COASTAL DATA EXCHANGE

USACE SEA LEVEL CHANGE CALCULATOR

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Sea Level Change Calculator

http://www.corpsclimate.us/ccaceslcurves.cfm
Sea Level Change Calculator

- Based on Engineer Circular(EC) 1165-2-212 “Sea Level Change Considerations for Civil Works Programs”

**USACE “Low” Curve =** Historic Rate of SLC  
**USACE “Intermediate” Curve =** modified NRC Curve I*  
**USACE “High” Curve =** modified NRC Curve III*

* considering both the most recent IPCC projections and modified NRC projections with the local rate of vertical land movement added

EC 1165-2-212, Equation 2: \[ E(t) = 0.0017t + bt^2 \]
Sea Level Change Calculator

- The three scenarios proposed by the NRC result in global *eustatic* sea-level rise values, by the year 2100, of 0.5 meters, 1.0 meters, and 1.5 meters.
- Adjusts the NRC equation to include the historic GMSL change rate of 1.7 mm/year (from recent IPCC).
- Adjusts to the start date of 1992 (which corresponds to the midpoint of the current National Tidal Datum Epoch of 1983-2001) which results in updated values for the coefficient “b”.
- Adding this eustatic rate to the local rate of vertical land movement¹ provides the 3 local relative SLC curves for a selected NOAA Tide Station.

¹ Technical Report NOS CO-OFS 065 (C. Zervas, S. Gill, W. Sweet)
Sea Level Change Calculator

Step 1 & 2: Enter Project Start Year and NOAA Tide Station Selection
Sea Level Change Calculator

Step 3: Enter FEMA Base Flood Elevation (optional)
Sea Level Change Calculator

Step 4 & 5: Enter Project End Year and Calculation Interval (in years)
Sea Level Change Calculator

Step 6: Enter Output Units and Chart Size (default is Feet and 500x800 pixels)
Step 7: Click “Calculate Curves” Button
Sea Level Change Calculator

Other Notes:
1) No “Datum Shift” for BFE to MSL Datum in Hawaii
2) NOAA Curves can be added to USACE curves
3) Updated EC calculates “b” based on 1992 (not 1986)
Sea Level Change Calculator

Outputs: Table and Curve of Relative SLC values by year

<table>
<thead>
<tr>
<th>Year</th>
<th>USACE Low</th>
<th>USACE Int</th>
<th>USACE High</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0.09</td>
<td>0.12</td>
<td>0.21</td>
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<tr>
<td>2015</td>
<td>0.11</td>
<td>0.16</td>
<td>0.31</td>
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<tr>
<td>2020</td>
<td>0.14</td>
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<td>2025</td>
<td>0.16</td>
<td>0.26</td>
<td>0.67</td>
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<tr>
<td>2030</td>
<td>0.19</td>
<td>0.32</td>
<td>0.72</td>
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<tr>
<td>2035</td>
<td>0.21</td>
<td>0.38</td>
<td>0.90</td>
</tr>
<tr>
<td>2040</td>
<td>0.24</td>
<td>0.44</td>
<td>1.09</td>
</tr>
<tr>
<td>2045</td>
<td>0.26</td>
<td>0.51</td>
<td>1.31</td>
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<tr>
<td>2050</td>
<td>0.29</td>
<td>0.59</td>
<td>1.54</td>
</tr>
<tr>
<td>2055</td>
<td>0.31</td>
<td>0.67</td>
<td>1.79</td>
</tr>
<tr>
<td>2060</td>
<td>0.34</td>
<td>0.75</td>
<td>2.05</td>
</tr>
<tr>
<td>2065</td>
<td>0.36</td>
<td>0.84</td>
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<tr>
<td>2070</td>
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<td>0.93</td>
<td>2.64</td>
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<tr>
<td>2075</td>
<td>0.41</td>
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<tr>
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<tr>
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<td>3.67</td>
</tr>
<tr>
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<td>0.49</td>
<td>1.34</td>
<td>4.05</td>
</tr>
<tr>
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<td>0.51</td>
<td>1.46</td>
<td>4.45</td>
</tr>
<tr>
<td>2100</td>
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<td>1.58</td>
<td>4.86</td>
</tr>
</tbody>
</table>
Sea Level Change Calculator

Outputs: Google Map showing selected NOAA Tide Station
Planners use my data for

- County Plans
- General Plans
- Conservation District Use Permits
- Setbacks
- Shoreline Certification
- Shoreline Permits
- Building Permits
- Special Area Management Permits
- Flood Zones
- Anything where projection of SLC is required
References

  http://www.nap.edu/catalog.php?record_id=1006
  http://www.ipcc.ch/ipccreports/ar4-wg2.htm
- EC 1165-2-212
  “Sea Level Change Considerations for Civil Works Programs”
- ER 1100-2-8162
  “Incorporating Sea Level Change in Civil Works Programs”