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.