COASTAL DATA EXCHANGE

USACE SEA LEVEL CHANGE CALCULATOR

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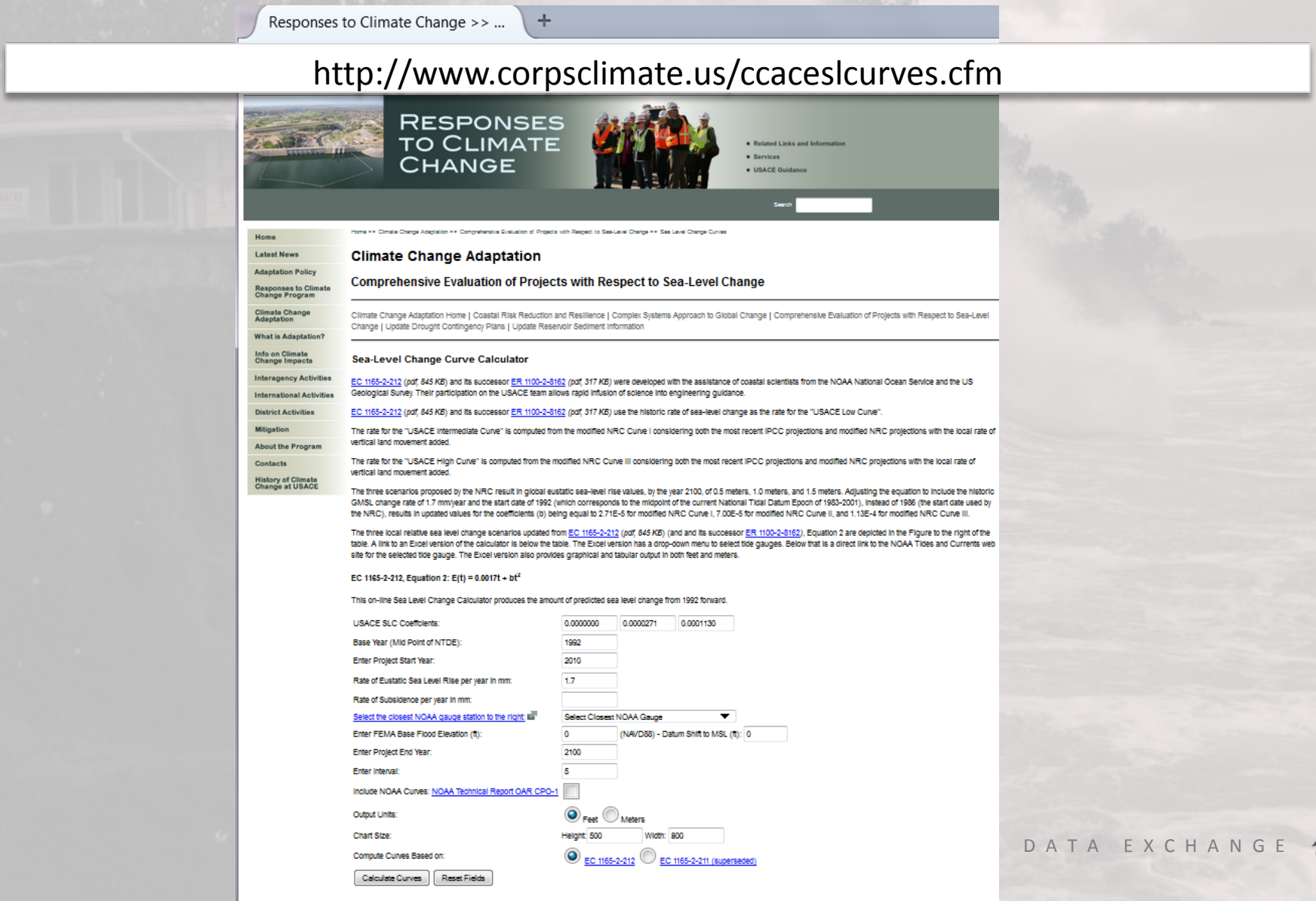
BUILDING STRONG®

J Schneider

Sea Level Change Calculator



DATA EXCHANGE

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*

EC 1165-2-212, Equation 2: $E(t) = 0.0017t + bt^2$

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

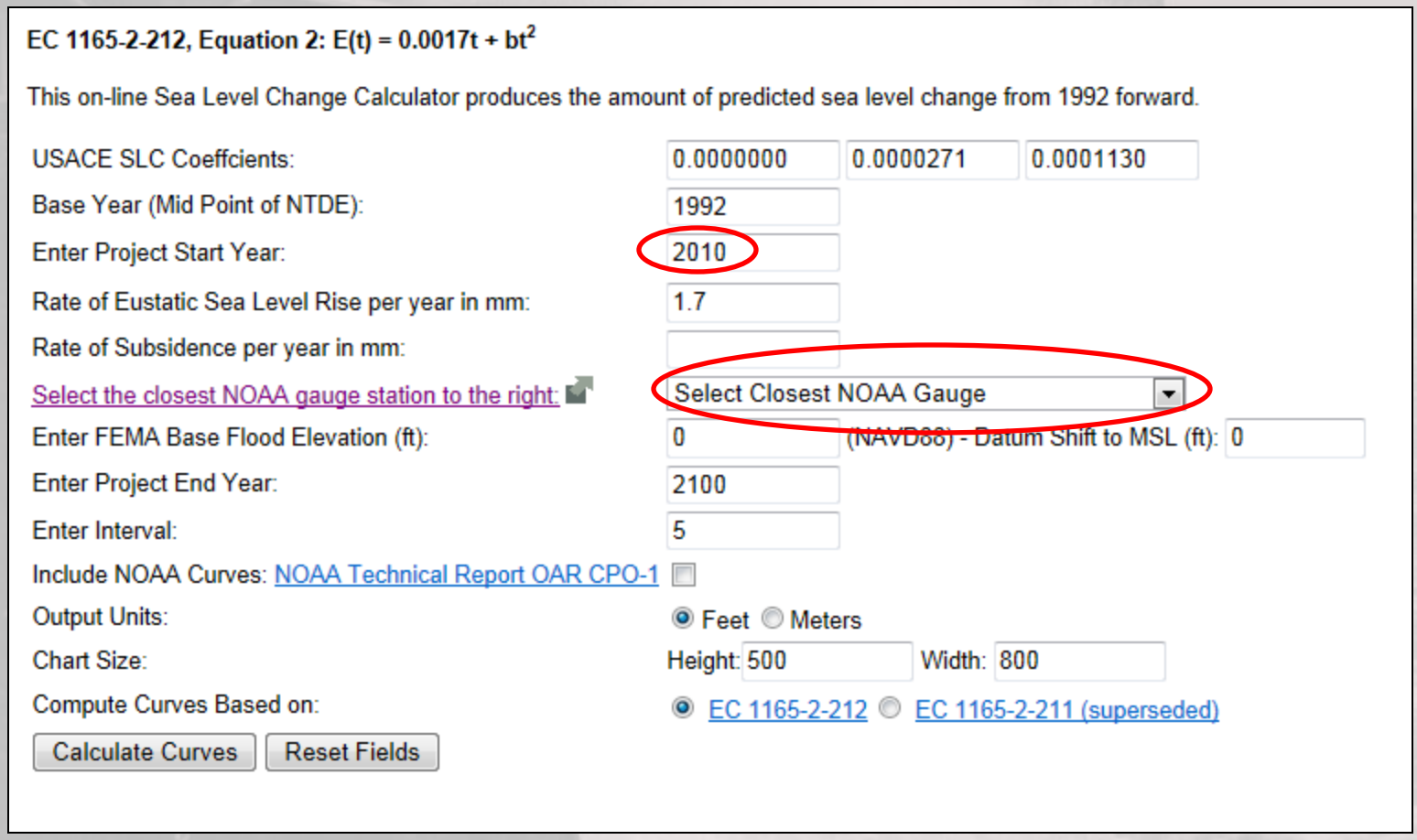
Sea Level Change Calculator

- 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 movement [1] provides the 3 local relative SLC curves for a selected NOAA Tide Station

[1] Technical Report NOS CO-OPS 065 (C. Zervas, S. Gill, W. Sweet)

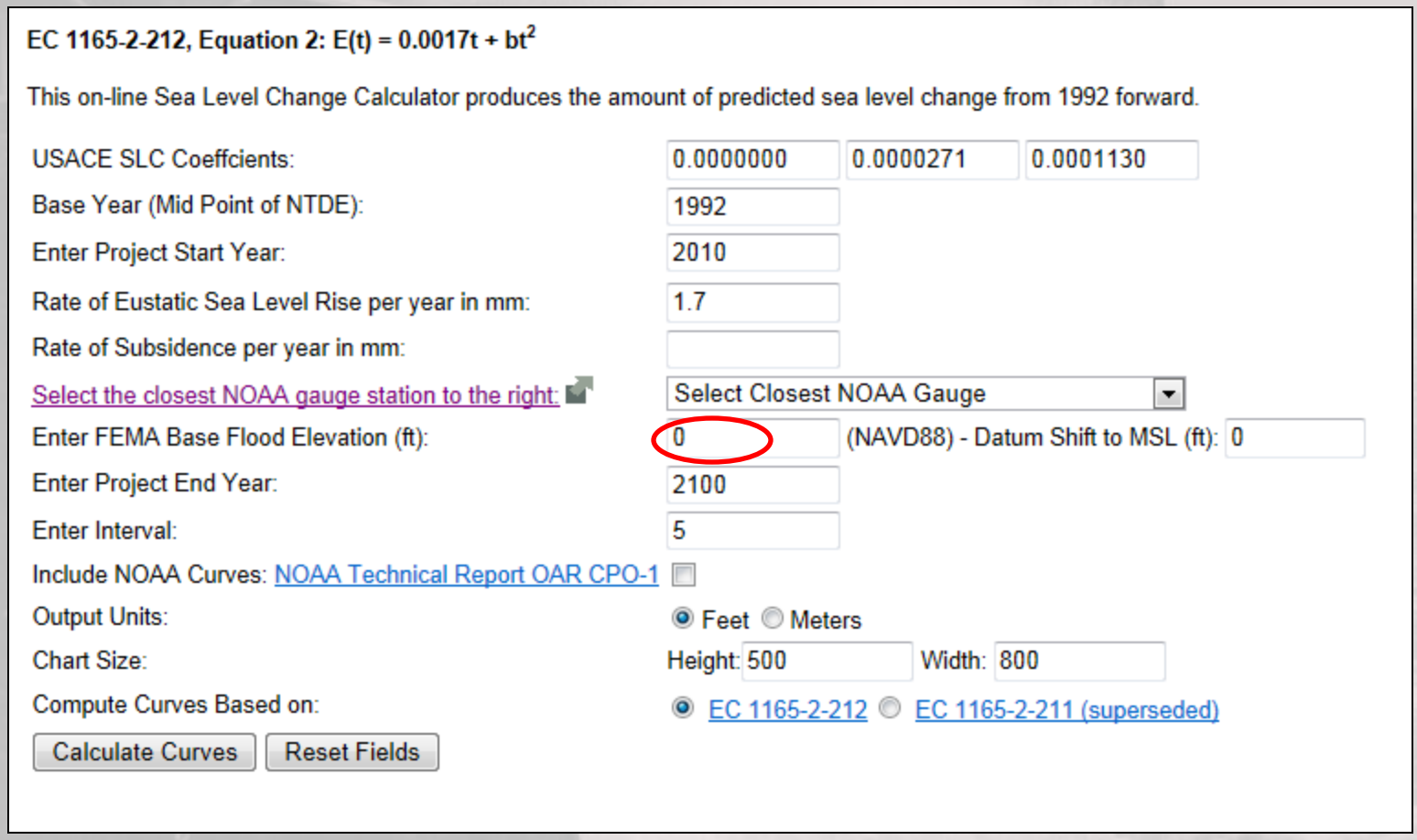
Sea Level Change Calculator

Step 1 & 2: Enter Project Start Year and NOAA Tide Station Selection



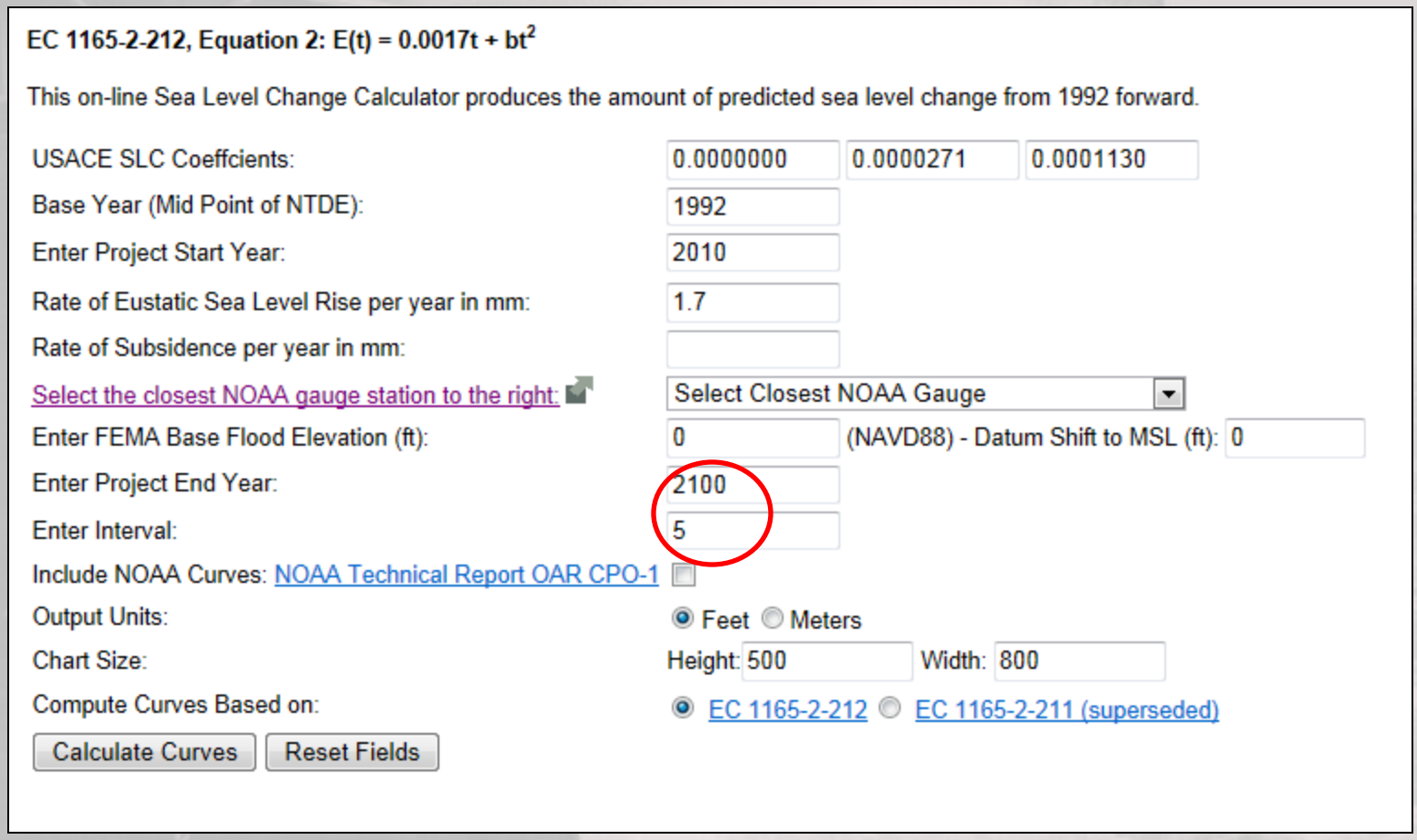
Sea Level Change Calculator

Step 3: Enter FEMA Base Flood Elevation (optional)



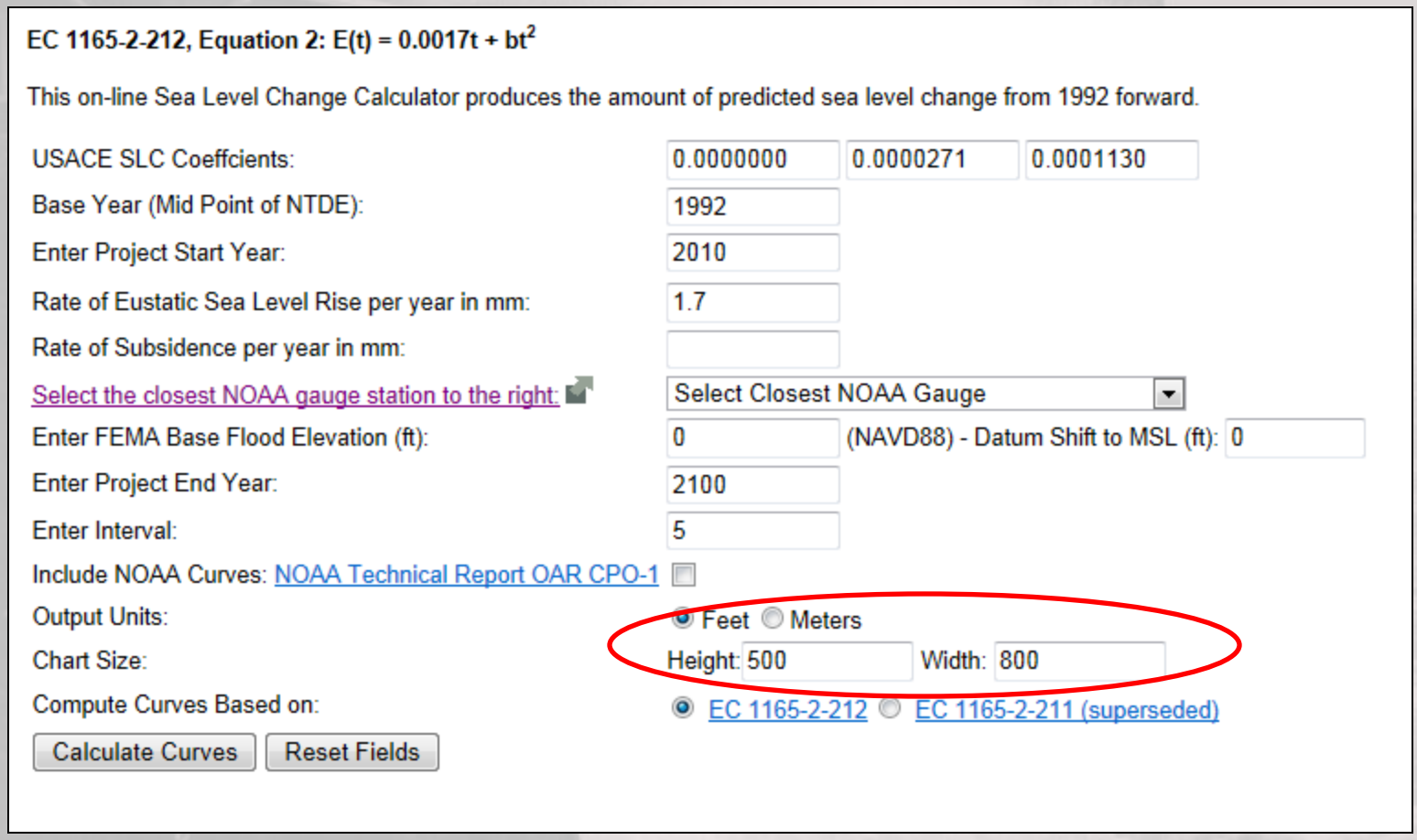
Sea Level Change Calculator

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



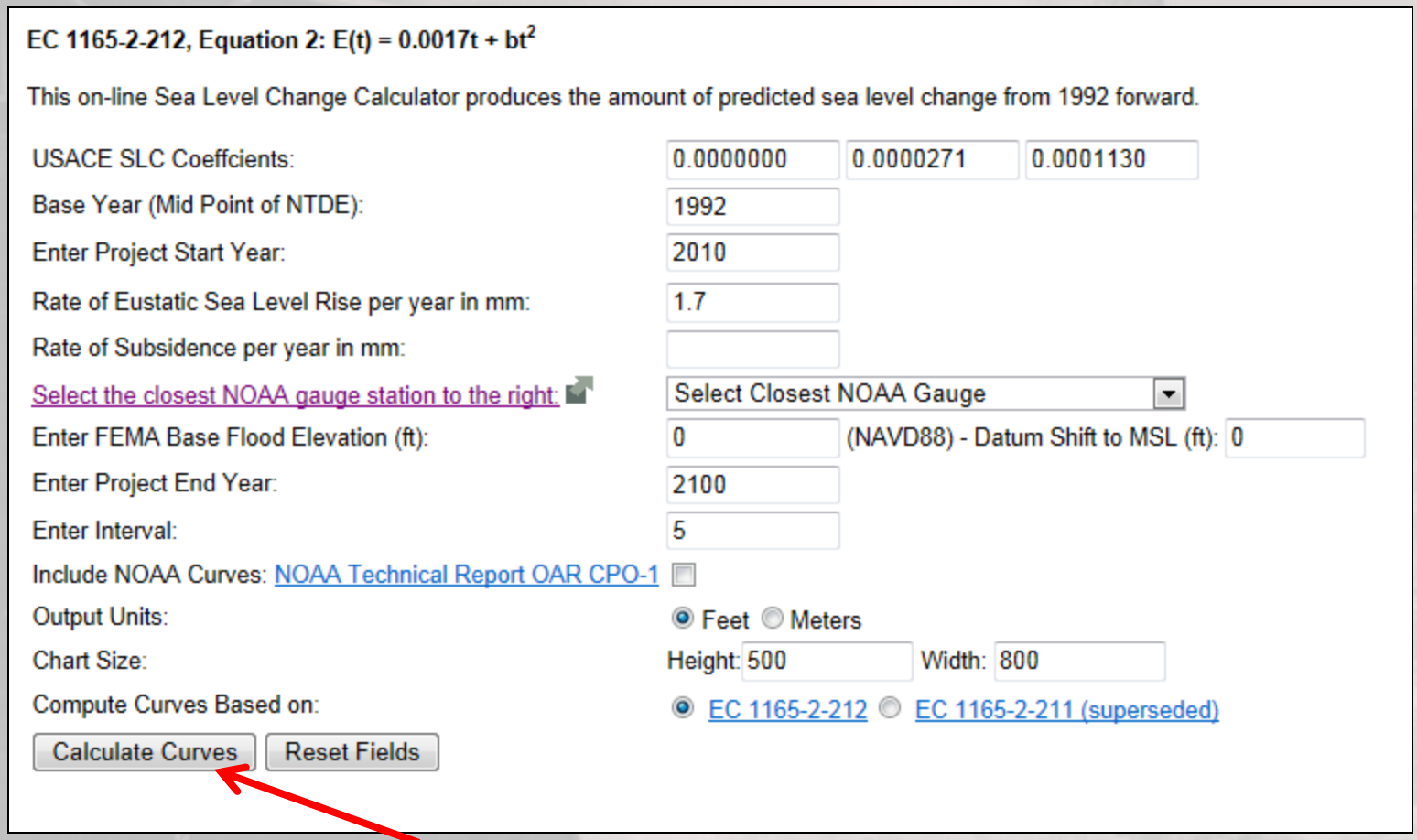
Sea Level Change Calculator

Step 6: Enter Output Units and Chart Size (default is Feet and 500x800 pixels)



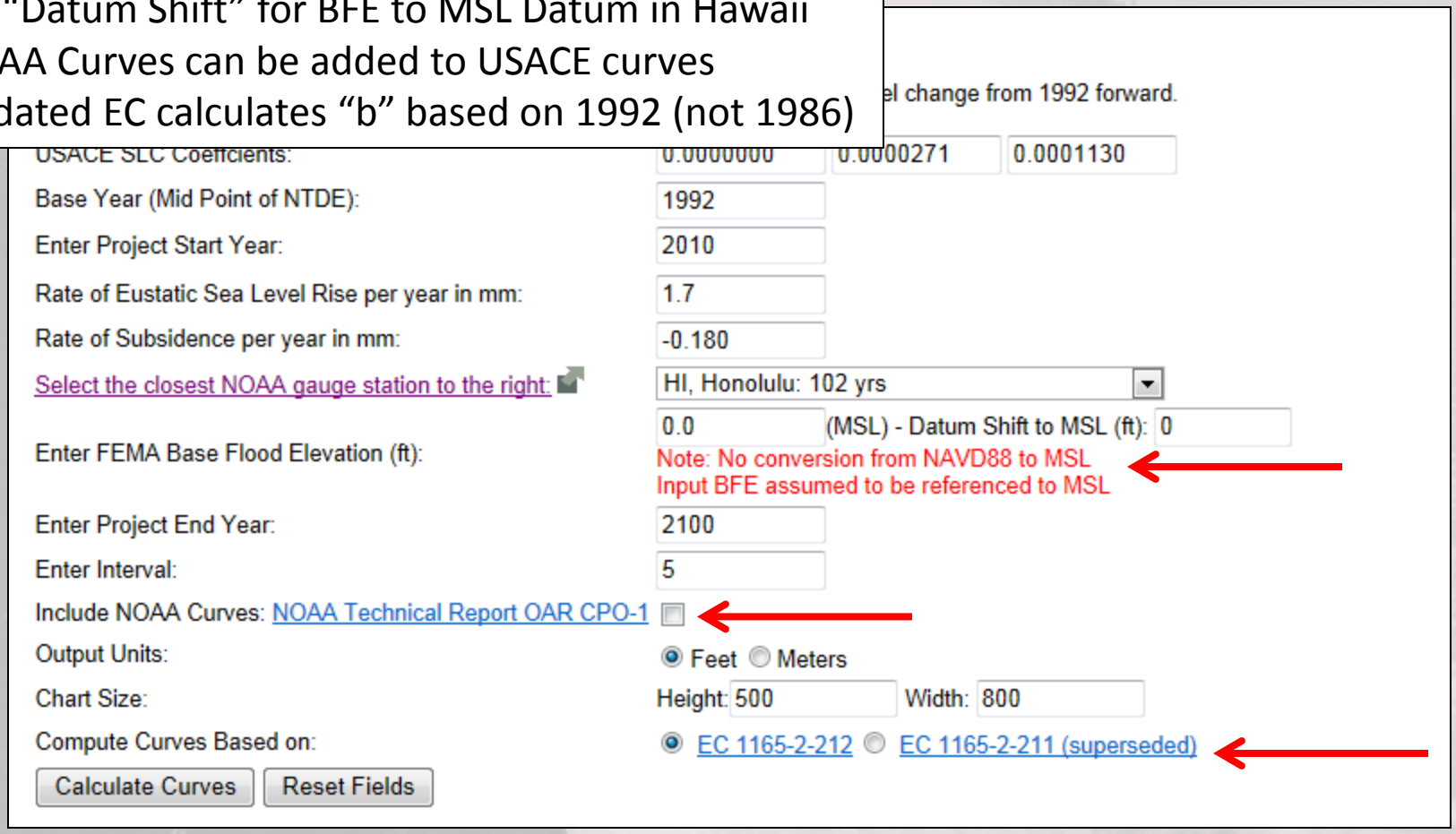
Sea Level Change Calculator

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)



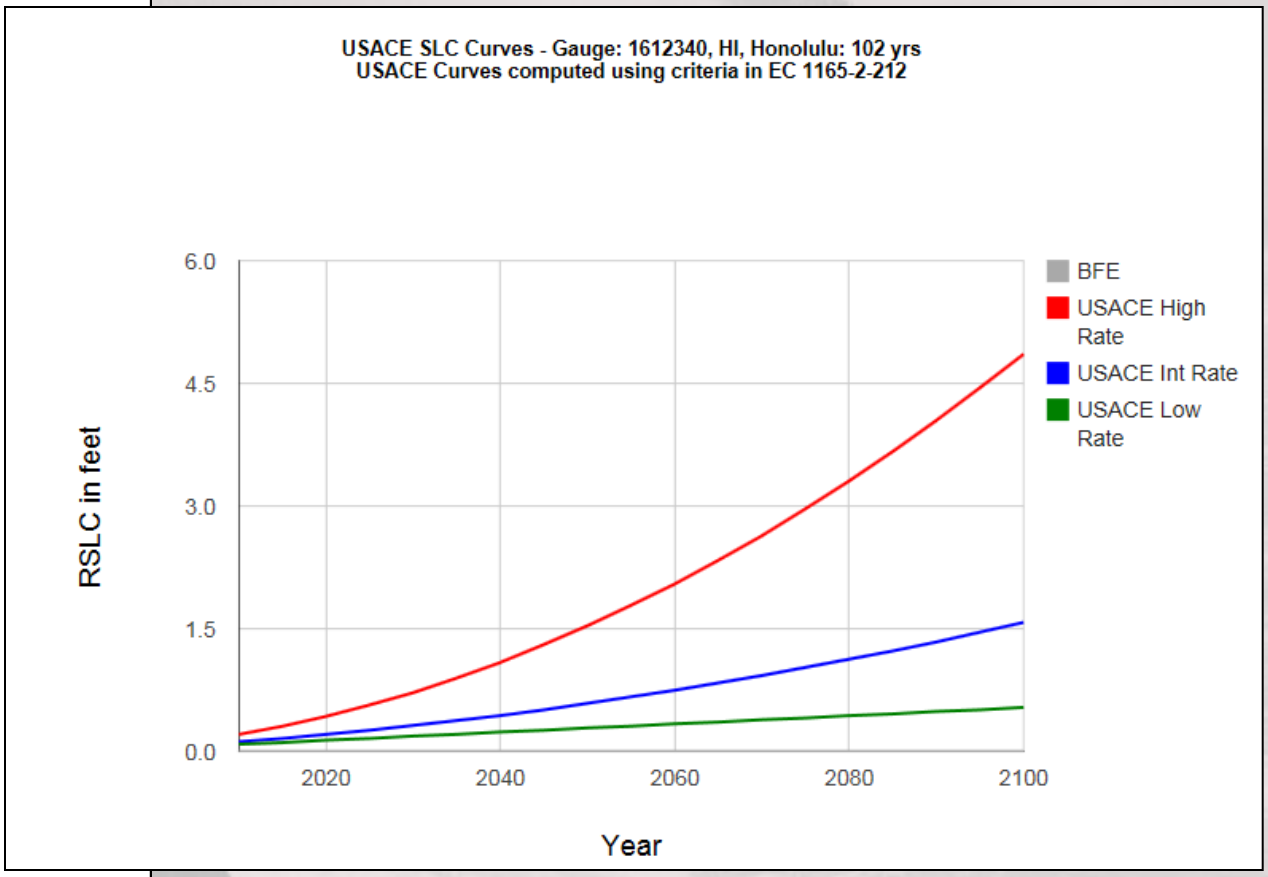
Sea Level Change Calculator

USACE Curves computed using criteria in USACE EC 1165-2-212

Gauge: 1612340, HI, Honolulu: 102 yrs
All values are in feet

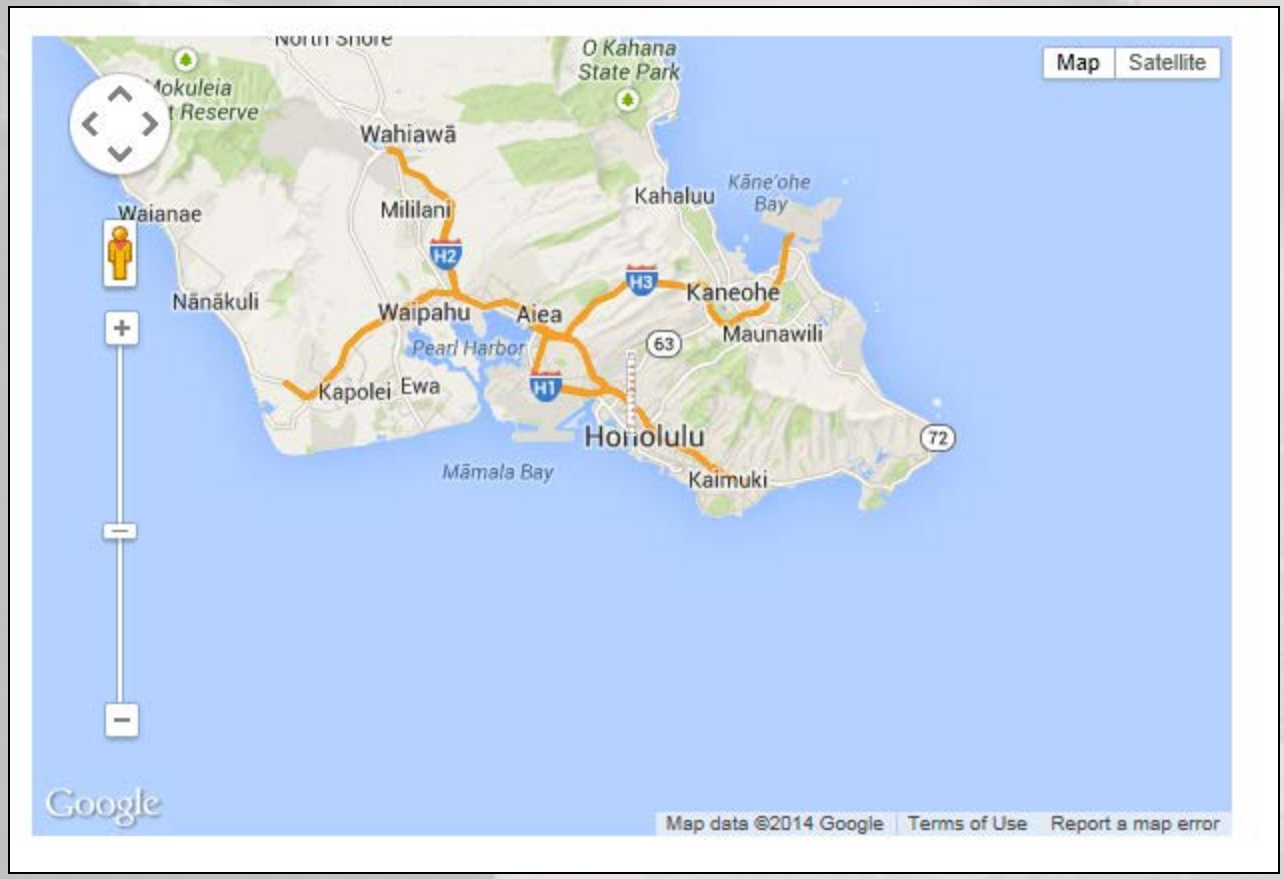
Year	USACE Low	USACE Int	USACE High
2010	0.09	0.12	0.21
2015	0.11	0.16	0.31
2020	0.14	0.21	0.43
2025	0.16	0.26	0.57
2030	0.19	0.32	0.72
2035	0.21	0.38	0.90
2040	0.24	0.44	1.09
2045	0.26	0.51	1.31
2050	0.29	0.59	1.54
2055	0.31	0.67	1.79
2060	0.34	0.75	2.05
2065	0.36	0.84	2.34
2070	0.39	0.93	2.64
2075	0.41	1.03	2.97
2080	0.44	1.13	3.31
2085	0.46	1.23	3.67
2090	0.49	1.34	4.05
2095	0.51	1.46	4.45
2100	0.54	1.58	4.86

Outputs: Table and Curve of Relative SLC values by year



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

- National Research Council, 1987. Responding to Changes in Sea Level: Engineering Implications. National Academy Press: Washington, D.C. http://www.nap.edu/catalog.php?record_id=1006
- IPCC (2007c) Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change." (M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson, eds.). Cambridge University Press, Cambridge, UK. http://www.ipcc.ch/ipccreports/ar4-wg2.htm
- EC 1165-2-212
  "Sea Level Change Considerations for Civil Works Programs"
  http://www.corpsclimate.us/docs/EC_1165-2-212%20-Final_10_Nov_2011.pdf
- ER 1100-2-8162

  "Incorporating Sea Level Change in Civil Works Programs"
  http://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1100-2-8162.pdf