

A photograph of Fort Mifflin, a large brick fortification, partially submerged in water. The fort's top is covered in green grass, and an American flag flies from a pole on the roof. Several people are visible standing on the beach and near the fort's base. The sky is clear and blue.

# Sea Level Rise Impacts to Coastal National Parks in the USA

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Roughly 400 National Park units in  
USA

Many are coastal, particularly on  
the Gulf of Mexico and Atlantic  
Ocean coasts

Plus Alaska, Hawaii, and territories



U.S. Department of the Interior 





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NPS Coastal Park units include :

- National Parks
- National Seashores
- National Historic Parks
- National Preserves
- National Monuments and Memorials
- National Battlefields



# Sea Level Rise Impacts

## Natural Resources

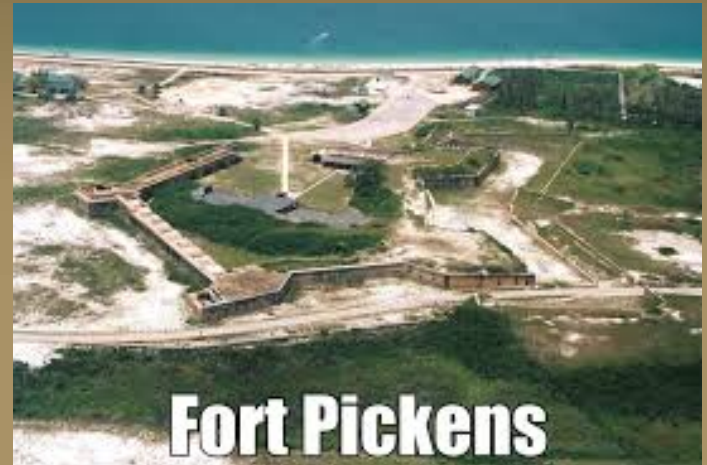
- Submerged lands
- Loss of wetlands
- Loss of beach-dune complexes
  - East Ship Island of Gulf Islands
  - Estimated 10 years from extinction
- Migration of salt marsh and mangroves



# Sea Level Rise Impacts

## Cultural Resources

- Forts
- Lighthouses
- Historic structures
  - Earth works
  - Ditches
  - Buildings





# At Risk-Submerged Lands



Structures



Roads



Coast



# At Risk-Cultural



## Fort Jefferson Dry Tortugas Florida



# Corrective Approaches

- Educate
  - An informed workforce
  - Better informed visitors
- Improve Sustainability of Parks
  - Get “Greener”/ reduce carbon footprint
    - Fuel efficient vehicles
    - Solar Power
    - High efficiency heating and cooling



# Corrective Approaches- continued

- Manage Resources in light of climate change forecasts
  - Infrastructure/roads
    - Move
    - Elevate
    - Develop alternative access



# Corrective Approaches- continued

- Manage Resources in light of climate change forecasts
  - Restore coastal ecosystems
  - Plantings
  - Beneficial use dredged materials
  - Restored hydrology-(Everglades)



# Wetland Restoration

## Baldcypress Plantings



PVC tree  
protectors



# Beneficial use of Dredged Sediments



Dune Restoration

Wetland Restoration



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## Beneficial use of Dredged Material Projects

- Raise elevation of landscape
- Offset erosion problems
- Offset sea level rise impacts
- Attenuates salt water intrusion
- Protect natural and cultural resources
- Must restore processes such as sediment transport



# Fort Massachusetts West Ship Island Mississippi



American Civil War Fort

After Restoration  
70 meters inland





It's hoped that restored hydrology can stimulate plant biomass production enough to build the peat layer and offset losses due to sea level rise.





# Key Lessons

- Sea Level rise a serious problem for US coastal National Parks
- Restoration of wetlands essential
- Restoration of barrier islands essential
- Restoration must include processes
- Sea Level Rise impacts must be addressed in each of our coastal National Parks
  - Resource Management
  - Protection of Resources
  - Protection of Infrastructure
  - Planning for the future



NPS Mission-The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and ***future*** generations.



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