Utilizing the Projection Guidance

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Using the Projection

Topics include:

• 2015 versus 2019 Projection
• Selecting a curve
• Choosing a reference elevation
• Tools for calculating curves and visualizing SLR
2015 versus 2019 Projection

How do these two projections compare?
• 1992 vs 2000 Baseline: Difference in MSL comparing 1992 to 2000 is > 1 inch

• 2015 versus 2019: Lowest curve ↑2-3 inches for 2030 planning horizon
  Higher curves↑7-22 inches after 2060 planning horizon

<table>
<thead>
<tr>
<th>Year</th>
<th>High Adaptability</th>
<th>Low Adaptability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IPCC Median Global (inches)</td>
<td>IPCC Median Regional (inches)</td>
</tr>
<tr>
<td>2030</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>2060</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>2100</td>
<td>31</td>
<td>33</td>
</tr>
</tbody>
</table>

Note: The NOAA Extreme curve values are not included in the table because there was not a comparable curve in the 2015 projection.
Selecting a Curve

Which curve should I use when considering siting and design of infrastructure projects?

![Graph showing Unified Sea Level Rise Projection](image)

**Unified Sea Level Rise Projection**
(Southeast Florida Regional Climate Change Compact, 2019)

<table>
<thead>
<tr>
<th>Year</th>
<th>IPCC Median (inches)</th>
<th>NOAA Intermediate High (inches)</th>
<th>NOAA High (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2040</td>
<td>10</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>2070</td>
<td>21</td>
<td>40</td>
<td>54</td>
</tr>
<tr>
<td>2120</td>
<td>40</td>
<td>92</td>
<td>136</td>
</tr>
</tbody>
</table>

**Figure 1: Unified Sea Level Rise Projection**
Selecting a Curve

What is the intersection of my planning horizon and the project adaptability and risk tolerance?

<table>
<thead>
<tr>
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<th>IPCC Median (inches)</th>
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<tr>
<td>2120</td>
<td>40</td>
<td>92</td>
<td>136</td>
</tr>
</tbody>
</table>

Adaptability/ Risk Tolerance

Planning Horizon

Long

Short

High

Low
Selecting a Curve

**IPCC Median Curve**
- Lower range of *likely* sea level rise
- Infrastructure with short life span, adaptable, few interdependencies
- Consequences limited if fails
Selecting a Curve

NOAA Intermediate High Curve
- Mid range of *likely* sea level rise
- Important infrastructure up to a 50 year design life
- Projects needing a greater safety factor
Selecting a Curve

NOAA High Curve
- Upper range of *likely* sea level rise
- Critical Infrastructure >50 year design life
- Low risk tolerance

**FIGURE 1: Unified Sea Level Rise Projection**
Selecting a Curve

NOAA Extreme Curve
- Upper range of possible sea level rise
- For information purposes only
**FIGURE 2: Unified Sea Level Rise Referenced to NAVD**

**Unified Sea Level Rise Projection**
(Southeast Florida Regional Climate Change Compact, 2019)

<table>
<thead>
<tr>
<th>Year</th>
<th>IPCC Median (Feet NAVD)</th>
<th>NOAA Intermediate High (Feet NAVD)</th>
<th>NOAA High (Feet NAVD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2040</td>
<td>0</td>
<td>0.6</td>
<td>1</td>
</tr>
<tr>
<td>2070</td>
<td>0.9</td>
<td>2.5</td>
<td>3.7</td>
</tr>
<tr>
<td>2120</td>
<td>2.5</td>
<td>6.9</td>
<td>10.5</td>
</tr>
</tbody>
</table>

- **IPCC Median**
- **NOAA Intermediate High**
- **NOAA High**

5-Year Average of Mean Sea Level:
- 1990: -0.2
- 2000: -0.2
- 2010: 0.0
- 2020: 0.6
- 2030: 1.8
- 2040: 2.5
- 2050: 3.7
- 2060: 4.6
- 2070: 6.9
- 2080: 13.8

- **NOAA Extreme**
- **NOAA High**
- **NOAA Intermediate High**
- **IPCC Median**
Choosing a Reference Elevation

**NOAA Tide Gauges**

- Lake Worth Pier (Station ID 8722670) est. 1996
- S. Port Everglades (Station ID 8722956) est. 2018
- Miami Beach (Station ID 8723170) est. 2003
- Virginia Key (Station ID 8723214) est. 1994
- Vaca Key (Station ID: 8723970) est. 1970
- Key West (Station ID 8724580) est. 1913

[https://tidesandcurrents.noaa.gov/map/index.html?type=active&region=Florida](https://tidesandcurrents.noaa.gov/map/index.html?type=active&region=Florida)
Converting Datum

**NOAA Tide Gauges**

Each station has a page of published datum to use for converting between elevations.
Tools

Custom calculate the NOAA curves

Visualizes site specific SLR projections

Visualizing inundation based on NOAA curves
USACE SLC Calculator

Sea-Level Change Curve Calculator

US Army Corps of Engineers

Estimated Relative Sea Level Change Projections - Gauge: 8723970, Vaca Key, FL

<table>
<thead>
<tr>
<th>Year</th>
<th>NOAA Low</th>
<th>NOAA Int Low</th>
<th>NOAA Int High</th>
<th>NOAA High</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>-0.55</td>
<td>-0.48</td>
<td>-0.33</td>
<td>-0.15</td>
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<tr>
<td>2025</td>
<td>-0.51</td>
<td>-0.41</td>
<td>-0.20</td>
<td>0.05</td>
</tr>
<tr>
<td>2030</td>
<td>-0.46</td>
<td>-0.33</td>
<td>-0.05</td>
<td>0.28</td>
</tr>
<tr>
<td>2035</td>
<td>-0.41</td>
<td>-0.25</td>
<td>0.12</td>
<td>0.53</td>
</tr>
<tr>
<td>2040</td>
<td>-0.36</td>
<td>-0.16</td>
<td>0.30</td>
<td>0.81</td>
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<tr>
<td>2045</td>
<td>-0.32</td>
<td>-0.07</td>
<td>0.49</td>
<td>1.12</td>
</tr>
<tr>
<td>2050</td>
<td>-0.27</td>
<td>0.03</td>
<td>0.69</td>
<td>1.45</td>
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<tr>
<td>2055</td>
<td>-0.22</td>
<td>0.13</td>
<td>0.91</td>
<td>1.81</td>
</tr>
<tr>
<td>2060</td>
<td>-0.17</td>
<td>0.24</td>
<td>1.15</td>
<td>2.19</td>
</tr>
<tr>
<td>2065</td>
<td>-0.13</td>
<td>0.35</td>
<td>1.40</td>
<td>2.60</td>
</tr>
<tr>
<td>2070</td>
<td>-0.08</td>
<td>0.46</td>
<td>1.66</td>
<td>3.03</td>
</tr>
</tbody>
</table>

8723970, Vaca Key, FL
NOAA's Regional Rate: 0.00951 feet/yr
All values are expressed in feet relative to NAVD88

http://corpsmapu.usace.army.mil/rccinfo/slc/slcc_calc.html
USACE SL Tracker

https://climate.sec.usace.army.mil/slr_app/
Florida Sea Level Sketch Planning Tool [https://sls.geoplan.ufl.edu/beta/viewer/](https://sls.geoplan.ufl.edu/beta/viewer/).
Apply the Compact’s 2019 projections to your projects

Questions?