-B001-03)	$2,428,120	5	57	0.022
174	3	4100	112082 (BU-BPSC-P C-11 Cabana Complex NEC17745300-B001-03)	$1,560,934	5	57	0.047
175	3	4100	112083 (BU-BPSC-P C-12 Cabana Complex NEC17745300-B001-03)	$1,040,623	5	57	0.039
176	3	4100	112084 (BU-BPSC-P C-13 Cabana Complex NEC17745300-B001-03)	$2,081,245	5	57	0.022
177	3	4100	112085 (BU-BPSC-P C-14 Cabana Complex NEC17745300-B001-03)	$1,040,623	5	57	0.04
178	3	4100	112086 (BU-BPSC-P C-15 Cabana Complex NEC17745300-B001-03)	$1,560,934	5	57	0.004
179	3	4100	112087 (BU-BPSC-P C-16 Cabana Complex NEC17745300-B001-03)	$2,428,120	5	57	0.003
180	3	4100	112088 (BU-BPSC-P C-17 Cabana Complex NEC17745300-B001-03)	$2,774,994	5	57	0.003
181	3	4100	112089 (BU-BPSC-P C-18 Cabana Complex NEC17745300-B001-03)	$2,774,994	5	57	0.003
182	3	4100	112090 (BU-BPSC-P C-19 Cabana Complex NEC17745300-B001-03)	$2,428,120	5	57	0.003
183	3	4100	112091 (BU-BPSC-P C-20 Cabana Complex NEC17745300-B001-03)	$2,081,245	5	57	0.003
184	3	4100	112092 (BU-BPSC-P C-21 Cabana Complex NEC17745300-B001-03)	$2,081,245	5	57	0.003
185	3	4100	112093 (BU-BPSC-P C-22 Cabana Complex NEC17745300-B001-03)	$2,774,994	5	57	0.003
186	3	4100	112094 (BU-BPSC-P C-23 Cabana Complex NEC17745300-B001-03)	$2,081,245	5	57	0.003
187	3	4100	112096 (BU-BPSC-P C-24 Cabana Complex NEC17745300-B001-03)	$2,774,994	5	57	0.003
188	3	4100	112102 (BU-BPSC-P RR-3 Restrooms NEC17745300-B001-03)	$233,281	5	57	0.068
189	3	4100	112104 (BU-BPSC-P RR-5 Restrooms NEC17745300-B001-03)	$2,430,006	5	57	0.005
190	3	4100	112105 (BU-BPSC-P RR-6 Restrooms NEC17745300-B001-03)	$1,458,003	5	57	0.01
191	3	4100	112106 (BU-BPSC-P RR-7 Restrooms NEC17745300-B001-03)	$1,458,003	5	57	0.011
192	3	4100	112107 (BU-BPSC-P RR-8 Restrooms NEC17745300-B001-03)	$1,360,803	5	57	0.007
193	3	4100	112108 (BU-BPSC-P RR-9 Restrooms NEC17745300-B001-03)	$466,561	5	57	0.036
194	3	4100	112109 (BU-BPSC-P G-1 Entrance Bldg NEC17745300-B001-03)	$73,095	5	57	0.046
195	3	1300	112112 (PK-BPSC-P Paved Parking Lot NEC17745300-B001-03)	$5,533,754	5	57	0
196	3	1300	112115 (PK-BPSC-P Unpaved Parking Lot NEC17745300-B001-03)	$822,660	5	57	0
197	3	1100	112117 (RD-BPSC-P Paved Road NEC17745300-B001-03)	$3,254,881	5	57	0.022
198	3	4100	112122 (BU-BPSC-P BC- 20 Bath Cabin Complex NEC17745300-B001-03)	$199,800	5	57	0

Table C27. (continued). GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
199	3	4100	112123 (BU-BPSC-P BC- 21 Bath Cabin Complex NEC17745300-B001-03)	$99,900	5	57	0
200	3	4100	115610 (BU-BPSC-P C-25 Cabana Complex)	$623,056	5	57	0.009
201	3	4100	115611 (BU-BPSC-P C-26 Cabana Complex)	$489,214	5	57	0.092
202	3	4100	115613 (BU-BPSC-P C-27 Cabana Complex)	$640,363	5	57	0.007
203	3	4100	115615 (BU-BPSC-P C-28 Cabana Complex)	$640,363	5	57	0.009
204	3	4100	115616 (BU-BPSC-P C-29 Cabana Complex)	$465,273	5	57	0.012
205	3	4100	115617 (BU-BPSC-P C-30 Cabana Complex)	$445,081	5	57	0.013
206	3	4100	115618 (BU-BPSC-P C-31 Cabana Complex)	$527,578	5	57	0.01
207	3	4100	115619 (BU-BPSC-P C-32 Cabana Complex)	$454,023	5	57	0.013
208	3	4100	115620 (BU-BPSC-P C-33 Cabana Complex)	$620,171	5	57	0.029
209	3	4100	115621 (BU-BPSC-P W-1 Pool Building)	$244,230	5	57	0.089
210	3	4100	115622 (BU-BPSC-P BC- 20 Rear Guard Shack at ocean access entry)	$14,811	5	57	0
211	4	6300	116081 (STIS GK Marina-C Docks)	$14,316,480	5	57	0
212	3	4100	112165 (BU-BPSG-P SGBC Pool Pump Bldg-1 NEC1774-5300-B002-03)	$41,811	5	57	0.144
213	3	4100	112066 (BU-BPSC-P BC- 17 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.135
214	3	4100	112068 (BU-BPSC-P BC- 19 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.13
215	3	4100	112097 (BU-BPSC-P E-1 Storage Bldg NEC17745300-B001-03)	$2,872,762	5	57	0.134
216	3	4100	112100 (BU-BPSC-P RR-1 Restrooms NEC17745300-B001-03)	$291,601	5	57	0.123
217	3	4100	112103 (BU-BPSC-P RR-4 Restrooms NEC17745300-B001-03)	$155,520	5	57	0.148
218	3	4100	112152 (BU-BPSG-P SGBC Play Area Shelter NEC1774-5300-B002-03)	$283,893	5	57	0.246
219	3	4100	112153 (BU-BPSG-P SGBC Cabana A Complex NEC1774-5300-B002-03)	$2,774,994	5	57	0.326
220	3	4100	112154 (BU-BPSG-P SGBC Cabana B Complex NEC1774-5300-B002-03)	$5,549,989	5	57	0.252
221	3	4100	112155 (BU-BPSG-P SGBC Cabana 3-C Complex NEC1774-5300-B002-03)	$6,937,486	5	57	0.369
222	3	4100	112156 (BU-BPSG-P SGBC Cabana 4-C Complex NEC1774-5300-B002-03)	$5,549,989	5	57	0.218
223	3	4100	112157 (BU-BPSG-P SGBC Cabana 5-D Complex NEC1774-5300-B002-03)	$1,387,497	5	57	0.491
224	3	4100	112158 (BU-BPSG-P SGBC Cabana 6-D Complex NEC1774-5300-B002-03)	$2,774,994	5	57	0.25
225	3	4100	112159 (BU-BPSG-P SGBC Cabana 7-D Complex NEC1774-5300-B002-03)	$2,428,120	5	57	0.24
226	3	4100	112160 (BU-BPSG-P SGBC Cabana 8-D Complex NEC1774-5300-B002-03)	$2,774,994	5	57	0.291
227	3	4100	112161 (BU-BPSG-P SGBC Cabana 9-D Complex NEC1774-5300-B002-03)	$4,162,492	5	57	0.231
228	3	4100	112167 (BU-BPSG-P SGBC Pool Pump Bldg-3 NEC1774-5300-B002-03)	$33,449	5	57	0.212
229	3	4100	115631 (BU-BPSG-P Lifeguard Shack)	$42,314	5	57	0.26
230	3	4100	112050 (BU-BPSC-P BC- 1 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.187
231	3	4100	112051 (BU-BPSC-P BC- 2 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.282

Table C27. (continued). GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
232	3	4100	112052 (BU-BPSC-P BC- 3 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.178
233	3	4100	112053 (BU-BPSC-P BC- 4 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.219
234	3	4100	112054 (BU-BPSC-P BC- 5 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.28
235	3	4100	112055 (BU-BPSC-P BC- 6 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.244
236	3	4100	112056 (BU-BPSC-P BC- 7 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.233
237	3	4100	112057 (BU-BPSC-P BC- 8 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.218
238	3	4100	112058 (BU-BPSC-P BC- 9 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.319
239	3	4100	112059 (BU-BPSC-P BC- 10 Bath Cabin Complex NEC17745300-B001-031-03)	$44,400	5	57	0.287
240	3	4100	112060 (BU-BPSC-P BC- 11 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.241
241	3	4100	112061 (BU-BPSC-P BC- 12 Bath Cabin Complex NEC17745300-B001-03)	$44,400	5	57	0.182
242	3	4100	112063 (BU-BPSC-P BC- 14 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.226
243	3	4100	112064 (BU-BPSC-P BC- 15 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.158
244	3	4100	112065 (BU-BPSC-P BC- 16 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.176
245	3	4100	112101 (BU-BPSC-P RR-2 Restrooms NEC17745300-B001-03)	$186,624	5	57	0.228
246	3	4100	112110 (BU-BPSC-P M-1 Bird House NEC17745300-B001-03)	$174,960	5	57	0.192
247	3	4100	112111 (BU-BPSC-P W-1 Bayberry Room NEC17745300-B001-03)	$344,427	5	57	0.284
248	3	1100	112714 (RD-BP-P RPYC Rockaway Point Yacht Club Road)	$15,004	5	57	1.689
249	3	4100	112062 (BU-BPSC-P BC- 13 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.563
250	3	4100	112067 (BU-BPSC-P BC- 18 Bath Cabin Complex NEC17745300-B001-03)	$77,700	5	57	0.548
251	3	4100	82242 (SAHO NDHB45 Magazine Storage Building)	$383,387	5	55	0
252	3	1100	115322 (STIS RD-00_220 Swinburn Perimeter Road)	$1,566,740	5	55	0
253	3	4100	115330 (STIS Ward Building C)	$275,226	5	55	0
254	3	4100	115332 (STIS Ward Building B)	$275,226	5	55	0
255	3	4100	115333 (STIS Incinerator Building D)	$317,569	5	55	0
256	3	4100	115334 (STIS Oil Tank Building E)	$25,406	5	55	0
257	3	1100	115327 (STIS RD-00_140 Hoffman Perimeter Road)	$1,321,937	5	55	0
258	5	1300	36105 (JABA PK-NSFB-C/Rt902 Gateway Marina Parking)	$4,233,066	5	55	0.066
259	3	6400	20406 (STIS MFHS326 Hanger apron)	$5,274,655	5	54	0
260	4	4100	45628 (JABA BU-BPRL-204 Plumbers Shop)	$836,076	5	53	0.426
261	3	7200	20407 (STIS MFHB46 Fire control tower)	$3,717,294	5	48	0
262	3	4100	45687 (BU-BPSG-P SGBC Restaurant NEC1774-5300-B002-03)	$7,918,380	5	47	0.033
263	3	4100	45688 (BU-BPSC-P A-1 Office NEC17745300-B001-03)	$431,417	5	47	0.244
264	5	4100	45684 (JABA BU-NSFB-C Gateway Marina Office)	$288,599	5	45	0.003
265	6	4100	88619 (JABA BU-NSFB-C Marina Restrooms)	$99,900	5	45	0.022

Table C27. (continued). GATE High Exposure Asset List.

ID	Level	Asset Code	Location (Description)	CRV	Optimiz Band	API	FCI
266	6	5400	88620 (JABA UT-NSFB-C Marina Utility Chamber)	$19,737	5	45	0
267	5	4100	82549 (JABA BU-NSFB-C Gateway Marina Store)	$119,330	5	45	0.044
268	6	4100	82551 (JABA BU-NSFB-C Marina Quanset Hut (Repair Shop))	$60,158	5	45	0.128
269	6	4100	82550 (JABA BU-NSFB-C Marina Gate House)	$9,900	5	45	0.404
270	4	4100	92453 (JABA BU-WDWR North Channel Bridge Parking WS Picnic Shelter)	$377,757	5	42	0.014
271	3	7200	22183 (STIS - FWHS171 Stone Jetty)	$97,630	5	41	0
272	4	4100	28507 (JABA BU-BPRP-602 Bay 13 Concession)	$76,732	5	30	0.399
273	3	2100	21214 (STIS MFR327 Shore Road , Historic (closed to Public))	$340,390	5	27	0
274	3	4100	102114 (JABA BU-NSFB-P NYPD Storage Bldg)	$55,748	5	19	0
275	3	4100	102116 (JABA BU-NSFB-P NYPD Boat House)	$134,896	5	19	0
276	4	4100	45617 (JABA BU-NSPB-301 Plumb Beach Visitor Center)	$859,812	5	19	0.298
277	4	4100	45629 (JABA BU-BPRL-215 Maintenance Storage)	$43,126	5	7	0
278	3	1300	112203 (PK-BPSG-P SGBC Unpaved Parking Lot NEC1774-5300-B002-03)	n/a	n/a	n/a	n/a
279	3	1300	112205 (PK-BPSG-P SGBC Paved Parking Lot NEC1774-5300-B002-03)	n/a	n/a	n/a	n/a
280	3	n/a	115654 (JABA UT-BPSG-P Pool & Pump System 3 (Day Camp Area))	n/a	n/a	n/a	n/a
281	3	4100	115656 (BU-BPSG-P Maintenance Office / Garage)	n/a	n/a	n/a	n/a
282	3	n/a	115657 (UT-BPSG-P Pool and Pump System 1 (Adult Pool))	n/a	n/a	n/a	n/a
283	3	n/a	115658 (UT-BPSG-P Pool and Pump System 2 (Kiddie Pool))	n/a	n/a	n/a	n/a
284	3	n/a	115676 (UT-BPSG-P Pool and Pump System 4 (Family Pool at PG))	n/a	n/a	n/a	n/a
285	3	n/a	238627 (JABA UT-BPSG-P Pool Filtering System)	n/a	n/a	n/a	n/a
286	5	n/a	225831 (JABA NSFB-C Gateway Marina Docks)	n/a	n/a	n/a	n/a
287	3	n/a	239403 (JABA D-WD West Pond Levee)	n/a	n/a	n/a	n/a
288	4	n/a	93887 (JABA PK-WDHB Hamilton Beach Parking Lot 2)	n/a	n/a	n/a	n/a
289	3	n/a	77499 (JABA Riis Landing Ferry Terminal)	n/a	n/a	n/a	n/a
290	4	n/a	105553 (JABA BK-BPRL Riis Landing Bulkhead)	n/a	n/a	n/a	n/a
291	4	n/a	238235 (JABA BK-BPRL Riis Landing Breakwater)	n/a	n/a	n/a	n/a
292	4	1300	238264 (JABA PL-BPRL Riis Landing Parking Lot 2)	n/a	n/a	n/a	n/a
293	3	n/a	21816 (SAHO North District Sandy Hook, Docks)	n/a	n/a	n/a	n/a
294	3	3100	28172 (SAHO NDT Picnic Area Lot K)	n/a	n/a	n/a	n/a
295	3	4100	19432 (SAHO CDS Flagpole Ranger Station)	n/a	n/a	n/a	n/a
296	3	n/a	19436 (SAHO CDS SEAWALL JETTY)	n/a	n/a	n/a	n/a
297	3	2100	82613 (SAHO CDBA Horseshoe Cove Beach/Trail)	n/a	n/a	n/a	n/a
298	3	n/a	115324 (STIS Swinburn Seawall 1873)	n/a	n/a	n/a	n/a
299	3	3100	20033 (STIS FW Battery Weed Complex)	n/a	n/a	n/a	n/a
300	3	n/a	115677 (UT-BPSC-P BC- 21 Pool and Pump System)	n/a	n/a	n/a	n/a
301	3	4100	115943 (SAHO NDB 631-Maintenance Garage & Warehouse Building)	n/a	n/a	n/a	n/a
302	3	2100	116724 (SAHO NDT Multi Use Path)	n/a	n/a	n/a	n/a

George Washington Birthplace National Monument (GEWA)

Table C28. Summary of Findings for GEWA.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	2	4	$4,984,022.67	13%
Limited Exposure	54	96%	$32,724,847.42	87%
TOTALS	**56**	**100%**	**$37,708,870**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) EAARL Topography - George Washington Birthplace National Monument
3) Hardaway CS and others. 2009. Status, Evolution, and Storm Vulnerability Assessments of the Shoreline at George Washington Birthplace National Monument. National Park Service, Northeast Region, Philadelphia, Pennsylvania. Published Report-2181176.

Process/methods for exposure determination
Used LiDAR and report about erosion and storm vulnerability (see data source above) to determine that the visitor center area has the most assets that should be considered high exposure to 1 m of SLR. Most of GEWA is over 3 m in elevation (above MHHW), although much of the shoreline is eroding. Many cultural resources not included in FMSS should be considered as high exposure.

GEWA Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

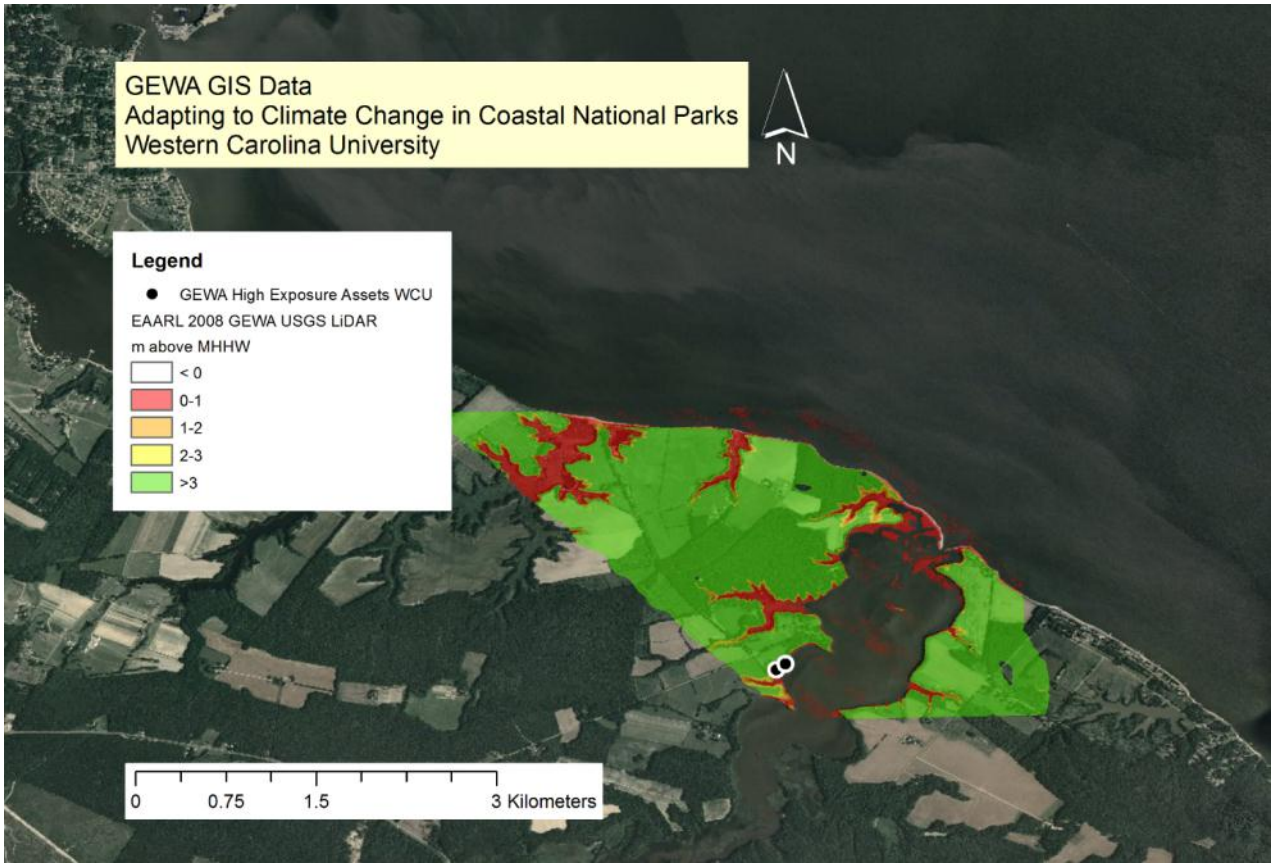

Figure C11. GEWA GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW, for GEWA used Colonial Beach, Potomac River, VA station: http://tidesandcurrents.noaa.gov/datums.html?id=8635150.

Table C29. Complete list of GIS Data utilized for GEWA.

Data Name	Data Source
EAARL Topography--George Washington Birthplace National Monument 2008	USGS: http://pubs.usgs.gov/ds/401/

Table C30. GEWA High Exposure Asset List

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	59355 (Visitor Center Building)	$3,866,834.98	1	88	0.03
2	1300	59356 (Visitor Center Access Road / Parking - Rt 10)	$1,117,187.69	3	88	0.18

Governors Island National Monument (GOIS)

Table C31. Summary of Findings for GOIS.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	11	34%	$71,223,382	46%
Limited Exposure	21	66%	$82,260,713	54%
TOTALS	**32**	**100%**	**$153,484,095**	**100%**

Park visit
N/A

Park contacts
Eddie Lorenzini

Primary data utilized
NY City LiDAR, 2010

Process/methods for exposure determination
Used LiDAR and maps to determine that GOIS assets near the outer edges of the island should be considered high exposure to 1 m of SLR. Park reviewed assets March 2014 and the current list reflects that review.

GOIS Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

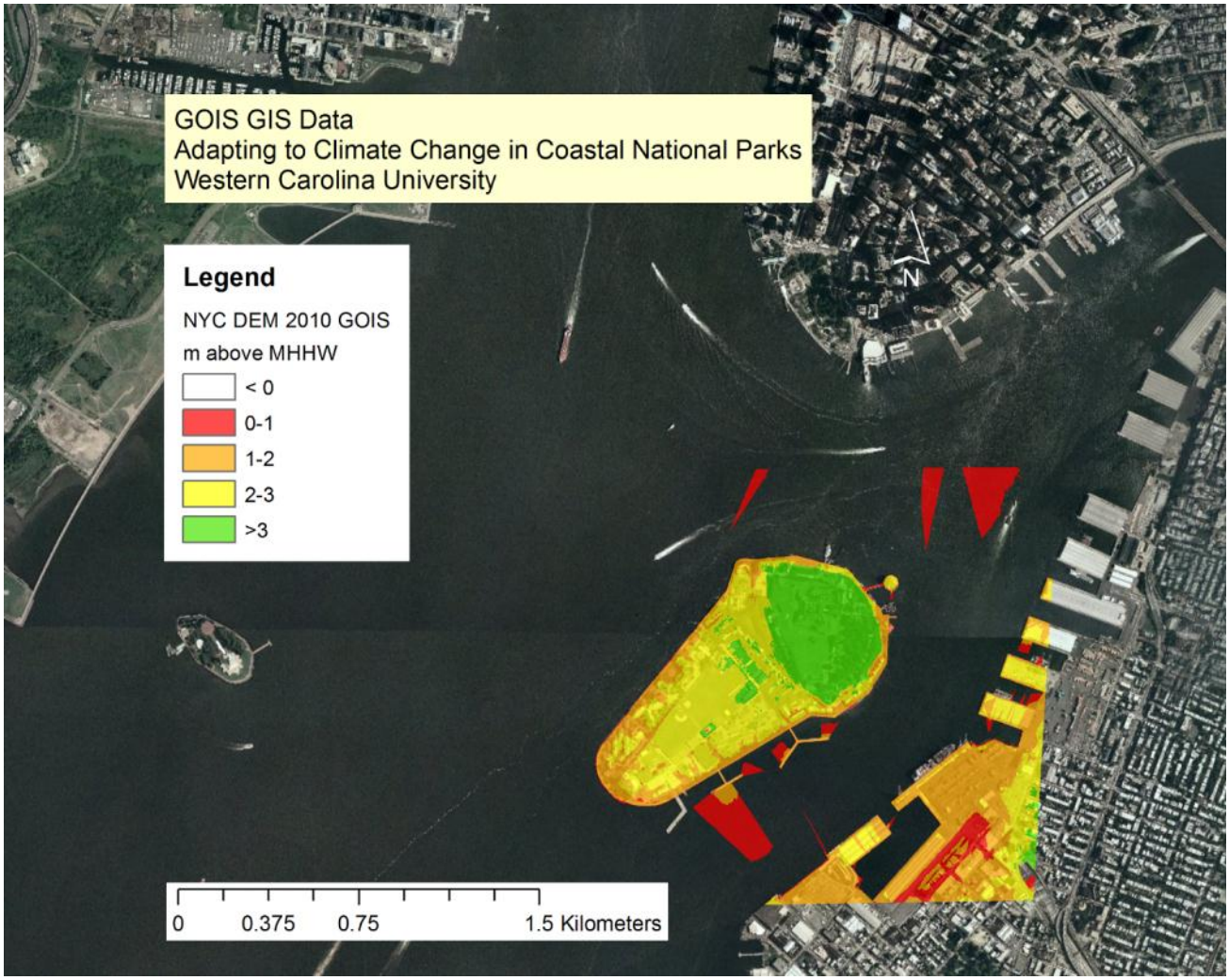

Figure C12. GOIS GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW, for GOIS used Battery Park, NY station: http://tidesandcurrents.noaa.gov/datums.html?id=8518750.

Table C32. Complete list of GIS Data utilized for GOIS.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
NYC 2010 LiDAR 3-foot Digital Elevation Model	GIS Staff, GATE

Table C33. GOIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	70163 (Building 140 - Visitor Contact Station)	$7,288,787	1	100	0
2	7300	70154 (Building 501 - Castle Williams)	$41,190,697	1	100	0.34
3	6300	70165 (Governors Island Pier Area, Docks)	$979,277	2	88	0
5	1100	70170 (Hay Road)	$1,831,332	4	80	0
6	1100	70168 (Kimball Road)	$406,963	4	80	0
7	1100	70166 (Tampa Road)	$1,017,407	4	80	0
4	1300	70173 (GOIS Parking Area 504)	$843,966	4	7	0
8	4100	70164 (Building S251 - Library)	$3,963,432	5	7	0
9	4100	70158 (Building 513B)	$6,021,371	5	7	0
10	4100	70156 (Building 513A)	$6,021,371	5	7	0
11	4100	70145 (Building 513D)	$1,658,780	5	7	0

New Bedford Whaling National Historical Park (NEBE)

Table C34. Summary of Findings for NEBE.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	5	25%	n/a	n/a
Limited Exposure	15	75%	n/a	n/a
TOTALS	**20**	**100%**	**n/a**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2006 Bristol Co. Mass. LiDAR

Process/methods for exposure determination
Used the location hierarchy report and the "areas" listed in report to group assets into high exposure and limited exposure. In the case of NEBE, anything east of the highway (JFK), including the dock areas was considered high exposure.
*Most of the assets listed in the location hierarchy report did not have a CRV listed (e.g., Wharfinger Building, Bourne Counting House, Waterfront Park, SW Corner State Pier) therefore the CRV values are not reported above.

NEBE Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

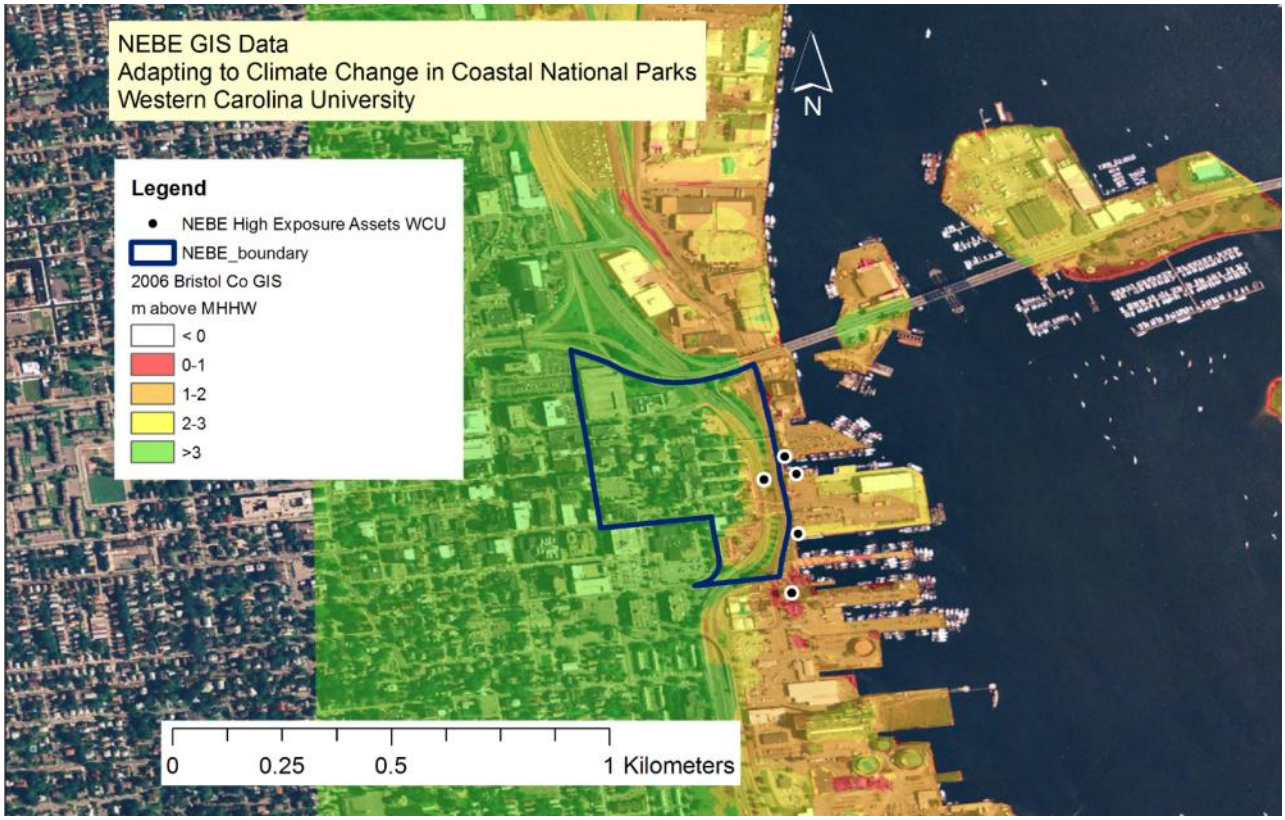

Figure C13. GIS Map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW, for NEBE used Woods Hole, MA station: http://tidesandcurrents.noaa.gov/gmap3/index.shtml?type=TidePredictions&region= .

Table C35. Complete list of GIS Data utilized for NEBE.

Data Name	Data Source
2006 Bristol Co. Mass LiDAR	Office of Geographic Information (MassGIS): http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/

Table C36. NEBE High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	73453 (Wharfinger Building)	n/a	n/a	n/a	n/a
2	4100	73464 (Bourne Counting House)	n/a	n/a	n/a	n/a
3	3100	73468 (Waterfront Park)	n/a	n/a	n/a	n/a
4	6300	73482 (SW Corner State Pier)	n/a	n/a	n/a	n/a
5	1100	73486 (Route 18)	n/a	n/a	n/a	n/a

Sagamore Hill National Historic Site (SAHI)

Table C37. Summary of Findings for SAHI.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	1	2%	$1,122,038	3%
Limited Exposure	42	98%	$40,665,707	97%
TOTALS	**43**	**100%**	**$41,787,745**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) NY Coastal LiDAR 2011-2012

Process/methods for exposure determination
Completed analysis using location hierarchy report, maps and LiDAR elevations. Determined that only one asset, located in a low elevation zone (below 1 m relative to MHHW) should be designated as high exposure. Received final park review March 2014.

SAHI Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

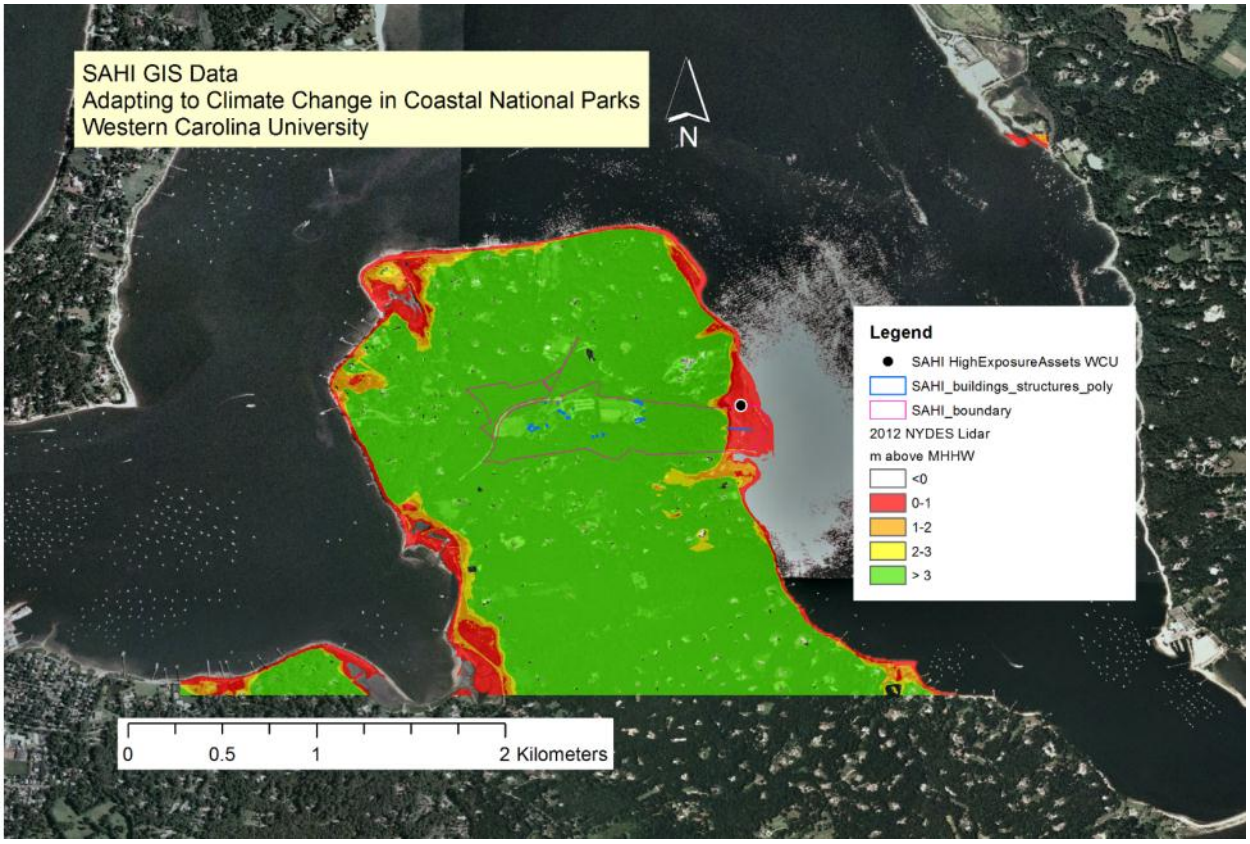

Figure C14. SAHI GIS Map of park boundary and high-exposure assets.NOAA tides and currents website was used to calculate MHHW, for SAHI used Glen Cove Yacht Club, Long Island, New York station: http://tidesandcurrents.noaa.gov/gmap3/index.shtml?type=TidePredictions&region= .

Table C38. Complete list of GIS Data utilized for SAHI.

Data Name	Data Source
2011 - 2012 New York State Department of Environmental Conservation (NYSDEC) Lidar: Coastal New York (Long Island and along the Hudson River)	NOAA: http://www.csc.noaa.gov/dataviewer/#
NYC 2010 LiDAR 3-foot Digital Elevation Model	GATE GIS Staff
Sagamore Hill NHS Buildings and Structures	IRMA, NPS: https://irma.nps.gov/App/
Sagamore Hill NHS Small Scale Features (Polygons)	

Table C39. SAHI High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	2200	47496 (TR- Eel Creek Boardwalk)	$1,122,038	3	73	0.21

Salem Maritime National Historic Site (SAMA)

Table C40. Summary of Findings for SAMA.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	27	92%	$30,948,717	74%
Limited Exposure	5	8%	$10,692,983	26%
TOTALS	**32**	**100%**	**$41,641,700**	**100%**

Park visit
N/A

Park contacts
Tim Thornhill

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2010 USACE LiDAR NE

Process/methods for exposure determination
Analysis was completed using location hierarchy report, maps and LiDAR elevations. Most of assets are within 100 m of Salem Sound and low in elevation. Received final park review March 2014.

SAMA Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

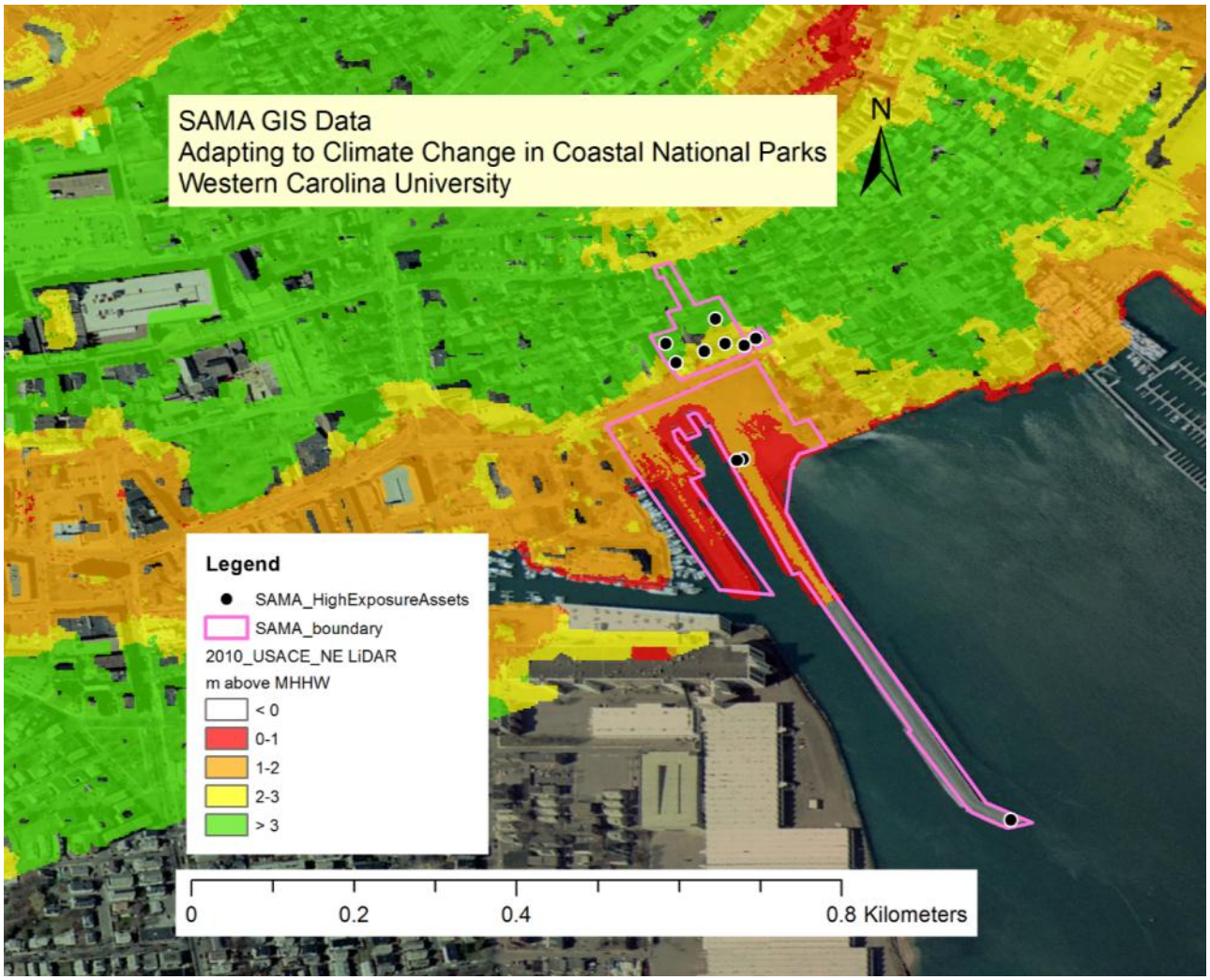

Figure C15. SAMA GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW, for SAMA used Boston, MA station: http://tidesandcurrents.noaa.gov/gmap3/index.shtml?type=TidePredictions&region= .

Table C41. Complete list of GIS Data utilized for SAMA.

Data Name	Data Source
SAMA Boundary	IRMA, NPS: https://irma.nps.gov/App/
2010 USACE JALBTCX Lidar: Northeast (Topo)	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table C42. SAMA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API
1	4100	65343 (Custom House)	$4,742,285	1	100
2	4100	65365 (Derby House)	$4,436,841	2	100
3	4100	65349 (Hawkes House)	$2,252,378	3	100
4	4100	65350 (Public Stores)	$4,751,055	3	100
5	4100	66479 (Central Wharf Warehouse)	$1,604,923	3	100
6	3100	65371 (HatchsWharf Grounds)	$49,923	3	100
7	3100	66485 (Central Wharf Grounds)	$82,750	3	100
8	3100	65413 (Derby Wharf Grounds)	$448,753	3	100
9	4100	116212 (Rigging Shed)	$399,120	3	93
10	4100	65376 (Light House)	$356,207	3	92
11	4100	65367 (St. Joseph Hall)	$6,013,036	3	90
12	2100	65347 (Salem Maritme NHS Trails)	$1,517,744	3	71
13	6300	66483 (Salem Wharf Area, Dock, Launch)	$296,691	3	70
14	4100	65342 (West India Goods Store)	$646,660	4	100
15	4100	65368 (Scale House)	$505,937	4	100
16	6300	65406 (Derby Wharf, Launch)	$49,470	4	80
17	3100	65416 (Derby Wharf Beach)	$101,078	4	72
18	2100	65418 (Hatchs Trail)	$37,527	4	64
19	4100	66488 (Satellite Maintenance Facitily)	$258,993	4	56
20	4100	66480 (Rest-Room/Shower Facility)	$1,022,877	4	42
21	2100	65423 (Salem Historic Brick Trail)	$432,201	4	40
22	5400	66482 (Central Wharf Electric System)	$127,658	4	27
23	5100	66481 (Central Wharf Water Supply System)	$200,585	4	27
24	2100	65378 (Derby Wharf Trail)	$231,798	5	80
25	7500	233292 (Saint Joseph Hall Storefront Exhibit)	$62,582	n/a	n/a
26	7500	233324 (Shipbuiding Exhibit)	$247,308	n/a	n/a
27	7500	233326 (World Trade Exhibit)	$72,337	n/a	n/a

Statue of Liberty National Monument (STLI)

Table C43. Summary of Findings for STLI.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	104	100%	$1,512,459,244	100%
Limited Exposure	0	0	0	0
TOTALS	**104**	**100%**	**$1,512,459,244**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
NY City Lidar, 2010

Process/methods for exposure determination
Used LiDAR to and maps to determine that all assets at STLI were high exposure to SLR. Unit assets are located on low elevation islands.

STLI Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

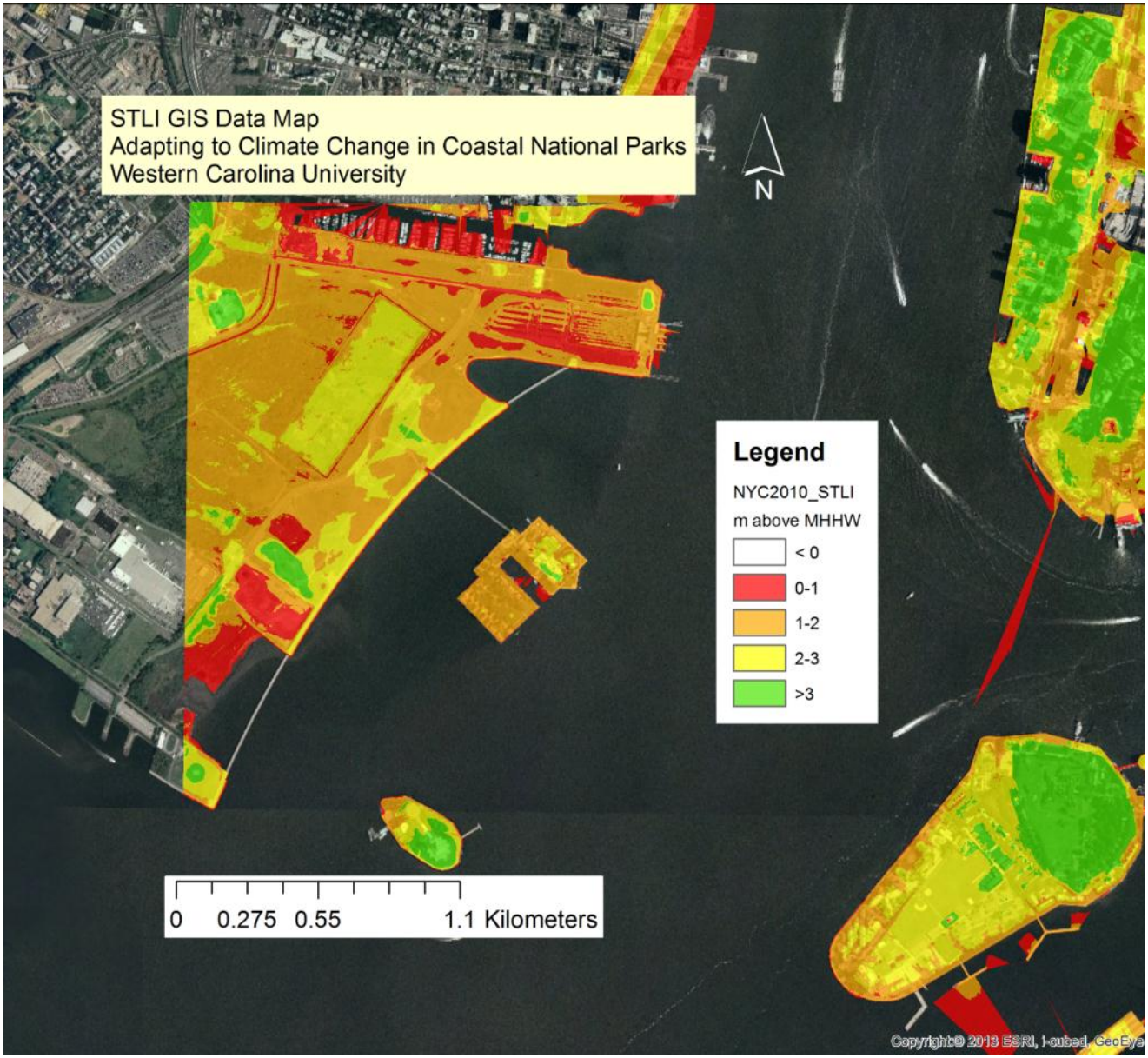

Figure C16. STLI GIS map of park boundary and high-exposure assets.

Table C44. Complete list of GIS Data utilized for STLI.

Data Name	Data Source
NYC 2010 LiDAR 3-foot Digital Elevation Model	GIS Staff, GATE

Table C45. STLI High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	3100	59958 (Island One (13.60 AC))	$19,501,565	0	100	0
2	3100	59965 (Island Two (7.00 AC))	$6,264,338	0	100	0
3	3100	59966 (Island Three (6.90 AC))	$8,166,085	0	100	0.02
4	5700	109785 (Diesel Fuel Oil Distribution Utility Liberty Island)	$1,217,101	0	92	0.04
5	4100	59917 (Administrative Building #37 HS-65)	$5,630,734	0	90	0.09
6	4100	60011 (Main Building (Three Story and Basement) HS-01)	$389,738,562	1	100	0.02
7	4100	59908 (Statue of Liberty STLI-01 (70,000 CF))	$104,869,515	1	100	0.02
8	4100	59909 (Pedestal STLI-01 (23,817 SF))	$35,681,103	1	100	0.03
9	4100	59910 (Fort Wood HS-67 (47,634 SF))	$71,362,207	1	100	0.03
10	4100	60061 (Kitchen and Laundry Building HS-04)	$25,468,311	1	100	0.08
11	3100	59913 (Statue Plaza and Mall Area)	$2,233,742	1	100	0.2
12	6300	108983 (Ferry Slip)	$3,149,152	1	100	0.68
13	4100	60025 (Bakery and Carpentry Building (Two Story) HS-10)	$6,421,457	1	92	0.04
14	4100	59976 (Main Power House (Two Story) HS-05)	$9,619,170	1	92	0.1
15	4100	60099 (Ferry BuildingHS-14)	$13,670,490	1	92	0.17
16	2100	60109 (Walkways Ellis Island)	$1,469,161	1	90	0.24
17	2100	60094 (Walkways Liberty Island)	$6,267,379	1	90	0.28
18	6300	93808 (Bulkhead And Pier For Docking At Ellis Island)	$1,105,560	1	88	0
19	4100	60021 (Refrigerating Plant (Ice House) HS-53)	$5,630,734	1	85	0.02
20	5400	92125 (Secondary Power Generation Liberty 4160v)	$2,564,562	1	80	0
21	4100	61138 (Liberty State Park Screening Site Tent)	$1,174,539	1	55	0
22	4100	61140 (Liberty Island Screening Tent)	$1,174,539	1	55	0.03
23	4100	61137 (Battery Park Screening Site Tent)	$3,745,340	1	55	0.09
24	5700	60113 (#2 Diesel Fuel Oil Distribution and related Equipment Ellis)	$585,347	1	53	0
25	6300	92345 (Granite Seawall LibertyIsland (3154 LF))	$37,613,580	2	93	0.42
26	6300	74364 (Granite Seawall HS-44 (6,362 LF) Ellis)	$76,822,888	2	93	0.55
27	4100	74013 (Laundry Building HS-17 (Hospital Out Building))	$4,504,587	2	83	0.54
28	4100	59926 (STLI002 Concession Building #38 HS-66)	$8,313,683	2	82	0.11
29	4100	102416 (Fuel Oil Pump and Fuel Filtration Shed Ellis)	$43,727	2	80	0
30	7300	60042 (Fort Gibson Stabilized Ruins HS-56)	$47,806,026	2	80	0
31	3100	59915 (LIIS Arrival Gate Area)	$3,937,841	2	80	0.02
32	5100	74377 (Water Tower HS-57)	$9,546,630	2	61	0
33	4100	74011 (Passageways HS-16 (8A, 8B, &, 8C))	$8,446,101	2	55	0
34	6300	60107 (Island One Main Pass Arrival Bulkhead)	$2,016,336	2	53	0
35	6300	74375 (Ellis Island Fuel Dock Southeast Ellis)	$1,528,015	2	52	0
36	4100	102413 (Oil Fueling Shed Ellis)	$43,727	2	50	0
37	1300	60106 (Unpaved Overflow Parking Lot)	$696,802	2	30	0
38	4100	64077 (OFFICE TRAILER - MARINE UNIT)	$187,691	2	20	0
39	4100	64078 (OFFICE TRAILER - K-9 UNIT)	$187,691	2	20	0

Table C45 (continued). STLI High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	4100	64079 (USPP Trailer)	$187,691	2	20	0
41	4100	61204 (MIO GUARD SHACK)	$70,384	2	20	0
42	4100	61203 (POST FOUR GUARD SHACK)	$7,038	2	20	0.03
43	6300	59927 (Liberty Island (Main Pass Pier), Dock South)	$4,863,418	3	90	5.27
44	4100	73985 (Recreation Hall HS-22)	$7,507,645	3	75	2.16
45	1700	60103 (Ellis IslandSteel Bridge (+/- 1,700 LF))	$51,438,118	3	70	0.06
46	4100	59918 (Maintenance Building #39)	$1,253,713	3	70	0.19
47	4100	73980 (Passage (Covered Ways 7A & 7B) HS-13)	$2,815,367	3	68	0.14
48	4100	73979 (Covered Way 5 (C-5) HS-12-5)	$1,407,683	3	68	0.33
49	2100	74372 (1903 Path Layout HS-51)	$326,480	3	63	0.04
50	4100	74007 (STLI003 Aramark Concession Kiosk)	$290,717	3	32	0.02
51	2100	74373 (1937 Path Layout HS-52)	$326,480	3	31	0.04
52	1300	60105 (Unpaved Parking Lot)	$471,793	3	30	0
53	4300	59923 (Quarters #44A One Story Shared Unit Attached)	$299,149	3	30	0.29
54	4300	59921 (Quarters #43A Two Story Unit Attached)	$370,433	3	30	1.11
55	4300	59925 (Quarters #44C One Story Shared Unit Attached)	$299,149	3	30	1.57
56	4100	60098 (Maintenance Shed Ellis steel structure 60'x30')	$660,493	3	29	0
57	4100	59919 (Incinerator Building #40)	$489,254	3	23	0.2
58	4100	60110 (Covered Ways HS-12-1 Corridor 1 (C-1))	$2,815,367	4	92	0.35
59	4100	73983 (Administration Building HS-20)	$28,904,433	4	79	0.24
60	4100	73981 (Psychopathic Ward HS-18)	$3,847,668	4	72	0.52
61	4100	73984 (Hospital Building 2 HS-21)	$28,904,433	4	72	0.57
62	4100	73982 (Hospital Building 1 HS-19)	$28,904,433	4	72	0.6
63	4100	74004 (Isolation Wards 31/32 (K) HS-40)	$6,306,422	4	72	1.27
64	4100	74005 (Staff House HS-41)	$4,551,510	4	72	1.48
65	4100	60057 (Shelter Oil Storage Building HS-07)	$819,500	4	68	0.12
66	4100	73978 (Covered Ways Extension HS-12-4 A)	$1,407,683	4	68	0.22
67	2100	74380 (Walkways & Concrete Apron Remnants HS-60)	$195,888	4	61	0.12
68	2100	74402 (Quadrangle Walkways HS-64)	$195,888	4	58	0.12
69	4100	4374 (Connecting Wing (Covered Way 6) HS-02)	$938,456	4	55	0.22
70	4100	73988 (Animal House HS-25 (Mortuary))	$844,610	4	55	0.41
71	4100	73987 (PowerHouse HS-24 (& Laundry Building))	$11,073,776	4	55	0.43
72	4100	74015 (Passageway HS-27 (Corridors 9A, 9B, 9D &,9E))	$16,892,201	4	55	0.72
73	4100	73999 (Contagious Disease Wards 23/24 (F/J) HS-36)	$5,855,963	4	55	0.72
74	4100	73989 (Laboratory HS-26 (Office))	$2,364,908	4	55	0.87
75	4100	73992 (Contagious Disease Wards 13/14 (E) HS-29)	$5,855,963	4	55	1
76	4100	73994 (Contagious Disease Wards 17/18 (A) HS-31)	$5,855,963	4	55	1
77	4100	73997 (Contagious Disease Wards 19/20 (B) HS-34)	$5,855,963	4	55	1
78	4100	73990 (Contagious Disease Wards 11/12 (G) HS-28)	$5,677,656	4	55	1.03
79	4100	73993 (Contagious Disease Wards 15/16 (C) HS-30)	$5,677,656	4	55	1.03

Table C45 (continued). STLI High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
80	4100	73998 (Contagious Disease Wards 21/22 (D) HS-35)	$5,677,656	4	55	1.03
81	4100	74001 (Contagious Disease Wards 25/26 (H) HS-37)	$5,677,656	4	55	1.03
82	4100	73995 (NursesQuarters HS-32 (Administration Building))	$12,575,305	4	55	1.03
83	4100	74002 (Isolation Wards 27/28 (I) HS-38)	$6,306,422	4	55	1.27
84	4100	74003 (Isolation Wards 29/30 (L) HS-39)	$6,306,422	4	55	1.27
85	4100	73986 (Recreation Shelter HS-23)	$209,285	4	55	1.44
86	4100	73996 (Kitchen Building HS-33)	$938,456	4	55	2.16
87	4100	60027 (Baggage and Dormitory Building (Three Story) HS-03)	$254,982,734	5	72	0.46
88	4100	73977 (Covered Ways 4 HS-12-4 (C-4))	$1,407,683	5	68	1.11
89	4100	100235 (STLI 002 Concession Kisok)	$11,731	5	59	0.59
90	7100	60039 (Wall of Honor (Names) (2,500 LF))	$19,448,891	5	55	0
91	7100	60041 (Wall of Honor Extension (Names) (500 LF))	$3,894,442	5	55	0
92	4100	73976 (Covered Ways HS-12-3 Covered Way 3 (C-3))	$2,815,367	5	55	0.2
93	4100	60100 (Immigrant BuildingHS-15)	$13,607,606	5	55	0.76
94	4100	73974 (Covered Ways HS-12-2 Corridor 2 (C-2))	$1,407,683	5	55	3.49
95	5700	74381 (Oil Pipe Trench HS-61 (500 LF))	$45,474	5	51	0
96	4100	93810 (STLI Ticket Kiosk At Castle Clinton NM)	$267,460	5	47	0.06
97	3800	74365 (Bluestone Curb/Retaining Wall HS-45 (400 LF))	$65,588	5	41	0
98	5100	74386 (Fire Hydrants HS-63)	$47,864	5	32	0
99	4100	74008 (STLI002 Hills Concession Kiosk)	$258,634	5	32	0.02
100	3800	74383 (Chain-Link Fences HS-62 (300 LF))	$17,490	5	23	0
101	7100	74378 (Concrete Flag Pole Base HS-58)	$134,090	5	22	0
102	4300	59924 (Quarters #44B One Story Shared Unit Attached)	$299,149	5	20	0.19
103	4300	59920 (Quarters #42 Two Story Unit)	$501,698	5	20	0.3
104	4300	59922 (Quarters #43B Two Story Unit Attached)	$317,094	5	20	1.3

Appendix D: Southeast Region Results

Figure D1. An aerial photo of Long Point campground along Core Banks in Cape Lookout National Seashore after Hurricane Irene in 2011.

Big Cypress National Preserve (BICY)

Table D1. Summary of Findings for BICY.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	210	83%	$414,159,499	40%
Limited Exposure	44	17%	$614,321,584	60%
TOTALS	**254**	**100%**	**$1,030,477,750**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
NPS FMSS location hierarchy report and maps

Process/methods for exposure determination
Discussion with NPS yielded results that all SER parks, with the exception of a few, should have all assets listed as high exposure due to the overall low elevation of the coastal parks in the region and the extreme vulnerability to tropical storms. However, during staff review it was pointed out that the northeastern portion of the unit has elevations well above 1 m. These assets were analyzed against Monroe County LiDAR DEM and those in the higher elevation portion of the unit were considered limited exposure.

BICY Documents
Map of high exposure assets & GIS data
High exposure assets*

*Sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

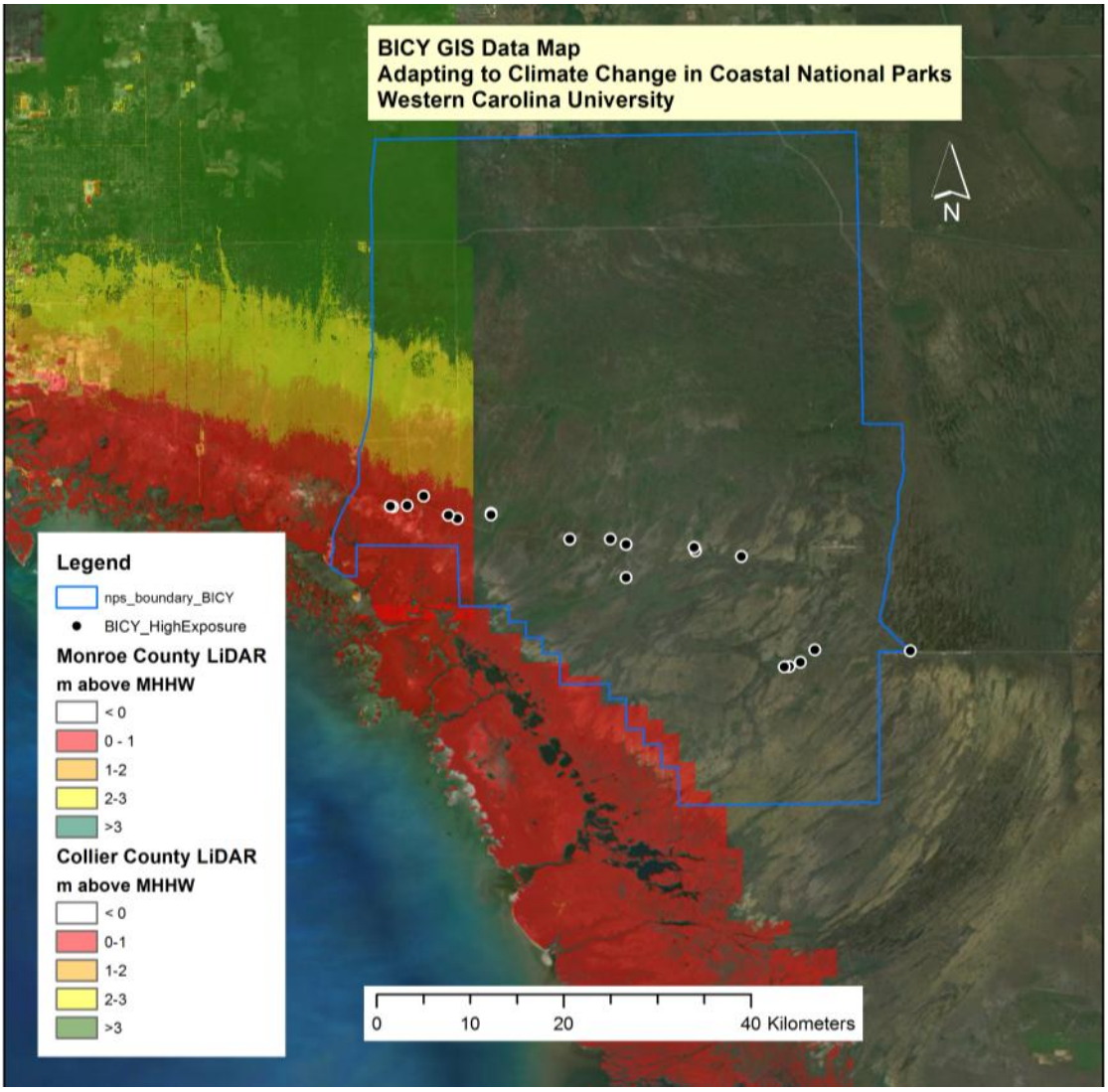

Figure D2. BICY GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW,for BICY used Naples, FL station: http://tidesandcurrents.noaa.gov/gmap3/index.shtml?type=TidePredictions&region= .

Table D2. Complete list of GIS Data utilized for BICY.

Data Name	Data Source
2007-08 Inland Monroe 10-ft DEM in NAVD 1988	South Florida Water Management District: http://my.sfwmd.gov/gisapps/sfwmdxwebdc/dataview.asp
2007-08 Collier 10-ft DEM in NAVD 1988	
BICY Trails (converted from KML files)	NPS Website: http://www.nps.gov/bicy/planyourvisit/things2do.htm

Table D3. BICY High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	234430 (ML- Monument Lake, Vault Toilet Bldg. A115)	$96,425	0	67	0
2	4100	234428 (MS - Monroe Station, Vault Toilet Bldg. A114)	$96,425	0	67	0
3	4100	234425 (MC - Mitchells Campground, Vault Toilet Bldg. A110)	$44,849	0	67	0
4	4100	234426 (MC - Mitchells Campground, Vault Toilet Bldg. A111)	$50,196	0	67	0
5	4100	234427 (BL - Burns Lake, Vault Toilet Bldg. A112)	$23,347	0	67	0
6	7500	231535 (OA - Oasis Int. Interp Exhibits)	$191,397	0	58	0
7	7500	231521 (SG Visitor Center Ext. Interp Exhibits)	$555,797	0	58	0
8	7500	234928 (SG Welcome Center Int. Interp Exhibits)	$463,483	0	58	0
9	4100	225920 (BL - Burns Lake Vault Toilet Bldg. A156)	$226,053	0	56	0
10	7500	235302 (Pine Crest BB Interp)	$3,717	0	50	0
11	1700	232405 (BCW - Culvert Bridge #5120-010S, Birdon Rd.)	$142,610	0	43	0
12	1700	233785 (BCW - Birdon Canal Culvert Bridge #1 #5120-008S)	$124,008	0	43	0
13	3100	235284 (PC - Pine Crest Informational Kiosk)	$4,532	0	20	0
14	1300	237840 (FO - Fire Operations Center, Parking Area (Unpaved))	$44,507	0	0	n/a
15	4100	00001695 (OH - Headquarters Bldg. A50)	$4,938,319	1	80	0
16	4100	00001696 (OA - Visitor Center Building A79)	$8,202,862	1	78	0
17	2100	92597 (Off Road Trail - Skillet North Trail)	$66,372,269	2	88	0
18	2100	92616 (Off Road Trail - Burns Lake Trail)	$58,914,710	2	88	0
19	4100	92586 (KS - Kirby Storter Vault Toilet Bldg A125)	$129,682	2	71	0
20	4100	92589 (HP - H.P. Williams Vault Toilet Bldg. A129)	$62,787	2	71	0
21	4100	92578 (TR - Turner River Vault Toilet Bldg. A130)	$129,682	2	71	0
22	3100	00001694 (MW - Midway Campground)	$2,768,631	2	61	0
23	3100	00002650 (ML - Monument Lake Campground)	$289,931	2	61	0
24	4100	92667 (GHS - Gator Hook, Vault Toilet Bldg. A132)	$62,787	2	53	0
25	2100	92590 (HP - H.P. Williams Boardwalk)	$155,619	2	48	0
26	1700	12888 (BCW - Levee 28 Canal Bridge #2, #5120-030S)	$1,379,523	2	42	0
27	1700	12890 (BCW - Levee 28 Canal Bridge #1, #5120-029S)	$1,379,523	2	42	0
28	4100	00001669 (OH - Quarters #16)	$516,557	2	40	0
29	4100	00001671 (OH - Quarters #19)	$278,170	2	40	0
30	4100	00001675 (OH - Quarters #23)	$350,948	2	40	0
31	4100	00001329 (OA - Quarters #1)	$788,384	2	40	0
32	4100	00001330 (TR - Quarters #2)	$296,114	2	40	0
33	4100	00001676 (BR - Quarters #25)	$267,436	2	40	0
34	3100	93083 (BCW - Big Cypress Wetland, Operations Support Area)	$4,538,435	3	90	0
35	2100	92593 (ORV - Monroe South Trail)	$3,663,080	3	88	0
36	1100	00002920 (OA - Oasis Road, unpaved RTE. 0405)	$821,402	3	82	0
37	5700	92661 (LP - Loop Road RS, Fuel Island (Unleaded Gas))	$64,841	3	82	0
38	1100	93125 (FO - Fire Operations Center, Entrance Road)	$21,614	3	82	0
39	4100	92846 (OA - Oasis Comfort Station Bldg. A126)	$203,743	3	78	0

Table D3 (continued). BICY High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	4100	92808 (MW - Midway, Pump House Bldg. A128)	$59,794	3	78	0
41	4100	00002620 (ML - Monument Pump House A77)	$46,778	3	78	0
42	6200	12428 (TR - Turner River Canoe Waterway Trail)	$2,566,126	3	77	0
43	6200	12427 (SG - Halfway Creek Canoe Waterway Trail)	$1,512,958	3	77	0
44	4100	92806 (MW - Midway, Comfort Station Bldg. A127)	$304,019	3	71	0
45	4100	00001765 (EE - E.E. Center Bldg. A61)	$430,258	3	71	0
46	1100	00002922 (LP - Loop Road Ranger Station Rd, Rte 404)	$308,026	3	70	0
47	1100	92656 (MC - Mitchell, Road)	$1,296,821	3	67	0
48	3100	92585 (KS - Kirby Storter, Day-use/Rest)	$259,364	3	61	0
49	3100	00002935 (HP - H.P. Williams Day-use/Rest)	$103,307	3	61	0
50	4100	93182 (KS - Kirby Storter Chickee Bldg. A141)	$14,319	3	57	0
51	4100	93186 (KS - Kirby Storter Chickee Bldg. A142)	$14,319	3	57	0
52	4100	93188 (KS - Kirby Storter Chickee Bldg. A143)	$14,319	3	57	0
53	4100	93189 (KS - Kirby Storter Chickee Bldg. A144)	$14,319	3	57	0
54	4100	93179 (TR - Turner River Chickee Bldg. A139)	$24,959	3	57	0
55	4100	93180 (TR - Turner River Chickee Bldg. A140)	$10,717	3	57	0
56	4100	93190 (GHS - Gator Hook, Chickee Bldg. A137)	$10,717	3	57	0
57	4100	93191 (GHS - Gator Hook, Chickee Bldg. A173)	$10,717	3	57	0
58	1100	12422 (BL - Burns Lake Road, Unpaved RTE. 0107)	$1,534,571	3	55	0
59	1100	109097 (MW - Midway Campground Loop Road Rte 204)	$632,765	3	52	0
60	4100	109222 (KS - Kirby Storter Boardwalk Chickee Bldg. A145)	$20,223	3	50	0
61	2100	92587 (KS - Kirby Storter Boardwalk)	$931,074	3	48	0
62	1100	92659 (PC - Pine Crest, Road)	$38,657	3	47	0
63	1100	00002921 (BCW - Pine Oaks Road, unpaved RTE. 0106)	$410,701	3	47	0
64	1100	92704 (BL - Burns Lake Campground, Road RT 107)	$1,296,821	3	45	0
65	4100	00001473 (OH - Quarters #15)	$452,461	3	40	0
66	4100	00001672 (OH - Quarters #20)	$372,897	3	40	0
67	4100	00001673 (OH - Quarters #21)	$387,893	3	40	0
68	4100	00001674 (OH - Quarters #22)	$483,572	3	40	0
69	4100	00001470 (TR - Quarters #4)	$296,114	3	40	0
70	4100	00001777 (FO - Quarters #74)	$248,953	3	40	0
71	4100	00001758 (OH - Maintenance Bldg. A54)	$884,999	3	33	0
72	1100	00002918 (OH - Mount Ochopee Dr., Unpaved RTE. 0105)	$616,051	3	33	0
73	4100	28881 (OH - Ochopee Vehicle Wash Station Bldg. A113)	$179,382	3	33	0
74	4100	11287 (OA - Wood Storage House A98)	$767,919	3	33	0
75	1100	00002916 (BCW - Jim Dill Road, unpaved RTE. 0406)	$12,311,012	3	30	0
76	1100	00002910 (BCW - Loop Road, paved - Rte 102)	$14,891,197	4	90	0
77	1700	106686 (BCW - Deep Lake Fire Station Culvert Bridge (Hwy 29) - 5120-042S)	$933,011	4	90	0
78	2100	92615 (ORV - Monument Trail)	$3,079,615	4	88	0

Table D3 (continued). BICY High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
79	1700	106685 (BCW - Jerome Creosote Site Culvert Bridge (Hwy 29) - 5120-041S)	$205,763	4	82	1
80	2100	113564 (OA - Oasis Boardwalk)	$34,423	4	81	0
81	4100	00002617 (EE - E.E. Center Pump House Bldg. A63)	$8,754	4	80	0
82	6400	62204 (OA - Air Strip - FAA Designation Code 9FL7)	$398,932	4	73	0
83	1700	106680 (BCW - Fire Ops Center Culvert Bridge SR 29, 5120-037S)	$304,062	4	73	0
84	4100	00002638 (LP - Loop Road RS, Bldg. A96 Office "A")	$757,949	4	71	0
85	4100	12341 (LP - Loop Road RS, Pumphouse A106)	$17,718	4	71	0
86	4100	00001757 (OH - Water Plant Bldg. A53)	$270,171	4	65	0
87	4100	00002621 (ML - Monument Comfort Station A78)	$188,369	4	65	0
88	4100	12333 (FO - Fire Operations Center, Bldg. A100)	$1,488,098	4	65	0
89	4100	00002633 (OA - Aviation Hangar A91)	$178,846	4	63	0
90	3100	92666 (GHS - Gator Hook Trail Corridor)	$86,455	4	61	0
91	3100	00002928 (BL - Burns Lake Campground)	$207,357	4	61	0
92	4100	00001763 (OH - Well House Bldg. A59)	$172,909	4	57	0
93	4100	00002623 (OA - Well House A81)	$25,988	4	57	0
94	4100	00002619 (OH - Ranger Station A67)	$365,414	4	53	0
95	1700	106677 (BCW - Culvert Bridge, Quarters #74, Hwy 29 - 5120-036S)	$759,737	4	53	0
96	4100	12337 (FO - Fire Operations Center Pump House, Bldg. A102)	$55,365	4	53	0
97	4100	00002630 (OA - Repeater Building A88)	$47,414	4	50	0
98	1300	16740 (HP - Williams Parking Area - Rte 901)	$224,247	4	50	0
99	1100	00002904 (BR - Bass Lake Road, Unpaved)	$1,080,684	4	47	0
100	7900	92642 (MW - Midway Amphitheater)	$20,585	4	46	0
101	7900	93078 (ML - Monument Lake Amphitheater)	$23,977	4	44	0
102	4100	12877 (BCW - Loop Road, 31 A94 (SCHED FOR DEMO))	$19,113	4	43	0
103	1700	12878 (BCW - Concho Billy Trail Culvert Bridge #5120-021S, Turner River Rd.)	$174,939	4	43	0
104	6100	12879 (BCW - Trail Access Dam #?, Turner River Rd.)	$87,502	4	43	0
105	1700	12883 (BCW - Culvert Bridge #5120-011S, Birdon Rd. DELETED)	$30,926	4	43	0
106	1700	12884 (BCW - Birdon Rd Culvert Bridge #3 #5120-013S)	$183,271	4	43	0
107	1700	12886 (BCW - Culvert Bridge #5120-015S, Turner River Rd.)	$55,667	4	43	0
108	1700	3599 (BCW - Earth Dam Access Bridge #2, Turner River Rd.)	$73,403	4	43	0
109	1700	3602 (BCW - Earth Dam Access Bridge #3, Turner River RD.)	$142,646	4	43	0
110	4100	109923 (OH - BICY Gathering Facility A-146)	$185,492	4	41	0
111	4100	00001670 (OH - Quarters #17)	$453,102	4	40	0
112	4100	00001677 (OH - Quarters #117)	$142,952	4	40	0
113	4100	00001678 (OH - Quarters #119)	$257,385	4	40	0
114	4100	00001679 (OH - Quarters #120)	$257,651	4	40	0
115	4100	00001680 (OH - Quarters #123)	$257,651	4	40	0
116	4100	00001681 (OH - Quarters #124)	$257,385	4	40	0

Table D3 (continued). BICY High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
117	4100	00001682 (OH - Quarters #126)	$149,567	4	40	0
118	4100	00001683 (OH - Quarters #217)	$149,567	4	40	0
119	4100	00001684 (OH - Quarters #219)	$300,535	4	40	0
120	4100	00001685 (OH - Quarters #220)	$300,309	4	40	0
121	4100	00001687 (OH - Quarters #223)	$300,535	4	40	0
122	4100	00001688 (OH - Quarters #224)	$300,619	4	40	0
123	4100	00001689 (OH - Quarters #226)	$131,096	4	40	0
124	4100	93081 (TR - Quarter #2 Pump House Bldg. A131)	$17,718	4	40	0
125	4100	12345 (LP - Loop Road RS, Bldg. A96 "B" Upstair Q-96)	$438,737	4	40	0
126	1100	00002919 (OH - Ochopee Maint. Facility Road)	$152,865	4	38	0
127	1300	93135 (CC - Cooks Camp, VIP Parking Lot)	$21,614	4	35	0
128	4100	00002629 (OA - Wash House A87 (SCHED FOR DEMO))	$54,034	4	33	0
129	1100	93131 (WP - Weeks Property,Road)	$1,449,655	4	33	0
130	1300	92668 (GHS - Gator Hook, Parking Area, Unpaved)	$641,926	4	32	0
131	1300	16739 (OH - HQ Parking Area, East- Rte 900B)	$182,676	4	30	0
132	1300	16738 (OH - HQ. Parking Area, West - Rte 900A)	$580,085	4	30	1
133	4100	93130 (OA - Quarters #10)	$180,190	4	27	0
134	1100	16736 (MW - Midway Campground Rd., Paved - Rte 103)	$173,584	4	25	0
135	1100	93082 (TR - Turner River Canoe Launch Road)	$64,841	5	100	0
136	4100	00002615 (MS - Monroe Station, Bldg. A76)	$1,138,463	5	93	0
137	2100	92592 (ORV - Buckskin Trail)	$66,938,742	5	88	0
138	2100	92596 (ORV - Pace's Dike Trail)	$24,609,944	5	88	0
139	6200	92598 (ORV - Sig Walker Airboat Waterway Trail)	$2,423,577	5	88	0
140	3100	92637 (CC - Cooks Fish & Wildlife Campground)	$43,227	5	82	0
141	4100	00001767 (DD - Dona Drive Check Station A64)	$16,413	5	80	0
142	4100	62184 (MS - Monroe Station, Check Station Bldg. A122)	$22,796	5	80	0
143	4100	62185 (40M - 40 Mile Bend Loop Road Check Station Bldg. A123)	$22,796	5	80	0
144	4100	92916 (SG - Big Cypress Swamp Welcome Center. A136)	$2,632,822	5	78	0
145	1300	92921 (SG - Parking Lot, Paved)	$232,407	5	78	0
146	6400	113067 (OH - Helipad)	$83,507	5	75	0
147	1100	00002684 (DD - Dona Drive paved - Rte 100)	$1,076,220	5	75	0
148	6200	92599 (ORV - Zone 4 Airboat Waterway Trail)	$8,524,306	5	73	0
149	1100	93075 (KS - Kirby Storter Road)	$201,829	5	71	0
150	4100	00001766 (EE - E.E. Center Lab, Bldg. A62)	$146,456	5	71	0
151	4100	00001760 (OH - Hazmat Storage A56)	$27,355	5	63	0
152	4100	00002622 (OA - Fire Pump House A80)	$42,519	5	63	0
153	4100	00002625 (OA - Fire Haz-Mat Storage A83)	$27,355	5	63	0
154	7100	94343 (HP - HP Williams Park Marker HS-02)	$11,398	5	63	0
155	4100	79230 (CS - Cal Stone Pump House A118)	$53,151	5	63	0
156	2100	12420 (ORV - Monroe North Trail)	$66,624,664	5	62	0

Table D3 (continued). BICY High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
157	1700	111316 (BCW - Loop Road Bridge #1, # 5120-031P)	$393,382	5	62	0
158	1700	111318 (BCW - Loop Road Bridge #2, #5120-032P)	$252,169	5	62	0
159	1700	111319 (BCW - Loop Road Bridge #3, 5120-033P)	$388,508	5	62	0
160	1700	111320 (BCW - Loop Road Bridge # 4, 5120-034P)	$388,508	5	62	0
161	4100	93149 (OH - Ranger Station Storage Bldg. A138)	$135,643	5	61	0
162	4100	00001769 (BR - SCA Building A68)	$620,039	5	58	0
163	4100	00001761 (OH - Paint Locker A57)	$44,680	5	56	0
164	4100	00001762 (OH - Flamable Storage Shed A58)	$27,355	5	56	0
165	4100	49605 (CS - Cal Stone Bunk House A117)	$499,228	5	56	0
166	4100	62188 (CS - Cal Stone Dining Hall A119)	$165,414	5	56	0
167	4100	62192 (CS - Cal Stone Shower Building A120)	$116,265	5	56	0
168	1700	106687 (BCW - Tamiami Canal Bridge SR 41 5120-007S)	$124,957	5	55	1
169	4100	11514 (OH - Equipment Storage Pole Barn A99)	$1,410,652	5	53	0
170	4100	00002639 (LP - Loop Road RS, Barn Bldg. A97)	$1,486,517	5	53	0
171	1700	12875 (BCW - LCEC Utility Bridge #2, #5120-028S, County Rd. 29)	$163,276	5	52	0
172	4100	00002626 (OA - Maintenance Haz-Mat Storage A84)	$27,355	5	50	0
173	4100	00002628 (OA - Herbicide Storage A86)	$86,369	5	50	0
174	3100	92655 (MC - Mitchell, Campground)	$206,586	5	50	0
175	3100	00002930 (PC - Pine Crest, Campground)	$206,586	5	50	0
176	2100	12426 (GHS - Gator Hook Trail)	$2,161,368	5	48	0
177	4100	00001754 (OH - Resource Management Lab. Bldg. A51)	$351,843	5	46	0
178	4100	12343 (WP - Weeks Storage Bldg. A108)	$484,717	5	46	0
179	4100	12344 (WP - Weeks Pole Barn A109)	$403,044	5	46	0
180	1700	12874 (BCW - Property Access Dam #4, Turner River Rd.)	$121,230	5	43	0
181	4100	12881 (BCW - Loop Road, garage A95 (SCHED FOR DEMO))	$37,111	5	43	0
182	4100	12342 (SC - Scissor Camp, Bldg. A107)	$148,995	5	43	0
183	1100	00002909 (SG - Seagrape Drive, Paved - Rte 104)	$1,041,504	5	42	0
184	4100	12421 (BCW - Loop Road, 30 A93 (SCHED FOR DEMO))	$172,909	5	41	0
185	4100	00002618 (BR - SCHRIER HOUSE (Q11) A66)	$393,133	5	41	0
186	4100	00001778 (WP - Weeks Property House Bldg. A75)	$625,165	5	41	0
187	4100	00002627 (OH - Ranger Storage A85)	$86,369	5	40	0
188	4100	50346 (OH - Herbicide Storage Shed A116)	$79,726	5	40	0
189	4100	00002631 (OA - Pole Barn #1 A89)	$452,413	5	40	0
190	4100	00002632 (OA - Pole Barn #2 A90)	$452,413	5	40	0
191	1300	62205 (OA - Air Strip Paved Parking Apron)	$200,606	5	40	0
192	1300	16742 (KS - Kirby Storter Parking Lot, Paved - Rte 902B)	$89,924	5	38	0
193	1100	00002908 (OH - Mahogany Dr., paved - Rte 401)	$399,243	5	38	0
194	1100	00002911 (OH - Satinwood Dr., paved - Rte 400)	$746,411	5	38	0
195	1300	92579 (TR - Turner River Canoe Parking Lot RT 909)	$43,227	5	38	0
196	1300	16744 (OA - Visitor Center Parking, Paved - Rte 904)	$599,595	5	38	1

Table D3 (continued). BICY High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
197	1300	16743 (MS - Monroe Station Parking Area, Paved - Rte 903)	$485,825	5	38	1
198	4100	12340 (OH - Resource Mgmt Storage Shed A105)	$44,291	5	36	0
199	4100	00001759 (OH - Masonary Storage Shed Bldg. A55)	$34,582	5	33	0
200	4100	00002616 (OH - Maint. Storage A52)	$54,034	5	33	0
201	4100	12339 (OH - Appliance Storage Shed A104)	$66,437	5	33	0
202	4100	92845 (OH - Supply Bldg. A124)	$22,146	5	33	0
203	1300	92882 (OH - Maintenance GOV Complex Parking RT 907)	$376,910	5	33	0
204	1300	92883 (OH - Maint. POV Parking East)	$64,841	5	33	0
205	1300	92891 (OH - Maint. GOV Parking West)	$237,750	5	33	0
206	1300	92892 (OH - Ranger Station POV Parking Lot RT 908)	$64,841	5	33	0
207	1300	92893 (OH - Ranger Station Equip. Parking Lot)	$21,614	5	33	0
208	4100	00002624 (OA - Hurricane/Fire Cache A82)	$88,472	5	33	0
209	1100	00002907 (ML - Monument Lake Road, Paved & Unpaved - Rte 0101)	$138,867	5	25	0
210	1700	106681 (BCW - Higbee Bridge #1 SR 29 5120-039S (SCHD FOR DEMO))	$195,932	5	12	0

Biscayne National Park (BISC)

Table D4. Summary of Findings for BISC.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	68	100%	$67,913,211	100%
Limited Exposure	0	0	0	0
TOTALS	**68**	**100%**	**$67,913,211**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2007 FL Division of Emergency Management: South Florida LiDAR Blocks

Process/methods for exposure determination
Discussion with NPS yielded results that all SER parks, with the exception of a few, should have all assets listed as high exposure due to the overall low elevation of the coastal parks in the region and the extreme vulnerability to tropical storms.

BISC Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

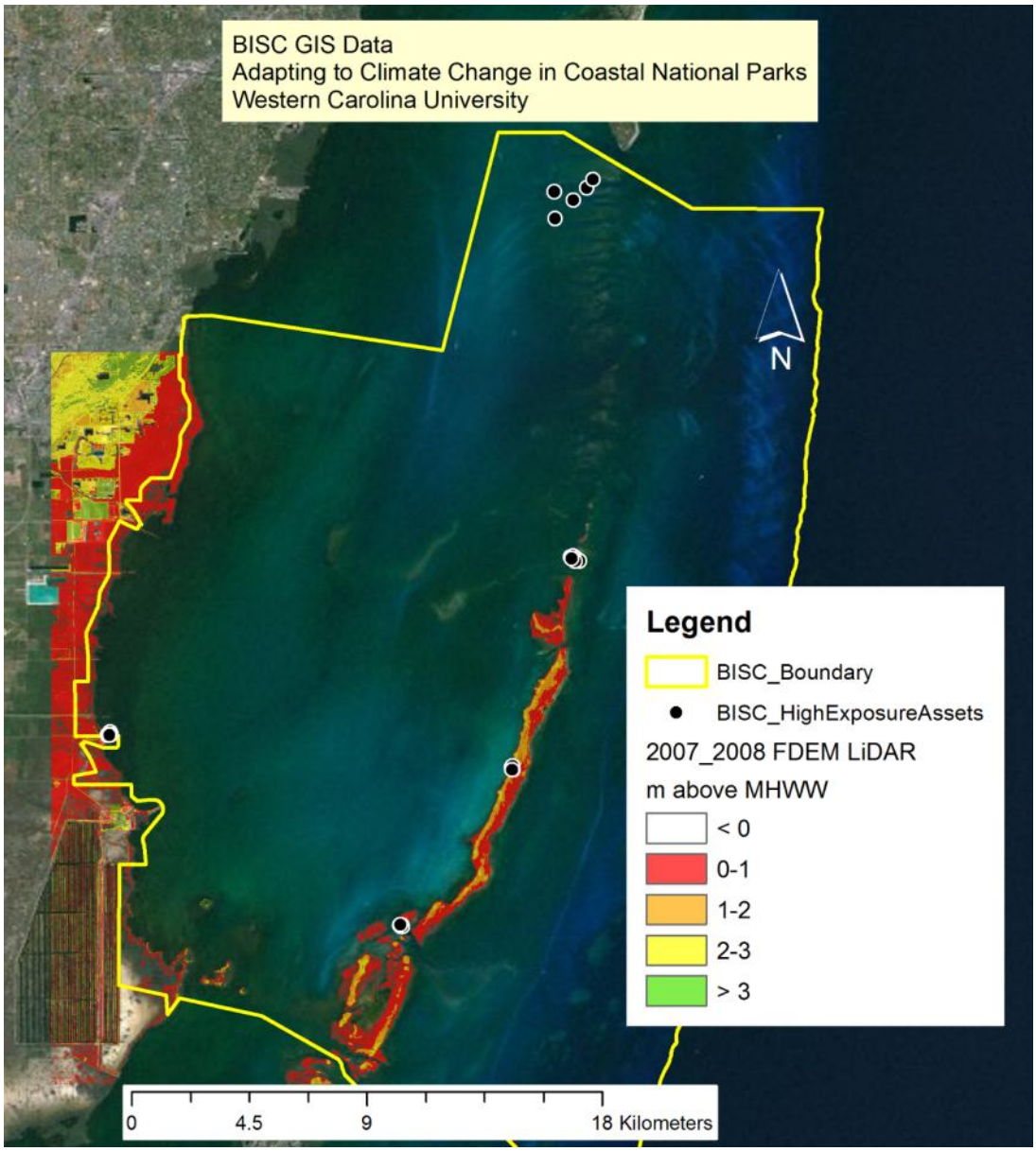

Figure D3. BISC GIS map of park boundary and high-exposure assets.

Table D5. Complete list of GIS Data utilized for BISC.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
2007 - 2008 Florida Division of Emergency Management (FDEM) Lidar Project	NOAA: http://www.csc.noaa.gov/dataviewer/#
MIAMI-DADE COUNTY 2FT CONTOUR LINES	FDEM: http://www.floridadisaster.org/gis

Table D6. BISC High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	5419 (BC Lighthouse)	$20,073,385	0	93	0.01
2	6200	111483 (Convoy Point Channel)	$943,995	0	88	0
3	6200	111481 (Black Point Channel)	$1,488,313	0	88	0
4	6300	93327 (CP Waterfront)	$3,083,386	0	88	0.04
5	1300	5341 (CP VC Parking)	$689,858	0	88	0.2
6	1100	5339 (CP Entrance Road)	$1,894,790	0	88	0.63
7	4100	5306 (CP Headquarters Building)	$3,292,064	0	82	0.05
8	2200	111528 (CP Elevated Boardwalk)	$681,999	0	81	0
9	7500	228364 (CP INTERIOR Interp Exhibits)	$1,048,823	0	81	0
10	2100	5346 (CP Mainland Trail)	$172,748	0	81	0
11	4100	5425 (BC Pavilion)	$331,612	0	81	0.02
12	2100	5439 (BC Boardwalk)	$703,963	0	78	0
13	4100	5308 (CP Visitor Center)	$6,948,123	0	78	0.01
14	4100	5454 (EK Comfort Station)	$1,548,202	0	78	0.09
15	4100	5455 (EK Visitor Center)	$1,053,806	0	78	0.15
16	1300	102420 (CP Dock Access Parking)	$33,246	0	78	0.2
17	4100	5424 (BC Generator Building)	$315,715	0	73	0.15
18	4100	5423 (BC Barn)	$911,054	0	73	0.17
19	7500	234608 (Islands Exterior Interp Waysides)	$83,704	0	71	0
20	2100	111529 (CP Jetty Walk)	$100,779	0	71	0
21	7500	228340 (CP Ext Intepretive Waysides)	$82,340	0	71	0
22	2100	100351 (Black Point Jetty Trail)	$233,284	0	71	0
23	3100	5469 (EK Campground)	$460,783	0	71	0
24	4100	5402 (AK Comfort Station)	$405,151	0	71	0
25	4100	5421 (BC Comfort Station)	$661,206	0	71	0
26	2100	5462 (EK Boardwalk)	$1,368,933	0	71	0.01
27	2100	5435 (BC Trail)	$93,334	0	71	0.01
28	1300	102525 (CP HQ Parking Unpaved)	$56,809	0	70	0
29	1300	5340 (CP HQ Parking Paved)	$440,899	0	70	0.21
30	2100	5431 (BC Sidewalk)	$112,437	0	68	0
31	4100	5403 (AK Pavilion)	$126,891	0	67	0
32	4100	5420 (BC Chapel)	$255,838	0	67	0.28
33	6300	111482 (EK University Dock)	$458,834	0	63	0
34	4100	5473 (EK WTP Building & Covered Storage)	$679,687	0	61	0.02
35	4100	5307 (CP Maintenance Building)	$1,242,111	0	61	0.04
36	3100	5338 (CP Grounds)	$777,030	0	60	0
37	6300	5414 (Black Point Jetty)	$1,512,912	0	60	0
38	4100	44342 (SV 2167 Historical Stiltsville)	$1,374,174	0	58	0.11
39	2100	5405 (AK Trail)	$79,796	0	54	0

Table D6 (continued). BISC High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	4100	110386 (AK Temp Storage Bldg)	$36,540	0	51	0
41	3800	233168 (BC Historic Wall)	$1,714,426	0	51	0
42	4100	5310 (CP Hazardous Material Storage Building)	$75,439	0	51	0
43	4100	44346 (SV 2146 Bay Chateau)	$1,593,246	0	47	0.04
44	2100	5468 (EK Horseshoe Trail)	$114,321	0	47	0.2
45	4100	44345 (SV 2157 A-Frame)	$806,581	0	47	0.21
46	4100	44344 (SV 2159 Hicks House)	$860,353	0	47	0.23
47	4100	44341 (SV 2173 Miami Springs)	$1,310,445	0	47	0.48
48	1300	102423 (CP Boneyard Parking)	$186,880	0	46	0.21
49	4100	5311 (CP Fuel Pump Building)	$26,980	0	44	0.09
50	7200	112531 (Jones Property Ruins)	$193,076	0	43	0
51	4100	5406 (AK Storage Building)	$14,383	0	43	0.04
52	4100	5397 (AK Generator Building)	$253,487	0	42	0
53	4100	110385 (AK Water Treatment Building)	$287,371	0	42	0.01
54	4100	5448 (EK Generator Building)	$185,372	0	42	0.03
55	4100	5449 (EK Maintenance Building)	$482,323	0	42	0.04
56	2100	5466 (EK Spite Highway Trail)	$1,134,337	0	38	0
57	2200	5326 (CP Catwalk)	$284,166	0	33	0
58	4100	110306 (CP RM Storage I)	$19,875	0	30	0
59	4100	110307 (CP IN Storage)	$22,359	0	30	0
60	4100	110383 (CP FM Storage I)	$9,937	0	30	0
61	4100	110384 (CP Quay Storage)	$31,901	0	30	0
62	4100	5312 (CP Boat Maintenance Shade Structure)	$98,658	0	30	0.01
63	4100	5451 (EK Storage Building)	$8,770	0	30	0.23
64	4100	5395 (AK Residence West 103)	$228,356	3	70	0
65	4100	5309 (CP Duplex Residence)	$1,252,906	3	70	0.03
66	4100	5396 (AK Residence East 102)	$250,150	3	70	0.03
67	4100	5453 (EK Residence West 212)	$304,279	3	70	0.07
68	4100	5452 (EK Residence East 213)	$304,279	3	70	0.08

Cape Hatteras National Seashore (CAHA)

Table D7. Summary of Findings for CAHA.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	559	100%	$1,173,309,846	100%
Limited Exposure	0	0	0	0
TOTALS	**559**	**100%**	**$1,173,309,846**	**100%**

Park visit

Not visited for this particular study; however, staff at PSDS has knowledge of park from past research and has visited park frequently.

Park contacts

N/A

Primary data utilized

1) NPS FMSS location hierarchy report
2) 2009 EAARL LiDAR Cape Hatteras National Seashore

Process/methods for exposure determination

Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms.

CAHA Documents

Map of high exposure assets & GIS data
Example of high exposure assets*

*First 100 assets, sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

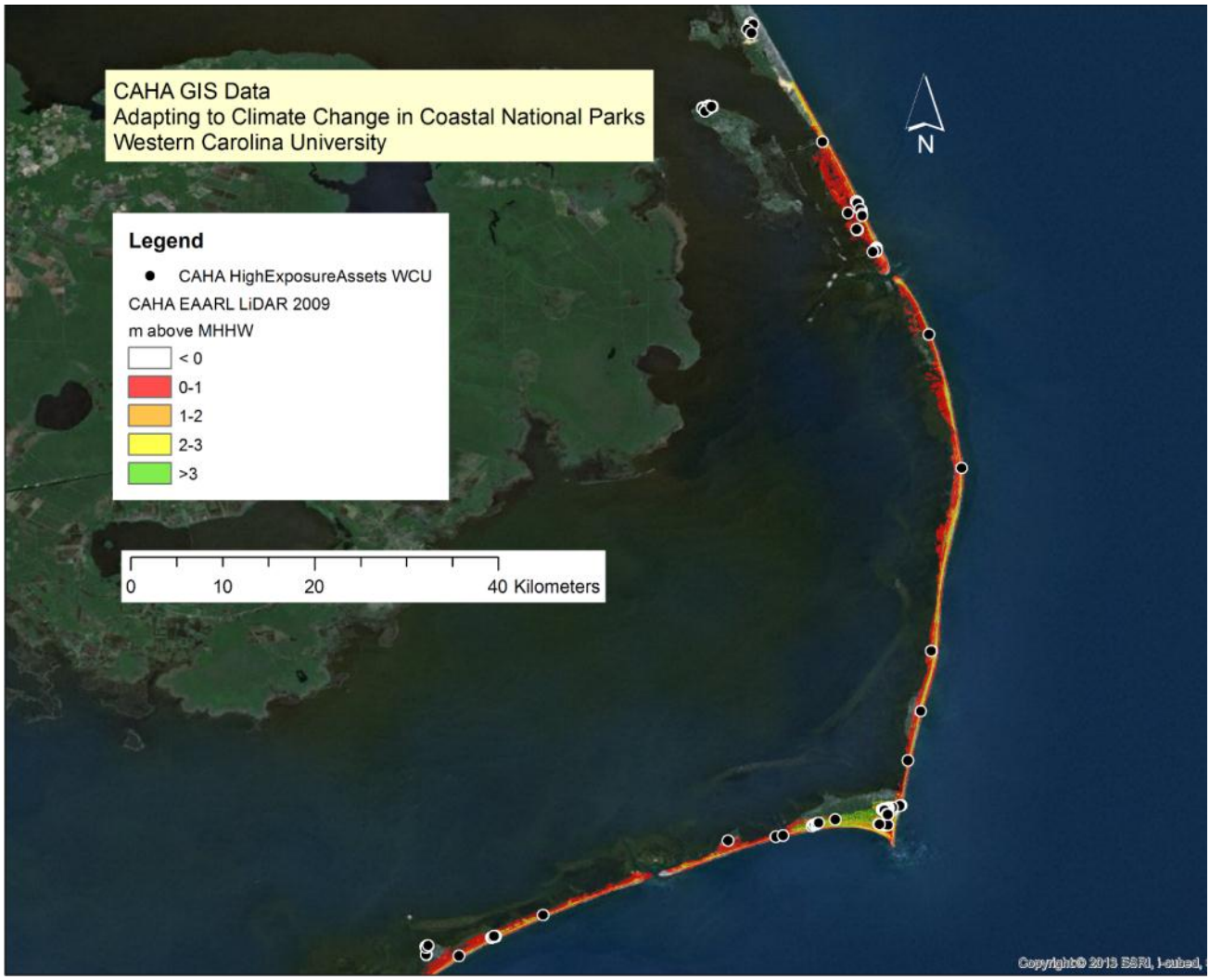

Figure D4. CAHA CAHA GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.43 m above NAVD88, for CAHA used Cape Hatteras Fishing Pier, NC station: http://tidesandcurrents.noaa.gov/datums.html?id=8654400.

Table D8. Complete list of GIS Data utilized for CAHA.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
2009 USGS/NPS EAARL: Cape Hatteras National Seashore - Post-Nor'easter Ida	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table D9. CAHA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	229422 (BI HS Bodie Island Lighthouse Oil House)	$2,719,483	0	100	0
2	3100	230317 (HI ML British Cemetery)	$315,297	0	92	0
3	7500	231300 (WB IM Visitor Center Exhibits)	$818,147	0	88	0
4	7500	228650 (BI IM Visitor Center Exhibits)	$171,628	0	88	0
5	7500	228651 (OI IM Visitor Center Exhibits)	$651,724	0	88	0
6	7500	228631 (FR IM Visitor Center Exhibits)	$1,219,257	0	88	0.835
7	1300	228858 (BI RD Coast Guard Station Parking - Rte.)	$49,316	0	78	0
8	7500	233387 (HI IM Visitor Center Exhibits)	$225,848	0	78	0
9	7500	233391 (HI IM Lighthouse Area Waysides)	$7,281	0	78	0
10	7500	233389 (HI IM Buxton Woods Waysides)	$12,140	0	70	0
11	7500	233379 (OI IM Hammock Hills Waysides)	$4,047	0	70	0
12	1100	231472 (BI RD Beach Ramp 1 - Rte. 0263)	$83,856	0	68	0
13	7500	233400 (WB IM Trail Waysides)	$50,265	0	65	0
14	7500	233399 (WB IM Pavilion Exhibits)	$2,336,342	0	65	0
15	7500	233398 (FR IM Theater Area Waysides)	$2,529	0	65	0
16	6300	93949 (HI MW Hatteras Island (Rodanthe) Fishing Pier)	$1,072,592	0	65	0
17	7500	233388 (HI IM Weather Station Exhibits)	$124,335	0	65	0
18	7500	233386 (FR IM Visitor Center/Fort Waysides)	$18,025	0	65	1.754
19	2100	232144 (BI BW Boardwalk & Roofed Observation Deck)	$166,436	0	63	0
20	3100	228572 (BI ML Firing Range)	$823,242	0	63	0
21	3100	228573 (HI ML Firing Range)	$311,054	0	63	0
22	7500	233397 (BI IM Oregon Inlet Fishing Center Waysides)	$970	0	52	0
23	3100	233958 (OI ML South End (VC, Dock, Ramp))	$729,692	0	52	0
24	1300	228855 (BI RD Lifesaving Station Parking - Rte.)	$33,737	0	50	0
25	7500	233394 (HI IM Old Lighthouse Site Waysides)	$2,328	0	48	0
26	7500	233381 (OI IM Lighthouse Waysides)	$1,012	0	48	0
27	7500	233396 (BI IM Pea Island Waysides)	$2,328	0	42	0
28	7500	233390 (HI IM British Cemetery Waysides)	$1,982	0	42	0
29	7500	233395 (HI IM Salvo Day Use Waysides)	$1,164	0	42	26.82
30	4100	231050 (BI TR Resource Management Trailer)	$123,913	0	36	0
31	4100	93951 (HI BD Hatteras Island (Rodanthe) Pier House)	$283,210	0	24	0
32	7100	113424 (WB MT First Flight Landing Marker #1)	$23,702	1	100	0
33	7100	113426 (WB MT First Flight Landing Marker #2)	$23,702	1	100	0
34	7100	113427 (WB MT First Flight Landing Marker #3)	$23,702	1	100	0
35	7100	113428 (WB MT First Flight Landing Marker #4)	$23,702	1	100	0
36	7100	113438 (WB MT 100TH Bronze Sculpture)	$292,566	1	100	0
37	3100	85920 (BI ML Bodie Island Maintained Landscape)	$499,345,314	1	100	0
38	7100	113483 (HI MT Lighthouse Monument)	$18,517	1	100	0
39	7100	114749 (HI MT Carved & Etched Granite Marker "The Loss of the US Monitor")	$42,589	1	100	0

Table D9 (continued). CAHA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	7100	114751 (HI MT Carved & Etched Granite Marker "Fort Clark")	$33,997	1	100	0
41	7100	114752 (HI MT Carved & Etched Granite Marker "Burnsides Expedition")	$33,330	1	100	0
42	7200	113511 (OI AS Loop Shack Hill Foundation #1)	$70,364	1	100	0
43	7200	113513 (OI AS Loop Shack Hill Foundation #2)	$59,254	1	100	0
44	7200	113515 (OI AS Loop Shack Hill Bunker)	$103,694	1	100	0
45	7200	113517 (OI AS Loop Shack Hill Signal Tower Foundation)	$70,364	1	100	0
46	7100	114754 (OI MT Carved & Etched Granite Marker "Fort Ocracoke")	$33,997	1	100	0
47	3100	85886 (WB NL WRBR Natural landscape)	$34,570,886	1	100	0.007
48	7100	29880 (WB MT Monument "Pylon")	$6,982,530	1	100	0.035
49	4100	29670 (OI HS Ocracoke Lighthouse)	$3,570,293	1	100	0.065
50	4100	58220 (FR BD Waterside Theater Rain Shelter)	$1,175,690	1	77	0
51	4100	107196 (FR BD Waterside Theater Light Tower Left)	$181,335	1	67	0
52	4100	29852 (FR BD Headquarters Storage Building)	$53,972	1	43	0
53	4100	29653 (OI BD Radio Shed)	$7,584	1	43	0
54	7100	29901 (WB MT First Flight Granite Marker)	$77,197	2	100	0
55	7300	29812 (FR Reconstructed Earthen Fort)	$589,641	2	100	0
56	7100	29816 (FR MT Virginia Dare Monument)	$27,615	2	100	0
57	3100	85922 (BI NL Bodie Island Natural Landscape)	$10,306,848	2	100	0.002
58	4100	28924 (BI HS Double Keepers Quarters (Visitor Center))	$1,829,034	2	100	0.024
59	1100	28946 (BI RD Highway 12 - Rte. 0010)	$9,572,581	2	100	0.024
60	3100	28587 (BI ML Historic Lighthouse Station)	$912,807	2	100	0.036
61	4100	113449 (BI HS Lifesaving Station Boathouse - Building 100A)	$84,372	2	93	0
62	4100	28659 (HI HS Lighthouse Oilhouse)	$159,906	2	92	0.221
63	4100	28661 (HI HS DKQ (Museum of the Sea))	$3,888,745	2	90	0.014
64	4100	28662 (HI HS PKQ (Principal Keepers Quarters))	$2,654,974	2	90	0.044
65	4100	113388 (OI BD RM Storage/Pilot Facility)	$227,803	2	82	0
66	4100	28664 (HI BD LH Comfort Station)	$771,823	2	78	0.049
67	4100	108679 (HI BD Visitor Center/Bookstore)	$903,855	2	77	0
68	4100	58219 (FR BD Waterside Theater Restrooms)	$1,037,578	2	77	0.004
69	1300	89488 (FR RD Waterside Theater Parking - Rte. 0903)	$2,275,140	2	77	0.567
70	4100	29826 (FR BD Bally Bldg)	$719,641	2	75	0.033
71	4100	91929 (WB BD Pavilion & Hangar Building)	$12,611,378	2	71	0.015
72	4100	58212 (FR BD Waterside Theater Maint Shop)	$308,904	2	69	0
73	4100	29727 (OI BD Pony Pen Pole Shelter 1)	$58,387	2	69	0
74	4100	29731 (OI BD Pony Pen Storage Shed 1)	$21,638	2	69	0
75	4100	29737 (OI BD Pony Pen Maintenance Tool Bldg)	$118,380	2	69	0
76	4100	58209 (FR BD Waterside Theater Mens Dressing Room)	$875,140	2	69	0.032
77	4100	58210 (FR BD Waterside Theater Rehearsal Hall (Gazebo))	$2,298,437	2	69	0.19
78	4100	58207 (FR BD Waterside Theater Womens Dressing Room)	$875,140	2	69	1.38

Table D9 (continued). CAHA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
79	4100	101577 (HI BD Frisco Campground Kiosk)	$27,848	2	67	0
80	7900	58202 (FR MI Waterside Theater Amphitheater)	$12,380,542	2	65	0
81	4100	112347 (FR BD Waterside Theater Costume Shop)	$1,403,666	2	65	0.13
82	4100	28913 (BI HS Lifesaving Station)	$775,581	2	63	0.195
83	4100	28909 (BI BD Haz-Mat Building)	$65,101	2	54	0.031
84	4100	35792 (HI BD Abandoned Fire Pump Shed)	$18,287	2	52	0
85	4100	29927 (WB BD Fuel Building)	$17,672	2	43	0
86	4100	29851 (FR BD Visitor Center Storage Building)	$53,972	2	43	0
87	4100	28893 (BI BD Gas Shed)	$23,503	2	43	0
88	4100	35791 (HI BD Resource Management Storage Shed #1)	$48,886	2	43	0.212
89	4100	29926 (WB BD Maintenance Storage)	$17,672	2	43	0.362
90	3100	29856 (FR ML Housing)	$13,491,857	2	31	0.002
91	4100	59930 (FR BD Prince House)	$393,330	2	0	0
92	4100	29900 (WB BD Reconstructed Hanger Bldg)	$431,620	3	100	0
93	4100	29675 (OI HS Oil House)	$48,285	3	100	0
94	4100	29677 (OI HS Privy)	$19,470	3	100	0
95	3100	29749 (OI ML Pony Pen Corral)	$10,711,086	3	93	0
96	1100	28651 (HI RD Little Kinnakeet Station Access - Rte. 0408)	$87,288	3	93	0.085
97	4100	113177 (OI BD Ocracoke Day Use SST)	$263,778	3	80	0
98	4100	29821 (FR BD VC Comfort Station)	$462,546	3	77	0
99	1100	110978 (HI RD State Route 12 - Rte. 5012H)	$98,318,383	3	77	0
100	4100	28883 (BI BD Whalebone Information Station)	$244,957	3	77	0

Cape Lookout National Seashore (CALO)

Table D10. Summary of Findings for CALO.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	289	100%	$878,717,414	100%
Limited Exposure	0	0	0	0
TOTALS	**289**	**100%**	**$878,717,414**	**100%**

Park visit

Not visited for this particular study, however; staff at PSDS has knowledge of park from past research and has visited park frequently.

Park contacts

Pat Kenney

Primary data utilized

1) NPS FMSS location hierarchy report
2) 2005 USACE National Coastal Mapping Program Topo/Bathy LiDAR
3) 2010 USACE JALBTCX Southeast LiDAR

Process/methods for exposure determination

Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms.

CALO Documents

Map of high exposure assets & GIS data
Example of high exposure assets*

*First 100 assets, sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

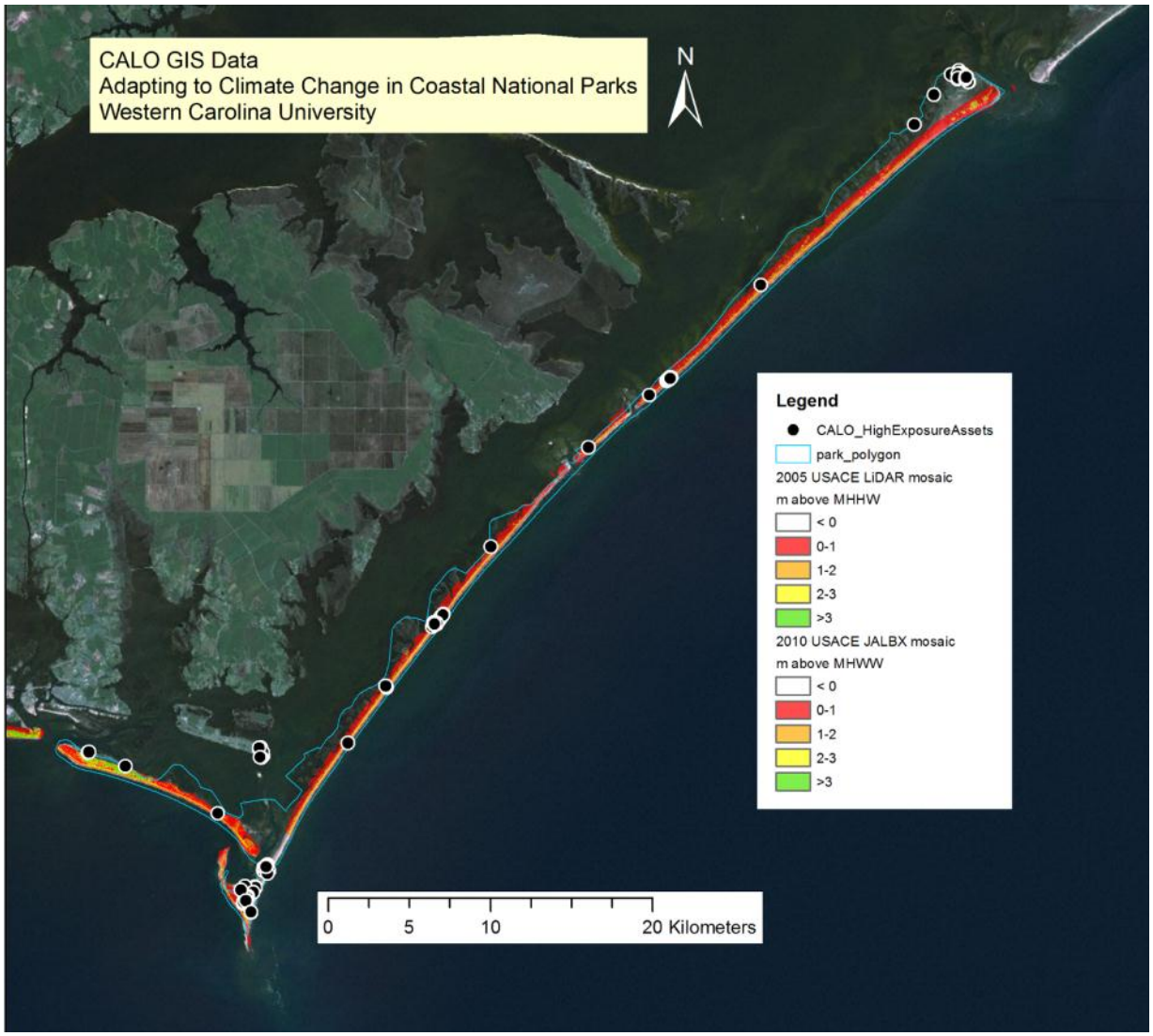

Figure D5. CALO GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.23 m above NAVD880), for CALO used Wrightsville Beach, NC http://tidesandcurrents.noaa.gov/datums.html?id=8658163.

Table D11. Complete list of GIS Data utilized for CALO.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
2005 USACE National Coastal Mapping Program Topo/Bathy Lidar: Delaware, Maryland, New Jersey, New York, North Carolina and Virginia	NOAA: http://www.csc.noaa.gov/dataviewer/#
2010 USACE JALBTCX Southeast Lidar: Florida, Georgia, South Carolina, North Carolina	

Table D12. CALO High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	5700	114238 (GI FS Great Island Fish Camp Fuel Dispenser #1)	$6,327	0	100	0
2	5700	114239 (GI FS Great Island Fish Camp Fuel Dispenser #2)	$6,327	0	100	0
3	4100	44265 (CP BD Coal Shed Lighthouse)	$84,184	0	100	0
4	4100	43790 (LP BD Long Pont Cabin Camps Wetland Pump House)	$126,268	0	100	0
5	7500	235222 (HI IM Visitor Center Exhibits)	$814,639	0	88	0
6	4100	43896 (GI BD Great Island Fish Camps Comfort Station)	$182,804	0	88	0
7	4100	97964 (GI BD Great Island Fish Camps Office)	$50,251	0	88	0
8	4100	43789 (LP BD Long Point Cabin Camps Comfort Station)	$139,832	0	88	0
9	5200	51552 (GI WW Dump Station Great Island Fish Camps)	$28,482	0	81	0
10	5200	51553 (LP WW Dump Station Long Point Cabins)	$28,482	0	81	0
11	7500	235265 (SB IM Shackleford Waysides)	$13,967	0	73	0
12	7500	235224 (HI IM Nature Trail Waysides)	$9,312	0	73	0
13	7500	235253 (GI IM Maintained Landscape Waysides)	$10,700	0	73	0
14	7500	235259 (CP Cape Lookout IM Keepers' Quarters Exhibits)	$1,020,879	0	73	0
15	7500	235247 (PV IM Dixon Salter Exhibit)	$610,734	0	73	0
16	7500	235235 (PV IM Historic Landscape Waysides)	$50,180	0	73	0
17	7500	235252 (LP IM Maintained Landscape Waysides)	$10,700	0	73	0
18	7500	235254 (CP IM HIstoric District Waysides)	$13,108	0	69	0
19	7500	235263 (CP IM Concession Shelter Boardwalk Waysides)	$15,356	0	67	0
20	7500	235261 (CP Cape IM Boardwalk Keepers' Qtrs Waysides)	$64,956	0	67	0
21	7500	235241 (PV IM Portsmouth Life Saving Station Exhibit)	$1,191,841	0	67	0
22	7500	235242 (PV IM Portsmouth Church Exhibit)	$256,153	0	67	0
23	7500	235243 (PV IM Portsmouth School Exhibit)	$133,545	0	67	0
24	7500	235245 (PV IM Post Office and General Store Exhibit)	$167,268	0	67	0
25	7500	235264 (SC IM Codds Creek IM Wayside)	$5,098	0	64	0
26	7500	235320 (NC IM North Core Banks Landscape Wayside)	$7,631	0	64	0
27	7500	235232 (HI IM Maintained Landscape Waysides)	$6,347	0	64	0
28	7200	114198 (CP AS Yeoman House Foundation Ruins at Cape Coast Guard Station)	$29,325	0	58	0
29	7500	235226 (HI IM Picnic Area Wayside)	$6,984	0	50	0
30	7200	114196 (CP FS Fuel System Foundation at Cape Coast Guard Station)	$25,586	0	47	0
31	4100	114225 (CP BD Bryant House Garage)	$25,484	0	20	0
32	4100	44386 (HI BD Oil Building Fuel Farm)	$72,857	1	100	0
33	5200	112267 (HI WW Septic Tank Maintenance Building)	$9,499	1	100	0
34	5200	112266 (HI WW Septic Tank Administrative Bldg. & Visitor Center)	$9,499	1	100	0
35	5200	112256 (HI WW Septic Tank Quarters 101)	$9,499	1	100	0

Table D12 (continued). CALO High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
36	5200	112258 (HI WW Septic Tank Quarters 103)	$9,499	1	100	0
37	5200	112259 (HI WW Septic Tank Quarters 105)	$9,499	1	100	0
38	5200	112260 (HI WW Septic Tank Quarters 106)	$9,499	1	100	0
39	3100	85984 (HI ML Harkers Island Landscape)	$10,561,059	1	100	0
40	1700	114221 (SC RD South Core Bridge)	$120,822	1	100	0
41	5200	112298 (GI WW Septic Tank Great Island Fish Camp # 2)	$9,499	1	100	0
42	5200	112299 (GI WW Septic Tank Great Island Fish Camp # 4)	$9,499	1	100	0
43	5200	112300 (GI WW Septic Tank Great Island Fish Camp #5)	$9,499	1	100	0
44	5200	112301 (GI WW Septic Tank Great Island Fish Camps #6)	$9,499	1	100	0
45	5200	112331 (GI WW Septic Tank Great Island Fish Camp #7)	$9,499	1	100	0
46	5200	112343 (GI WW Septic Tank Great Island Fish Camp # 8)	$9,499	1	100	0
47	5200	112378 (GI WW Septic Tank Great Island Fish Camp #9)	$9,499	1	100	0
48	5200	112380 (GI WW Septic Tank Great Island Fish Camp #10)	$9,499	1	100	0
49	5200	112409 (GI WW Septic Tank Great Island Fish Camp #11)	$9,499	1	100	0
50	5200	112463 (GI WW Septic Tank Great Island Fish Camp #12)	$9,499	1	100	0
51	5200	112464 (GI WW Septic Tank Great Island Fish Camp #13)	$9,499	1	100	0
52	5200	112469 (GI WW Septic Tank Great Island Fish Camp #14)	$9,499	1	100	0
53	5200	112471 (GI WW Septic Tank Great Island Fish Camp #15)	$9,499	1	100	0
54	5200	112473 (GI WW Septic Tank Great Island Fish Camp # 16)	$9,499	1	100	0
55	5200	112477 (GI WW Septic Tank Great Island Fish Camp #20)	$9,499	1	100	0
56	5200	112550 (GI WW Septic Tank Great Island Fish Camp #21)	$9,499	1	100	0
57	5200	112632 (GI WW Septic Tank Great Island Fish Camp #23)	$9,499	1	100	0
58	5200	112732 (GI WW Septic Tank Great Island Fish Camp #24)	$9,499	1	100	0
59	5200	112618 (GI WW Septic Tank Great Island Fish Camp #25)	$9,499	1	100	0
60	5200	114176 (GI WW Septic Tank Ranger Cabin Great Island)	$9,499	1	100	0
61	5200	112731 (GI WW Septic Tank Great Island Fish Camp #23)	$9,499	1	100	0
62	5200	114236 (GI WW Septic Tank Great Island Fish Camp #3)	$9,499	1	100	0
63	5200	114183 (GI WW Septic Tank Dump Station Great Island)	$9,499	1	100	0
64	3100	85985 (GI ML Great Island Fish Camps Maintained Landscape)	$5,126,226	1	100	0
65	5200	114237 (GI WW Septic Tank Great Island Fish Camp #17)	$9,499	1	100	0
66	5200	112730 (GI WW Septic Tank Great Island Fish Camp #22)	$9,499	1	100	0
67	5200	114181 (GI WW Septic Tank Great Island Caretaker Cabin)	$9,499	1	100	0
68	4100	106668 (CP BD Cape Lookout Light Station Visitor Center)	$417,432	1	100	0
69	4100	106669 (CP BD Light Station Restroom Facility)	$427,715	1	100	0
70	2100	114213 (CP BW Park Service Dock Boardwalk)	$17,211	1	100	0
71	4100	44100 (CP BD Cape Lookout Coast Guard Station Equipment Building)	$296,553	1	100	0

Table D12 (continued). CALO High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
72	5200	114158 (CP WW Septic Tank Lighthouse (Oceanside) Restrooms)	$9,499	1	100	0
73	3100	85981 (CP ML Cape Lookout Historic Landscape)	$26,402,648	1	100	0
74	4100	44266 (CP BD Cape Lookout Light Station Kitchen)	$65,169	1	100	0
75	4100	51073 (CP BD Coca-Cola House)	$438,321	1	100	0
76	4100	51179 (CP BD Baker-Holderness House (Casablanca))	$644,624	1	100	0
77	4100	95110 (CP BD Guthrie Ogilvie House)	$264,995	1	100	0
78	1100	100801 (NC RD Back Road (Sand) - North Core Banks)	$1,241,472	1	100	0
79	4100	114218 (PV BD Generator Building at Portsmouth Village)	$21,967	1	100	0
80	4100	42952 (PV BD Robinson, Roy, House)	$118,953	1	100	0
81	4100	42960 (PV BD Babb, Jesse, House)	$310,052	1	100	0
82	3100	42966 (PV ML Babb/Dixon/Pigott Cemetery)	$63,455	1	100	0
83	4100	43000 (PV BD McWilliams-Dixon House)	$216,707	1	100	0
84	4100	43063 (PV BD Post Office and General Store)	$187,410	1	100	0
85	4100	43065 (PV BD Dixon-Salter House)	$677,861	1	100	0
86	4100	43069 (PV BD Dixon, Carl, House)	$135,049	1	100	0
87	4100	43070 (PV BD Gaskill, Frank, House)	$157,140	1	100	0
88	4100	43071 (PV BD Styron-Bragg House)	$448,831	1	100	0
89	4100	43072 (PV BD Potter, T.T., House)	$285,802	1	100	0
90	4100	43324 (PV BD Styron,Ed, House)	$97,271	1	100	0
91	4100	43330 (PV BD Gilgo, Cecil, House)	$130,837	1	100	0
92	4100	53392 (PV BD Portsmouth Life-Saving Station Kitchen)	$109,210	1	100	0
93	3100	85983 (PV ML Portsmouth Village Historic Landscape)	$42,244,236	1	100	0
94	3100	85986 (LP ML Long Point Maintained Landscape)	$5,280,530	1	100	0
95	6300	44114 (CP MW Cape Lookout Historic District Marine/Waterways)	$2,065,864	1	100	0.01
96	2100	44022 (CP BW Boardwalk Cape Keepers Quarters)	$2,179,597	1	100	0.02
97	6300	44491 (GI MW Great Island Fish Camps Marine/Waterways)	$444,107	1	100	0.03
98	4100	43895 (GI BD Great Island Fish Camps Water Shed (Pump & Well House))	$101,857	1	100	0.04
99	4100	57031 (HI BD Harkers Island Admin. Bldg. & VC)	$7,478,669	1	100	0.04
100	4100	42927 (PV BD Portsmouth Church)	$353,326	1	100	0.07

Canaveral National Seashore (CANA)

Table D13. Summary of preliminary findings for CANA.

Exposure Level	# of assets	% of assets	CRV	% of total CRV
High Exposure	167	100%	$88,404,508	100%
Limited Exposure	0	0	0	0
TOTALS	**167**	**100%**	**$88,404,508**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2007 FL Division of Emergency Management; Brevard County LiDAR
3) 2010 USACE LiDAR

Process/methods for exposure determination
Discussions with NPS led to the conclusion that most SER parks should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms.

CANA Documents
Map of high exposure assets & GIS data
Example of high exposure assets*

*First 100 assets, sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

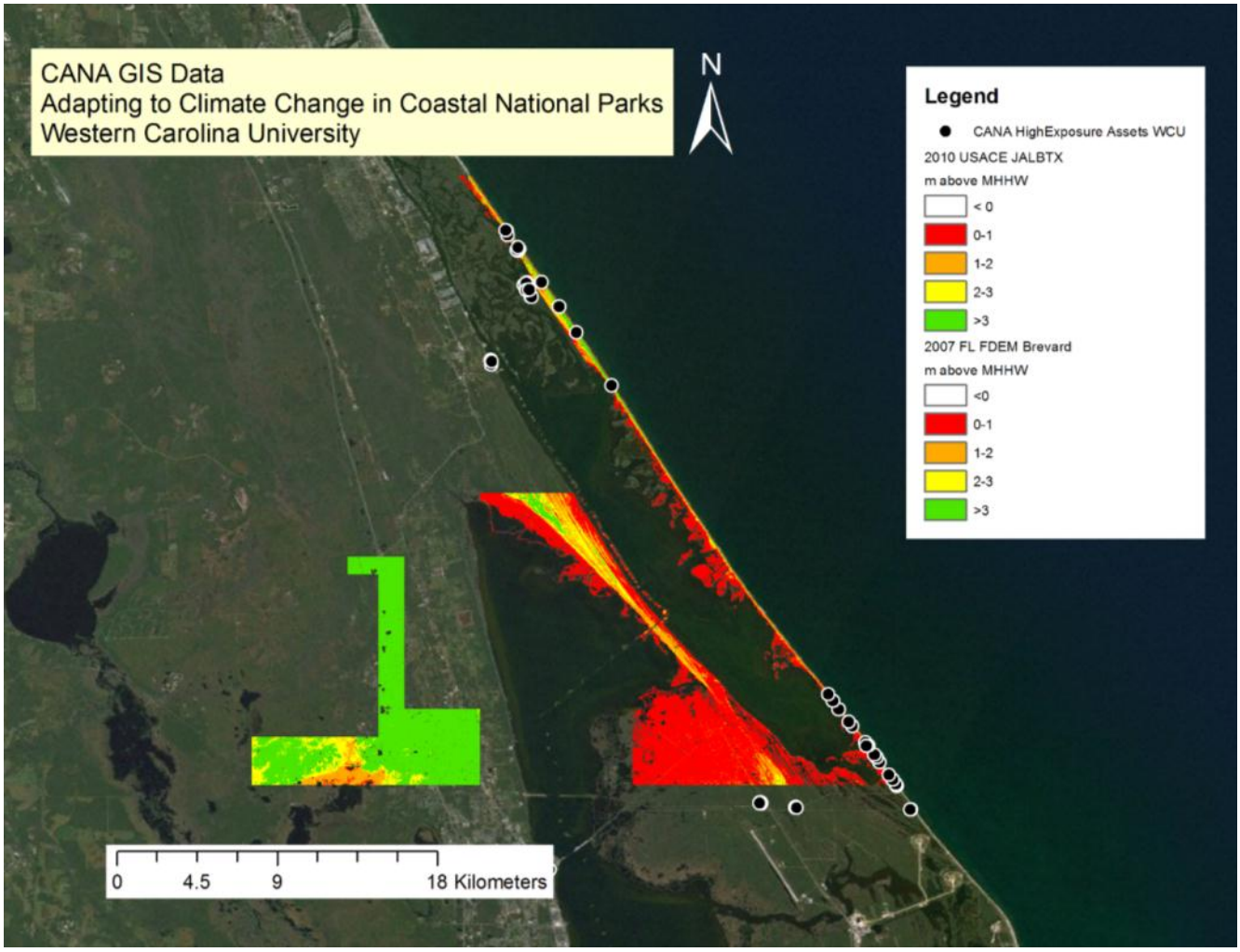

Figure D6. CANA GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.32 m above NAVD88), for CANA used Trident Pier, FL station: http://tidesandcurrents.noaa.gov/datums.html?id=8721604.

Table D14. Complete list of GIS Data utilized for CANA.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
2010 USACE JALBTCX Southeast Lidar: Florida, Georgia, South Carolina, North Carolina	NOAA: http://www.csc.noaa.gov/dataviewer/#
2007 Florida Division of Emergency Management (FDEM) Lidar Project: Brevard County	

Table D15. CANA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	72987 (AD Pump House Building)	$17,444	7	5	0
2	4100	60167 (AD Life Guard Building (Willard))	$144,717	7	5	0.05
3	4100	65908 (AD Ranger Beach Garage (Henderson))	$102,634	7	5	0.11
4	4100	65918 (AD Schultz Garage (Leeper))	$96,115	7	5	0.57
5	4100	65913 (AD Resource Mgnt Storage Bldg (Heebner/SCA))	$42,483	7	4	0
6	4100	65921 (AD Grey Estate Building (DBCC))	$209,616	7	3	0.09
7	4100	65910 (AD Resource Management Beach Garage (Flankey))	$129,781	7	1	0
8	4100	235658 (AD Resource Mgmt Garage)	$33,103	7	0	0
9	1100	105801 (AD Old S. Atlantic Ave - Rte 404)	$5,883	13	3	0
10	4100	60162 (AD Small Equipment Storage Building)	$46,051	13	3	0
11	4100	60208 (PD Wilson Corner Pole Shed East)	$121,697	13	3	0
12	4100	60209 (PD Wilson Corner Pole Shed West)	$319,586	13	3	0
13	4100	65922 (AD Grey Estate Garage (DBCC))	$42,373	13	3	0.12
14	4100	60160 (AD Pole Shed 1)	$318,624	13	3	0.15
15	4100	113460 (AD Grey Estate Boat House (DBCC))	$39,275	19	4	0
16	4100	65917 (AD Schultz House (Leeper))	$339,684	19	3	0.1
17	2100	95099 (AD Eldora Hammock Trail)	$91,954	20	4	0
18	1300	60802 (PD Contact Station RV Pullout - Rte 0915)	$24,983	20	4	0.42
19	4100	60161 (AD Maintenance Storage Building)	$63,725	21	4	0
20	4100	60205 (PD Wilson Corner Bally Storage Building)	$68,031	21	4	0
21	4100	60207 (PD Wilson Corner Water Storage Building)	$11,063	21	4	0
22	4100	72974 (AD Kelly Building)	$51,113	21	4	0
23	4100	60204 (PD Wilson Corner Equipment Storage Building)	$29,305	21	3	0
24	4100	60225 (PD Life Guard Building)	$100,650	21	3	0
25	1300	72967 (PD Wilson Corner Yard)	$199,143	23	3	0
26	4100	60220 (PD Ranger Station Pump House)	$14,129	25	3	0.09
27	1300	73414 (SR Seminole Rest Overflow Parking Lot - RT943)	$20,283	27	4	0.23
28	4100	113461 (AD Fellers Boat House (UCF))	$22,127	27	3	0
29	3100	113856 (AD Backcountry Campsites)	$35,298	29	4	0
30	4100	95003 (AD Carpenter Shop)	$133,968	29	3	0
31	1100	73443 (SR Seminole Rest Service Drive RT 403)	$19,407	30	4	0
32	4100	60203 (PD Wilson Corner Maintenance Shop)	$410,626	32	2	0
33	4100	107948 (SR Seminole Rest Maintenance Utility Bldg)	$39,074	32	2	0
34	4100	60158 (AD Maintenance Shop)	$355,908	32	1	0.2
35	4100	108593 (HQ - Head Quarters)	$1,094,425	33	2	0
36	1300	60911 (AD Ranger Station Parking Lot)	$10,163	35	4	0
37	1100	60782 (AD Maintenance Access Road - Rte 0400)	$63,781	35	3	0
38	1100	60838 (PD Wilson Corner Maintenance Road RT 402)	$67,638	35	3	0
39	4100	60219 (PD Ranger Station Garage)	$206,010	35	2	0.02

Table D15 (continued). CANA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	4100	60159 (AD Equipment Repair Shop)	$296,195	35	2	0.13
41	1300	60801 (PD Ranger Station Parking Lot - Rte 0914)	$126,600	35	2	0.42
42	5700	72724 (AD Fuel Dispensing Tank)	$28,683	36	2	0
43	4100	60217 (PD Eddy Creek Storage Building)	$39,074	36	2	0
44	1100	105805 (SR Fire Break Rd - Rte 208)	$79,354	40	4	0
45	1100	60783 (AD River Road - Rte 0206)	$21,432	40	3	0
46	1100	60784 (AD River Trace Lane - Rt 401)	$13,251	40	3	0
47	1300	60796 (AD Parking Lot 9 - Rte 0939)	$86,873	42	4	1.12
48	1300	60810 (PD Vista 6 - Rte 0921)	$61,685	42	2	0.42
49	1300	60786 (AD Parking Lot 1 - Rte 0931)	$484,910	42	2	0.42
50	1300	60789 (AD Parking Lot 2 - Rte 0932)	$125,689	42	2	0.42
51	1300	60790 (AD Parking Lot 3 - Rte 0933)	$126,874	42	2	0.42
52	1300	60791 (AD Parking Lot 4 - Rte 0934)	$124,103	42	2	0.42
53	1300	60795 (AD Parking Lot 8 - Rte 0938)	$132,718	42	2	0.42
54	1300	60804 (PD Vista 2 - Rte 0917)	$120,197	42	2	0.42
55	1300	60806 (PD Vista 3 - Rte 0918)	$76,878	42	2	0.42
56	1300	60809 (PD Vista 5 - Rte 0920)	$94,441	42	2	0.42
57	1300	60815 (PD Parking Lot 1 - Rte 0901)	$281,413	42	2	0.42
58	1300	60817 (PD Parking Lot 2 - Rte 0902)	$355,403	42	2	0.42
59	1300	60818 (PD Parking Lot 3 - Rte 0903)	$304,135	42	2	0.42
60	1300	60819 (PD Parking Lot 4 - Rte 0904)	$391,282	42	2	0.42
61	1300	60820 (PD Parking Lot 5 - Rte 0905)	$390,851	42	2	0.42
62	1300	60826 (PD Parking Lot 7 - Rte 0907)	$339,515	42	2	0.42
63	1300	60832 (PD Parking Lot 10 - Rte 0910)	$294,189	42	2	0.42
64	1300	60833 (PD Parking Lot 11 - Rte 0911)	$141,030	42	2	0.42
65	1300	60835 (PD Parking Lot 13 - Rte 0913)	$124,740	42	2	0.42
66	1300	60792 (AD Parking Lot 5 - Rte 0935)	$90,848	42	2	0.42
67	1300	60793 (AD Parking Lot 6 - Rte 0936)	$91,337	42	2	0.42
68	1300	60803 (PD Vista 1 - Rte 0916)	$97,593	42	2	0.42
69	1300	60827 (PD Parking Lot 6 - Rte 0906)	$412,555	42	2	0.42
70	1300	60829 (PD Parking Lot 8 - Rte 0908)	$407,582	42	2	0.42
71	1300	60831 (PD Parking Lot 9 - Rte 0909)	$244,271	42	2	0.42
72	1300	60834 (PD Parking Lot 12 - Rte 0912)	$144,241	42	2	0.42
73	1300	60794 (AD Parking Lot 7 - Rte 0937)	$104,348	42	2	0.42
74	1300	60808 (PD Vista 4 - Rte 0919)	$62,292	42	2	0.42
75	1300	60812 (PD Vista 7 - Rte 0922)	$77,681	42	2	0.42
76	1300	60813 (PD Vista 8 - Rte 0923)	$57,798	42	2	0.42
77	1300	60799 (PD Playalinda Entrance Parking - Rte 0900)	$37,299	42	2	0.42
78	4100	60226 (PD Beach P.O.L. Building)	$49,889	43	3	0
79	4100	60221 (PD Ranger Station P.O.L. Building)	$56,518	43	3	0.02

Table D15 (continued). CANA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
80	4100	231196 (AD POL Building (New))	$46,159	43	0	0
81	4100	227564 (PD Wilson Corner P.O.L Shed)	$37,424	43	0	0
82	4100	60150 (AD Comfort Station 1)	$104,923	44	2	0
83	4100	60152 (AD Comfort Station 3)	$90,049	44	2	0
84	4100	60154 (AD Comfort Station 4)	$90,049	44	2	0
85	4100	60155 (AD Comfort Station 5)	$90,049	44	2	0
86	4100	60156 (AD Comfort Station 8)	$90,049	44	2	0
87	4100	60157 (AD Comfort Station Boat Ramp)	$90,049	44	2	0
88	4100	60189 (PD Comfort Station 1)	$90,049	44	2	0
89	4100	60190 (PD Comfort Station 2)	$90,049	44	2	0
90	4100	60191 (PD Comfort Station 3)	$90,049	44	2	0
91	4100	60192 (PD Comfort Station 4)	$90,049	44	2	0
92	4100	60193 (PD Comfort Station 5)	$90,049	44	2	0
93	4100	60194 (PD Comfort Station 6)	$90,049	44	2	0
94	4100	60195 (PD Comfort Station 7)	$90,049	44	2	0
95	4100	60196 (PD Comfort Station Eddy Creek)	$104,923	44	2	0
96	4100	60197 (PD Comfort Station 8)	$90,049	44	2	0
97	4100	60198 (PD Comfort Station 9)	$90,049	44	2	0
98	4100	60199 (PD Comfort Station 10)	$104,923	44	2	0
99	4100	60200 (PD Comfort Station 11)	$90,049	44	2	0
100	4100	60201 (PD Comfort Station 12)	$90,049	44	2	0

Castillo de San Marcos National Monument (CASA)

Table D16. Summary of Findings for CASA.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	54	100%	$26,544,130,871	100%
Limited Exposure	0	0	0	0
TOTALS	**54**	**100%**	**$26,544,130,871**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2008 St. Johns County LiDAR

Process/methods for exposure determination
Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms. Fort Matanzas (FOMA) was originally not included in analysis but during park review these assets were added.

CASA Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

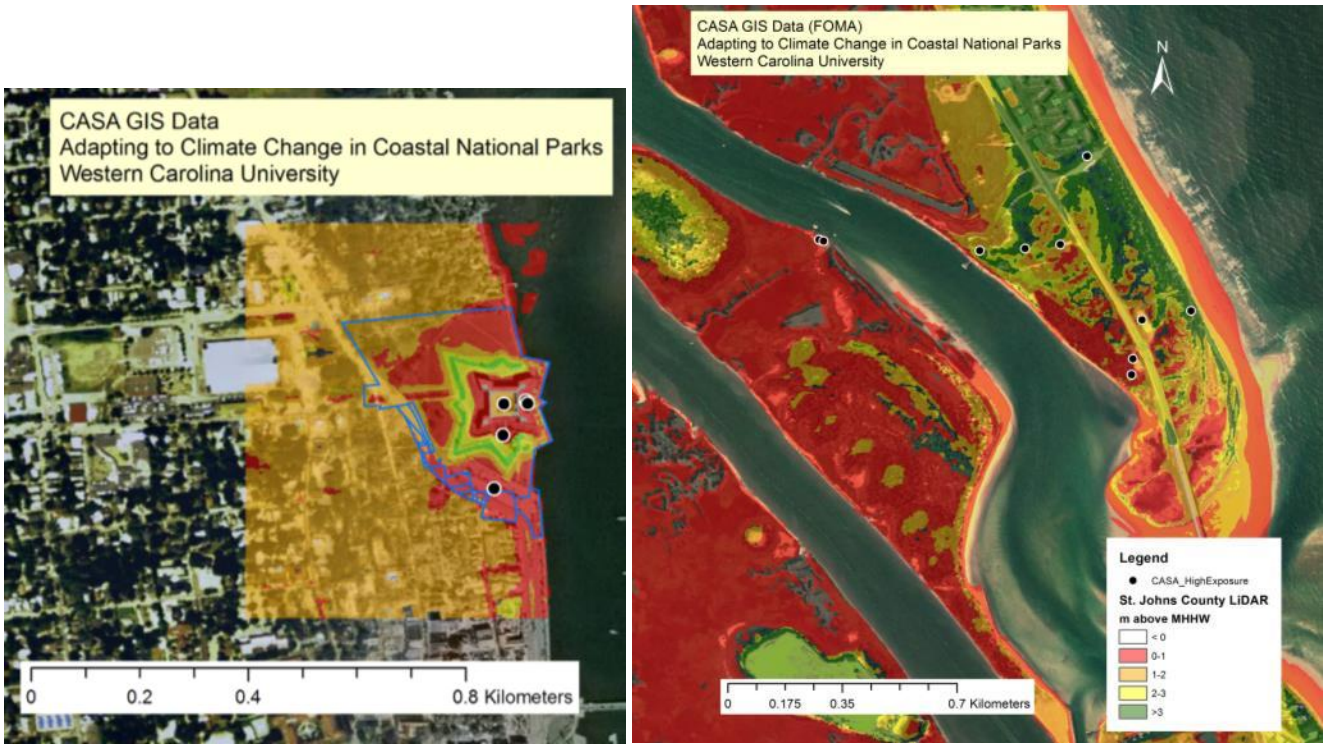

Figure D7. CASA GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW, for CASA used Vilano Beach ICWW, FL station and the State Road A1a Bridge, FL (both approximately 0.57 m above NAVD88) http://tidesandcurrents.noaa.gov/datums.html?id=8720554.

Table D17. Complete list of GIS Data utilized for CASA.

Data Name	Data Source
2008 St. Johns County, FL Countywide Lidar	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table D18. CASA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	233417 (CASA New Visitor Use Assistant Office)	$147,344	0	90	0
2	7500	234561 (CASA-Fort Interpretive Media)	$1,560,215	0	73	0
3	7500	234565 (CASA-Grounds Interpretive Media)	$24,841	0	67	0
4	4100	117043 (CASA Eastern & LE Ranger Office)	$97,962	0	63	0
5	4100	230261 (CASA (NEW) Living History Storage Room)	$95,163	0	60	0
6	7300	13554 (CASA Fort)	$25,984,182,067	1	100	0
7	7300	13566 (FOMA Fort)	$21,391,548	1	100	0
8	7300	13661 (CASA Sea Wall)	$69,615,300	1	93	0
9	7300	36794 (CASA Ravelin)	$28,289,230	1	93	0
10	7300	13660 (CASA Water Battery)	$123,424,865	2	93	0

Table D18 (continued). CASA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
11	7300	13664 (CASA Covered Way)	$37,244,213	2	93	0
12	7300	13591 (CASA Moat)	$276,125,591	2	93	0
13	7300	13603 (CASA Hot Shot Furnace)	$372,442	2	93	0
14	1300	37037 (FOMA Visitor Parking Road FHWA RT 900)	$835,397	2	88	0
15	7300	36793 (CASA City Gate)	$12,180,085	2	87	0
16	4100	13568 (FOMA Visitor Center)	$453,574	2	78	0
17	1300	37041 (FOMA Dunes Parking FWHA RT905)	$197,357	2	78	0
18	1300	37042 (FOMA River Parking FHWA RT906)	$118,804	2	78	0
19	7300	13659 (CASA Cubo Line)	$7,094,136	3	71	0
20	4100	13649 (CASA Ranger Offices)	$144,494	3	71	0
21	2100	36572 (FOMA Nature Trail Boardwalk)	$236,064	3	71	0
22	4100	13648 (CASA Restrooms)	$441,307	3	71	1
23	2100	36573 (FOMA Oceanside Boardwalk)	$129,347	3	71	2
24	2100	36574 (FOMA Bayside Boardwalk)	$48,204	3	71	2
25	4100	13650 (CASA Administration Building)	$1,142,112	3	70	0
26	1300	37033 (CASA Administration Area Parking Lot RT 900)	$56,188	3	70	1
27	1300	37040 (FOMA Beach Access Parking FWHA Rte#902)	$232,893	3	68	1
28	1300	104762 (FOMA Visitor Parking North, RT 900A)	$32,649	3	65	0
29	1300	104768 (FOMA Visitor Parking, South, RT 900B)	$30,798	3	65	0
30	4100	13654 (CASA Gas Shed)	$12,153	3	61	0
31	4100	13655 (CASA Maintenance Bay Storage Buildings)	$681,610	3	61	0
32	4100	32798 (Chief of Maintenance Office)	$81,911	3	61	0
33	4100	37050 (FOMA Maintenance Shop)	$322,923	3	61	0
34	4100	13596 (FOMA New LE Office (old Ranger Office))	$90,993	3	61	0
35	4100	13594 (FOMA Public Restrooms)	$665,743	3	60	0
36	4100	31710 (CASA Gift Shop Eastern National Park & Monument)	$128,826	3	55	0
37	4100	37051 (FOMA Maintenance Outbuilding)	$209,552	3	54	0
38	1300	37034 (CASA Maintenance Parking Lot RT 901)	$22,165	3	50	1
39	4100	13593 (CASA Fee Booth)	$26,519	4	68	1
40	1300	37031 (CASA Main Visitor Parking Lot FHWA RT 902)	$692,655	4	48	0
41	4100	24421 (FOMA Quarters Johnson House QMIS 0000008 C , D, E)	$2,029,755	4	43	0
42	3100	36580 (FOMA Fort Maintained Landscape)	$34,149	4	43	0
43	1100	37047 (FOMA Service Road)	$20,169	4	43	0
44	1300	104969 (FOMA Rattlesnake Island Parking, RT 903)	$10,611	4	38	0
45	4100	24424 (FOMA New Ranger Office (Old VC Apartment))	$180,385	4	38	0
46	1100	104877 (FOMA, Fishing Road, RT 200)	$13,339	4	27	0
47	3100	36577 (FOMA Quads Maintained Landscape)	$61,013	4	27	0
48	1300	37032 (CASA Ranger Parking Lot FHWA RT 904)	$98,944	4	21	1
49	4100	37049 (FOMA Balley Building)	$93,691	5	30	0
50	3100	37045 (FOMA Maintenance Yard)	$31,934	5	13	0

Table D18 (continued). CASA High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
51	1300	37039 (FOMA Ranger Parking FWHA Rte#901)	$52,770	5	13	0
52	7500	234566 (FOMA-Fort Interpretive Media)	$135,936	n/a	73	0
53	4100	117042 (FOMA Fire Cache)	$17,473	n/a	36	0
54	4100	37710 (CASA Living History Storage Room)	$148,532	n/a	n/a	n/a

Cumberland Island National Seashore (CUIS)

Table D19. Summary of Findings for CUIS.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	33	16%	$19,361,490	17%
Limited Exposure	171	84%	$93,069,529	83%
TOTALS	**204**	**100%**	**$112,431,019**	**100%**

Park visit
April 2012

Park contacts
John Fry

Primary data utilized
1) NPS FMSS location hierarchy report
2) LiDAR obtained from Chester Jackson, Georgia Southern University

Process/methods for exposure determination
Combination of visit/discussion with park staff during visit and LiDAR/geologic analysis of assets.

CUIS Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

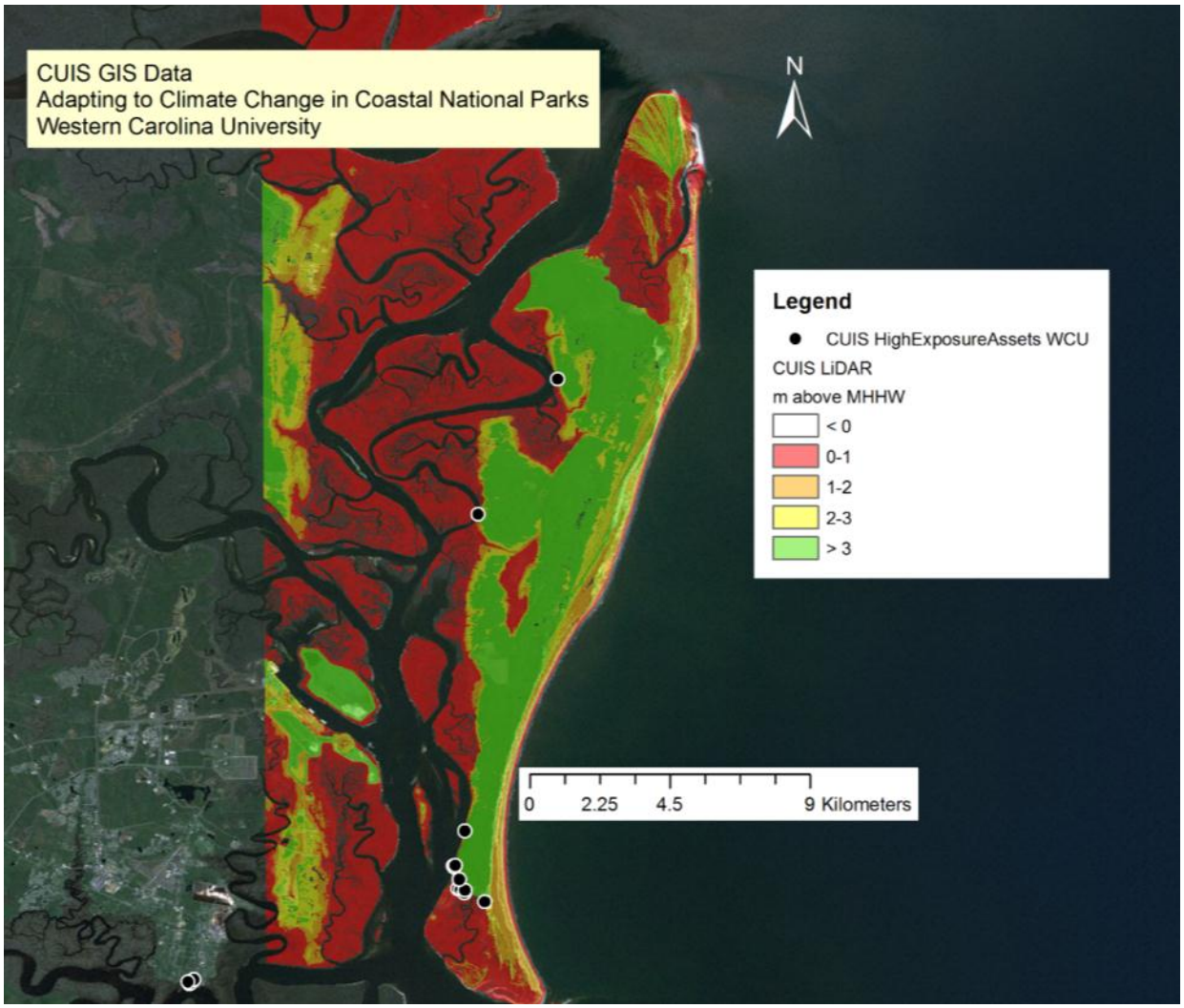

Figure D8. CUIS GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.84 m above NAVD88), for CUIS used Fernandina Beach, FL station: http://tidesandcurrents.noaa.gov/datums.html?id=8720030.

Table D20. Complete list of GIS Data utilized for CUIS.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
CUIS LIDAR, meters, NAVD88	Chester Jackson, Department of Geology & Geography Georgia Southern Univ.
Cumberland Island National Seashore Small-Scale Base GIS Data	IRMA, NPS: https://irma.nps.gov/App/

Table D21. CUIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7500	235366 (Interpretive Media Mainland Musuem Exibits)	$565,502	0	100	0
2	7500	235364 (Interpretive Media Ice House Exibits)	$744,758	0	100	0
3	7500	235365 (Interpretive Media Mainland VC Exibits)	$469,847	0	92	0
4	6300	107552 (Dungeness Seawall)	$3,966,461	1	100	0
5	4100	62791 (Mainland Museum)	$4,581,306	1	100	0.02
6	4100	63826 (Dungeness Dock Ice House (Museum))	$750,282	1	93	0.63
7	4100	62789 (Mainland Visitor Center)	$2,135,096	1	88	0.02
8	4100	62804 (Dungeness Boat House)	$441,748	1	88	0.03
9	4100	62814 (Seacamp Ranger Station)	$1,084,468	1	77	0.15
10	4100	62790 (Bachlott House)	$1,015,343	1	71	0.05
11	4100	113369 (Plum Orchard Octagon Shed)	$79,306	1	40	0
12	7200	113364 (Dungeness Dock Cistern (Ruin))	$311,969	1	33	0
13	1300	109009 (Bachlott House Parking Lot)	$36,478	2	65	0
14	7200	112938 (Dungeness Water Wheel House Ruin)	$462,431	2	43	0
15	7200	112905 (Dungeness Garden House (Ruin))	$146,625	2	33	0
16	7200	112909 (Dungeness Greenhouse (Ruin))	$423,565	2	33	0
17	4300	62810 (White Cottage (QMIS- 00000011))	$612,618	2	32	0
18	5100	107620 (White Cottage Well System)	$39,950	2	32	0
19	4100	112863 (White Cottage Well Pump House)	$17,624	2	15	0
20	4100	113358 (White Cottage Laundry House)	$25,378	2	15	0
21	2100	63810 (Dungeness Marsh Boardwalk)	$310,190	3	46	0
22	4100	112939 (Mainland Gazebo)	$52,589	3	24	0.08
23	3100	63862 (Brickhill Campground)	$17,827	3	20	0
24	5100	108408 (Brickhill Campground Well System)	$34,227	4	78	0
25	7200	114683 (White Cottage Duck Pond)	$83,584	4	62	0
26	4100	63855 (Mainland Maintenance Shop)	$251,664	4	61	0.04
27	4100	113359 (White Cottage Fire Cache (Small Frame Building))	$109,971	4	30	0
28	4100	113360 (White Cottage Fire Cache (Large Frame Bldg))	$186,105	4	30	0
29	1300	112941 (Mainland Museum Parking Lot)	$72,198	4	13	0
30	5100	109802 (Dungeness Mansion Garden Well System)	$34,227	5	72	0
31	7200	112946 (Dungeness Recreation Guest House (Ruin))	$263,926	5	33	0
32	5100	109800 (White Cottage Well System (Duck Pond))	$34,227	5	23	0
33	4100	238007 (The Grange Dock House)	n/a	n/a	n/a	n/a

De Soto National Memorial (DESO)

Table D22. Summary of Findings for DESO.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	10	100%	$3,366,160	100%
Limited Exposure	0	0	0	0
TOTALS	**10**	**100%**	**$3,366,160**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report

Process/methods for exposure determination
Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms.

DESO Documents
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

Table D23. DESO High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7500	111652 (Interpretive Media Talking Chickee Hut)	$30,129	0	n/a	0
2	7500	231801 (DESO- Visitor Center Interpretive Media)	$96,101	0	n/a	0
3	7500	231813 (DESO- Nature Trail Interpretive Media)	$81,578	0	n/a	0
4	4100	50396 (Visitor Center)	$1,699,416	1	n/a	0.06
5	4100	75316 (Maintenance/Administration Building)	$758,247	2	n/a	0.03
6	2100	50400 (DESO Nature Trail)	$180,377	2	n/a	0.04
7	1300	53322 (Maintenance Shell Road/Parking RT 0901)	$72,045	3	n/a	0
8	4100	75320 (Irrigation Pump House)	$19,689	3	n/a	0
9	4100	75317 (Fuel and Paint Shed)	$32,246	3	n/a	0.08
10	1300	50413 (Paved Road/Parking-RT 900)	396331.25	3.00	n/a	0.17

Everglades National Park (EVER)

Table D24. Summary of findings for EVER.

Exposure Level	# of assets	% of assets	CRV	% of total CRV
High Exposure	493	100%	$657,087,096	100%
Limited Exposure	0	0	0	0
TOTALS	**493**	**100%**	**$657,087,096**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report

Process/methods for exposure determination
Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms. Each park unit may have specific assets that should be removed from this list and placed into the limited exposure category (please note if this is the case for EVER).

EVER Documents
Example of high exposure assets*

*First 100 assets, sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

Table D25. EVER High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	6300	228469 (FLFB Little Rabbit Key Dock)	$56,288	0	100	0
2	6300	231149 (NWVC Chockoloskee Bay AIP AToNs)	$126,909	0	100	0
3	6300	115571 (FLFB Channel Markers)	$1,855,686	0	100	0.56
4	6200	102074 (NWBC Thousands Islands Coastal Waterway)	$129,999	0	92	0
5	4100	226208 (NWSV New SV Shade Structure)	$140,481	0	88	0
6	4100	115768 (NWSV 328B Concession Ticket Booth)	$34,036	0	88	0.37
7	4100	226605 (FLMY 429 Flamingo HazMat Storage Bldg)	$38,091	0	80	0
8	4100	116431 (FLPH 498 Flamingo Housing 00000498)	$416,812	0	80	0
9	4100	116433 (FLPH 499 Flamingo Housing 00000499)	$387,682	0	80	0
10	4100	116428 (PIKL 501 Housing Unit 0000501)	$380,808	0	80	0
11	4100	116844 (PIKL 507 Key Largo Dormitory)	$576,917	0	80	0
12	4100	116845 (PIKL 508 Key Largo Research Lab)	$780,624	0	80	0
13	4100	67206 (FLVC 460 Flamingo Restaurant/Lounge)	$4,660,000	0	77	0.24
14	7500	228502 (FLCG Campground Waysides)	$23,935	0	75	0
15	7500	237100 (FLMR Main Road North Interpretive Media)	$11,246	0	75	0
16	7500	237104 (FLMR Main Road South Interpretive Media)	$18,141	0	75	0
17	7500	228500 (FLVC Flamingo VC Museum Display)	$1,480,919	0	75	0
18	7500	228501 (FLVC Flamingo VC Waysides)	$13,643	0	75	0
19	7500	228496 (FLWL West Lake Waysides)	$13,204	0	75	0
20	7500	228504 (PIRP Royal Palm Waysides)	$88,165	0	75	0
21	7500	116432 (PIVC Coe VC Grounds Waysides)	$63,508	0	75	0
22	7500	228512 (PIVC Pine Island VC Museum Displays)	$2,915,338	0	75	0
23	7500	228479 (PILP Long Pine Key Waysides)	$24,299	0	75	0
24	7500	228495 (PIPA Pa-Hay-Okee Waysides)	$30,421	0	75	0
25	7500	228493 (PIMH Mahogany Hammock Waysides)	$15,770	0	75	0
26	7500	228503 (PIPL Pinelands Waysides)	$51,370	0	75	0
27	7500	228511 (NWSV Shark Valley VC Waysides)	$110,896	0	75	0
28	7500	228510 (NWST Shark Valley Tower Waysides)	$45,790	0	75	0
29	6300	236207 (NWBC Sandfly Island Dock)	$120,190	0	75	0
30	7500	228498 (NWEC Ever City VC Museum Display)	$377,928	0	75	0
31	7500	228499 (NWEC Ever City VC Waysides)	$96,442	0	75	0
32	4100	226205 (NWSV 320 Comfort Station)	$741,464	0	73	0
33	4100	226603 (FLCG 409 Flamingo Fee Station)	$68,073	0	73	0.01
34	4100	226237 (NWSV 329 Entrance Station)	$68,073	0	73	0.01
35	6300	115695 (NWBC Coopertown Boat Launch)	$52,327	0	71	0.41
36	6300	228475 (FLBC Cane Patch Dock)	$56,288	0	70	0
37	7900	70993 (FLCG 430 Flamingo Amphitheater)	$457,764	0	68	0
38	7500	228513 (PICH Chekika Waysides)	$26,128	0	67	0
39	7500	230570 (PIKL Key Largo Waysides)	$10,638	0	67	0

Table D25 (continued). EVER High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	7500	228494 (PIMR Rock Reef Boardwalk Waysides)	$10,638	0	67	0
41	7500	228505 (PIMR PI Rt 10 Pull-Off 1 Waysides)	$10,638	0	67	0
42	7500	228506 (PIMR PI Rt 10 Pull-Off 2 Waysides)	$5,319	0	67	0
43	7500	228507 (PIMR PI Rt 10 Pull-Off 3 Waysides)	$5,319	0	67	0
44	7500	228508 (PIMR PI Rt 10 Pull-Off 4 Waysides)	$5,319	0	67	0
45	7500	228509 (NWLR Loop Road Waysides)	$18,439	0	67	0
46	7500	228497 (NWBC Sandfly Island Waysides)	$11,991	0	67	0
47	4100	93256 (PIOP SFNRC Krome Center)	$6,571,806	0	65	0
48	4100	67223 (FLVC 470 Tour Boat Rental Office)	$80,512	0	65	0.27
49	6300	236206 (NWBC Crooked Creek Chickee)	$120,190	0	64	0
50	6300	229502 (NWBC Camp Lonesome Dock)	$67,542	0	64	0
51	6300	229504 (NWBC Watsons Place Dock)	$56,288	0	64	0
52	6300	229505 (NWBC Willy Willy Dock)	$56,288	0	64	0
53	6200	236205 (NWEC Halfway Creek Canoe Trail)	$152,532	0	64	0
54	6300	229506 (NWBC Lostmans Five Dock)	$56,288	0	64	0.07
55	6100	99821 (FLBC Raulerson Canal Plug)	$433,457	0	63	0
56	6300	228476 (NWBC Broad River Dock)	$56,288	0	60	0.1
57	6300	231045 (FLFB Johnson Key Chickee)	$122,281	0	58	0
58	6300	231046 (FLFB Shark Point Chickee)	$122,281	0	58	0
59	1300	86697 (FLCS 218 Cottage Access Parking -X)	$196,485	0	57	0.13
60	1100	86556 (FLCS 218 Flamingo Cottage Access Rd)	$865,372	0	57	0.15
61	6300	228473 (FLFB Nest Key Dock)	$56,288	0	55	0
62	4100	66876 (FLPH 491 Employee Laundry)	$44,775	0	40	0.54
63	1100	83627 (FLMR 010 Flamingo Route 10)	$54,111,477	1	100	0.02
64	1700	86795 (FLMR Buttonwood Bridge)	$3,894,593	1	100	0.14
65	6200	82485 (FLVC Buttonwood Canal)	$42,415,962	1	88	0
66	4100	73192 (NWLR 343B Loop Road Comfort Stn)	$280,021	1	88	0.03
67	4100	70477 (PIVC 160 Pine Island VC Bldg)	$5,370,759	1	88	0.13
68	4100	73247 (NWSV 349 Shark Valley Visitor Center)	$528,662	1	88	0.2
69	4100	70491 (PIVC 162 Pine Island Entrance Stn)	$616,361	1	88	0.21
70	4100	67621 (NWEC 604 Everglades City VC)	$2,449,537	1	88	0.74
71	4100	73200 (NWLR 343E Loop Road Cook Chickee)	$112,488	1	81	0
72	4100	72937 (PILP 168 Long Pine Comfort Stn)	$280,826	1	81	0.05
73	4100	72946 (PILP 169 Long Pine Comfort Stn)	$280,826	1	81	0.05
74	4100	70997 (PILP 148 Long Pine Comfort Stn)	$280,826	1	81	0.05
75	6200	82506 (FLBC Wilderness Waterway)	$1,610,463	1	80	0.02
76	4100	70475 (PIVC 161 Headquarters Building)	$3,264,671	1	80	0.14
77	4100	70478 (PIVC 160A Pine Island VC Comfort Stn)	$578,175	1	68	0.06
78	2100	70980 (PIRP Anhinga Boardwalk)	$1,363,190	1	68	0.34
79	2100	77363 (PIRP Anhinga Trail)	$733,564	1	68	0.65

Table D25 (continued). EVER High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
80	4100	97839 (NWST 327 Tower Comfort Station)	$1,185,918	1	58	0.11
81	4100	73219 (NWST 327A Shark Valley Tower)	$2,176,363	2	100	0
82	6300	111345 (NWEC Everglades City Marina)	$4,832,185	2	100	0.13
83	6100	73178 (FLVC Buttonwood Canal Plug)	$195,481	2	100	0.18
84	4100	67252 (FLMY 410 Flamingo Sewer Plant)	$290,436	2	92	0.01
85	4100	73189 (NWLR 343 Loop Road Office)	$527,889	2	88	0.03
86	4100	67209 (FLVC 466 Flamingo Marina Store)	$1,320,925	2	88	0.16
87	6300	90598 (NWEC Everglades City Waterfront)	$1,190,525	2	88	0.26
88	4100	115765 (NWSV 328A Concession Sales)	$111,729	2	88	0.35
89	4100	67315 (FLVC 419 Fish Cleaning Station)	$737,219	2	87	0.02
90	6200	82529 (FLBC Noble Hammock Canoe Trail)	$169,099	2	85	0
91	4100	71000 (PILP 151 Long Pine Comfort Stn)	$280,826	2	81	0.04
92	4100	70999 (PILP 150 Long Pine Comfort Stn)	$280,826	2	81	0.04
93	4100	70998 (PILP 149 Long Pine Comfort Stn)	$280,826	2	81	0.05
94	4100	86893 (NWEC Ever City Picnic Chickee)	$167,938	2	81	0.55
95	6300	82512 (FLBL Bear Lake Canoe Trail)	$675,058	2	80	0
96	6200	82508 (NWBC Northwest Wilderness Waterway)	$4,670,344	2	80	0.01
97	4100	72919 (PIEE 703 Housing (Lg Hernandez))	$2,371,340	2	80	0.02
98	4100	67303 (FLPH 442 Flamingo Housing 00000442)	$1,744,033	2	80	0.03
99	4100	73170 (NWTC 350 Trail Center Housing)	$426,525	2	80	0.03
100	4100	73166 (NWSA 334 Shark Valley Admin Housing)	$324,301	2	80	0.03

Fort Pulaski National Monument (FOPU)

Table D26. Summary of Findings for FOPU.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	52	100%	$286,318,757	100%
Limited Exposure	0	0	0	0
TOTALS	**52**	**100%**	**$286,318,757**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report

Process/methods for exposure determination
Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms.

FOPU Documents
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

Table D27. FOPU High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7500	235581 (FOPU Interpretive Media Waysides- Historic Distric)	$32,935	0	77	0
2	7500	235582 (FOPU Interpretive Media Waysides- West Cockspur)	$1,572	0	73	0
3	7500	235576 (FOPU Interpretive Media Waysides- McQueens Island)	$3,494	0	73	0
4	7500	235583 (Interpretive Media Waysides- Outside McQueen/Cockspur Islands)	$3,144	0	72	0
5	7500	235584 (FOPU Interpretive Media Exhibits- Historic District)	$242,297	0	60	0
6	7300	66525 (HD-Fort Pulaski)	$220,471,370	1	100	0.02
7	6200	66541 (HD-Feeder Canal)	$170,971	2	93	0
8	4100	66517 (WC- Cottage)	$1,065,025	2	92	0.02
9	4100	66529 (HD-Visitor Center)	$1,912,954	2	88	0.03
10	7300	66526 (HD-Fort Moat)	$1,932,874	2	80	0
11	7300	66527 (HD-Fort Demilune)	$5,798,622	2	80	0
12	4100	66528 (HD-Cockspur Lighthouse)	$8,364,166	2	80	0.12
13	4100	66518 (WC- Maintenance Shop)	$1,733,343	2	73	0.03
14	3100	66653 (HD-Historic Landscape)	$13,788,778	3	100	0
15	7300	66531 (HD-Battery Hambright)	$1,932,874	3	80	0
16	2100	112695 (MI-Rails to Trails)	$143,921	3	61	0
17	4100	112684 (HD-Fort Pulaski Comfort Station)	$170,851	3	60	0
18	4100	81677 (HD-VC Comfort Station)	$462,754	3	60	0.03
19	4100	66520 (WC-Picnic Area Comfort Station)	$138,625	4	62	0
20	2100	112491 (HD-Lighthouse Overlook Trail)	$88,531	4	61	0
21	3100	66519 (WC-Picnic Area)	$45,592	4	34	0
22	4100	112894 (WC Picnic Shelter)	$162,294	4	24	0
23	4100	66524 (MI-Entrance Station)	$9,162	4	21	0.01
24	1100	69971 (MI Entrance Road - Route 0010)	$1,411,573	5	88	0.1
25	1700	66523 (MI-Bridge)	$7,610,142	5	88	1.04
26	7200	112858 (HD-Cistern No. 5 (Ruin))	$9,620	5	80	0
27	7200	112886 (HD-Cistern No. 2)	$10,381	5	80	0
28	7200	112887 (HD-Cistern No. 3)	$21,631	5	80	0
29	7200	112889 (HD-Brick Foundation Ruin at Cistern No. 3)	$2,446	5	80	0
30	7200	112895 (HD-Cistern No. 1)	$13,805	5	80	0
31	7200	112896 (HD-Cistern No. 4)	$27,556	5	80	0
32	7200	112906 (HD-Brick Foundation Ruin at Cistern No. 4)	$1,196	5	80	0
33	7200	112945 (HD-Cistern No. 6)	$12,283	5	80	0
34	7200	112952 (HD-Cistern No. 7)	$2,718	5	80	0
35	7200	112953 (HD-Stones from Cistern (Ruin))	$1,087	5	80	0
36	7200	66537 (HD-North Pier)	$922,676	5	80	0
37	1300	69967 (HD Visitor Center Parking Lot)	$703,049	5	69	0.18
38	1100	69969 (HD Fort Loop)	$1,983,262	5	62	0.01
39	2100	66662 (HD-Nature Trail)	$203,462	5	61	0.07

Table D27 (continued). FOPU High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
40	1100	69975 (WC West Road Intersection to West Gate)	$1,349,526	5	60	0.17
41	1100	69977 (WC Pilot Road)	$93,070	5	57	0.11
42	4100	112685 (HD-Fort Pulaski Bally Building)	$120,018	5	52	0
43	7300	112960 (WC-West End Small Powder Magazine)	$487,337	5	45	0
44	7300	66521 (WC-West End Magazine)	$12,183,429	5	45	0
45	1300	69978 (WC Cockspur Picnic Parking)	$18,845	5	40	0.18
46	1300	69982 (HD South Channel Parking C & D)	$14,500	5	36	0.5
47	1300	69973 (MI South Channel Parking A & B)	$12,760	5	36	0.66
48	1300	69979 (WC Maintenance Parking)	$74,479	5	23	0.27
49	4100	112860 (WC Fuel House)	$101,521	5	19	0
50	4100	112862 (WC Pole Shed)	$96,215	5	19	0
51	1100	69980 (WC Loop Drive)	$124,095	5	19	0.06
52	1100	231771 (WC Beach Access Loop - Rt 0201)	$29,925	n/a	n/a	n/a

Fort Sumter National Monument (FOSU)

Table D28. Summary of Findings for FOSU.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	38	100%	$1,230,735,376	100%
Limited Exposure	0	0	0	0
TOTALS	**38**	**100%**	**$1,230,735,376**	**100%**

Park visit
Summer 2012

Park contacts
Rick Dorrance

Primary data utilized
1) NPS FMSS location hierarchy report

Process/methods for exposure determination
Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms.

FOSU Documents
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

Table D29. FOSU High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7500	235212 (Fort Sumter Landscape Interpretive Media)	$81,343	0	55	0
2	7500	235210 (Fort Sumter Proper Museum Interpretive Media)	$1,275,605	0	55	0
3	7500	235215 (LS Visitor Education Center Interpretive Media)	$1,291,194	0	55	0
4	7500	235216 (LS Landscape Interpretive Media)	$42,765	0	55	0
5	7500	235217 (Fort Moulrtie Visitor Center Interpretive Media)	$1,970,079	0	55	0
6	7500	235220 (Fort Moultrie Visitor Center Landscape Interpretive Media)	$8,936	0	55	0
7	7500	235221 (Fort Moultrie HECP Interpretive Media)	$322,459	0	55	0
8	7500	235223 (Fort Moultrie Landscape Interpretive Media)	$63,277	0	55	0
9	7300	45814 (Fort Sumter Proper)	$638,438,586	1	100	0.01
10	7300	45992 (Fort Moultrie Proper)	$279,798,499	1	100	0.01
11	3100	5818(FS Landscape: Man Made Island Above Ground Island Area)	$6,206,241	1	88	0.02
12	6300	45817 (Fort Sumter Waterfront (Dock))	$3,598,376	1	88	0.02
13	7300	45815 (Fort Sumter Battery Huger)	$51,170,913	1	88	0.08
14	6300	45790 (Liberty Square Waterfront (Dock))	$10,261,784	1	55	0
15	7300	45993 (Fort Moultrie HECP)	$10,895,904	2	100	0.04
16	6300	45989 (Fort Moultrie Waterfront (Dock))	$1,516,082	2	70	0.2
17	4100	45987 (Fort Moultrie Visitor Center)	$3,526,576	2	67	0.03
18	4100	45786 (Liberty Square Visitor Education Center)	$9,251,842	2	55	0
19	1300	58535 (Ft. Moultrie VC Prkg Area,Paved., RT0900 -Asset1300)	$605,075	2	55	0.68
20	4100	45793 (QMIS FOSU 02 & FOSU 03 Life-saving Station Quarters)	$1,953,453	2	54	0.02
21	1100	58903 (LISQ S Acc., Rd, Paved., RT -Asset1100)	$351,845	2	48	0
22	7300	45994 (Fort Moultrie Battery Jasper)	$170,789,955	3	73	0.02
23	7300	45997 (Fort Moultrie C230)	$24,148,214	3	70	0.01
24	4100	45795 (Life-saving Station Garage)	$1,086,796	3	63	0.02
25	4100	45794 (Life-saving Station Carpenter Shop\Boat House)	$500,113	3	63	0.13
26	4100	45995 (Fort Moultrie Generator Building)	$115,582	3	57	0.02
27	4100	45988 (Fort Moultrie Park Headquarters)	$780,174	3	54	0.02
28	1100	58902 (LISQ N. Access Rd, Paved.,RT -Asset 1100)	$198,804	3	48	0
29	7300	45796 (Life-saving Station Bunker)	$2,227,695	3	48	0
30	4100	45787 (Liberty Square Shade Shelter East)	$428,378	3	38	0
31	4100	45789 (Liberty Square Shade Shelter West)	$403,772	3	38	0
32	5100	45996 (Fort Moultrie Cistern)	$701,184	4	42	0.06
33	1100	58517 (Battery Jasper Svc. Rd, Unpaved, Paved.,RT0101)	$47,923	4	40	0.01
34	1100	58516 (C230 Access Road, Unpaved., RT0100)	$15,974	4	31	0
35	1300	58542 (C230/SPAWARAcc.Rd.&Pkg Area,Paved.,RT0902)	$58,680	4	31	0.29
36	6300	45816 (Fort Sumter Breakwater)	$5,909,235	5	82	1.12
37	1300	58536 (USCG L-SS Pkg Area,Paved.,RT0901-Asset1300)	$91,386	5	31	2.64
38	4100	45998 (Fort Moultrie Spawars Building)	$600,677	5	23	0

Gulf Islands National Seashore (GUIS)

Table D30. Summary of Findings for GUIS.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	355	81%	$3,930,189,186	80%
Limited Exposure	81	19%	$1,008,351,061	20%
TOTALS	**436**	**100%**	**$4,938,540,247**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2)EAARL Coastal Topography and Imagery--Naval Live Oaks Area, Gulf Islands National Seashore, Florida, 2007
3) 2010 USACE JALBTCX Topobathy Lidar: Alabama Coast and Florida Gulf Coast

Process/methods for exposure determination
Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms. Each park unit may have specific assets that should be removed from this list. In the case of GUIS, it was discussed that the mainland assets would be an exception, and should be listed as having a limited exposure.

GUIS Documents
Map of high exposure assets & GIS data
LIMITED exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)

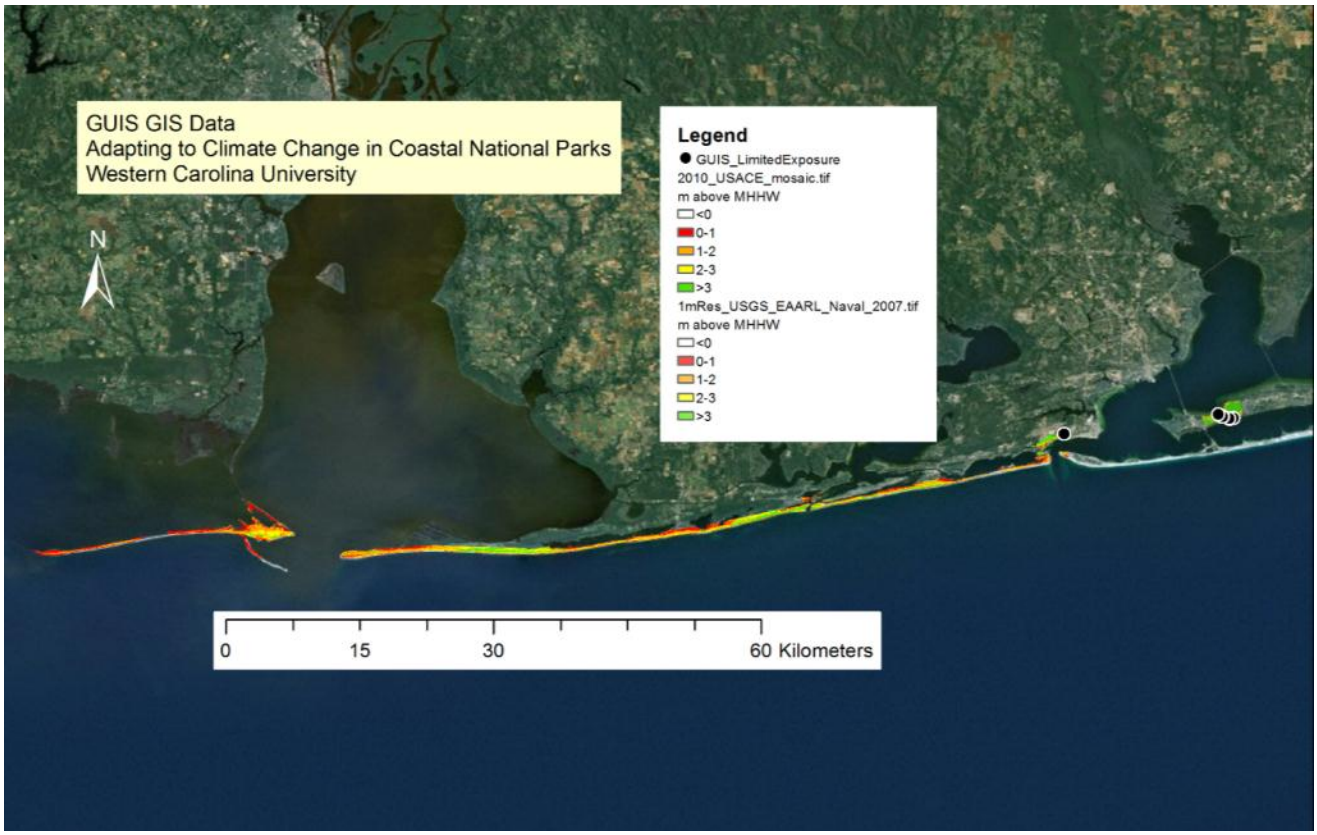

Figure D9. GUIS GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.21 m above NAVD88), for GUIS used Dauphin Island, FL station: http://tidesandcurrents.noaa.gov/datums.html?id=8735180.

Table D31. Complete list of GIS Data utilized for GUIS.

Data Name	Data Source
2010 USACE JALBTCX Topobathy Lidar: Alabama Coast and Florida Gulf Coast	NOAA: http://www.csc.noaa.gov/dataviewer/#
EAARL Coastal Topography and Imagery--Naval Live Oaks Area, Gulf Islands National Seashore, Florida, 2007	

Table D32. GUIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7500	230099 (NLO Visitor Center Exhibit)	$544,868	0	93	0
2	7500	235921 (NLO Visitor Center Waysides)	$45,220	0	83	0
3	7500	235923 (NLO Brackenridge Nature Trail Waysides)	$100,523	0	83	0
4	7500	235920 (NLO HQ Picnic Area Waysides)	$2,139	0	75	0
5	7500	235919 (NLO HQ Picnic Area Restroom Waysides)	$3,976	0	63	0
6	7500	235818 (NLO North Bay Trail Wayside)	$7,226	0	63	0

Table D32 (continued). GUIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
7	7500	235820 (NLO Campground Shelter Waysides)	$2,991	0	63	0
8	3100	56644 (NLO HQ Picnic Area)	$31,244	1	88	0
9	4100	56651 (NLO Headquarters/Visitor Center (FL42))	$2,406,182	1	88	0
10	4100	79787 (NLO H Q Picnic Area Restroom (FL43))	$6,829,311	1	77	0
11	4100	79780 (NLO Group Camping Restroom (FL40))	$682,931	1	77	0
12	3100	56646 (NLO Group Camping Area)	$31,244	1	70	0
13	3100	59072 (FB Historic Landscape)	$97,574	3	93	0
14	3100	108368 (FB Advance Redoubt Historic Landscape)	$121,968	3	93	0
15	4100	59051 (FB Visitor Center Complex (FL48))	$796,754	3	88	0
16	4100	56642 (NLO Hurricane Building (FL46))	$333,690	3	83	0
17	7300	59053 (Fort Barrancas (LCS 00526 STRC NUM FB-0))	$284,901,192	4	100	0
18	7300	59070 (FB Advance Redoubt (LCS 05421 STRU NUM FB-1))	$507,845,197	4	100	0
19	1300	59057 (FB Parking)	$51,451	4	88	0
20	3100	59063 (FB Picnic Area)	$31,912	4	77	0
21	2100	67888 (FB Woodland Nature Trail)	$75,855	4	75	0
22	4100	89316 (NLO Headquarters Picnic Area Shelter (FL 44))	$154,857	4	65	0
23	7300	59067 (FB Battery San Antonio-Water Battery-LCS 05422 STRU NUM FB-2)	$179,100,073	5	100	0
24	3100	113840 (NLO Maintenance/Recreation Area Grounds)	$14,970,311	5	100	0
25	2100	56638 (NLO Andrew Jackson Trail (LCS 05406 STRC NUM N-11))	$531,310	5	93	0
26	1300	72784 (NLO Headquarters and Visitors Center Parking RT. 0925)	$626,769	5	88	0
27	1100	56650 (NLO Road RT. 0210)	$1,670,794	5	88	0.08
28	1100	72679 (NLO Headquarters and Visitor Center Access Road RT. 0207)	$1,670,794	5	88	0.15
29	7400	112031 (NLO Communication Towers)	$287,307	5	83	0
30	4100	56640 (NLO Fire Cache Building (FL 47))	$440,509	5	83	0
31	1300	108369 (FB Advance Redoubt Parking)	$31,662	5	81	0
32	1300	72781 (NLO North Parking RT. 0923)	$206,926	5	77	0.36
33	2100	66681 (FB Trench Trail)	$51,030	5	75	0
34	1300	72773 (NLO Group Camping Area Parking RT. 0922)	$151,946	5	70	0.36
35	2100	67889 (NLO Brackenridge Nature Trail)	$292,525	5	65	0
36	4100	89317 (NLO Group Camping Area Shelter (FL 41))	$154,857	5	65	0
37	4100	56641 (NLO Pole Barn (FL45))	$291,219	5	63	0
38	4100	113824 (NLO Portable Office Building (IT/RM))	$13,366	5	63	0.04
39	1300	72783 (NLO Maintenance Complex Parking RT. 0924)	$534,783	5	63	0.36
40	3100	56639 (NLO Rutherford Cemetery)	$61,986	5	62	0
41	7200	109422 (NLO Butherpen Mound)	$188,332	5	62	0
42	7200	109423 (NLO Manly Mound)	$54,507	5	62	0
43	1100	81802 (NLO Picnic (Primitive Area) Access Road RT. 0205)	$289,058	5	62	0.03
44	4100	110090 (NLO Office Trailer #1 HQ Area)	$33,416	5	61	0
45	4100	110091 (NLO Office Trailer #2 Compound South Trailer)	$33,416	5	61	0

Table D32 (continued). GUIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
46	4100	98063 (NLO Florida District Sign Shop)	$275,561	5	60	0
47	2100	112026 (NLO Pine Scrub Trail)	$15,405	5	60	0
48	2100	112027 (NLO North South Trail)	$251,382	5	60	0
49	2100	67891 (NLO Beaver Pond Trail)	$233,425	5	60	0
50	2100	67892 (NLO Old Borrow Pit Trail)	$62,247	5	60	0
51	2100	67893 (NLO Old Quarry Trail)	$75,585	5	60	0
52	2100	67894 (NLO Browns Pond Trail)	$57,808	5	60	0
53	2100	67895 (NLO North Bay Trail)	$26,677	5	60	0
54	2100	67897 (NLO Boy Scout Trail)	$31,999	5	60	0
55	2100	67890 (NLO Fishing Trail)	$117,369	5	55	0
56	2100	59761 (NLO Highway Access Trails)	$21,347	5	54	0
57	4100	110367 (NLO Office Trailer #3 Compound North Trailer)	$33,416	5	54	0
58	3100	56645 (NLO Primitive Picnic Area)	$31,912	5	52	0
59	4100	113837 (NLO Portable Fee Collection Booths 1-3)	$46,074	5	42	0
60	4100	108376 (NLO HQ Portable Maintenance Storage Shed #F)	$1,778	5	40	0
61	4100	101733 (NLO Portable Maintenance Storage Building #A)	$12,804	5	40	0
62	4100	101734 (NLO Portable Maintenance Supply Storage Building #C)	$9,849	5	40	0
63	4100	101735 (NLO Portable YCC Storage Building #B)	$9,849	5	40	0
64	4100	101736 (NLO Portable 1st Aid Storage Building #D)	$13,132	5	40	0
65	4100	101737 (NLO Portable Interp Storage Building #E)	$13,296	5	40	0
66	4100	101738 (NLO Portable Hazardous Material Storage Building)	$7,162	5	40	0
67	4100	112028 (NLO Portable Maintenance Storage Shed #G)	$6,683	5	40	0
68	4100	113833 (NLO Headquarters/Visitor Center Backflow Building)	$2,140	5	23	0
69	4100	113834 (NLO HQ Picnic Area Restroom Backflow Building)	$2,140	5	23	0
70	4100	113836 (NLO Fire Cache Backflow Building)	$2,140	5	23	0
71	4100	114589 (NLO Florida District Sign Shop Backflow Building)	$3,210	5	23	0
72	4100	113839 (NLO Group Camping Restroom Backflow Building)	$2,140	5	23	0
73	5100	80237 (FB Wells (OPER/OBSO))	$105,761	5	19	0
74	7500	237118 (Fort Barrancas Exhibits)	$4,219	n/a	n/a	n/a
75	7500	237120 (FB Grounds Waysides)	$23,892	n/a	n/a	n/a
76	7500	237119 (FB Battery San Antonio - Water Battery Waysides)	$2,139	n/a	n/a	n/a
77	7500	237121 (FB Historic Landscape Waysides)	$15,695	n/a	n/a	n/a
78	7500	237122 (FB Woodland Nature Trail Waysides)	$21,110	n/a	n/a	n/a
79	7500	237124 (FB Advance Redoubt Grounds Waysides)	$11,077	n/a	n/a	n/a
80	7500	237125 (FB Advance Redoubt Historic Landscape Waysides)	$5,931	n/a	n/a	n/a
81	7500	237123 (FB Trench Trail Waysides)	$9,507	n/a	n/a	n/a

Timucuan Ecological and Historic Preserve (TIMU)

Table D33. Summary of Findings for TIMU.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	42	38%	$9,941,883	35%
Limited Exposure	69	62%	$18,320,652	65%
TOTALS	**111**	**100%**	**$28,262,535**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report

Process/methods for exposure determination
Discussions with NPS led to the conclusion that all SER parks (with a few exceptions) should have ALL assets listed as high exposure. This is due to the overall low elevation of the coastal parks in the region and the extreme vulnerability of these units to tropical storms. However, TIMU has a number of locations with elevations well above 1 m. These were pointed out during park review and have been added to the limited exposure category.

TIMU Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

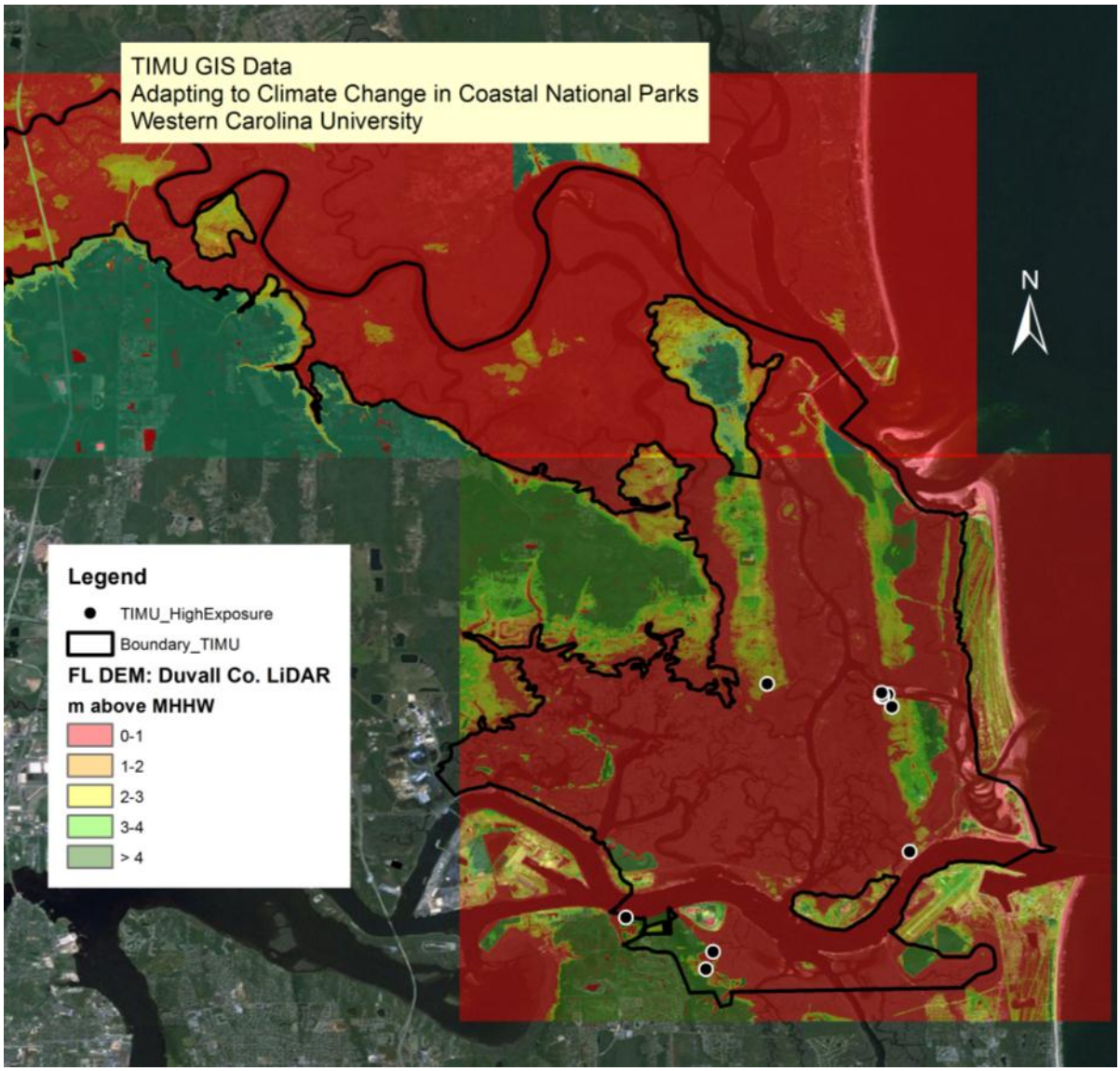

Figure D10. TIMU GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.63 m above NAVD88), for GUIS used Mayport Naval Sta., St Johns River FL: http://tidesandcurrents.noaa.gov/datums.html?id=8720211.

Table D34. Complete list of GIS Data utilized for TIMU.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
FL Division of Emergency Management: Duval County LiDAR	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table D35. TIMU High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7200	112925 (TIMU-KP-Slave Cabin W-1)	$192,709	0	100	0
2	7200	TIMU-KP-Slave Cabin W-2	$111,432	0	100	0.01
3	7200	TIMU-KP-Slave Cabin W-3	$111,432	0	100	0.01
4	7200	TIMU-KP-Slave Cabin W-16	$151,658	0	100	0.01
5	7200	TIMU-KP-Slave Cabin W-4	$111,432	0	100	0.02
6	7200	TIMU-KP-Slave Cabin W-5	$111,432	0	100	0.02
7	7200	TIMU-KP-Slave Cabin W-6	$111,432	0	100	0.02
8	7200	TIMU-KP-Slave Cabin W-7	$111,432	0	100	0.02
9	7200	TIMU-KP-Slave Cabin W-15	$89,327	0	100	0.02
10	7500	233709 (TIMU -CP- Interpretive Media Grounds)	$258,973	0	71	0
11	7500	234067 (TIMU-FOCA- Interpretive Media Grounds)	$80,449	0	71	0
12	2100	112882 (TIMU-FOCA-VC Overlook Deck)	$10,964	0	36	0
13	6300	112898 (Broward House Dock)	$19,548	0	0	
14	7200	11912 (TIMU-KP-25 Slave Cabin Ruins - Parent)	$430,754	1	100	0.01
15	4100	93706 (TIMU-KP-Broward House)	$1,670,794	2	43	0.06
16	6300	25720 (TIMU-KP-Kingsley Dock)	$702,120	3	67	0
17	7500	00001085 (TIMU-FOCA-Fort Exhibit)	$1,622,968	3	67	0.09
18	6300	112899 (TIMU-KP-Seawall)	$54,073	3	63	0
19	4100	12868 (TIMU-KP-Kingsley Pole Barn)	$284,797	3	61	0.04
20	4100	12867 (TIMU-KP-Carpenter Shop)	$233,749	3	61	0.07
21	4100	12869 (TIMU-KP-Kingsley Grounds Shop)	$65,422	3	61	0.17
22	7400	12943 (TIMU-TRA-Round Marsh Overlook Tower)	$8,020	3	54	0
23	7200	12825 (TIMU-KP-CP-Ruins (Fitzpatrick Ruins))	$173,959	3	51	0
24	1100	12939 (TIMU-KP-CP-Boat Access Rd., Unpaved)	$28,103	4	44	0
25	3100	(TIMU-FOCA-Fort Grounds)	$19,465	4	40	0
26	2100	12941 (TIMU-TRA-Timucuan Trail)	$100,558	4	40	0.73
27	2200	11929 (TIMU-FOCA-Hammock/NatureTrail Bridge, #5310-001S)	$61,495	4	36	0
28	2100	12942 (TIMU-TRA-Round MarshTrail)	$11,565	4	36	0
29	4100	12870 (TIMU-KP-Kingsley Fire Cache)	$15,802	4	36	0.06
30	2100	11927 (TIMU-FOCA-Hammock Trail)	$132,175	4	36	0.17
31	2100	12937 (TIMU-KP-Kingsley Walking Trail)	$53,520	4	36	0.21
32	2100	25725 (TIMU-KP-Kingsley Plantation Dock Trail)	$11,682	4	36	0.26
33	6300	25717 (TIMU-FOCA-Floating Boat Dock)	$688,701	5	71	0
34	1700	11905 (TIMU-TRA-WB Trail Bridge, Hammock Creek, #5308-001S)	$68,328	5	70	0
35	2100	11904 (TIMU-TRA-Willie Browne Trail)	$33,780	5	70	3.39
36	2100	11928 (TIMU-FOCA-River Bluff Trail)	$27,867	5	50	0.21
37	6300	12938 (TIMU-KP-CP-Cedar Point Area, Launch)	$61,433	5	46	0
38	2100	25732 (TIMU-KP-CP-Loop Trail)	$712,644	5	44	0
39	1100	25764 (TIMU-KP-CP-Perimeter Rd.)	$118,917	5	44	0
40	2100	13347 (TIMU-KP-CP-Entrance Trail)	$220,292	5	44	0.56
41	1100	25756 (TIMU-KP-CP-Sohn Property Roads)	$613,997	5	30	0
42	1100	12826 (TIMU-KP-TC-Roads, Unpaved)	$242,682	5	30	0.01

Appendix E: Pacific West Region Results

Figure E1. A Pacific West Region park.

Cabrillo National Monument (CABR)

Table E1. Summary of Findings for CABR.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	0	0	0	0
Limited Exposure	55	100%	$41,741,304	100%
TOTALS	**55**	**100%**	**$41,741,304**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2009 - 2011 CA Coastal Conservancy Coastal Lidar Project

Process/methods for exposure determination
Manually located a number of the assets listed in the location hierarchy report and compared to the area LiDAR. CABR is a rocky, high elevation peninsula and, therefore, it was determined that no assets in the park are threatened by 1 m of SLR.

CABR Documents
Map of limited exposure assets & GIS data

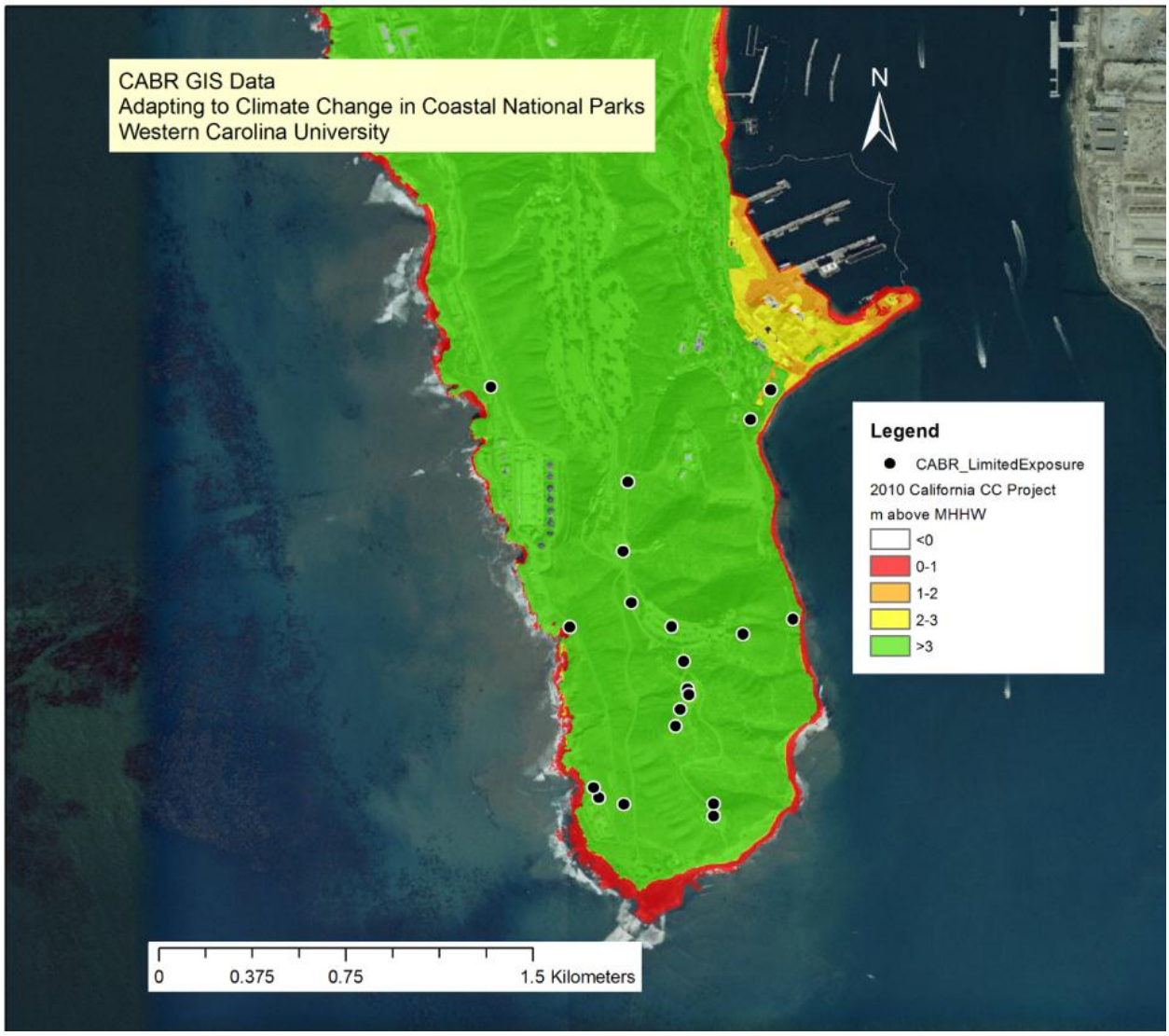

Figure E2. CABR GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.6 m above NAVD88), for CABR used La Jolla, CA station: http://tidesandcurrents.noaa.gov/datums.html?id=9410230.

Table E2. Complete list of GIS Data utilized for CABR.

Data Name	Data Source
2009 - 2011 CA Coastal Conservancy Coastal Lidar Project	NOAA: http://www.csc.noaa.gov/dataviewer/#

Channel Islands National Park (CHIS)

Table E3. Summary of Findings for CHIS.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	23	14%	$46,691,845	29%
Limited Exposure	143	86%	$113,547,395	71%
TOTALS	**166**	**100%**	**$160,239,240**	**100%**

Park visit

not visited for this particular study, however, staff at PSDS has knowledge of park from other research and has visited the park in the past.

Park contacts

Karl Bachman; Facility Manager

Primary data utilized

1) NPS FMSS location hierarchy report
2) 2009 - 2011 CA Coastal Conservancy Coastal Lidar Project
3) 2009 US Army Corps of Engineers Joint Airborne Lidar Bathymetry Technical Center of Expertise Bathymetric Lidar: Southern California
4) 2002/2003 IfSAR data for Southern California: Digital Elevation Model

Process/methods for exposure determination

Analysis completed using LiDAR, maps, geologic analysis and knowledge of area. It was determined that on the islands, primarily docks and piers (and associated assets) are high exposure, as well as a number of the mainland assets (HQ area). It should be noted that many of the docks and piers may have SLR as a consideration in the design, and therefore, would be able to adapt to SLR. One asset not listed in FMSS but mentioned in the review process is also noted below.

CHIS Documents

Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

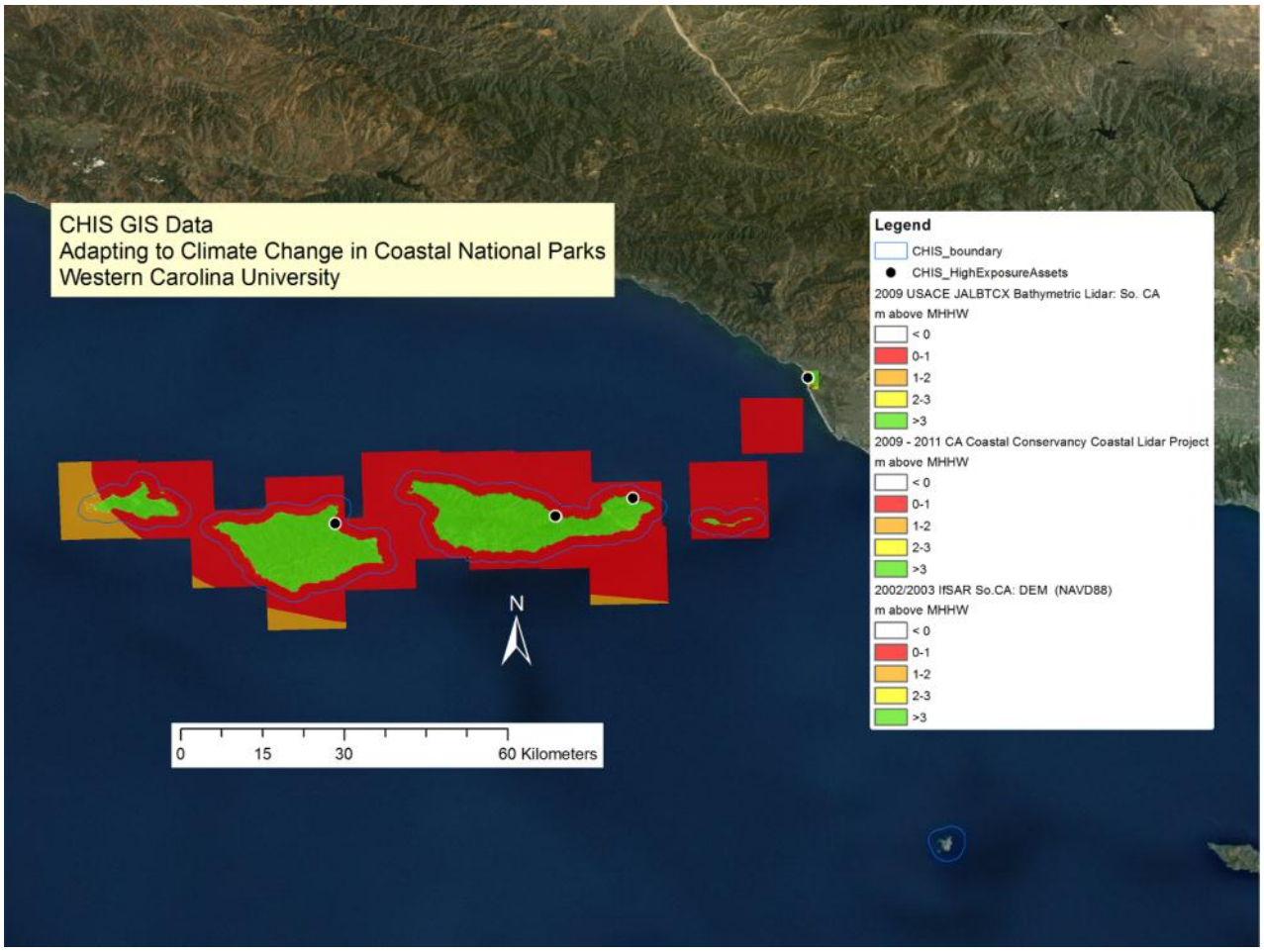

Figure E3. CHIS GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.6 m above NAVD88), for CHIS used Santa Barbara, CA station: http://tidesandcurrents.noaa.gov/datums.html?id=9411340.

Table E4. Complete list of GIS Data utilized for CHIS.

Data Name	Data Source
2002/2003 IfSAR data for Southern California: Digital Elevation Model (NAVD88)	NOAA: http://www.csc.noaa.gov/dataviewer/#
2009 - 2011 CA Coastal Conservancy Coastal Lidar Project	
2009 USACE JALBTCX Bathymetric Lidar: Southern California	
Road Density Metric Product (RDD), 2009, NPS Natural Resource Inventory and Monitoring Division	IRMA, NPS: https://irma.nps.gov/App/

Table E5. CHIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	3100	48909 (G HQ Native Plant Garden)	$582,967	36	4	0
2	1300	48907 (R HQ Parking and Service Paved Road)	$618,757	38	3	0
3	4100	75518 (B HQ HAZ MAT Building)	$47,872	40	4	0
4	4100	61201 (B HQ Propane Building)	$47,872	40	3	0
5	4100	109465 (B HQ Green House)	$47,355	43	5	0
6	4100	109300 (B HQ Resource Management Annex)	$3,865,748	52	4	0
7	4100	109307 (B HQ Administration Midway Office Bldg.)	$6,765,059	53	4	0
8	4100	77550 (B HQ Bally Building)	$54,811	56	4	0
9	3100	79379 (G MSC Prisoners Harbor Historic Groves)	$3,289,214	57	5	0
10	5700	102567 (U SBI Propane System)	$128,033	61	2	0
11	3100	48063 (G MSC Corrals Prisoners Historic)	$933,824	62	5	0
12	4100	47747 (B SBI Dock Building)	$471,879	63	2	0
13	3100	48067 (G MSC Prisoners Picnic Area)	$16,589	64	4	0
14	4100	47919 (B ESC Vault Toilet/Beach)	$60,670	64	4	0
15	5300	75338 (U HQ Heating & Cooling Plant)	$500,160	65	3	0
16	5100	77431 (S MSC Prisoners Well Historic)	$13,192	68	5	0
17	6300	47914 (ESC East Santa Cruz Island, Pier)	$5,366,714	78	2	1
18	4100	48905 (B HQ Headquarters Building)	$7,528,631	78	1	0
19	6300	48906 (HQ Headquarters, Docks)	$779,627	78	1	0
20	6300	61194 (D MSC Prisoners Pier)	$1,536,458	88	1	0
21	6300	48077 (D AI Anacapa Island, Docks)	$911,844	88	1	0
22	6300	47756 (SBI Area Santa Barbara Island Waterfront System)	$1,395,122	88	1	0
23	6300	48090 (D SRI Bechers Pier)	$11,729,447	100	2	1
Not in FMSS version but mentioned by park as high exposure (not included in totals)						
236183 (IM AI Anacapa Island Dock Waysides)						

Fort Point National Historic Site (FOPO)

Table E6. Summary of Findings for FOPO.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	5	29%	$191,161,089	92%
Limited Exposure	12	71%	$17,017,551	8%
TOTALS	**17**	**100%**	**$208,178,640**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2010 Northern San Francisco Bay Area LiDAR

Process/methods for exposure determination
Used the location hierarchy report and the "areas" listed in report to group assets into high exposure and limited exposure. Also manually located a number of the assets and compared to LiDAR elevations. In the case of FOPO, only the assets on the very exterior near the bay were considered high exposure primarily due to the risk of erosion. Most of FOPO is above 3 m in elevation (above MHHW). Upon review from unit, the optimizer band was changed for 2 assets.

FOPO Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

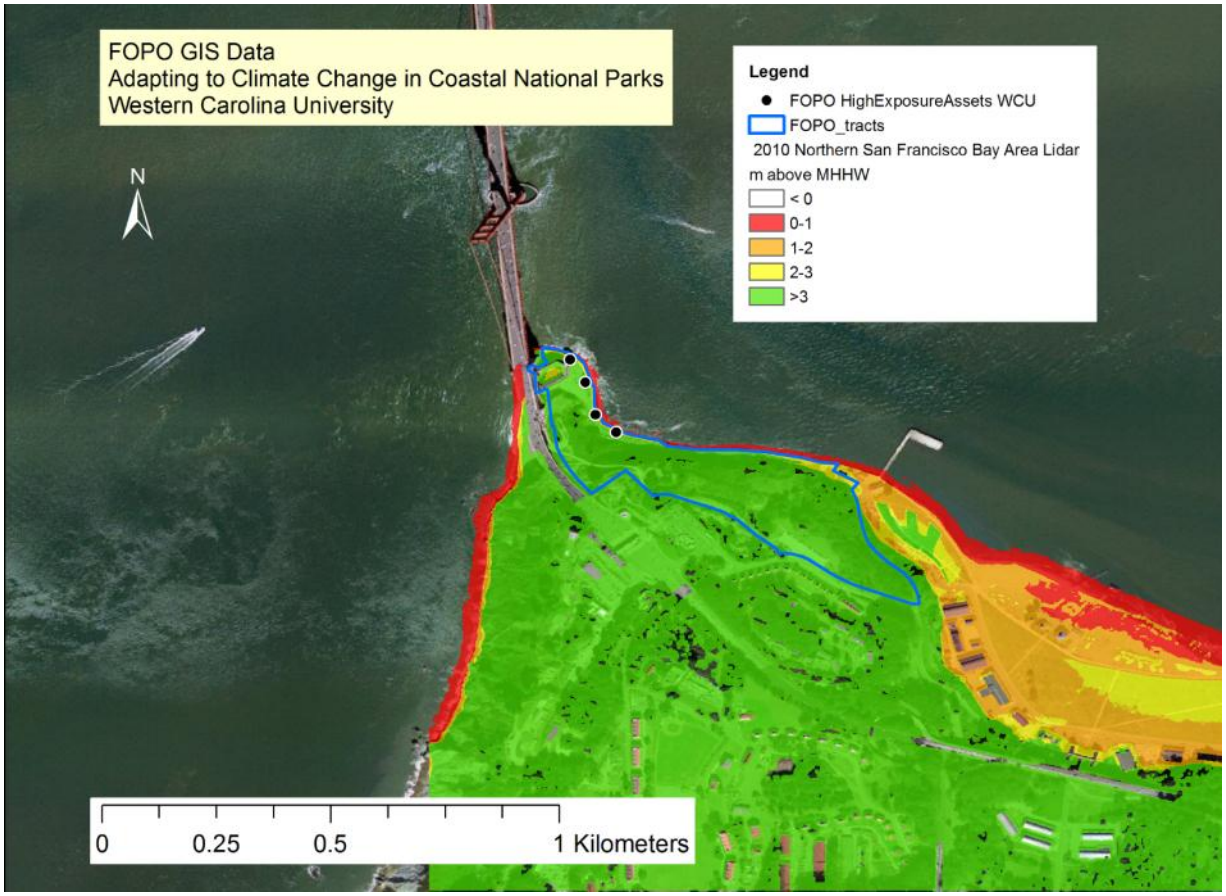

Figure E4. FOPO GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.8 m above NAVD88), for FOPO used San Francisco, CA station: http://tidesandcurrents.noaa.gov/datums.html?id=9414290.

Table E7. Complete list of GIS Data utilized for FOPO.

Data Name	Data Source
2010 Northern San Francisco Bay Area Lidar: Portions of Alameda, Contra Costa, Marin, Napa, San Francisco, Solano, and Sonoma Counties	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table E8. FOPO High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	7300	38212 (Fort Point (FP-999))	$188,134,467	2	100	1
2	1100	38225 (Road, Marine Drive RN601)	$668,103	2	100	3
3	1300	38219 (Parking Lot, Fort Point)	$631,673	2	55	1
4	1300	38220 (Parking Lot, Marine Drive)	$299,856	2	32	1
5	6300	40726 (Seawall, Derussys and Elliots FP-996)	$1,426,990	3	100	1

Golden Gate National Recreation Area (GOGA)

Table E9. Summary of Findings for GOGA.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	114	11%	$617,570,959	13%
Limited Exposure	935	89%	$4,317,129,057	87%
TOTALS	**1049**	**100%**	**$4,934,700,016**	**100%**

Park visit
April 2012

Park contacts
Stephen Skartvedt

Primary data utilized
1) NPS FMSS location hierarchy report
2) San Francisco Area LiDAR (obtained from park)

Process/methods for exposure determination
Combination of visit/discussion with park staff and LiDAR/geologic analysis; used location hierarchy report and "areas" to eliminate groups of assets that are in high elevations portions of the park. Park review led to the addition and review of the Presidio assets (PRES) from FMSS as well and the results are included in the GOGA findings. Also, the optimizer band was changed for a number of assets reviewers noted (based on reviewers notes, FMSS not accessed again after original acquisition of data).

GOGA Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

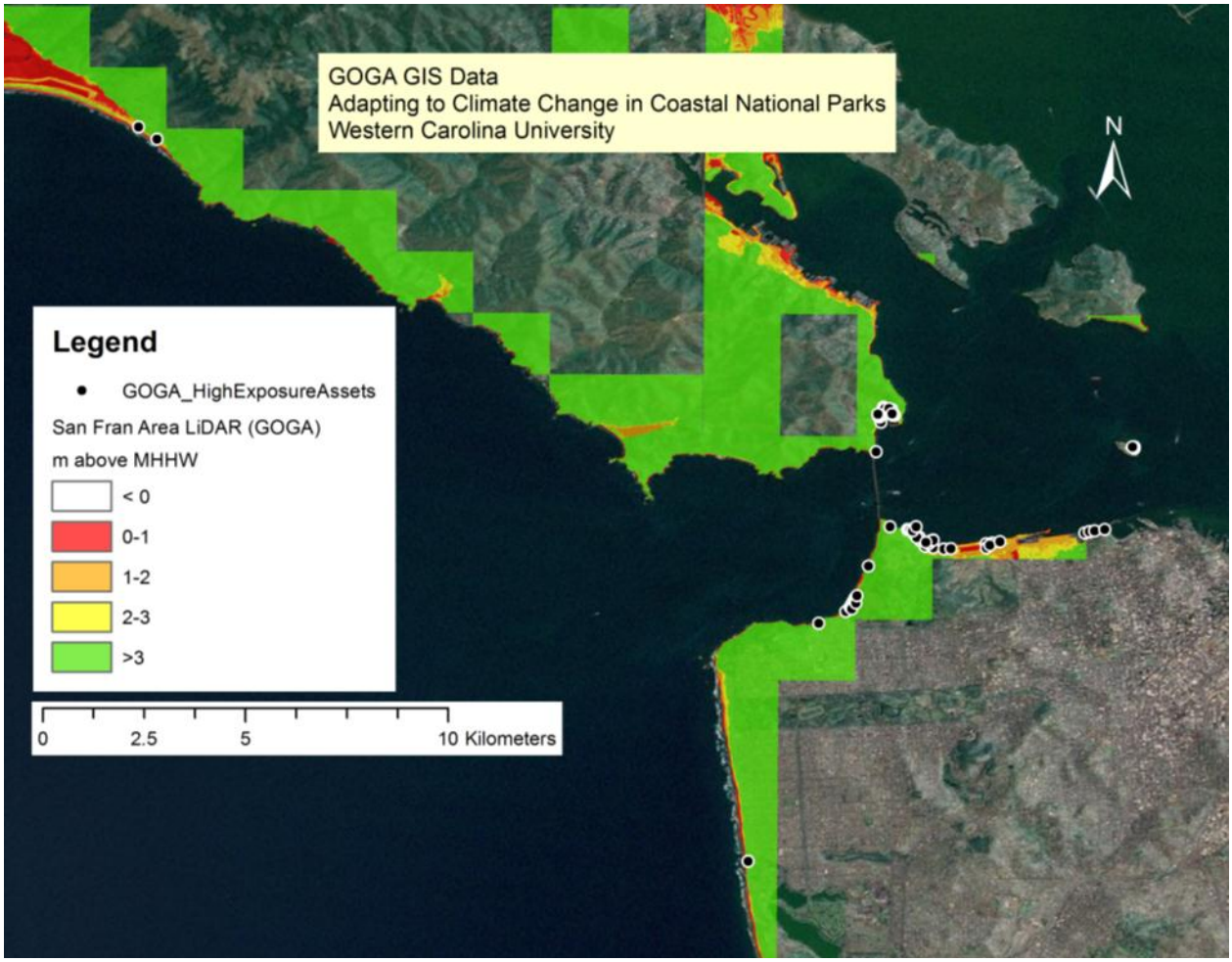

Figure E5. GOGA GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.8 m above NAVD88), for GOGA used San Francisco, CA station: http://tidesandcurrents.noaa.gov/datums.html?id=9414290.

Table E10. Complete list of GIS Data utilized for GOGA (includes PRES).

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
San Francisco Area LiDAR	GOGA GIS Staff, Stephen Skartvedt

Table E11. GOGA High Exposure Asset List (includes PRES).

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	3100	14423 (Sand Area Stinson Beach)	$1,603,442	1	93	0
2	4100	42079 (BADM Bakery FB-557)	$690,739	1	90	0
3	4100	42080 (BADM Blacksmith Shop FB-644)	$1,113,295	1	90	0
4	4100	42082 (BADM Commissary Storehouse FB-637)	$1,558,612	1	90	0
5	4100	42089 (BADM Wagon Shed FB-561)	$2,448,709	1	90	0
6	4100	38094 (Restroom, Sloat Blvd. (OB-3001))	$1,823,689	1	54	0
7	4100	14435 (South Restroom (SB-8))	$1,306,137	1	37	0
8	4100	14442 (North Restroom (SB-10))	$1,552,621	1	37	0
9	4100	38300 (Pier 3 Shed, Lower Fort Mason (FM-321))	$15,855,758	2	100	0
10	3100	38095 (Sand Area Ocean Beach)	$1,912,506	2	100	0
11	2100	38397 (Agave Trail)	$2,280,312	2	100	0
12	4100	42081 (BADM Carpenter and Paint Shop FB-645)	$1,001,965	2	90	0
13	4100	42085 (BADM Gas Station FB-566)	$70,992	2	90	0
14	4100	43220 (Mine Cable Building FB-670)	$1,486,477	2	85	0
15	4100	38388 (Dock Office, Waiting Room (AL-212))	$365,989	2	78	0
16	2100	231880 (Muir Beach Trail)	$4,378,069	2	61	0
17	1300	79959 (Parking lot, Children s Discovery Parking (RN-P933))	$1,153,858	2	55	0
18	3100	14443 (North Picnic Area (SB-))	$195,085	2	35	0
19	4100	38298 (Pier 2 Shed, Lower Fort Mason (FM-319))	$12,869,040	3	100	0
20	1100	43286 (Road, Moore Road FB-711, RN-419)	$269,535	3	83	1
21	4100	38389 (Restroom, Pier (AL-2))	$863,906	3	67	0
22	4100	38375 (Maintenance Garage (AL-213))	$385,415	3	66	0
23	1300	103998 (Alcatraz Island Book Store & Chapel Parking RN977G)	$85,694	3	65	1
24	4100	43302 (USCG Pumphouse FB-671)	$609,949	3	62	0
25	1300	79954 (Parking lot, BLDG 637 Annex Parking (RN-P935))	$129,815	3	55	0
26	1300	79956 (Parking lot, Bldg 637 Parking (RN-P934))	$572,690	3	55	0
27	1300	43428 (Parking Lot, Muir Beach)	$425,344	3	55	0
28	3100	43430 (Picnic Area, Muir Beach)	$195,085	3	48	0
29	1300	14444 (North Parking Lot (Stinson - RN-P920-A))	$1,540,257	3	48	1
30	1700	40921 (Rodeo Lagoon Bridge)	$1,094,452	4	100	0
31	4100	38295 (Pier 1 Shed, Lower Fort Mason (FM-317))	$24,562,216	4	85	0
32	1300	104006 (Fort Baker Pier Parking (RN974))	$70,070	4	83	0
33	6300	38096 (Seawall (OShaughnessy)(OB-1))	$68,765,599	4	75	0
34	1300	104005 (Fort Baker Maintenance Storage parking (RN973))	$368,520	4	75	0
35	1300	104009 (Alcatraz Island Storehouse Parking RN977C)	$132,884	4	75	1
36	7300	59457 (Mine Cable Casemate Seawall (FB-509))	$415,367	4	63	0

Table E11 (continued). GOGA High Exposure Asset List (includes PRES).

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
37	6300	43280 (Refueling Dock and marine railway FB-668)	$2,142,003	4	59	0
38	6300	43278 (Dock #1 (Presidio Yacht Club))	$1,556,138	4	47	0
39	6300	43279 (Dock #2 (Presidio Yacht Club))	$1,556,138	4	47	0
40	7300	42078 (Ammo Bunker (FB-408))	$707,277	4	45	0
41	6300	42096 (Fort Baker, Ramps)	$318,835	4	37	0
42	2200	232008 (Stinson Beach Bridge)	$38,487	4	36	1
43	4100	85571 (Building 665 (FB-665))	$560,367	4	31	0
44	2100	115027 (Kirby Cart Trail)	$11,259	4	20	0
45	6300	38296 (Pier 2 (FM318))	$73,972,072	5	100	0
46	6300	38299 (Pier 3 (FM320))	$86,560,107	5	100	0
47	6300	38293 (Pier 4, Fort Mason)	$42,092,572	5	93	0
48	6300	97524 (Alcatraz waterfront)	$29,178,931	5	93	0
49	4100	42101 (Clubhouse, Presidio Yacht Club FB-679)	$5,619,715	5	90	0
50	3100	108549 (Big Lagoon Wetlands)	$10,543,629	5	87	0
51	4100	38304 (Pier 4 Waiting Room (FM-17))	$253,541	5	80	0
52	1300	79997 (Parking lot, Pump Station Parking (RN-P915))	$54,606	5	73	1
53	4100	43293 (Ship Repair Shop FB-699)	$208,628	5	66	1
54	4100	43300 (USCG FB-633)	$519,638	5	62	0
55	4100	43301 (USCG FB-655)	$8,491,891	5	57	0
56	4100	108211 (Fire Control Station, B111/20, Lime Point)	$458,590	5	42	0
57	1300	80125 (Parking lot, Bldg 670 (RN-P940))	$542,416	5	30	0
58	4100	43217 (Lift Station Shed, Yacht Club (FB-659))	$67,876	5	20	2
59	4100	38395 (Storage Vault (AL-218))	$284,449	5	12	0
60	1300	****103976 (Fort Baker Coast Guard Storage Parking (RN965))**	$174,696	5	7	0
61	4100	43299 (USCG Shed FB-435)	$47,450	5	0	0
62	7900	112229 (Crissy Amphitheater)	$49,644	8	4	0
63	2100	112218 (Amphitheater Trail)	$72,935	15	4	0
64	2100	38204 (Chamberlin Trail)	$234,347	15	4	0
65	3100	112224 (West Bluff Picnic Area)	$374,811	17	4	0
66	3100	112225 (East Beach Picnic Area)	$70,011	17	4	0
67	3100	89789 (Baker Beach Landscaped Area)	$964,137	17	2	0
68	2100	112219 (West Bluff Picnic Trail)	$202,983	24	4	0
69	2100	112227 (East Beach Berm Trail)	$128,844	24	4	0
70	2100	112228 (East Beach Trail)	$71,606	24	4	0
71	2100	38201 (East Beach Picnic Trail)	$175,367	24	4	0
72	2100	38207 (East Crissy Trail)	$403,903	24	4	0
73	2100	112221 (West Beach Trail)	$85,578	32	4	0

Table E11 (continued). GOGA High Exposure Asset List (includes PRES).

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
74	1300	80725 (Warming Hut Parking Lot)	$3,915	32	2	0
75	1300	38189 (Crissy Field Promenade parking (RN962) East Beach)	$2,784,735	32	2	0
76	1300	38190 (West Bluff/Warming Hut Parking (RN960))	$2,546,069	32	2	0
77	2100	112223 (Mason Street Bike Trail)	$3,264,463	36	4	0
78	4100	38213 (Loading Room (Garage) (FP-985))	$297,658	42	3	0
79	4100	38214 (Loading Room (Garage) (FP-986))	$297,658	42	3	0
80	2100	232009 (Baker Beach Access Trail # 1)	$15,937	47	4	0
81	2100	232010 (Baker Beach Access Trail # 2)	$12,843	47	4	0
82	2100	232011 (Baker Beach Access Trail # 3)	$11,460	47	4	0
83	2100	232284 (Baker Beach Access Trail # 4)	$10,341	47	4	0
84	2100	236780 (Baker Beach Access Trail # 5)	$11,460	47	4	0
85	2100	236781 (Baker Beach Access Trail # 6)	$12,777	47	4	0
86	2100	112226 (Promenade Cut-off Trail)	$128,844	47	4	0
87	2100	38199 (China Beach Trail)	$247,104	47	4	0
88	4100	80857 (Garage near NOAA Building (PE-1907))	$140,959,410	48	3	0
89	1300	80728 (Crissy Field Old Coast Guard Station Parking (RN961))	$506,916	50	5	0
90	2100	236779 (Anza Trail)	$140,793	50	4	0
91	2100	38206 (Dune Trail)	$289,847	50	4	0
92	4100	80852 (Building #1 on NOAA Pier)	$204,827	50	4	0
93	4100	80854 (Building #2 on NOAA Pier)	$47,106	50	4	0
94	2100	114568 (Marshalls Beach Trail)	$181,430	50	3	0
95	4100	60206 (NOAA Admin Building (PE1903))	$3,154,413	50	3	1
96	6300	40728 (Torpedo Wharf, Fort Point)	$18,210,909	52	4	0
97	2100	38209 (Crissy Field Promenade Trail)	$1,115,502	55	4	0
98	4100	38217 (Ranger Office (FP-988))	$210,294	55	3	0
99	4100	50090 (Restroom, Baker Beach (PE-1610))	$456,805	55	1	0
100	4100	50092 (Restroom and Shower, Crissy Field, East Beach)	$831,666	55	1	0
101	4100	38216 (Meeting Room (FP-989))	$1,325,384	56	4	0
102	4100	40725 (Warming Hut, (FP-983))	$952,889	59	5	0
103	2100	112215 (Airstrip Cut-off Trail #2)	$117,797	59	4	0
104	2100	112216 (Airstrip Cut-off Trail #3)	$129,409	59	4	0
105	2100	81973 (Airstrip Trail)	$124,566	59	4	0
106	2100	81974 (Airstrip Cut-off Trail #1)	$91,791	59	4	0
107	2100	81976 (East Beach Lagoon Trail)	$663,446	59	4	0
108	2100	236221 (Golden Gate Overlook Trail)	$1,390,029	59	1	0
109	6300	80850 (Presidio Area A District, Waterfront)	$745,507	60	1	0
110	1700	106156 (Crissy Field Channel Bridge)	$11,531,211	67	4	0

Table E11 (continued). GOGA High Exposure Asset List (includes PRES).

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
111	1300	38166 (Parking lot, Baker Beach (RN0971))	$748,264	67	3	0
112	1300	38168 (Parking lot, Baker Beach South)	$438,431	67	3	0
113	4100	38218 (Restroom, West Bluff (FP-987))	$407,485	67	1	0
Not in FMSS version but mentioned by park as high exposure (not included in totals)						
Breakwater Moore (42047)						
Breakwater Slatterlee (42098)						

**Reviewers noted this asset is now removed, but was included in our original analysis

Lewis and Clark National Historical Park (LEWI)

Table E12. Summary of Findings for LEWI.

	# of assets	Exposure level	CRV	% of total CRV
High Exposure	35	70%	$18,047,865	54%
Limited Exposure	15	30%	$15,349,176	46%
TOTALS	**50**	**100%**	**$33,397,041**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report

Process/methods for exposure determination
Analysis completed using park maps, geology and location hierarchy report to determine high exposure assets.

LEWI Documents
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

Table E13. LEWI High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	1700	231062 (BRDG- South Slough Bridge)	$717,056	0	77	0
2	2100	235508 (TRLS- Kwis Kwis Loop Trail)	$560,857	0	71	0
3	4100	232827 (BLDG F2C Lower Skip Vault Toilet)	$64,150	0	54	0
4	1100	231744 (ROAD- Drainfield Road)	$6,335	0	39	0
5	7500	230196 (IM- Salt Works- Wayside Panel)	$1,489	0	36	0
6	7500	230060 (IM- Netul Landing)	$36,736	0	36	0
7	4100	230751 (BLDG - Netul Picnic Shelter #1)	$46,909	0	36	0
8	4100	230753 (BLDG - Netul Picnic Shelter #2)	$121,109	0	36	0
9	7500	229787 (IM- Visitor Loop Trail- Wayside Panels)	$5,309	0	36	0
10	2100	92061 (TRLS - Netul River Landing Trail)	$1,367,767	1	100	0
11	2100	28101 (TRLS - Fort to Sea Trail)	$4,814,538	2	87	0
12	3100	23700 (SPEC - Salt Works (Seaside))	$1,330,563	2	81	0
13	4100	116259 (BLDG - Sunset Beach Education Center)	$1,735,971	2	63	0.06
14	4100	100906 (BLDG - Romtec Two Holer Restroom)	$74,412	2	53	0
15	4100	88810 (BLDG - Romtec Four Holer-Restroom)	$148,824	2	53	0
16	4100	23698 (BLDG - Maintenance Shop)	$806,026	2	52	0
17	2100	23702 (TRLS - Main Visitor Loop Trail)	$81,675	2	52	0.13
18	7100	42348 (Signs, Road, Second Entrance, Wood, 102.00 IN,X 72.50 IN)	$12,536	2	30	0
19	7100	42358 (Signs, Roads, Primary Entrance , Wood ,)	$15,130	2	30	0
20	7100	42360 (Signs, Road, Primary Highway, 69.00 IN,X 48.00 IN)	$9,726	2	30	0
21	5700	28342 (UTLS - MS Fuel Storage Tank)	$30,325	2	13	0
22	2200	116291 (BRDG- 165' Netul River Trail Foot Bridge)	$692,031	3	73	0
23	2100	116292 (TRLS - South Slough Loop Trail)	$59,863	3	63	0
24	1300	106380 (PRKG - Maintenance Shop Parking)	$153,605	4	54	0
25	4100	88807 (BLDG - Netul Landing Bus Shelter)	$317,830	4	52	0
26	1300	88811 (PRKG - Netul Landing Parking)	$1,433,366	4	52	0
27	3100	28344 (GRDS - Picnic Area)	$69,884	4	36	0
28	4100	28346 (BLDG - Picnic Shelter #1)	$24,944	4	36	0
29	4100	28349 (BLDG - Picnic Shelter #2)	$24,944	4	36	0.33
30	4100	28350 (BLDG - Picnic Shelter #3)	$24,944	4	36	0.33
31	1100	28137 (ROAD - Burn Road)	$248,842	4	19	0
32	2100	28102 (TRLS - Employee/Secondary Trails)	$35,127	4	13	0
33	7100	88822 (SPEC - Statue, Bronze, Scagawea)	$418,427	5	36	0
34	4100	27930 (BLDG - Blackpowder Shed)	$13,811	5	28	0
35	3100	231357 (WA- Station Camp)	$2,542,806	n/a	n/a	n/a

Olympic National Park (OLYM)

Table E14. Summary of Findings for OLYM.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	72	8%	$37,500,350	4%
Limited Exposure	801	92%	$935,628,928	96%
TOTALS	**873**	**100%**	**$973,129,278**	**100%**

Park visit
July 2012

Park contacts
Roger Hoffman

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2009-2011 USACE Oregon and Washington Topo-Bathy LiDAR

Process/methods for exposure determination
Combination of visit/discussion with park staff and LiDAR/geologic analysis. Also applied buffer to eroding coastline to capture assets that are threatened by erosion (100 m from shoreline to represent shoreline in approximately 100 years).

OLYM Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

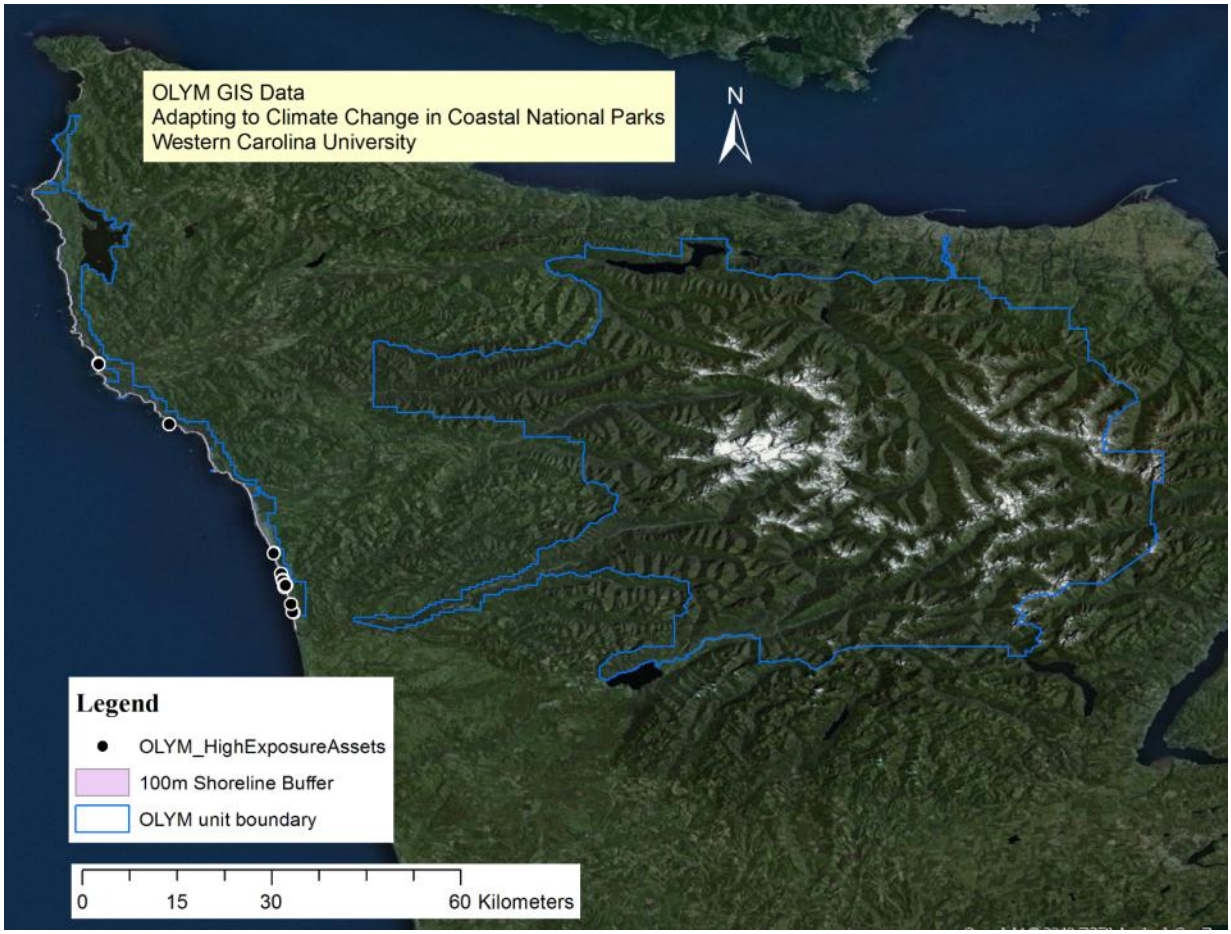

Figure E6.OLYM GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (2.17 m above NAVD88), for OLYM used Neah Bay, WA station: http://tidesandcurrents.noaa.gov/datums.html?id=9443090.

Table E15. Complete list of GIS Data utilized for OLYM.

Data Name	Data Source
Olympic National Park Small-Scale Base GIS Dat	IRMA, NPS: https://irma.nps.gov/App/
2010-2011 US Army Corps of Engineers (USACE) JALBTCX Topobathy Lidar: Oregon and Washington	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table E16. OLYM High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	1300	114637 (Parking Area Kalaloch Campground Parking RT0956)	$671,817	0	64	0
2	3100	110172 (Cmpg Kalaloch South Beach Campground)	$1,567,976	0	64	0
3	3100	110171 (Grnd Kalaloch Ashenbrenner Picnic Area)	$78,492	0	57	0
4	3100	110173 (Grnd Mora Rialto Beach Picnic Area)	$342,950	0	56	0
5	4100	116470 (Bldg Backcountry Toleak Point Shelter)	$34,773	0	35	0
6	4100	27906 (Bldg Old Kalaloch Lift Station Building by Fish Station)	$5,936	1	88	0
7	4100	27907 (Bldg Kalaloch North Campground Lift Station)	$15,830	1	88	0
8	2200	106500 (Trail Kalaloch Minor Bridge Beach 1)	$38,116	1	81	0
9	2200	106501 (Trail Kalaloch Minor Bridge Beach 4)	$40,442	1	81	0
10	2100	105727 (Trail Kalaloch Kalaloch)	$1,168,362	1	81	0.31
11	1100	48573 (Road Mora Rialto Beach Paved RT115)	$7,198,632	1	77	0.13
12	4100	20455 (Bldg 1504 Kalaloch South Beach Comfort Station)	$359,269	1	75	0
13	4100	20457 (Bldg Kalaloch Beach Trail 4 CXT VaultToilet 1 (Male) (G-R))	$70,489	1	75	0.01
14	4100	27909 (Bldg Kalaloch Beach Trail 4 CXT Vault Toilet 2 (Female) (G-R))	$70,489	1	75	0.01
15	4100	20624 (Bldg 963 Mora Rialto Beach Comfort Station)	$467,050	1	68	0
16	4100	20449 (Bldg 894 Kalaloch Comfort Station 1)	$246,998	1	68	0
17	4100	20450 (Bldg 895 Kalaloch Comfort Station 2)	$359,269	1	68	0
18	4100	36207 (Bldg Kalaloch Ashenbrenner Vault Toilet)	$44,519	1	68	0
19	4100	27905 (Bldg 685 Kalaloch Comfort Station 5)	$359,269	1	68	0.05
20	7900	20593 (SPFE Kalaloch Amphitheater)	$1,136,780	2	81	0
21	4100	81417 (Bldg 1550 Kalaloch Campground Fee Booth)	$26,428	2	78	0.05
22	4300	20490 (Hous 1291 Kalaloch Duplex)	$1,305,691	2	52	0.08
23	1300	48668 (Parking Area Mora Rialto Beach Paved 939P)	$673,219	3	77	0.12
24	4100	95796 (Bldg Mora Rialto Beach CXT Vault Toilet (TS))	$126,880	3	68	0
25	3100	20458 (Cmpg Kalaloch Campground)	$5,020,810	3	64	0.11
26	1100	48597 (Road Kalaloch South Beach Unpaved RT219)	$150,974	3	62	0.08
27	4100	82114 (CBldg 470 Kalaloch Lodge Store & Gas Station)	$611,903	5	88	0.01
28	1100	20991 (CRoad Kalaloch Lodge Paved RT229)	$2,992,074	5	77	0.13
29	3100	82167 (CGrnd Kalaloch Lodge Grounds)	$1,369,387	5	73	0
30	4100	82127 (CBldg 743 Kalaloch Lodge Furnace & Laundry Room)	$378,894	5	70	0.02
31	4100	82136 (CBldg 1412 Kalaloch Lodge Log Cabin 19)	$166,892	5	65	0
32	4100	82137 (CBldg 1413 Kalaloch Lodge Log Cabin 20)	$166,892	5	65	0
33	4100	82138 (CBldg 1414 Kalaloch Lodge Log Cabin 21)	$166,892	5	65	0
34	4100	82145 (CBldg 1421 Kalaloch Lodge Log Cabin 28)	$166,892	5	65	0
35	4100	82149 (CBldg 1425 Kalaloch Lodge Log Cabin 32)	$166,892	5	65	0
36	4100	82153 (CBldg 1429 Kalaloch Lodge Log Cabin 36)	$166,892	5	65	0
37	4100	82154 (CBldg 1430 Kalaloch Lodge Log Cabin 37)	$166,892	5	65	0

Table E16 (continued). OLYM High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
38	4100	82155 (CBldg 1431 Kalaloch Lodge Log Cabin 38)	$166,892	5	65	0
39	4100	82144 (CBldg 1420 Kalaloch Lodge Log Cabin 27)	$166,892	5	65	0
40	4100	82148 (CBldg 1424 Kalaloch Lodge Log Cabin 31)	$166,892	5	65	0
41	4100	82151 (CBldg 1427 Kalaloch Lodge Log Cabin 34)	$166,892	5	65	0
42	4100	82152 (CBldg 1428 Kalaloch Lodge Log Cabin 35)	$166,892	5	65	0
43	4100	82160 (CBldg 1546 Kalaloch Lodge Log Cabin Duplex 43-44)	$411,213	5	65	0
44	4100	82142 (CBldg 1418 Kalaloch Lodge Log Cabin 25)	$166,892	5	65	0
45	4100	82146 (CBldg 1422 Kalaloch Lodge Log Cabin 29)	$166,892	5	65	0
46	4100	82150 (CBldg 1426 Kalaloch Lodge Log Cabin 33)	$166,892	5	65	0
47	4100	82126 (CBldg 734 Kalaloch Lodge Cabin 14)	$199,100	5	65	0
48	4100	82132 (CBldg 1408 Kalaloch Lodge Duplex Cabin 15-16)	$223,649	5	65	0
49	4100	82143 (CBldg 1419 Kalaloch Lodge Log Cabin 26)	$166,892	5	65	0
50	4100	82122 (Cbldg 724 Kalaloch Lodge Cabin 6)	$262,364	5	65	0.01
51	4100	82147 (CBldg 1423 Kalaloch Lodge Log Cabin 30)	$166,892	5	65	0.01
52	4100	82117 (CBldg 714 Kalaloch Lodge Cabin 1)	$117,650	5	65	0.01
53	4100	82125 (CBldg 733 Kalaloch Lodge Cabin 13)	$268,003	5	65	0.01
54	4100	82161 (CBldg 1547 Kalaloch Lodge Log Cabin Duplex 41-42)	$411,213	5	65	0.01
55	4100	82156 (CBldg 1432 Kalaloch Lodge Cabin Duplex 39-40)	$514,956	5	65	0.01
56	4100	82118 (CBldg 716 Kalaloch Lodge Cabin 2)	$126,296	5	65	0.01
57	4100	82139 (CBldg 1415 Kalaloch Lodge Log Cabin 22)	$166,892	5	65	0.01
58	4100	82123 (Cbldg 725 Kalaloch Lodge Cabin 7)	$167,267	5	65	0.01
59	4100	82134 (CBldg 1410 Kalaloch Lodge Cabin/Cottage Overly)	$268,003	5	65	0.01
60	4100	82133 (CBldg 1409 Kalaloch Lodge Cabin/Cottage Macy)	$268,003	5	65	0.01
61	4100	82135 (CBldg 1411 Kalaloch Lodge Seacrest Motel 401-410)	$1,850,354	5	65	0.01
62	4100	82119 (CBldg 718 Kalaloch Lodge Cabin 3)	$126,296	5	65	0.01
63	4100	82141 (CBldg 1417 Kalaloch Lodge Log Cabin 24)	$166,892	5	65	0.01
64	4100	82121 (CBldg 722 Kalaloch Lodge Cabin 5)	$185,309	5	65	0.02
65	4100	82120 (CBldg 720 Kalaloch Lodge Cabin 4)	$185,309	5	65	0.02
66	4100	82130 (CBldg 1406 Kalaloch Lodge Duplex Cabin 9-10)	$223,649	5	65	0.02
67	4100	82140 (CBldg 1416 Kalaloch Lodge Log Cabin 23)	$166,892	5	65	0.02
68	4100	82124 (CBldg 726 Kalaloch Lodge Cabin 8)	$262,364	5	65	0.02
69	4100	82131 (CBldg 1407 Kalaloch Lodge Duplex Cabin 11-12)	$223,649	5	65	0.03
70	3100	82166 (CCmpg Kalaloch Lodge Group Campground)	$102,956	5	64	0
71	4100	82128 (CBldg 747 Kalaloch Lodge Manager s Residence)	$523,028	5	57	0.01
72	4100	82115 (CBldg 500 Kalaloch Lodge Maintenance Storage)	$308,158	5	35	0

Point Reyes National Seashore (PORE)

Table E17. Summary of Findings for PORE.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	25	4%	$34,929,157	5%
Limited Exposure	614	96%	$704,396,200	95%
TOTALS	**639**	**100%**	**$739,325,357**	**100%**

Park visit
April 2012

Park contacts
Jackie Cardwell

Primary data utilized
1) NPS FMSS location hierarchy report
2) California LiDAR (given by GOGA)
3) 2009 - 2011 CA Coastal Conservancy Coastal Lidar Project: Hydro-flattened Bare Earth DEM

Process/methods for exposure determination
Combination of visit/discussion with park staff and LiDAR/geologic analysis; used location hierarchy and "areas" to eliminate groups of assets located in high elevation regions of the park.

PORE Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

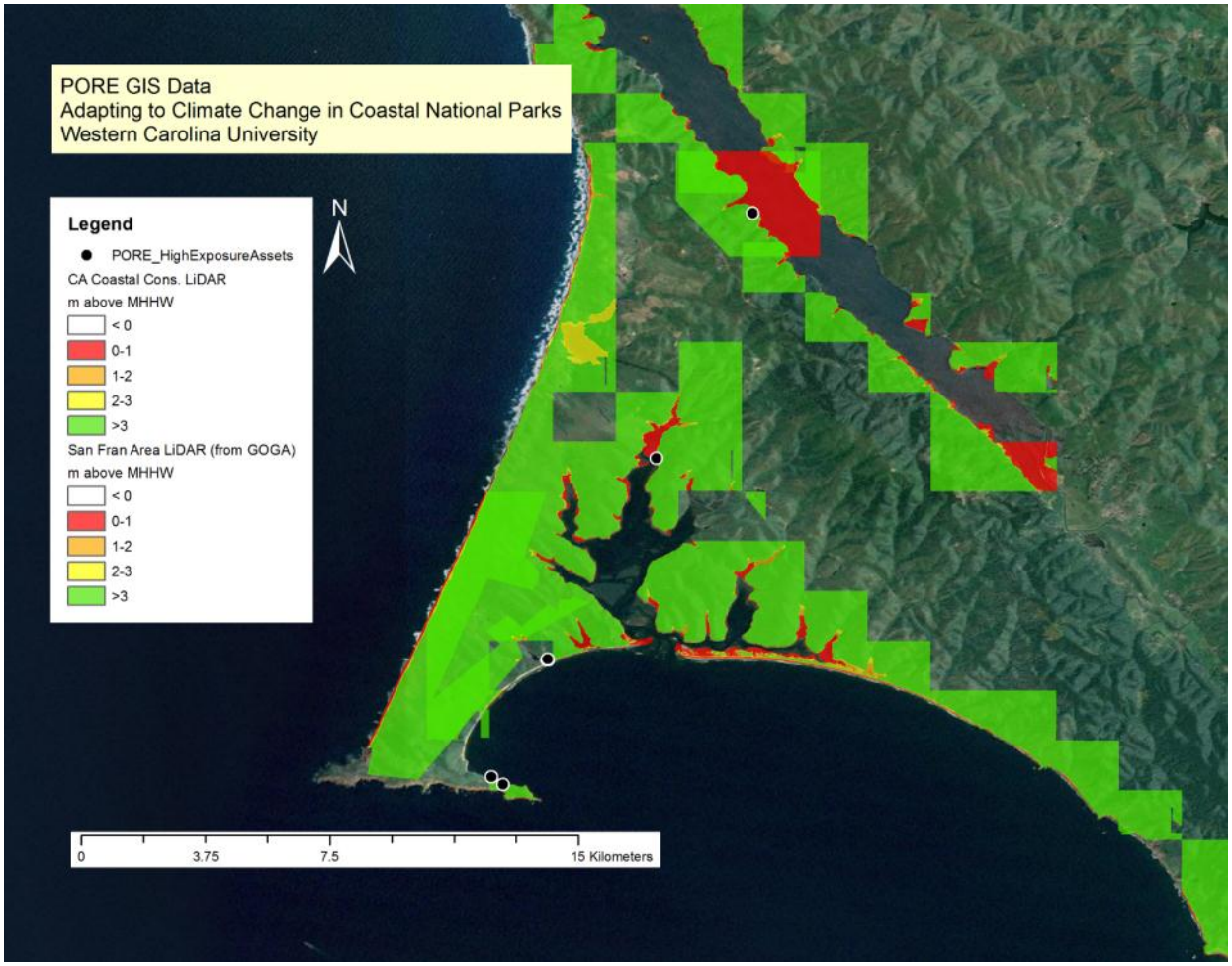

Figure E7. PORE GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.75 m above NAVD88), for PORE used Point Reyes, CA station: http://tidesandcurrents.noaa.gov/datums.html?id=9415020.

Table E18. Complete list of GIS Data utilized for PORE.

Data Name	Data Source
GIS Structure Geographic Data	NPS staff, Brian Diethorn: Facilities Management GIS Specialist, Lakewood, CO
San Francisco Area LiDAR	GOGA GIS Staff, Stephen Skartvedt
2009 - 2011 CA Coastal Conservancy Coastal Lidar Project: Hydro-flattened Bare Earth DEM	NOAA: http://www.csc.noaa.gov/dataviewer/#

Table E19. PORE High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	00002513 (Drakes Beach Ken Patrick Visitor Center KPVC (FM))	$2,878,772	1	78	0.22
2	4100	40707 (Historic Lifeboat Station Boathouse (FM) (CR))	$4,476,492	1	85	0.07
3	1300	89513 (Drakes Beach Parking Lot Route 0911)	$6,754,013	1	90	0.62
4	4100	111735 (Tomales Beach Campground Vault Toilet)	$48,322	2	48	0
5	4100	115007 (Schooner Bay Kayak Launch Vault Toilet)	$48,322	2	63	0
6	2200	88988 (Bridge, 40x6, Estero Trail, Home Bay)	$68,388	2	70	0
7	2100	3087 (Estero Trail)	$6,693,055	2	70	0
8	4100	34141 (Main Bldg at Sacramento Landing (Spengers)BLDG 554(FM))	$1,944,013	2	73	0.69
9	4100	90309 (Historic Lifeboat Station Fire Pumphouse (CR))	$38,327	2	76	0
10	6300	112401 (Historic Lifeboat Marine Railway (CR))	$3,479,173	2	79	0
11	4100	83548 (Drakes Beach Restroom Facility(FM))	$855,780	2	81	0.01
12	6300	34140 (Sacramento Landing Pier)	$3,293,894	2	83	0.02
13	4100	00002514 (Drakes Beach Cafe(FM))	$1,008,790	3	55	0.23
14	1300	90633 (Sacramento Landing Main House Parking Area Route 0952)	$22,330	3	61	0.55
15	1300	97171 (Sacramento Pier Parking Lot Route 0953)	$39,077	3	61	0.84
16	1300	89526 (Schooner Bay Parking Lot Route 0950)	$175,119	3	63	0
17	3100	89266 (Tomales Beach Campground)	$168,691	3	63	0.05
18	2100	3079 (Limantour Beach Trail (From South Parking Lot))	$29,371	3	70	0.14
19	1300	89452 (Lifeboat Station Parking Lot Route 0944)	$105,185	3	79	0.06
20	6300	111736 (Mendoza Fish Dock)	$1,856,038	4	40	0
21	4100	90143 (Historic Lairds Landing Shed/Boathouse (CR))	$47,445	4	58	0.36
22	7100	90576 (National Historic Landmark Plaque Lifeboat Station)	$11,398	5	20	0
23	4100	111737 (Mendoza Fish Dock Shed)	$864,366	5	20	0
24	7100	90565 (Drakes Beach Nova Albion Plaque)	$11,398	5	38	0
25	7100	90562 (Drake Navigators Guild Monument)	$11,398	5	38	0

Redwood National Park (REDW)

Table E20. Summary of Findings for REDW.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	20	4%	$7,871,075	2%
Limited Exposure	470	96%	$360,024,101	98%
TOTALS	**490**	**100%**	**$367,895,176**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report & topographic maps
2) 2002 NASA/USGS Airborne LiDAR Assessment of Coastal Erosion (ALACE) Project for California, Oregon, and Washington Coastlines

Process/methods for exposure determination
Used maps and location hierarchy report to eliminate "areas" of assets that should be considered as having a limited exposure. The remaining assets listed as high exposure are near the coast or the exact location was unknown. Upon review (completed by Barney Riley) numerous assets were removed from the high exposure list.

REDW Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

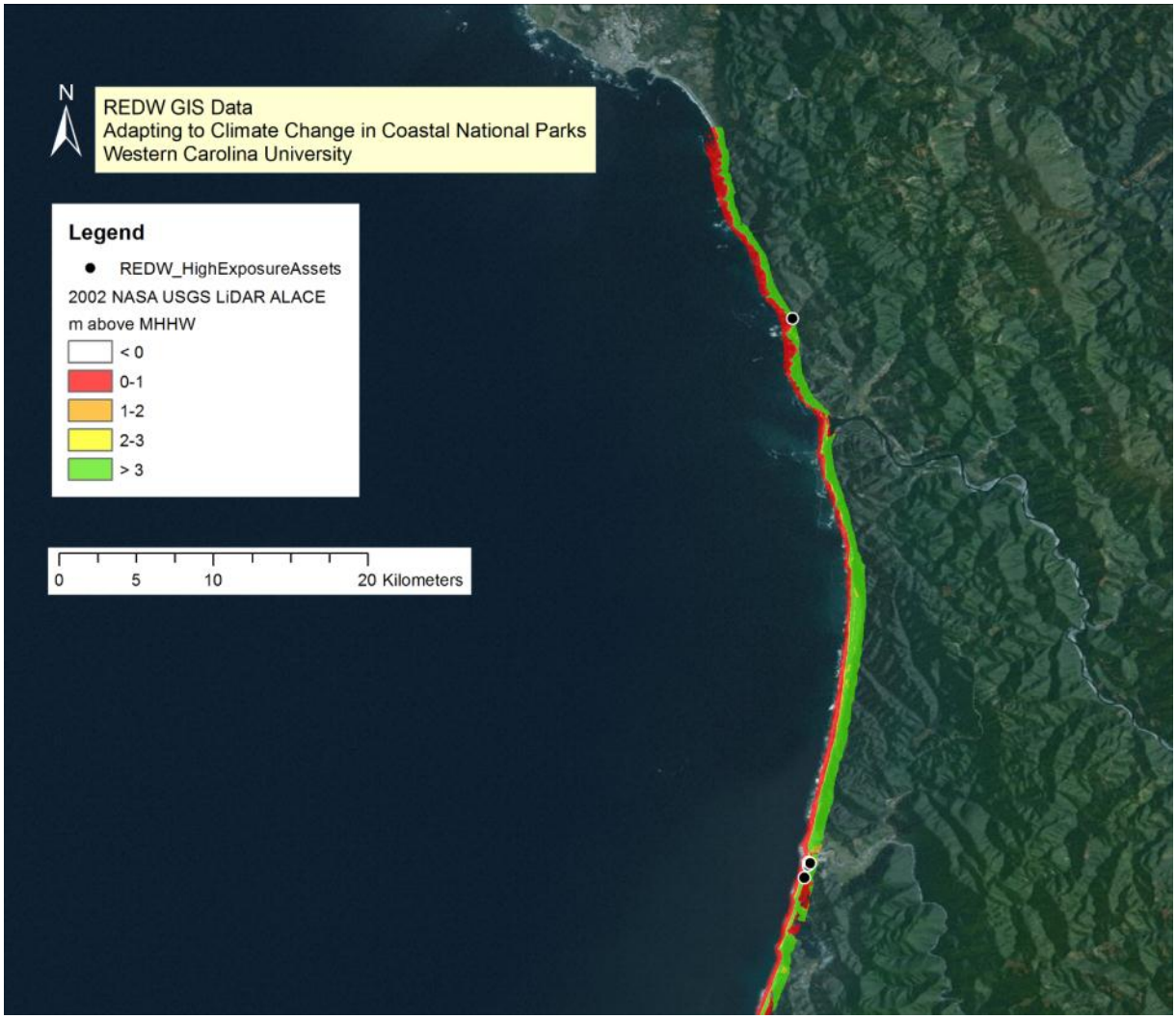

Figure E8. REDW GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (1.88 m above NAVD88), for REDW used Fields Landing, Humbolt Bay, CA station: http://tidesandcurrents.noaa.gov/datums.html?id=9418723.

Table E21. Complete list of GIS Data utilized for REDW.

Data Name	Data Source
2002 NASA/USGS Airborne LiDAR Assessment of Coastal Erosion Project for CA, OR, and WA Coastlines	NOAA: http://www.csc.noaa.gov/dataviewer/#
Redwood Transportation	IRMA, NPS: https://irma.nps.gov/App/

Table E22. REDW High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	11093 (Thomas Kuchel Visitor Center (RIC), 6500)	$3,484,488	1	90	0.03
2	1300	15619 (Parking Thomas Kuchel VC (RIC) Paved Rte 900)	$597,441	2	78	0.22
3	1100	11049 (Thomas Kuchel VC (RIC) Road., Paved - Rte 215)	$605,620	2	67	0.03
4	4100	3984 (Lagoon Creek Restroom)	$464,713	2	65	0.06
5	3100	12288 (Lagoon Creek Day Use / Picnic Area)	$174,232	2	60	0
6	1100	15655 (Thomas Kuchel VC (RIC) Service Road., paved Rte 415)	$163,051	3	52	0.24
7	1300	11037 (Parking Lagoon Creek Day Use/Picnic Paved -Rte 907)	$761,744	3	42	0.15
8	2100	12951 (Redwood Creek Estuary Trail/Boardwalk)	$194,710	4	54	0
9	3100	15673 (Freshwater Lagoon Day Use / Picnic Area)	$435,580	4	50	0.17
10	1300	15975 (Parking Freshwater Lagoon Boat Launch Unpaved)	$27,735	4	42	0.45
11	1300	28037 (Parking Freshwater Day Use Area Unpaved)	$476,189	4	42	0.49
12	2200	16782 (Lagoon Creek Pedestrian Trail Bridge, #8480-008T)	$45,748	4	30	0
13	6300	15974 (Freshwater Lagoon Marina System)	$23,526	4	27	0
14	1300	3457 (Parking False Klamath Cove Paved)	$144,043	4	24	0.19
15	1100	3458 (Freshwater Lagoon Access Road)	$141,622	4	24	0.65
16	2100	16025 (Freshwater Bike Trail)	$130,632	5	17	0
17	n/a	28036 (Freshwater Sand Spit Site)	n/a	n/a	n/a	n/a
18	n/a	238374 (Wilson Beach)	n/a	n/a	n/a	n/a
19	n/a	238372 (Parking Wilson Beach)	n/a	n/a	n/a	n/a
20	n/a	238373 (Wilson Beach Day Use Area / Picnic Area)	n/a	n/a	n/a	n/a

San Francisco Maritime National Historical Park (SAFR)

Table E23. Summary of Findings for SAFR.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	21	43%	$262,743,226	29%
Limited Exposure	28	57%	$638,466,462	71%
TOTALS	**49**	**100%**	**$901,209,688**	**100%**

Park visit
No official visit, but visited unit grounds during GOGA field work.

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report
2) 2010 Northern San Francisco Bay Area LiDAR

Process/methods for exposure determination
Located a number of the assets and compared to LiDAR elevations. In the case of SAFR, only the assets on the very exterior of the park near the bay were considered high exposure. After park review several assets were moved to the high exposure list as recommended.

SAFR Documents
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

Table E24. SAFR High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	74876 (AQ-Sala Burton (Museum/Bathhouse) Building)	$21,333,441	1	100	0.214
2	4100	74912 (SB-West Bleachers/Maintenance Shop)	$3,129,265	1	92	0.515
3	4100	74911 (SB-East Bleachers/Exhibit and Maintenance Shops)	$6,804,926	1	92	0.699
4	6300	40906 (AQ - NHL Aquatic Park Municipal Pier)	$156,529,747	2	100	0.382
5	6300	74916 (Hyde Street Pier Area, Docks, Piers)	$33,159,689	2	90	0.032
6	1100	75113 (RT-Aquatic Park Service Road)	$600,326	2	88	0.728
7	4100	74928 (HSP-Small Boat Work Shed)	$496,555	2	83	0
8	4100	74917 (HSP-Multi-Purpose Building)	$1,850,213	2	82	0.084
9	4100	74923 (HSP-Small Boat Butler Bldg)	$447,244	2	82	0.086
10	4100	75100 (BS-HQ-Building E Fort Mason Center)	$26,666,437	2	82	0.611
11	7100	74956 (HSP-Lewis Ark)	$1,156,410	2	81	0.173
12	4100	74918 (HSP-Tubbs Building)	$565,118	2	80	0.097
13	1100	102637 (RT-Hyde Street Pier, Old Highway 101)	$1,530,832	2	77	0.072
14	4100	74890 (AQ-Sea Scout Base Building)	$1,214,338	2	70	0.033
15	6300	75114 (AQ-Aquatic Park Seawall)	$5,088,092	3	80	0
16	6300	231029 (Sea Scout Marina)	$843,737	3	80	0.381
17	4100	74951 (HSP-Sea Fox Cabin)	$226,894	3	71	0.103
18	4100	74921 (HSP-Pier Comfort Station)	$601,584	3	55	0
19	4100	74920 (HSP-Bookstore)	$475,394	3	40	0.028
20	4100	74941 (HSP-Fee Booth)	$13,939	3	37	0
21	4100	79551 (HSP - Book Store Shed)	$9,048	4	17	0

Santa Monica Mountains National Recreation Area (SAMO)

Table E25. Summary of Findings for SAMO.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	0	0	0	0
Limited Exposure	270	100%	$163,605,010	100%
TOTALS	**270**	**100%**	**$163,605,010**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
NPS FMSS location hierarchy report & maps of park

Process/methods for exposure determination
Discussion with NPS about the high elevation coastline and that no actual NPS owned assets are situated on the coast. Therefore, SAMO was considered as having no assets high exposure to SLR. Park review confirmed this analysis.

Appendix F: Intermountain Region Results

Figure F1. An Intermountain Region park.

Palo Alto Battlefield National Historical Park (PAAL)

Table F1. Summary of Findings for PAAL.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	0	0	0	0
Limited Exposure	26	100%	$9,366,512	100%
TOTALS	**26**	**100%**	**$9,366,512**	**100%**

Park visit
N/A

Park contacts
N/A

Primary data utilized
1) NPS FMSS location hierarchy report

Process/methods for exposure determination
Most of park is >10 miles from the coast, so it was determined that PAAL should have no assets considered high exposure to long-term SLR (1 m).

Padre Island National Seashore (PAIS)

Table F2. Summary of Findings for PAIS.

Exposure level	# of assets	% of assets	CRV	% of total CRV
High Exposure	14	18%	$40,920,359	53%
Limited Exposure	64	82%	$36,245,277	47%
TOTALS	**78**	**100%**	**$77,165,636**	**100%**

Park visit
March 2012

Park contacts
Travis Clapp, Jim Lindsay

Primary data utilized
1) NPS FMSS location hierarchy report
2) EAARL Coastal Topography–PAIS

Process/methods for exposure determination
Combination of visit/discussion with park staff and LiDAR/geologic analysis of assets.

PAIS Documents
Map of high exposure assets & GIS data
High exposure assets*

*Assets sorted by values for:
1) Optimizer Band (low to high)
2) API (high to low)
3) FCI (low to high)

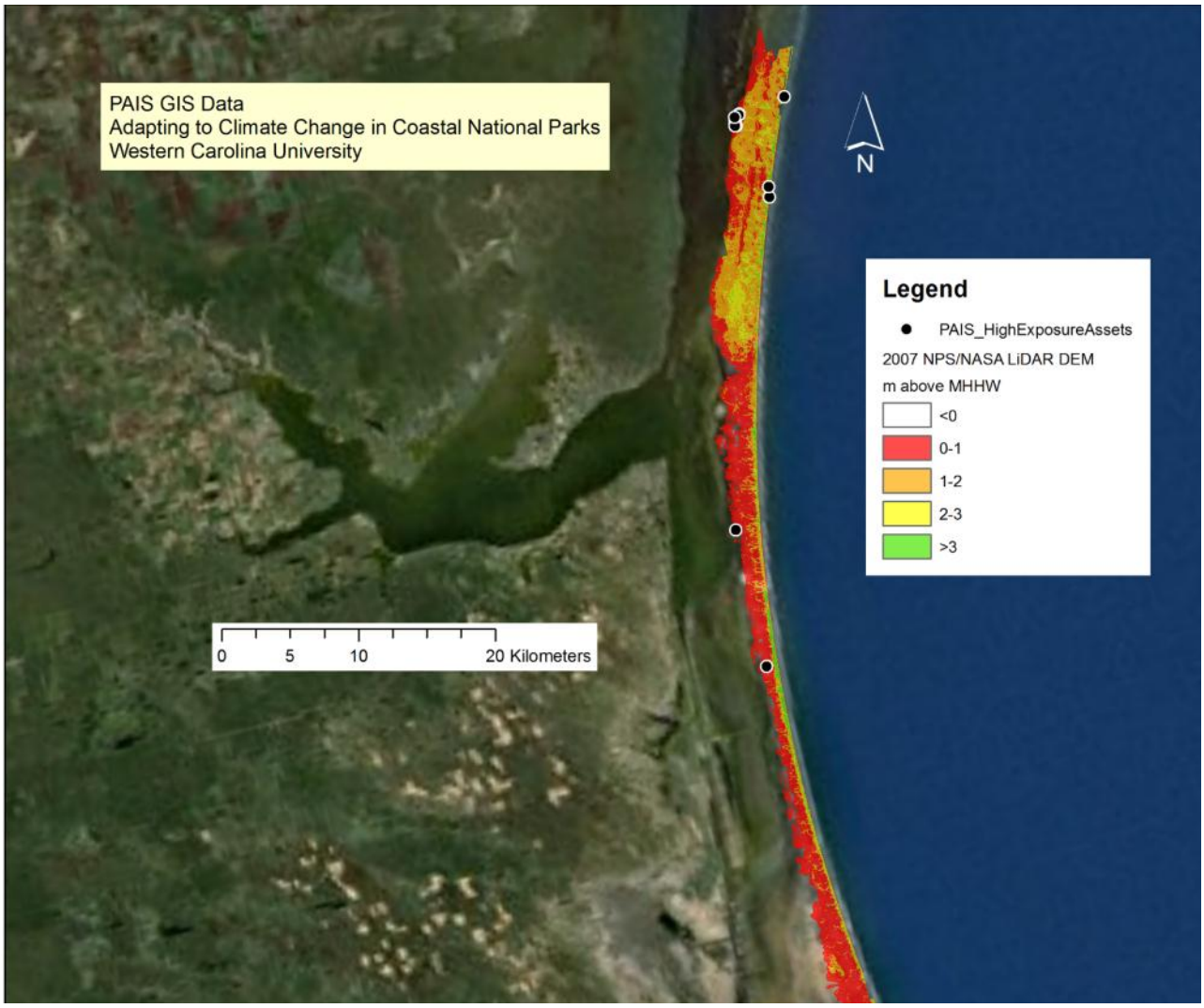

Figure F2. PAIS GIS map of park boundary and high-exposure assets. NOAA tides and currents website was used to calculate MHHW (0.36 m above NAVD88), for PAIS used Bob Hall Pier, Corpus Christi, TX station: http://tidesandcurrents.noaa.gov/datums.html?id=8775870.

Table F2. Complete list of GIS Data utilized for PAIS.

Data Name	Data Source
2009 USACE JALBTCX Topographic Lidar: South Texas Coast	NOAA: http://www.csc.noaa.gov/dataviewer/#
EAARL Topography-PAIS NS 2007	PAIS Staff; Travis Klapp
GIS Data for PAIS (roads, trails, infrastructure)	

Table F3. PAIS High Exposure Asset List.

ID	Asset Code	Location Code (Description)	CRV	Optimiz Band	API	FCI
1	4100	Windsurfing Concession Building	$213,586	0	65	0
2	6300	Bird Island Basin Waterfront	$1,307,015	1	75	0
3	3100	BIB Primitive Campground	$148,243	2	81	0.11
4	1100	Windsurfers Road	$131,984	2	81	0.14
5	1100	Yarborough Pass Rd, RT 0101	$585,245	2	64	1.54
6	4100	BIB Center Vault Toilet (Day-Use Area)	$80,085	2	61	0
7	4100	Boat Ramp Vault Toilet-BIB	$78,633	2	61	0
8	4100	Windsurfer Vault Toilet - BIB	$84,124	2	61	0.01
9	1300	BIB RV Parking Area	$55,894	3	88	0
10	1100	North Beach Sand Road	$643,770	3	83	0
11	1100	High Road (South Beach Sand Road)	$35,114,699	3	83	0.01
12	1300	Boat Ramp Parking	$1,532,636	3	71	0.01
13	4300	Mobile Home (LE Housing)	$63,431	3	61	0.34
14	1100	Back Island Rd., Unpaved RT 0202	$881,014	5	27	0.41

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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