THE CHANGING LANDSCAPE: COASTAL FLOOD RISK MANAGEMENT APPROACHES

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2017 INTERAGENCY FLOOD RISK MANAGEMENT WORKSHOP
February 28 – March 3, 2017
St. Louis, MO

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Adaptation to Rising Sea Levels: When, Not If

Flooding of Coast, Caused by Global Warming, Has Already Begun

Scientists’ warnings that the rise of the sea would eventually imperil the United States’ coastline are no longer theoretical.

By JUSTIN GILLIS  SEPT. 3, 2016

Science of Sea Level Change

- 2012 Interagency Report led by NOAA
- 2016 interagency product of the Coastal Assessment Regional Scenario Working Group
- 2017 Interagency group produced 1º gridded SLC information
When, Not If

- Adverse impacts from coastal climate change are occurring now and will continue into the future
- Chronic flooding is a better descriptor than nuisance flooding
- The adaptation question is “When, not if.”
Evacuation Route may experience issues after 2055. Consider monitoring and raising if MSL persists along high scenario.

House may experience issues beginning in 2035. Consider raising 1 ft to reduce risk until 2100 for low and intermediate scenarios.
How Does SLC Affect Infrastructure?

Source: GAO representation of U.S. Army Corps of Engineers data. | GAO-15-660
What Does Reduced Reliability Look Like?
Best Practices for Coastal Climate Change Adaptation

Common Vertical Datum
- Historical
  - Local Mean Sea Level
  - NGVD29
- Current
  - NAVD88
- Future
  - GRAV-D

Performance Triggers and Thresholds
- Elevation
- Function
- Reliability

Coastal Forcing
- Global Sea Level Rise
  - Observed/Historical
  - USACE Scenarios
  - Other Scenarios
  - Unique Storm Events
  - Climate Change
    - Precipitation changes
    - Coastal Storms/Hurricanes
    - Tides
    - Frequency
  - Total Water Level
    - Still Water Level
    - Dynamic Water Level
    - Wave Run Up

Evaluations
- Apply Coastal Forcing to Elevation, Process, Function, and Reliability Triggers or Thresholds
- Assess Performance Over 100-yr Life Cycle
- Identify Adaptation Measures Needed, If Any
Coastal Climate Adaptation

Conventional wisdom:

• Protect, Accommodate, Retreat
• Included in our ETL 1100-2-1

Upon reflection:

• Protection may not really be an adaptation method because there is no complete protective method
• Accommodate encompasses most adaptive measures but can still result in increased residual risk
• Retreat eliminates residual risk (from the particular climate change impacts)
Anticipated Levee Lift Schedule

Example: Adapt (Accommodate)

Settlement and Subsidence Curve

Required Elevation for 1% Annual Chance Exceedence Surge Over Time
(Includes Subsidence, Settlement and Sea-Level Rise)
Example: Adapt (Accommodate)
Example: Adapt (Retreat)

The small community of Isle de Jean Charles used to be surrounded by marsh and coastal forest, but Louisiana’s coastal land loss has left it increasingly exposed to the water. Concerns for community’s future resulted in a January announcement of $48 million from the U.S. Housing and Urban Development to the state for a first of its kind relocation of residents to a safer area.

Source: Terrebonne Levee and Conservation District, Google maps
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