COASTAL DATA EXCHANGE

LOCALIZED SLR/INUNDATION
EXTREMES SCENARIOS

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Sea Surface Height through Time and Space

Reconstructed Sea Surface Height from altimetry and tide gages: 1950-2009
CCAR, University of Colorado, Boulder

Data source: NASA Goddard Institute for Space Studies
Visualization credit: NASA Goddard’s Scientific Visualization Studio

COASTAL DATA EXCHANGE
Rationale

• There is a growing demand for accurate information that can be used to evaluate the potential vulnerability of facilities and infrastructure, as well species and ecosystems, to SLR/coastal inundation under a changing climate. Such information supports decision-making ranging from area-wide vulnerability assessment related to climate adaptation planning and disaster risk reduction to site-specific analysis related to design and maintenance.

• Of particular interest is the practical application of extreme value analysis to inform decision and policy making that takes into account
  – sea level and storminess-related variability as well as trends; and
  – differences that exist from location to location in terms of the relative importance of various contributors to extremes.
Hindcast Diagnosis

Analysis of Location Parameter

P = perigean cycle
N = nodal cycle
S = seasonality
LT = long-term trend
CLI = climate index
Hindcast Products - Honolulu

- Seasonal 50-yr Return Level with location & scale parameters contributions

- Summer, Winter and Annualized 50-yr Return Level with Tide and Trend contributors

- Return Level Interval Curves for year 2011 by season respective to tidal and trend value contributions
Forecast Products - Honolulu

- 100-yr Return Level with Tidal contribution, SLR Scenarios (~Int. Low), and Hindcast location and scale trends
- 2041 Return Level Interval Curves at warm, neutral and cool EMI conditions
- “Decay curve” of year 2011 100-yr Return Level (fixed elevation) as a function of tide/SLR scenario/hindcast contributors (top figure)
Forecast Products - Hilo

- 100-yr Return Level with Tidal contribution, SLR Scenarios (~Int. Low), and Hindcast location and scale trends

- 2041 Return Level Interval Curves at warm, neutral and cool EMI conditions

- “Decay curve” of year 2011 100-yr Return Level (fixed elevation) as a function of tide/SLR scenario/hindcast contributors (top figure)
Discussion

• Places information in a risk-based context
• Includes patterns as well as trends
• Currently only for Still Water Level and for site-specific application
• Plan is to extend this to Total Water Level and for area-wide application
NEW Probabilistic estimates of extreme still water levels under a changing climate for specific locations in the Pacific Islands.

http://www.noaaclimatepacificis.org/slr/phase2.php