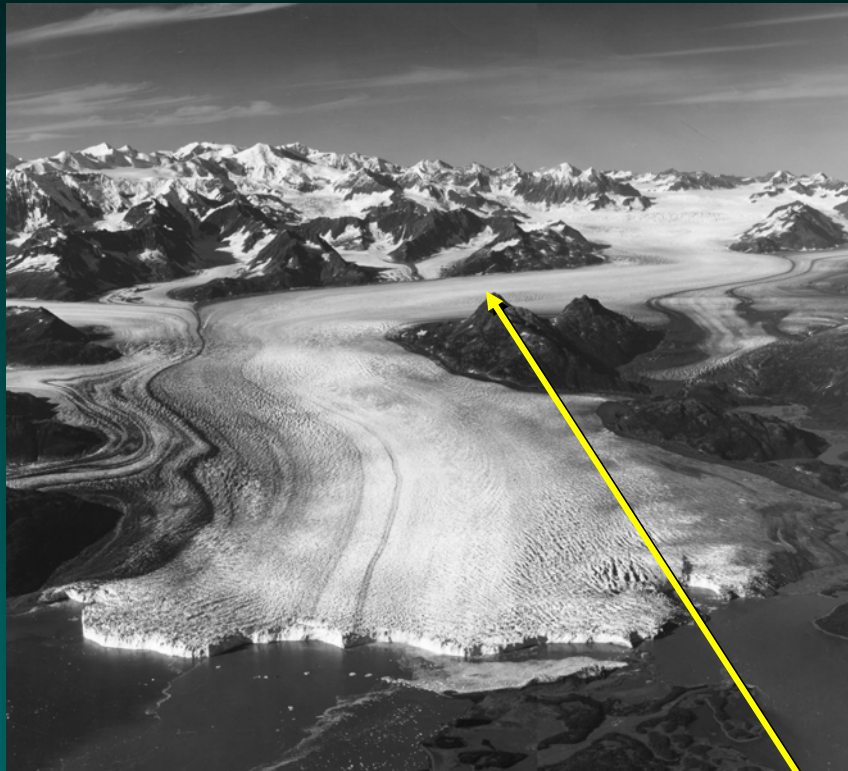


Global Warming & Sea Level Rise

Evidence for Climatic Warming



Columbia Glacier, Alaska 1980 v. 2005
Arrows point to the same peak!

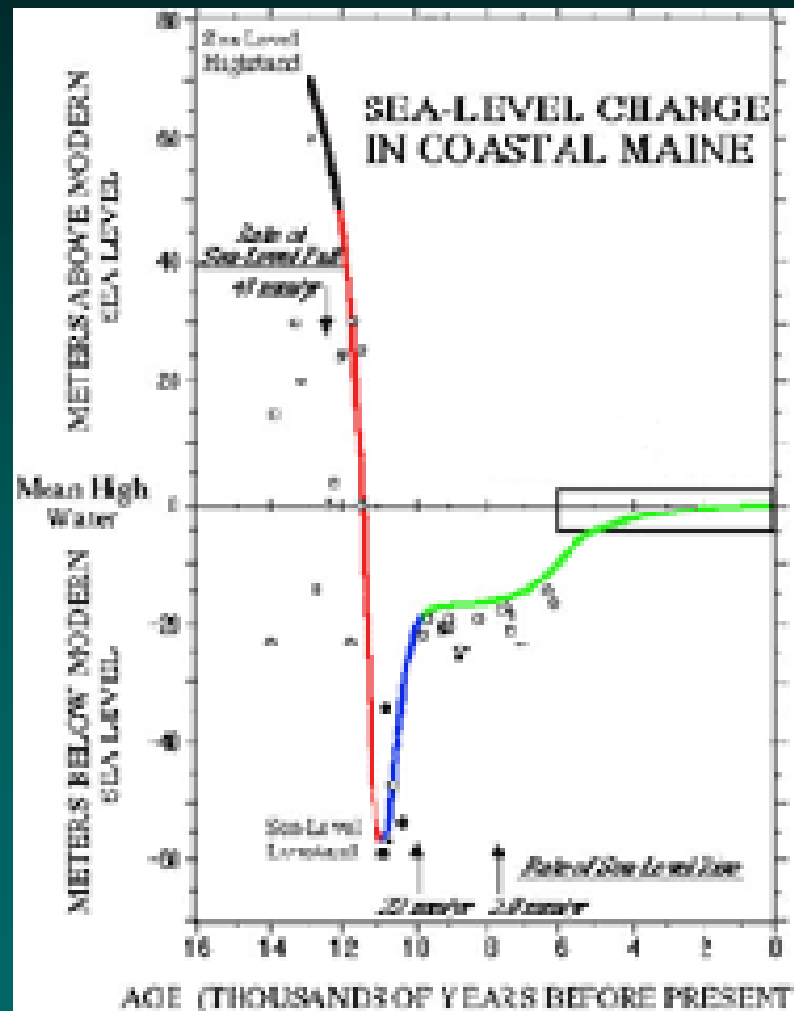
Why is the Climate Warming?

Do We Have a Plan to Avoid Submergence at the Shore?

- Cycles of Solar Radiation or Earth axis orientation
 - *(no chance of human control)*
- Continuation of a 15,000 year melting of the ice sheets.
 - *(very limited ability to influence geologic trends)*
- Variation in climate on a smaller scale like the cool times that started about 1,500 years ago and ended by 1850.
 - *(either wait it out or deliberately attempt to cool the earth)*
- Human use of fossil fuels and other chemicals that trap solar radiation in the atmosphere.
 - *(if there is a global intervention, we may be able to influence the rate of warming and eventually reverse it)*

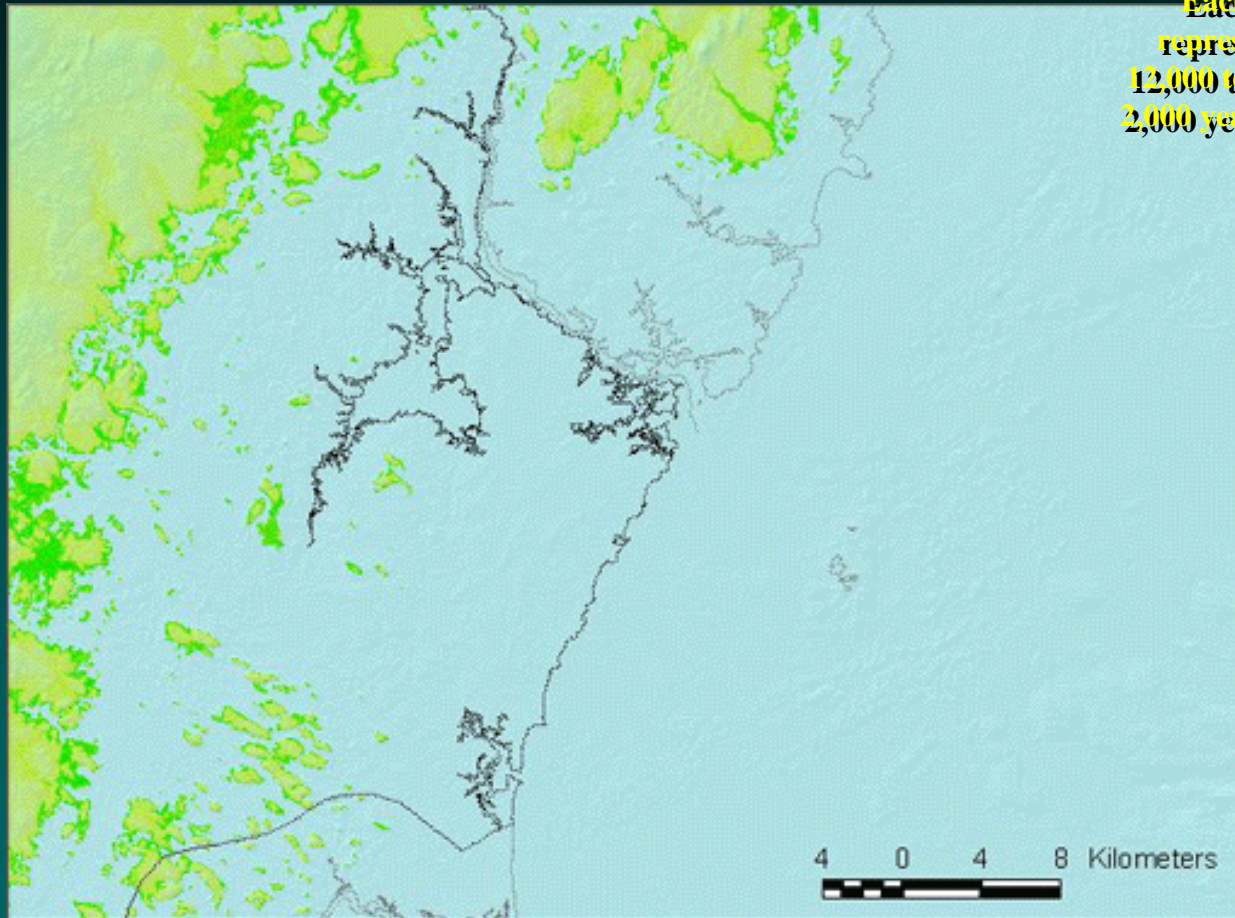
Time Graph of New England Sea Level Rise

12,000 years ago as the ice melted, the sea flooded up to the present 70-foot contour on land. The depressed land re-bounded causing the sea to retreat beyond the present shoreline (-55'). After 11,000 years ago the sea has gradually risen to the present.



Sea Level Rises in New England

Univ. of New Hampshire Study



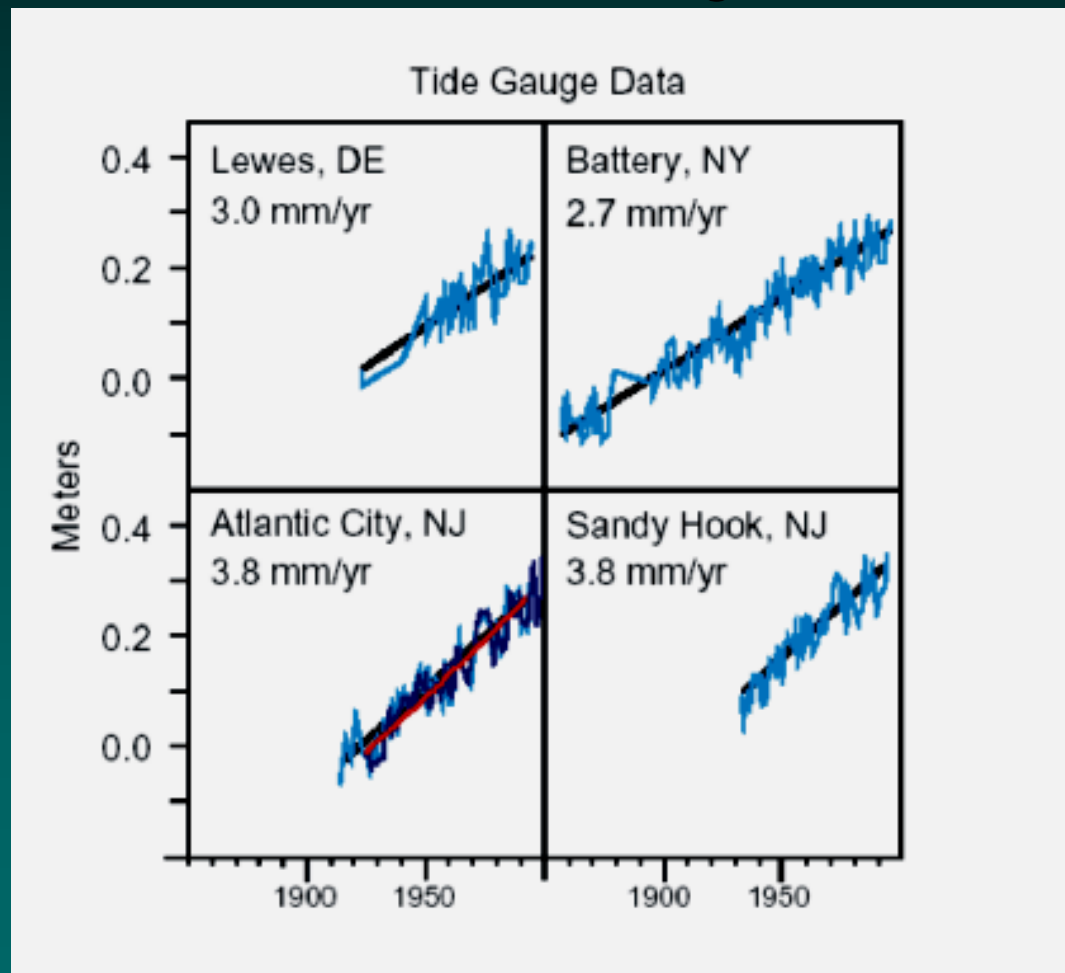
Each shoreline change represents 500 years from 12,000 to 7,000 years ago, then 2,000 year moves to the present

- Shoreline of New Hampshire between 12,000 yr bp and present

Sea Level Changes in New Jersey

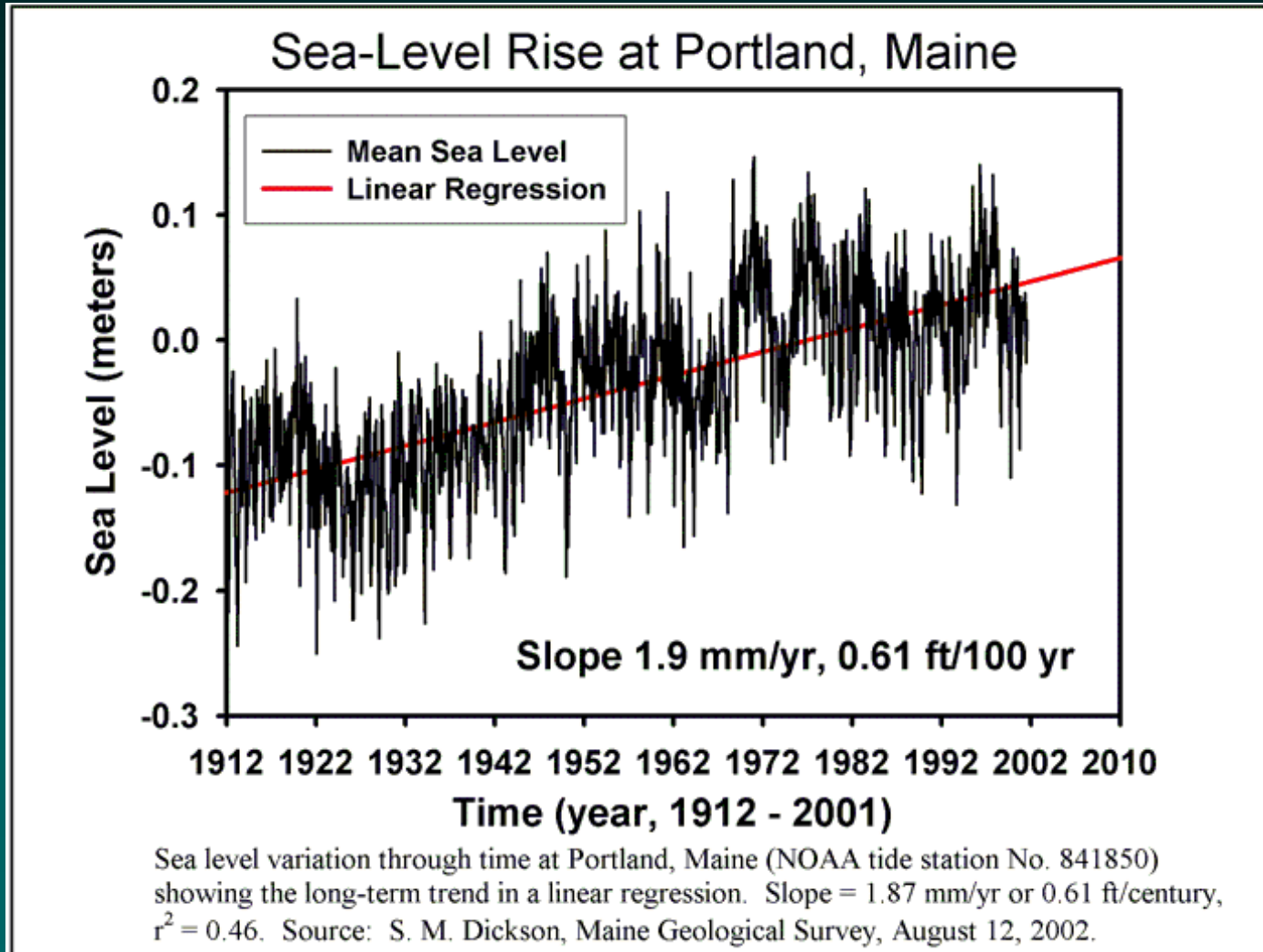
With 100 years of data, Sea Level is rising at 1.0 foot/century

- **Data Sets from Psuty & Collins, 1986**
 - Sandy Hook and Atlantic City impacted by **ground water withdrawal.**



Yearly Mean Sea Level Rise in Portland, Me.

This data shows the yearly variation, but the regression line shows the unmistakable trend of rise (0.61 ft./100 years)



Tidal Epoch Cycles and Mean Sea Level

National Oceanographic & Atmospheric Administration data indicates a larger rise rate over 41 years.

Mean Sea Level Difference: for Station 8534720 Atlantic City, NJ

- 1983-2001 Epoch 7.17 ft.
- 1960-1978 Epoch 6.83 ft.

- Difference: + 0.34 ft.

Long-term Animation of Sea Level Rise



University of New Hampshire New England Sea Level Rise Study

Impacts of Sea Level Rise on the Developed New Jersey Coastline

- A warmer ocean surface means more frequent & more intense storms = HIGHER DAMAGE POTENTIAL
- Rising Sea Level Drowns a Developed Barrier Island in place = GREATEST IMPACT ON THE BAY SHORE
- Storm Induced Water Level Rise (Storm Surge) Reaches Higher Elevations = INCREASES STORM DAMAGE
- Lack of New Sediment Arriving at the NJ Shoreline Naturally Means More Rapid Erosion = GREATER SHORELINE RETREAT RATE AS SEA LEVEL RISES