SEA LEVEL RISE THREAT
JOINT BASE LANGLEY-EUSTIS

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Deputy Commander
633d Mission Support Group

Ready Engineers ... Ready to Go
Overview

- JBLE-Eustis
  - Storm Surge Impact
  - 2018 DoD Legacy Resource Management Program

- JBLE-Langley
  - Resiliency Efforts
    - Prevention and Mitigation
    - Preparation
    - Recovery
JBLE-Eustis
Storm Surge Impact
Enhancement of Force Protection, Resilience to Sea-Level Rise, and Natural Resources at Coastal Military Installations
Project Synopsis

- Develop a structural adaptation strategy and test tactics to enhance nearshore force protection and resilience to sea-level rise while concurrently conserving and rehabilitating natural resources at coastal military installations.

- Pre-Proposal submitted by Dr. Romuald Lipcius (Virginia Institute of Marine Science) was approved to move forward by DoD Legacy Program.
Strategy

Determine locations and establish pilot project for:

- Structural (concrete/granite/shell) oyster reefs that will provide:
  - Force Protection Barriers in shallow near-shore areas
  - Substrate for oysters
  - Shoreline erosion protection
  - Protection of habitat between reef and shore to rehabilitate native species such as blue crab, salt marsh and seagrass beds
- $100,000 proposed for work at 2-3 installations
  - NWS Yorktown, JEBLC-FS, JB Langley-Ft. Eustis
USACE using Oyster “Castle” blocks to build a reef
Oysters fully established on concrete “Reef Ball” structures
Pyramid-shaped structures
JBLE-LANGLEY
# Storm Comparison

## Langley Air Force Base

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</thead>
<tbody>
<tr>
<td>Water Level (ft)</td>
<td>8.9</td>
<td>6.3</td>
<td>7.9</td>
<td>7.6</td>
<td>7.5</td>
<td>6.9</td>
<td>6.5</td>
<td>6.12</td>
<td>5.78</td>
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<tr>
<td>Storm Wind (mph)</td>
<td>82</td>
<td>55</td>
<td>62</td>
<td>75</td>
<td>85</td>
<td>90</td>
<td>46</td>
<td>65</td>
<td>61</td>
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<tr>
<td>Damage ($)</td>
<td>No Data</td>
<td>No Data</td>
<td>146M*</td>
<td>44M*</td>
<td>1.5M*</td>
<td>40K*</td>
<td>6.5M**</td>
<td>9K**</td>
<td>168K*</td>
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<tr>
<td>Air Field Open</td>
<td>No Data</td>
<td>No Data</td>
<td>4 Days</td>
<td>72 hrs</td>
<td>24 hrs</td>
<td>24 hrs</td>
<td>72 hrs</td>
<td>18 hrs</td>
<td>--</td>
</tr>
<tr>
<td>Base Open</td>
<td>No Data</td>
<td>No Data</td>
<td>1 Wk</td>
<td>48 hrs</td>
<td>24 hrs</td>
<td>24 hrs</td>
<td>72 hrs</td>
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1933  | 1999 Floyd | 2003 Isabel | 2011 Irene | 2012 Sandy | 2015 Joaquin |

[Images of storms and flooding]

Ready Engineers … Ready to Go
Resilience Efforts
Langley Air Force Base

- Prevention and Mitigation
  - Shoreline Stabilization
  - Relocation of Critical Infrastructure
  - Master Planning

- Preparation
  - Command and Control
  - Predictive Modelling: NASA Flood Tool
  - Flood Barrier Program

- Recovery
  - Groundwater Pump Station
  - Vacuum Sanitary Sewer System
Prevention and Mitigation
Shoreline Stabilization

- Living shoreline concept
  - Shoreline seagrasses filter sediment, provide habitat
- $4.9M Stabilization
  - 10K linear foot rip-rap sea wall
- JBLE-Langley’s sea-wall is 5.4 feet above MSL
Ready Engineers ... Ready to Go

Prevention and Mitigation
Raised Critical Infrastructure

- Raised Critical Infrastructure
Partnered w/NASA to develop flood prediction model
Based on Sewell’s Point data
18,000 elevation points base wide
- Includes building/window threshold heights
Powerful decision making tool

6.0 Feet above MSL
7.0 Feet above MSL
7.9 Feet above MSL
9.0 Feet above MSL
Recovery
Groundwater Pumping Station

- Constructed in 2004 for $5M
- 4 high efficiency pumps displace 31K gallons/minute
- 7.4 million gallons per hour
After 100 years of supporting military operations at both Langley and Eustis, what have Engineers learned?

Storms happen…

Flooding is inevitable…

Planning and preparation are crucial…

Mission Resiliency = Mission Success
QUESTIONS?