Florida Sea Level

FACTSHEET

Definitions:

- Global (eustatic) sea level is determined by the volume of water in the ocean.
- A tide gauge is a water level measuring instrument attached to a structure such as a pier.
- Mean sea level (MSL) is the average of the 8760 hourly heights at a tide gauge for a calendar year.
- Relative sea level (RSL) is the relationship between the MSL water surface and the juxtaposed survey benchmarks on land.

RSL at a given site depends on seven interacting variables:

- Vertical Land Motion
- Glacial but not Sea Ice Melt
- Thermohaline Expansion
- Coastal Currents
- Atmospheric Pressure
- Prevailing Winds
- Tides and Tidal Currents

Florida vertical land motion is measured by permanent Global Positioning System receivers, and in general is -0.02±0.15 feet/century.

Florida land motion can vary from site to site, which affects RSL.

Glacial melt accounts for about 0.56 feet/century of global sea level rise.

Thermal expansion accounts for about 0.29 feet/century of global SLR.

Florida coastal currents increase local RSL by less than 0.01 feet/century.

Atmospheric pressure change over Florida adds 0.03 feet/century to RSL.

Florida RSL has averaged 0.71±0.10 feet/century (4-5 inches in the last 50 years), and is steadily rising.

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<table>
<thead>
<tr>
<th></th>
<th>Longitude (°W)</th>
<th>Latitude (°N)</th>
<th>Trend (feet/century)</th>
<th>SE (feet/century)</th>
<th>Epoch</th>
<th>N (years)</th>
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<tbody>
<tr>
<td>Cedar Key</td>
<td>83.03</td>
<td>29.14</td>
<td>0.53</td>
<td>±0.06</td>
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<td>30.67</td>
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<td>±0.04</td>
<td>1898-2012</td>
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<tr>
<td>Key West</td>
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<td>24.56</td>
<td>0.74</td>
<td>±0.03</td>
<td>1913-2013</td>
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<td>Mayport</td>
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<td>0.77</td>
<td>±0.06</td>
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<td>Miami, Merged</td>
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<td>±0.04</td>
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<td><strong>MEAN ± SD</strong></td>
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<td></td>
<td><strong>0.71±0.10</strong></td>
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Key West Sea Level 1913-2013

\[ y = 0.0076x - 15.993 \]
\[ R^2 = 0.8910 \]

\[ y = 14.896\ln(x) - 114.03 \]
\[ R^2 = 0.8907 \]

\[ y = 6\times10^{-6}x^2 - 0.0154x + 6.5552 \]
\[ R^2 = 0.8914 \]

References: