Responding to Climate Change
-- focus on Warren, RI --

Welcome and Introductions
Kate Michaud (Town of Warren)

Sea Level Rise and Storms
Charles Roman (URI Coastal Institute)

Tools to Assess Coastal Risk
Teresa Crean (URI Coastal Resources Center and RI SeaGrant)

Climate Policies
Janet Freedman (RI CRMC)

Adaptation
Wenley Ferguson (Save The Bay)

A Forum for Evaluating Adaptation Practices

- Explore adaptation strategies to address sea-level, storm surge, and flooding
- Broad collaboration with partners
- Synthesize and fill information gaps
- Outreach and education

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Climate Response Demonstration Sites

-- representing RI coastal settings and land use types --

Natural Areas

- undeveloped
- ecological values
- recreational values

Mixed-Use Areas

- town centers
- historic heritage
- mixed land use
- natural areas, open space

Urban Areas

- industrial/commercial
- economic significance
- urban parks

Sea Level Rise and Storm Surge

Photo courtesy, RIEMA

http://queens.brownstoner.com/2012/11/broad-channel-also-abused-by-hurricane-sandy/

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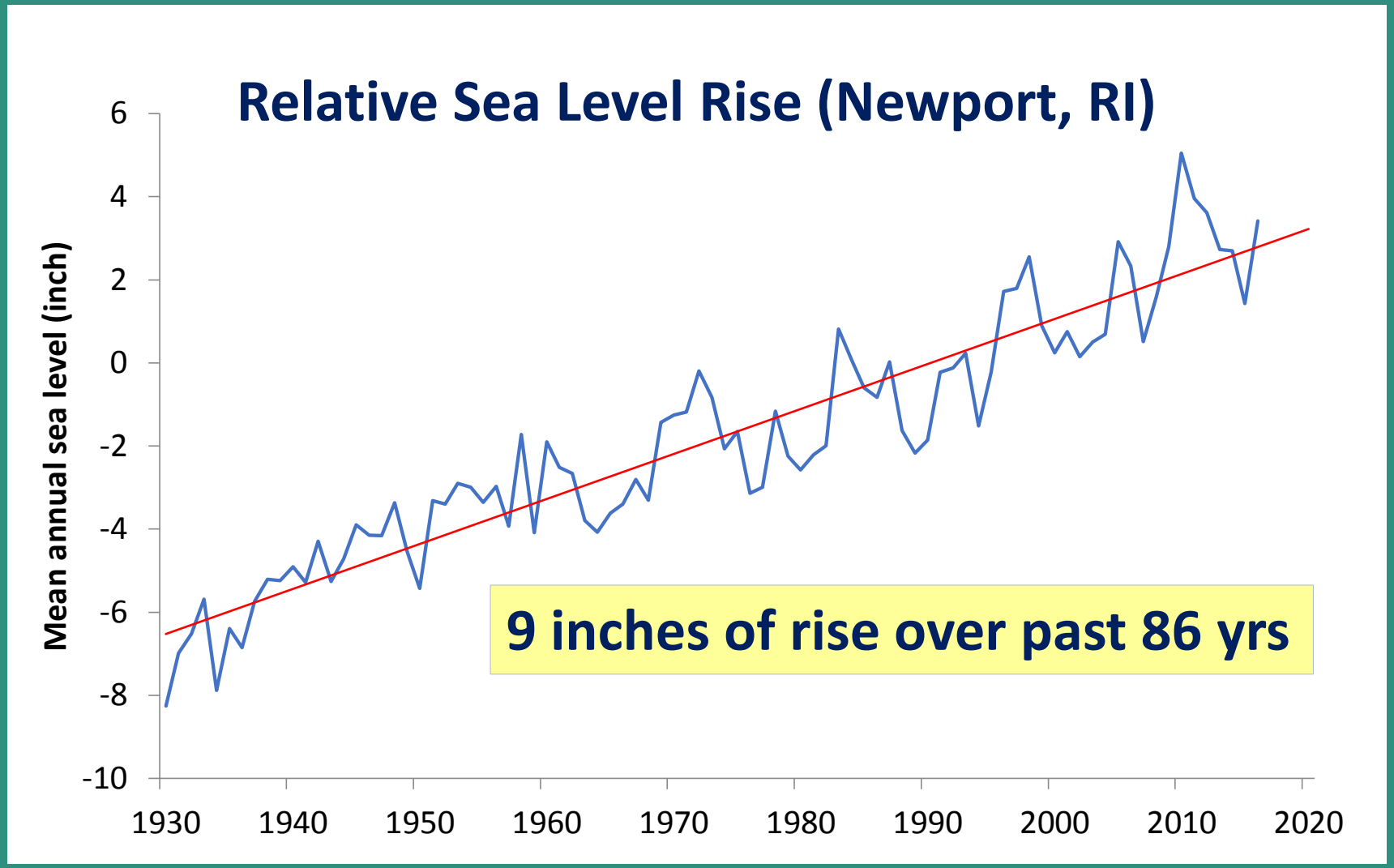

Data Source: https://tidesandcurrents.noaa.gov/waterlevels.html?id=8452660

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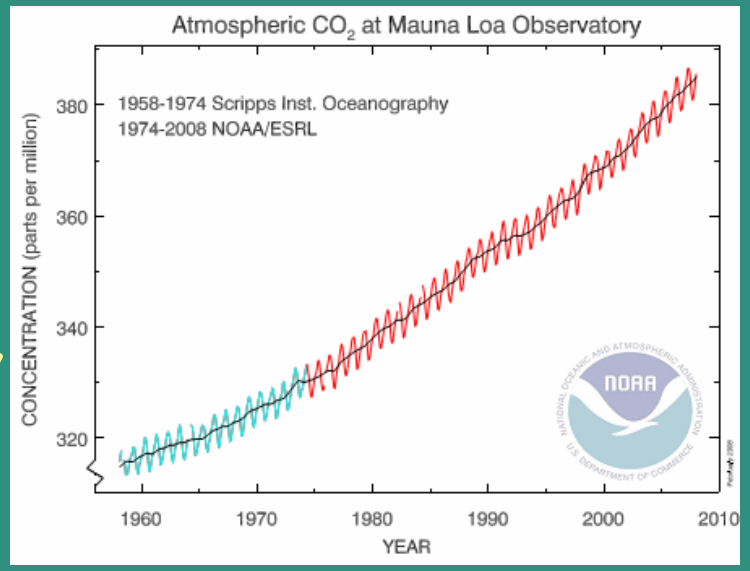
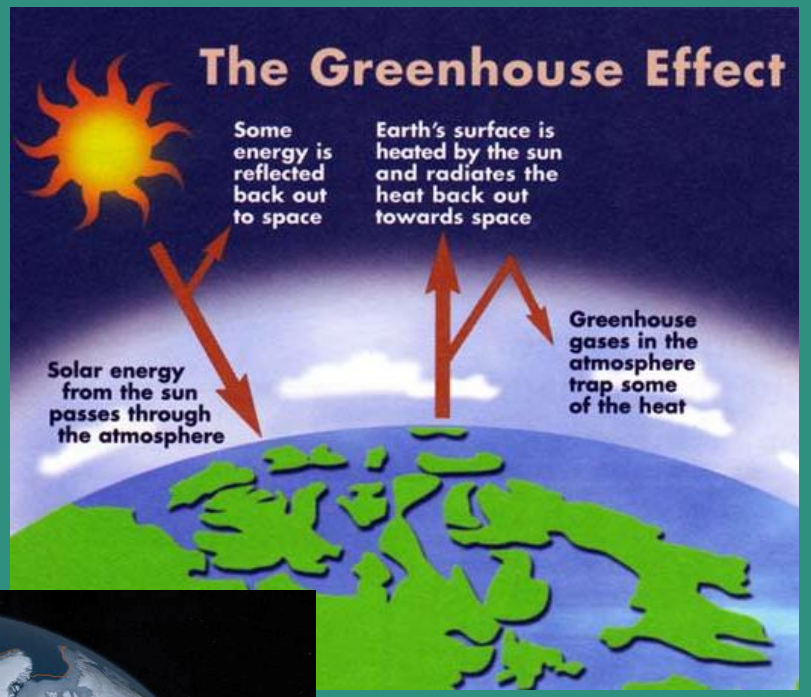
Why is Sea-Level Rise Projected to Accelerate?

- Increase greenhouse gases, increase temperature, thermal expansion of oceans
- Melting of polar ice, including Greenland and Antarctica ice sheets
- Changing ocean circulation





Courtesy: www.greenenergynetwork.org

Courtesy: NASA Goddard's Scientific Visualization Studio

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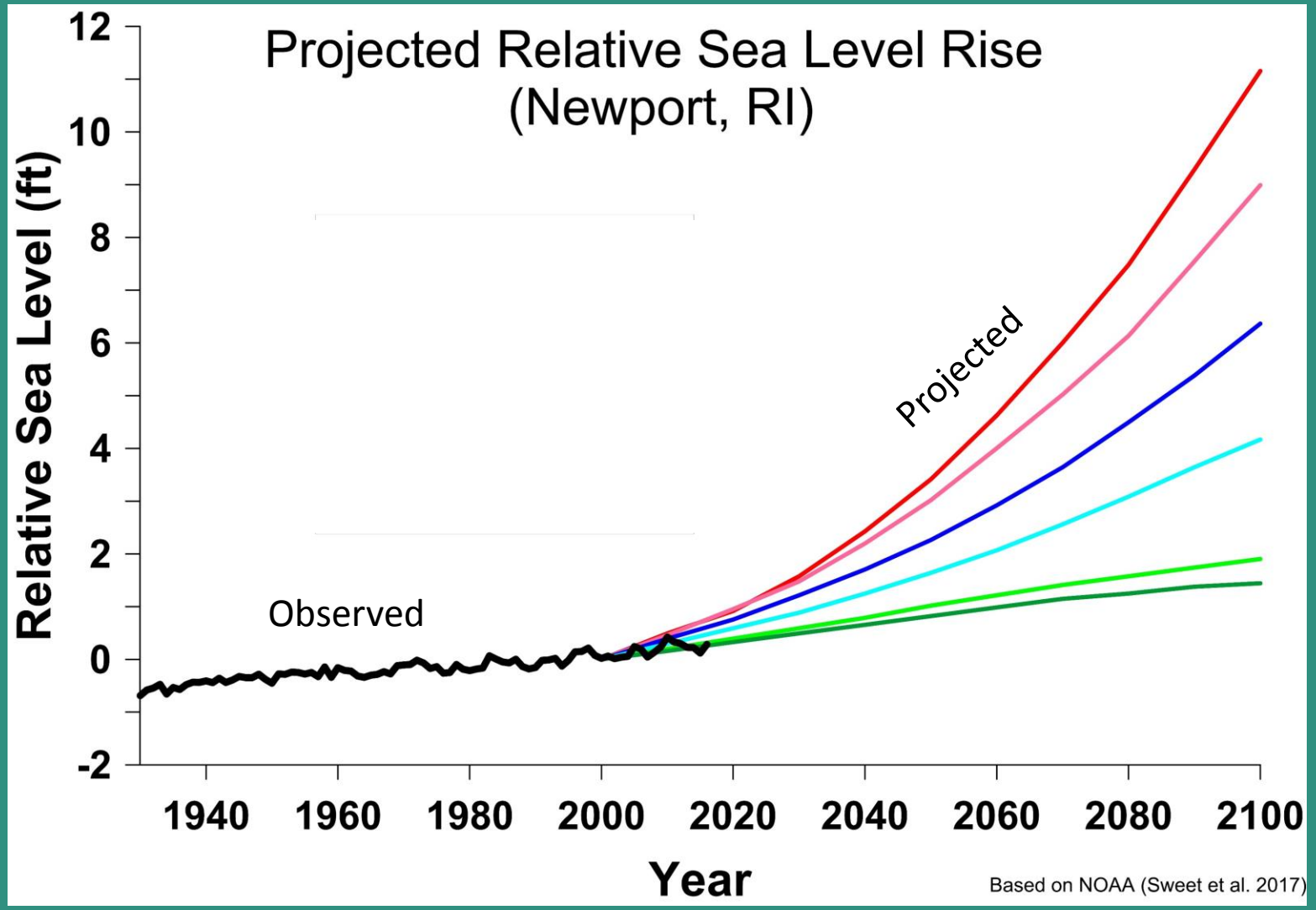

Based on projected future greenhouse gas emissions

- Low – Aggressive reductions
- High – Business as usual

Could be 9 ft or more of sea level rise by 2100 (82 yrs)

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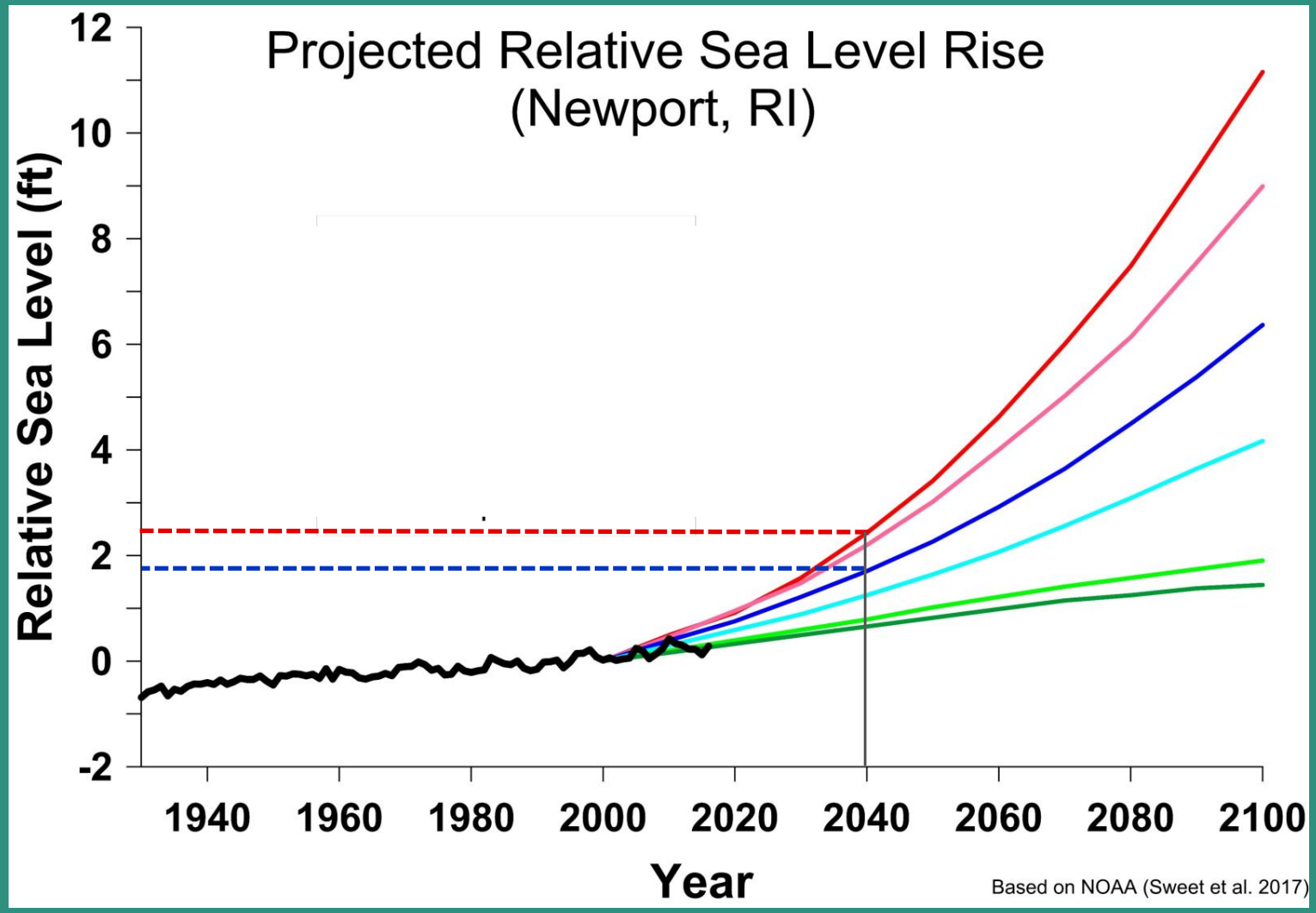
Projected Rise in Sea Level



22 yrs from now (2040)

- Low 10" rise
- Mid 1' 11"
- High 2' 7"

52 years (2070)

- Low 1' 7" rise
- Mid 4' 2"
- High 6' 4"

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Increased Intensity of Storms and Storm Surge

Source: National Weather Service. http://www.weather.gov/okx/Hurricane Sandy

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1938 Hurricane

Conimicut Point

Weybosset St.

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Salt Marsh Loss

Source: Watson et al. (2017)

Vegetation Loss over the Past 40 years (1972 – 2011)

- Hundred Acre Cove: 22% loss
- Palmer River: 19% loss

Will marshes be sustainable with greater rates of sea level rise?

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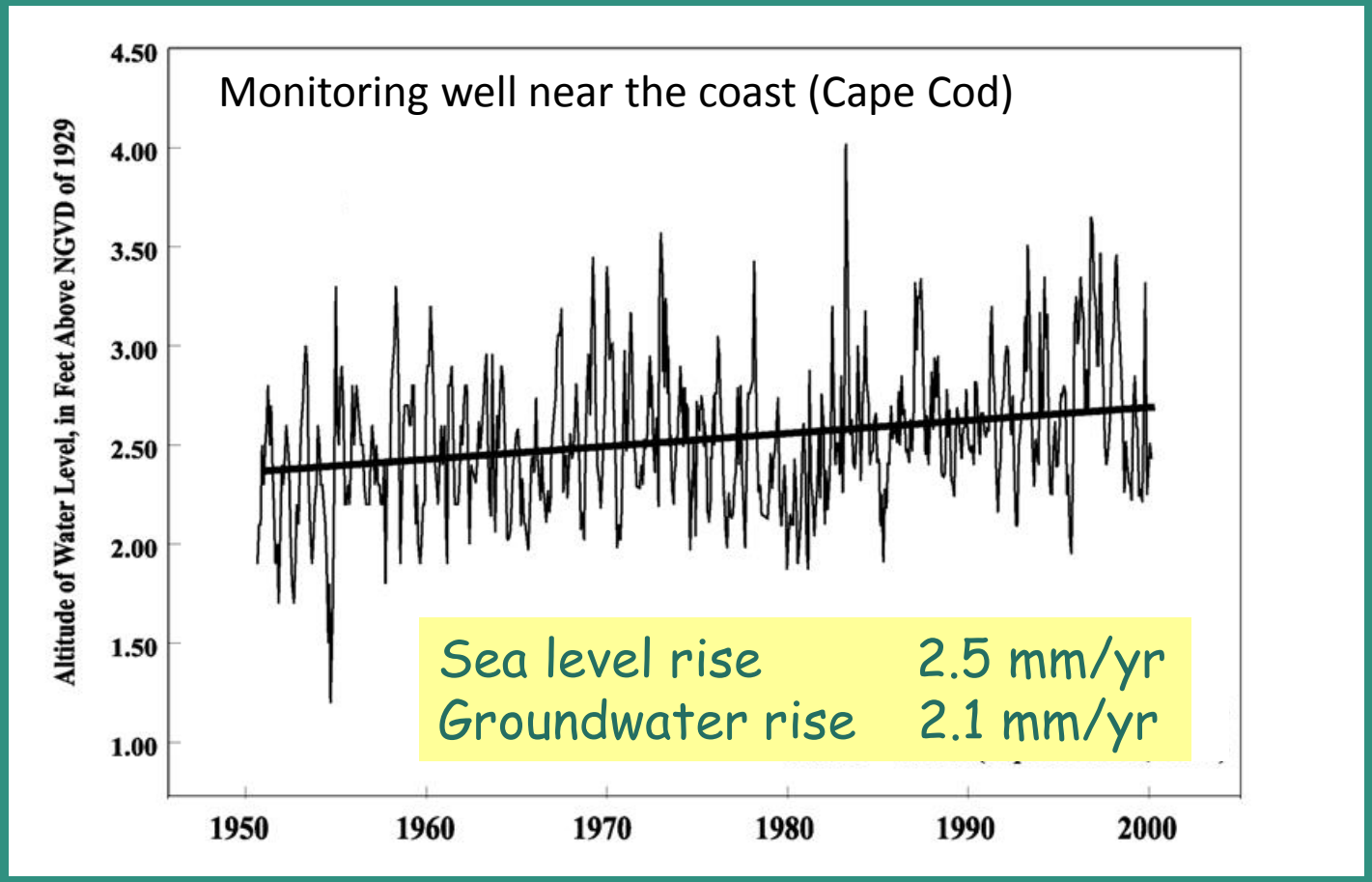
Groundwater Response to Sea Level Rise



Source: McCobb and Weiskel 2003 (USGS)

The future with 6 ft rise of sea level (New Hampshire, Knott et al. 2017)

- groundwater could respond at a distance of 2-3 miles from the coast

- Consider impacts to;
  - basements
  - septic systems
  - road integrity
  - underground utilities
  - natural resources

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