



# South Bethany SLR Study: Sea Level Rise Scenarios

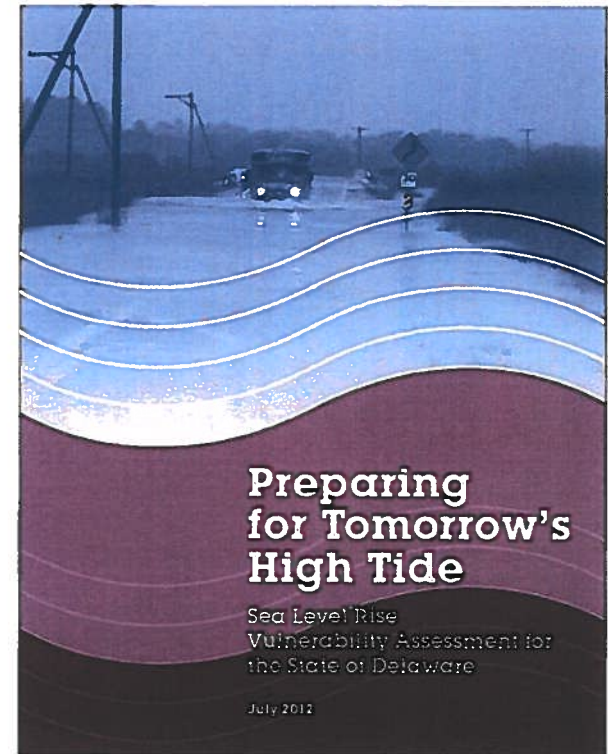


August 27, 2015

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# Reports Reviewed

- *Recommended Sea Level Rise Scenarios for Delaware (2009)*
  - DNREC SLR Technical Workgroup
- *Preparing for Tomorrow's High Tide (2012)*
  - DNREC Delaware Coastal Programs
- *Fifth Assessment Report (AR5) (2013)*
  - Intergovernmental Panel on Climate Change



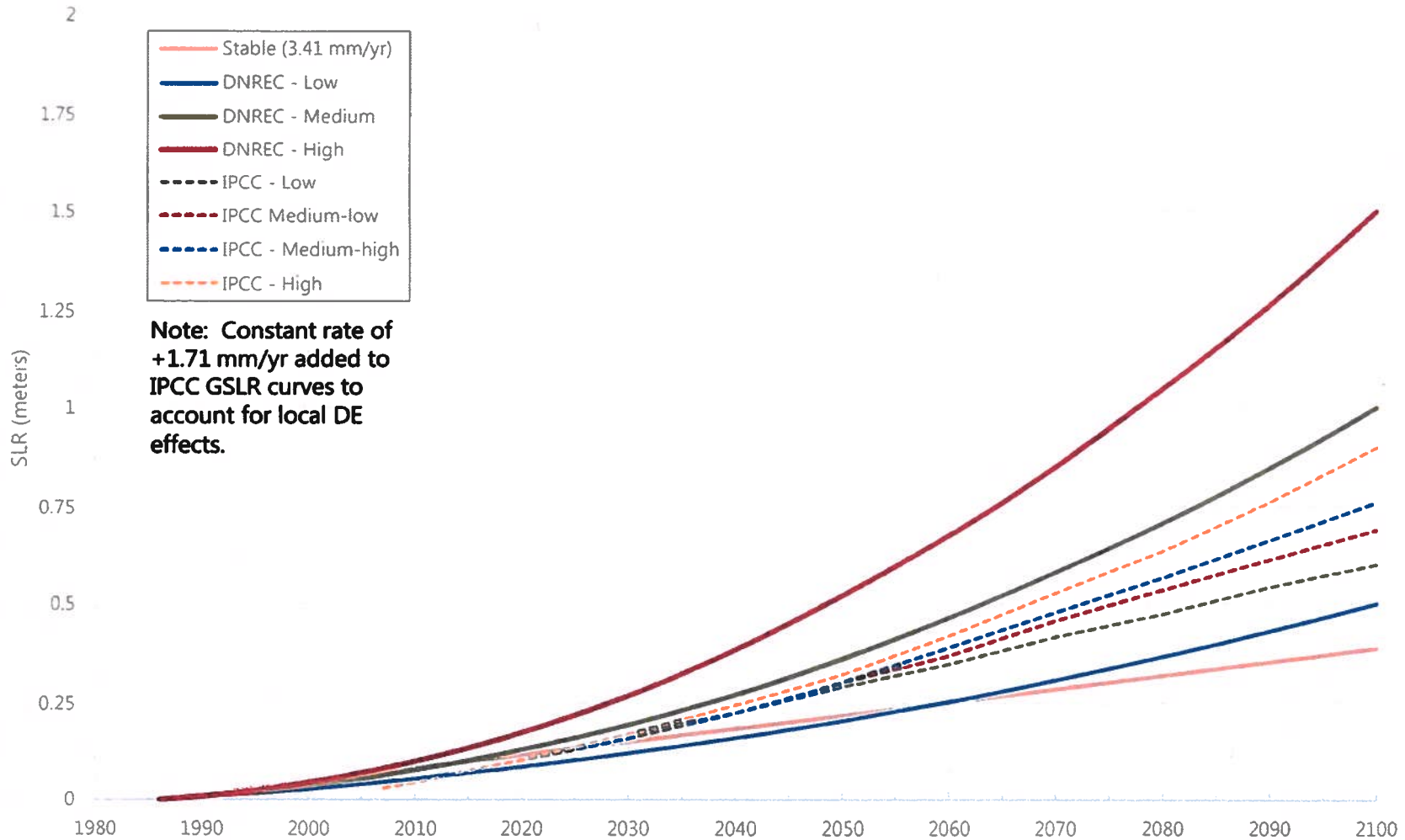
# Summary of *Recommended SLR Scenarios*

- Informs *Preparing for Tomorrow's High Tide*
- Workgroup reviewed publications and guidelines from various sources
  - USACE, NASA, NOAA, US Climate Change Science Program (CCSP), IPCC Fourth Assessment Report (AR4)
- Developed conversion from GSLR to LSLR
  - Accounts for local geologic effects (e.g., subsidence)
  - Assuming difference from GSLR and historic Lewes LSLR is constant (+1.65 mm/yr)
  - Updated LSLR for Lewes increases difference to +1.71 mm/yr
- Recommended NRC model used by USACE
  - 0.5 (Low), 1.0 (Med.), and 1.5 (High) meters by 2100
  - Model can be adjusted for intermediate time horizons

## Summary of *Fifth Assessment Report*

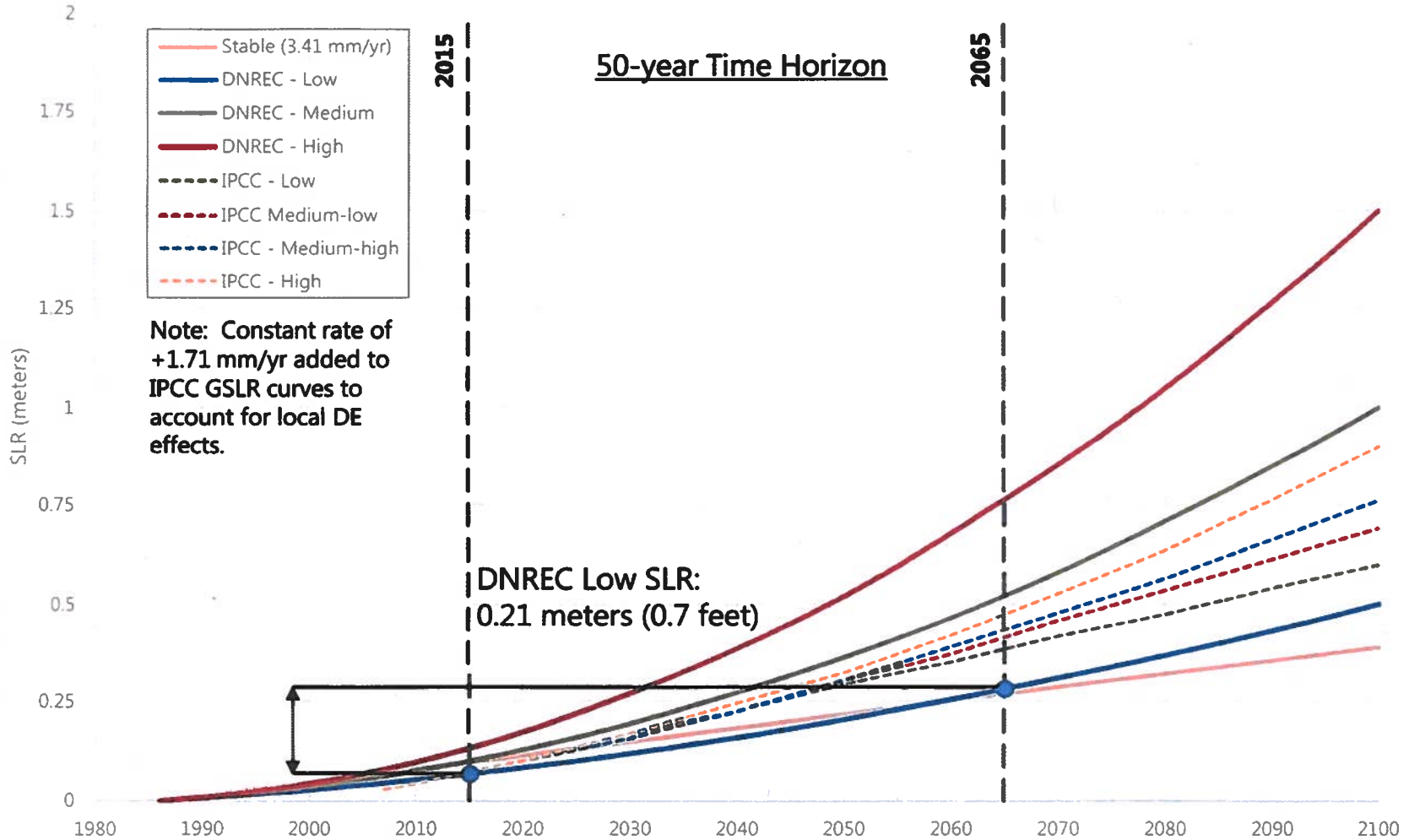
- Considers a range of emissions scenarios
- Provides GSLR projections at 10-year increments up to 2100
- Incorporates land-ice contributions unlike AR4

## NRC vs. IPCC AR5



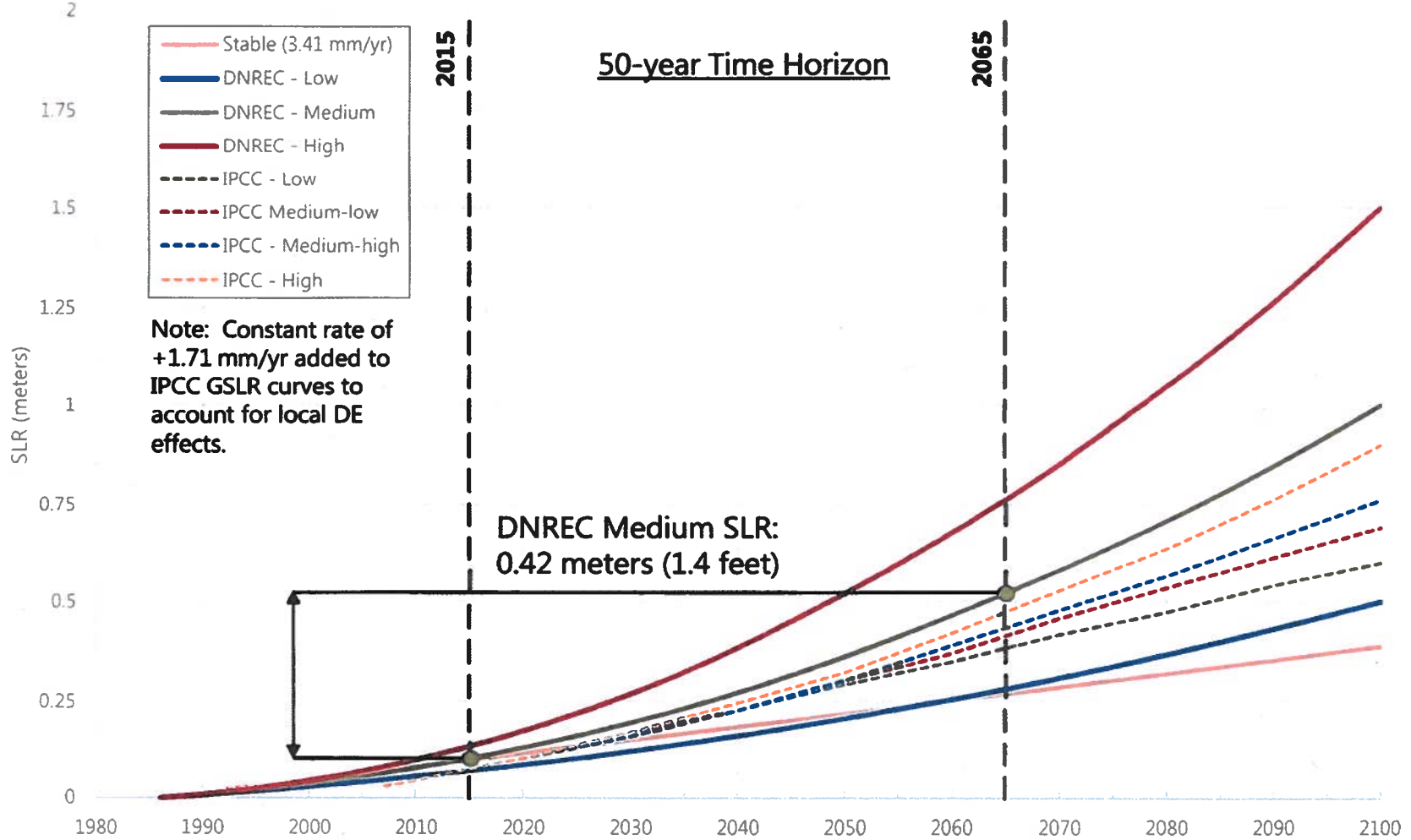
## DNREC vs. IPCC Sea Level Rise Predictions

# NRC vs. IPCC AR5



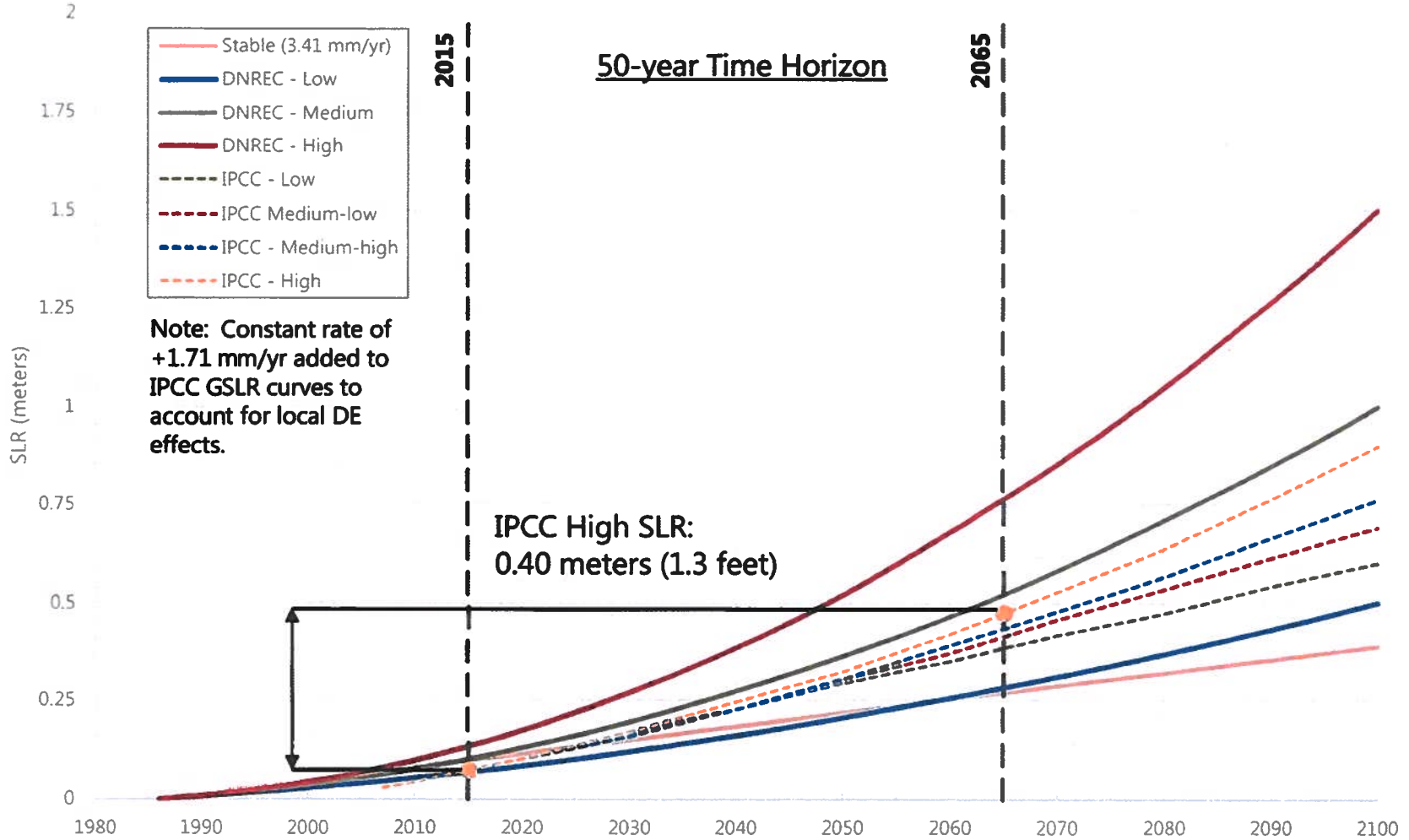
## DNREC vs. IPCC Sea Level Rise Predictions

# NRC vs. IPCC AR5



## DNREC vs. IPCC Sea Level Rise Predictions

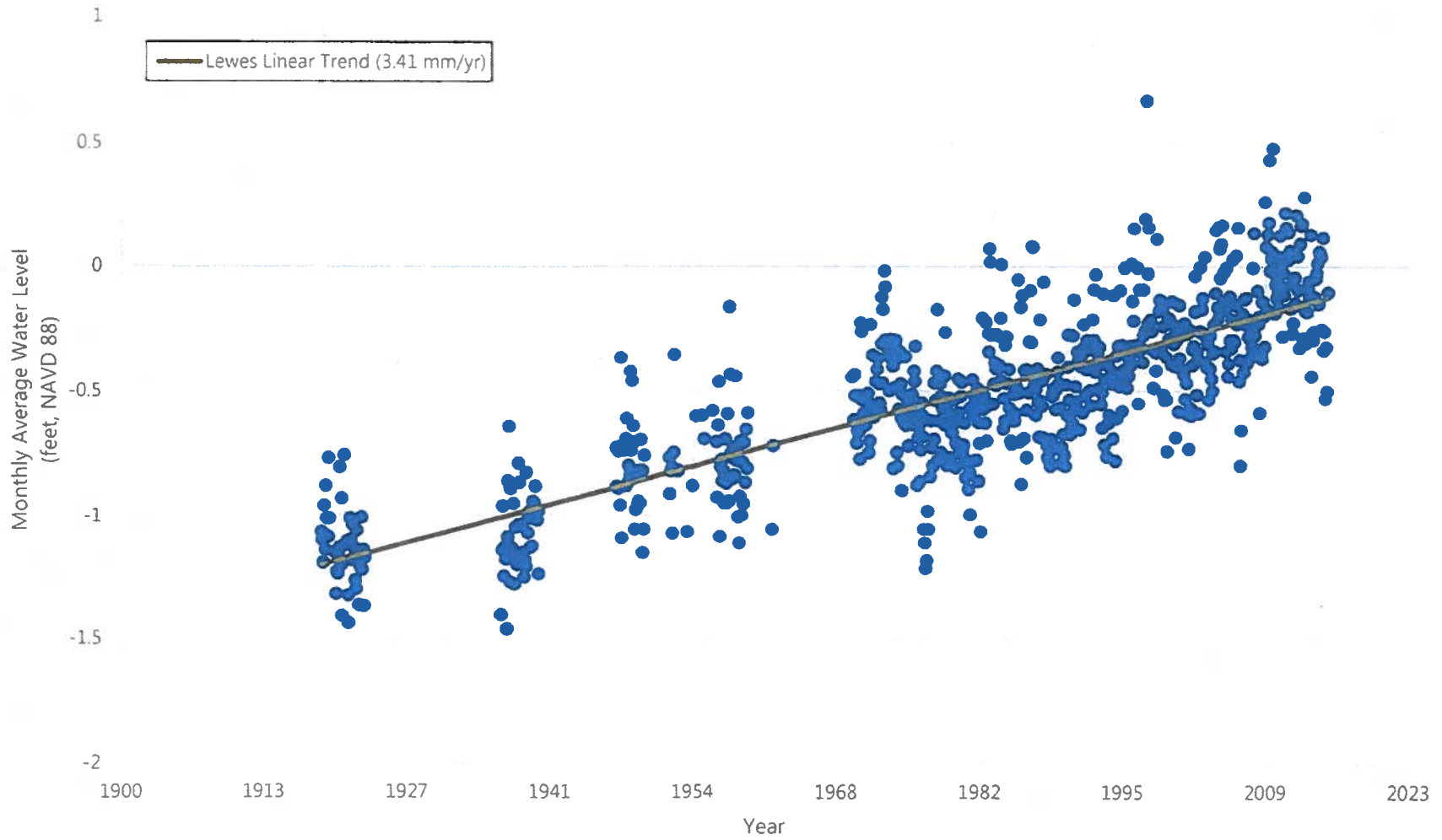
# NRC vs. IPCC AR5



## DNREC vs. IPCC Sea Level Rise Predictions



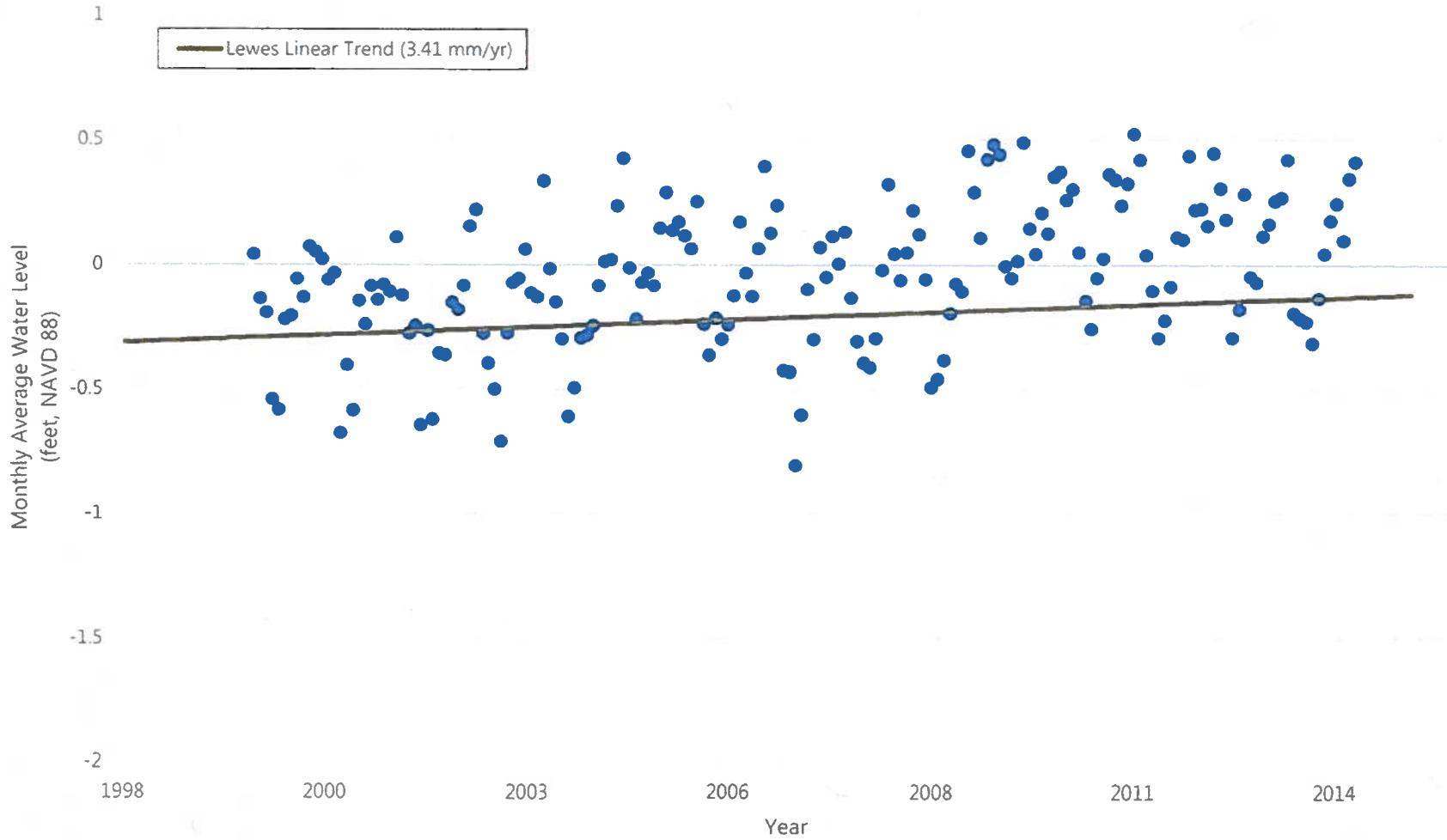
Lewes Mean Sea Level Trend



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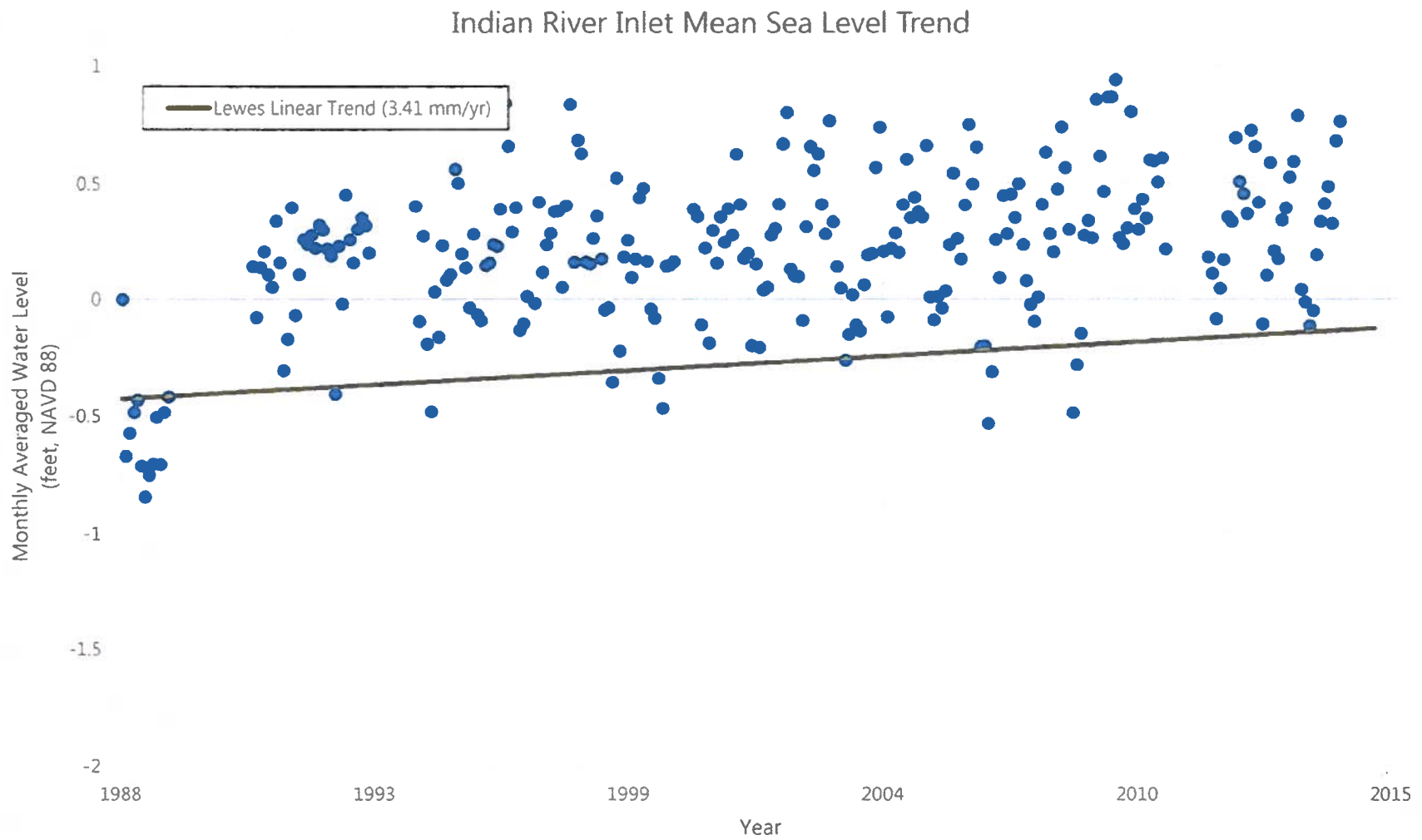
# Lewes Tide Data

Fenwick Island Mean Sea Level Trend



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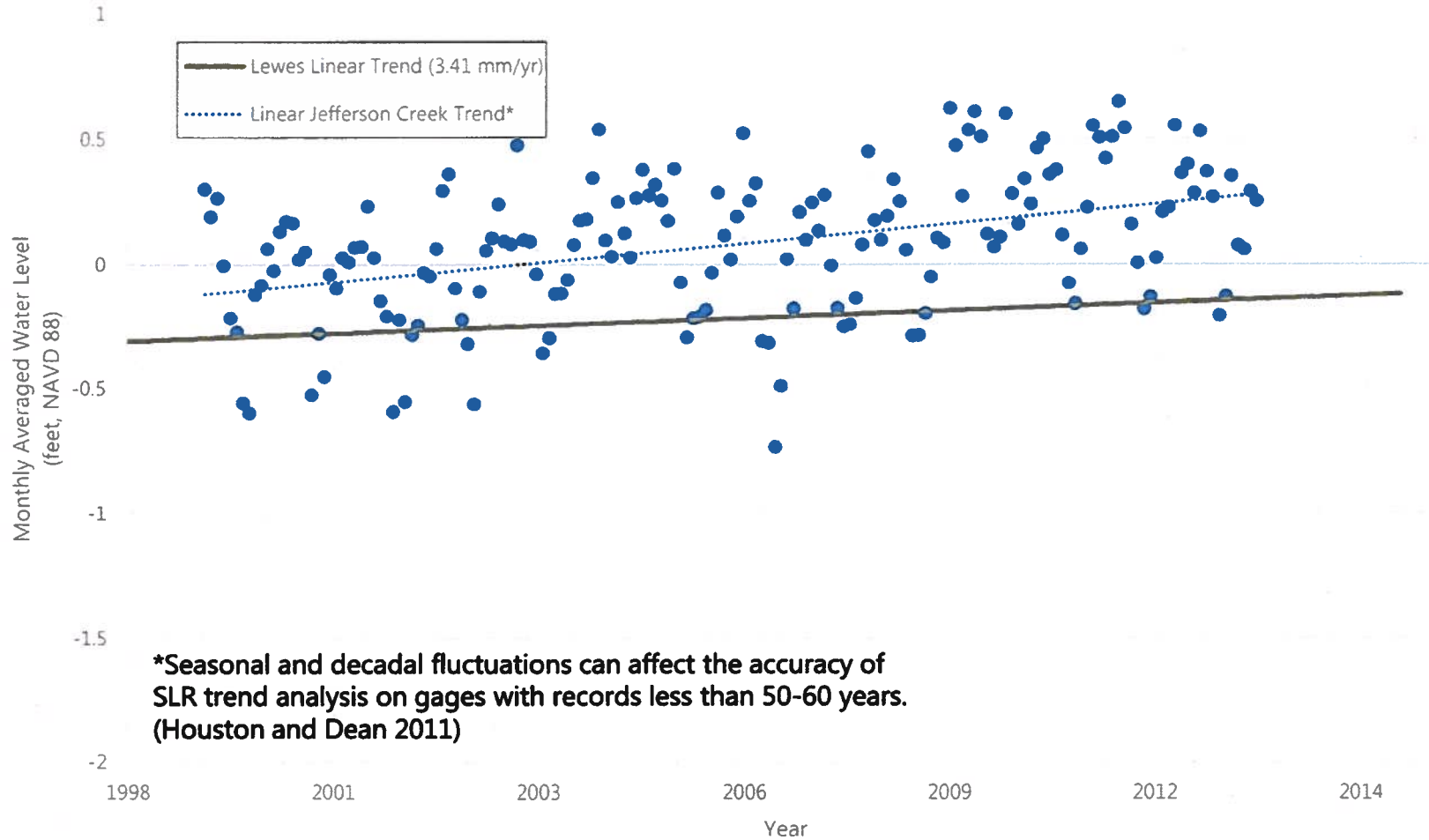
# Fenwick Island Tide Data



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# Indian River Inlet Tide Data

## Jefferson Creek Mean Sea Level Trend



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# Jefferson Creek (South Bethany) Tide Data

# Tide Data Analysis

- Tidal records less than 50-60 years can be affected by decadal fluctuations
- Length of record
  - Lewes: 96 years
  - Jefferson Creek: 16 years
- We recommend the continuation of data collection at the Jefferson Creek gage

# Conclusions and Recommendations

- We recommend the 50 year time horizon for South Bethany
  - This is the practical design life for typical municipal civil works projects
- The IPCC AR5 SLR trend lines are bound by the “Medium” and “Low” DNREC SLR recommendations
- Recommended SLR for 50 year time horizon (2065)
  - Lower bound: 0.7 feet (*DNREC – Low*)
  - Upper bound: 1.7 feet (*DNREC – Medium*)\*

*\*Includes local DE correction factor of 0.3 feet (+1.71 mm/yr).*

# Questions/Discussion

