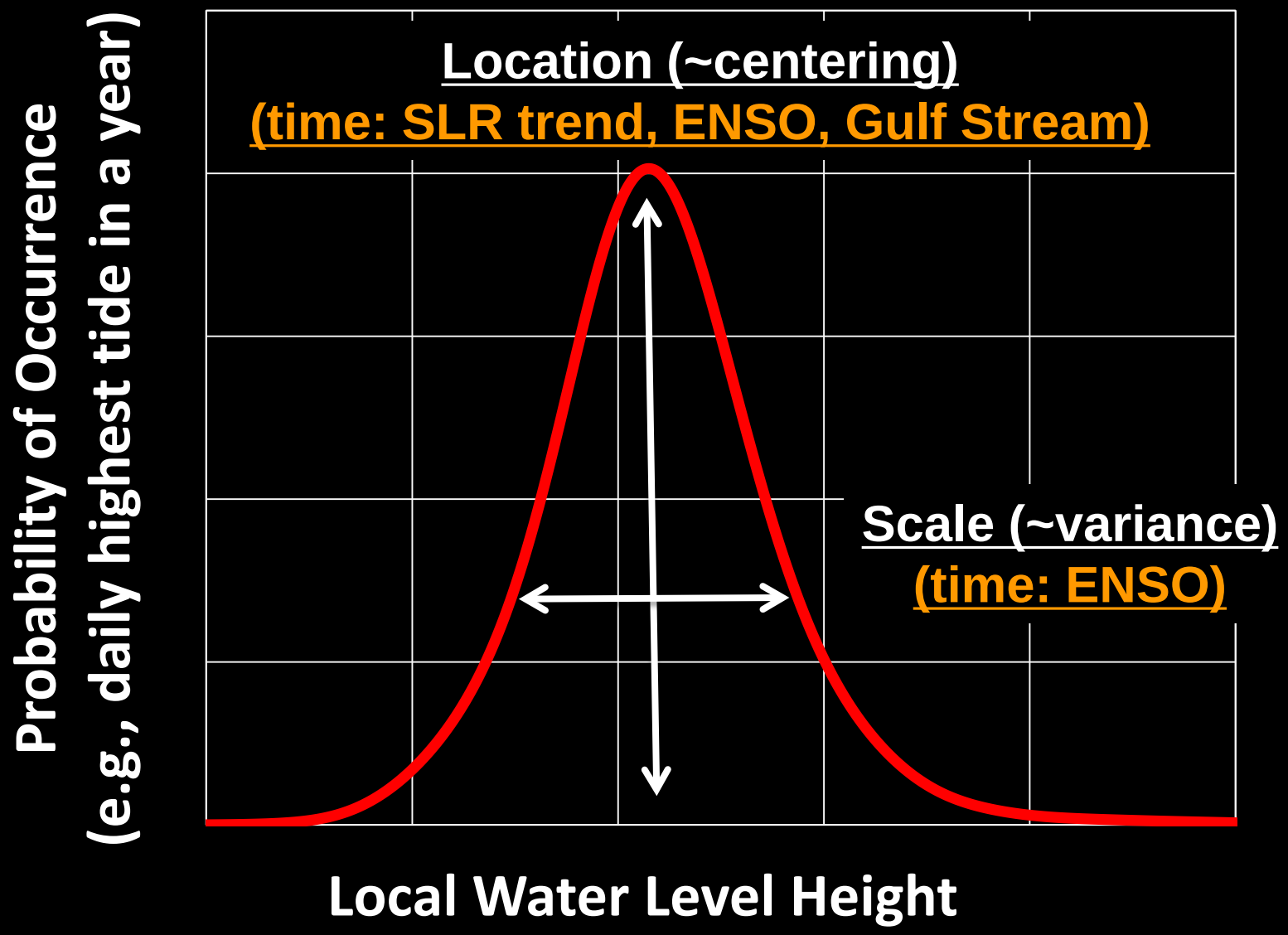
Global/Regional Factors Affecting U.S. East Coast Tidal Flood Frequencies

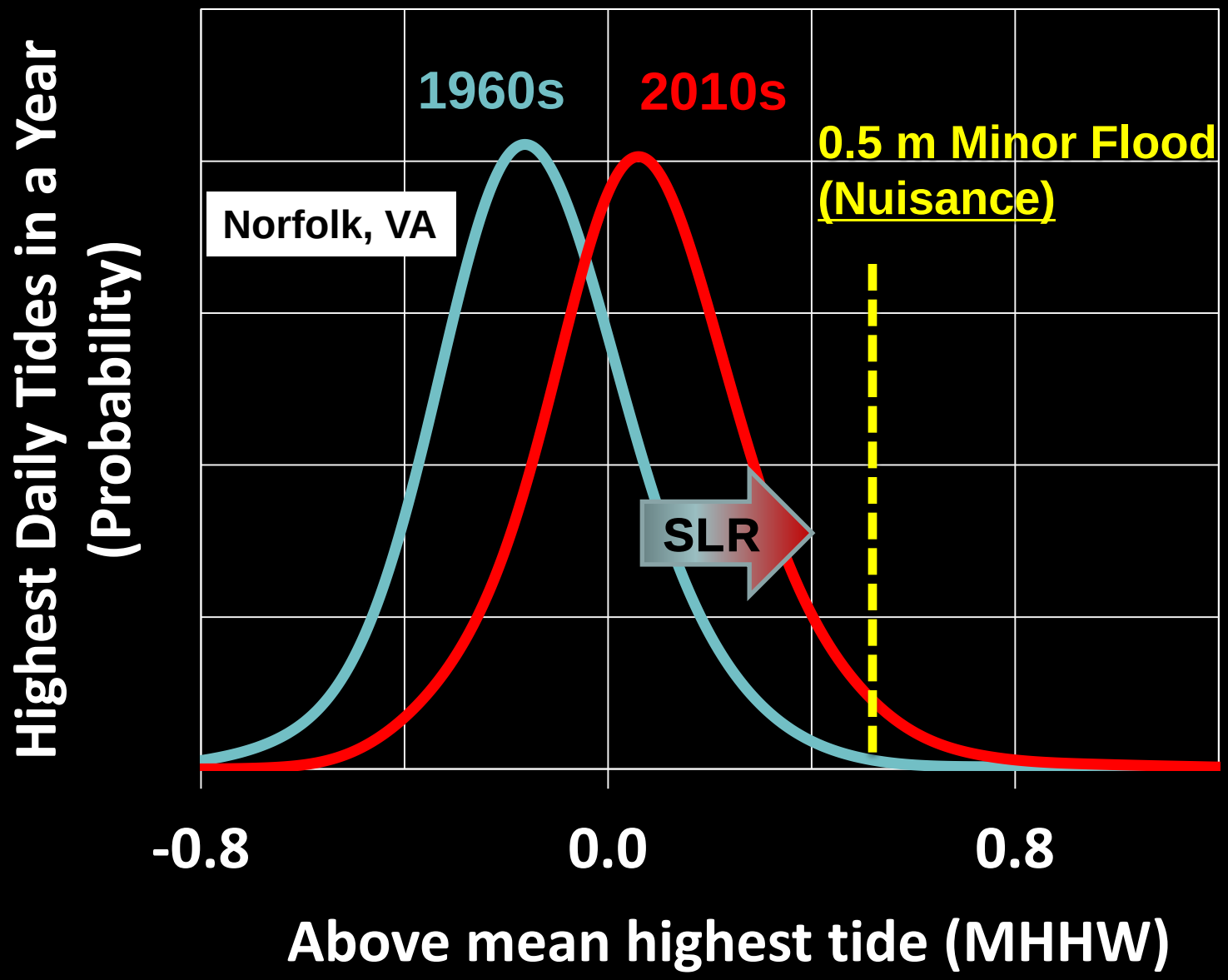
NOAA Ocean Observing and Monitoring Division Community Workshop
May 9, 2017

William Sweet
NOAA CO-OPS Oceanographer

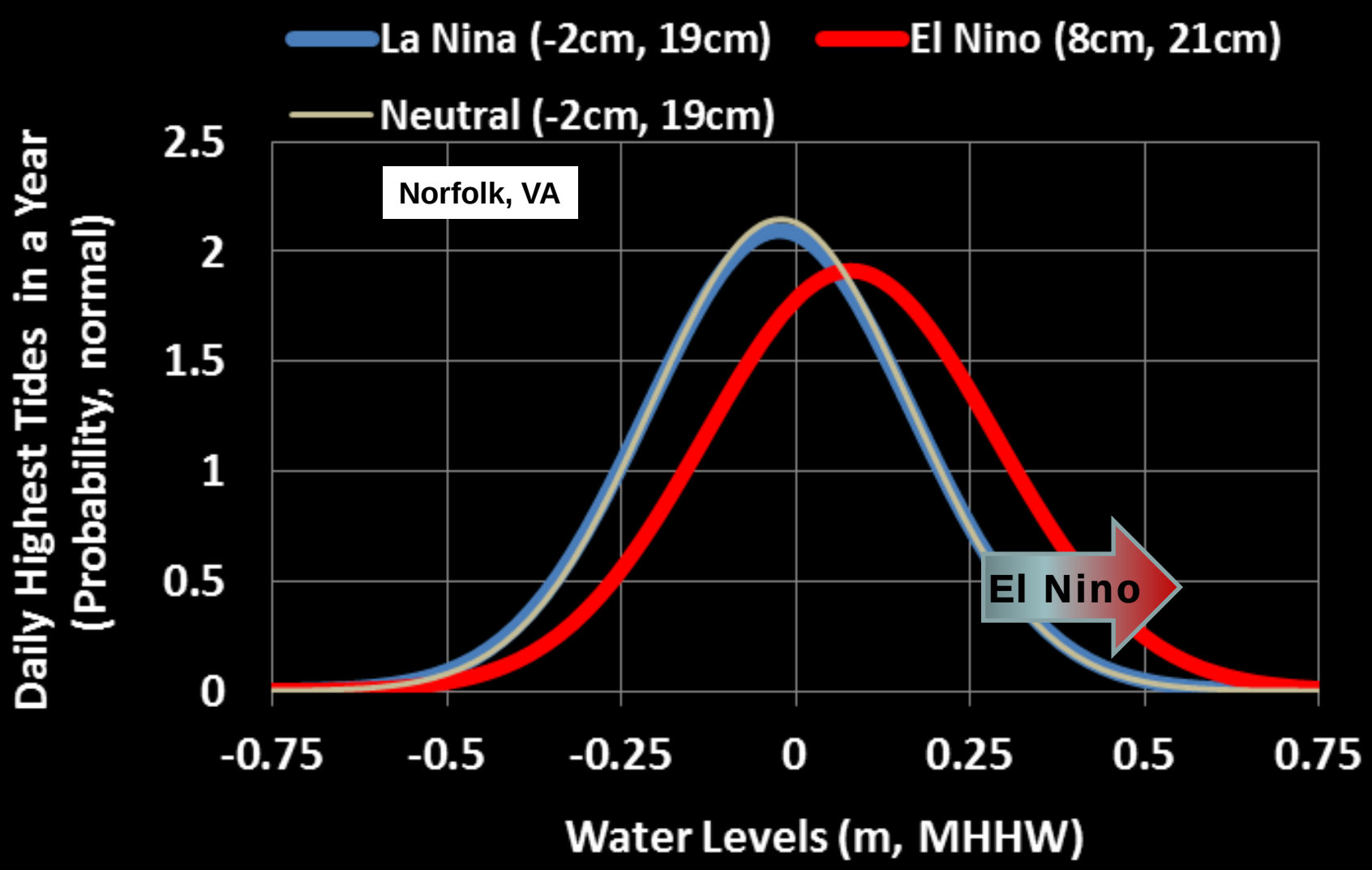
Probabilities of Tidal Flooding



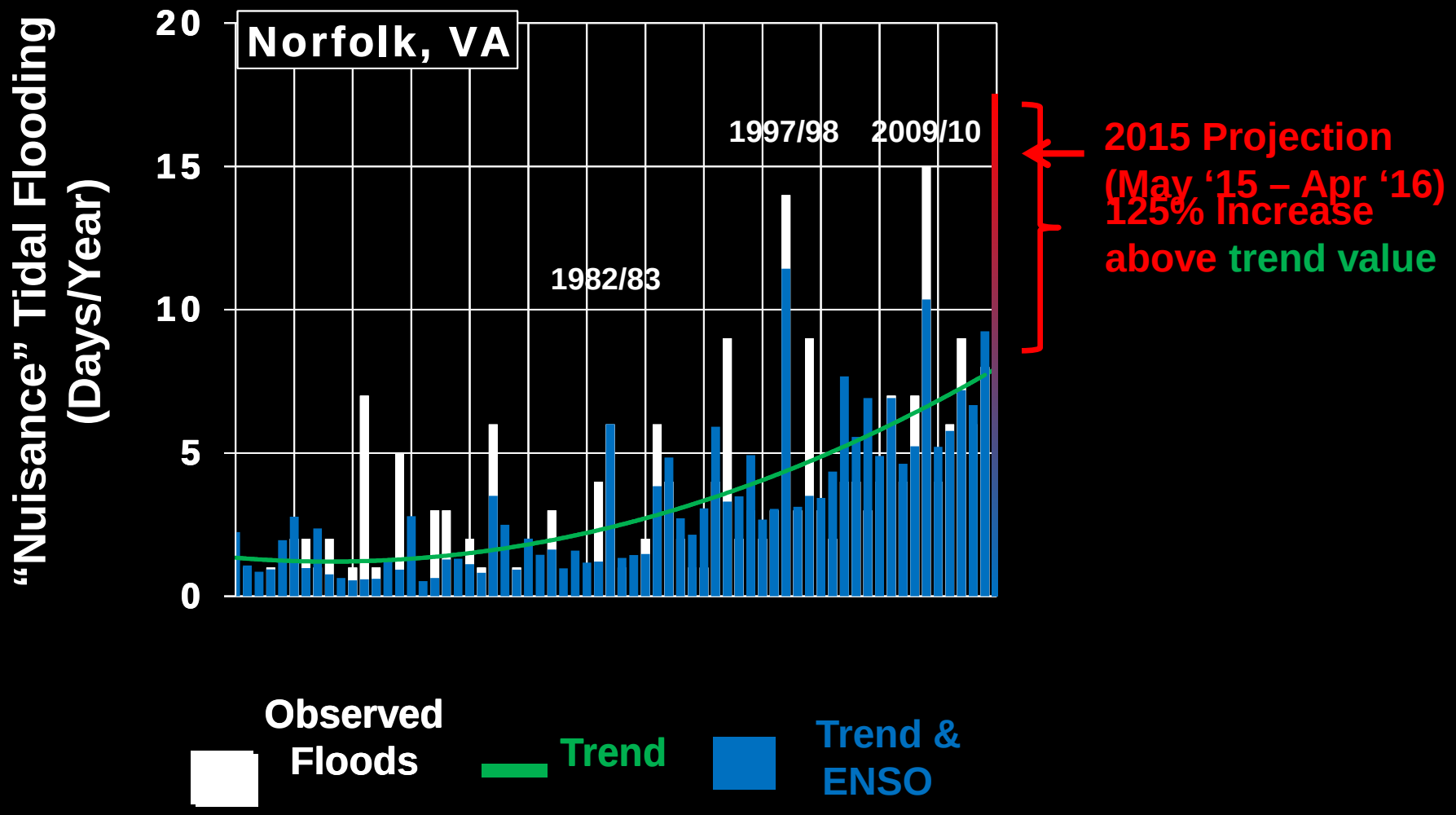
Bye-bye Freeboard:
Global/Regional/Local Relative Sea Level Rise (SLR)



During strong El Nino, changes in extreme : "mean" & "variance"

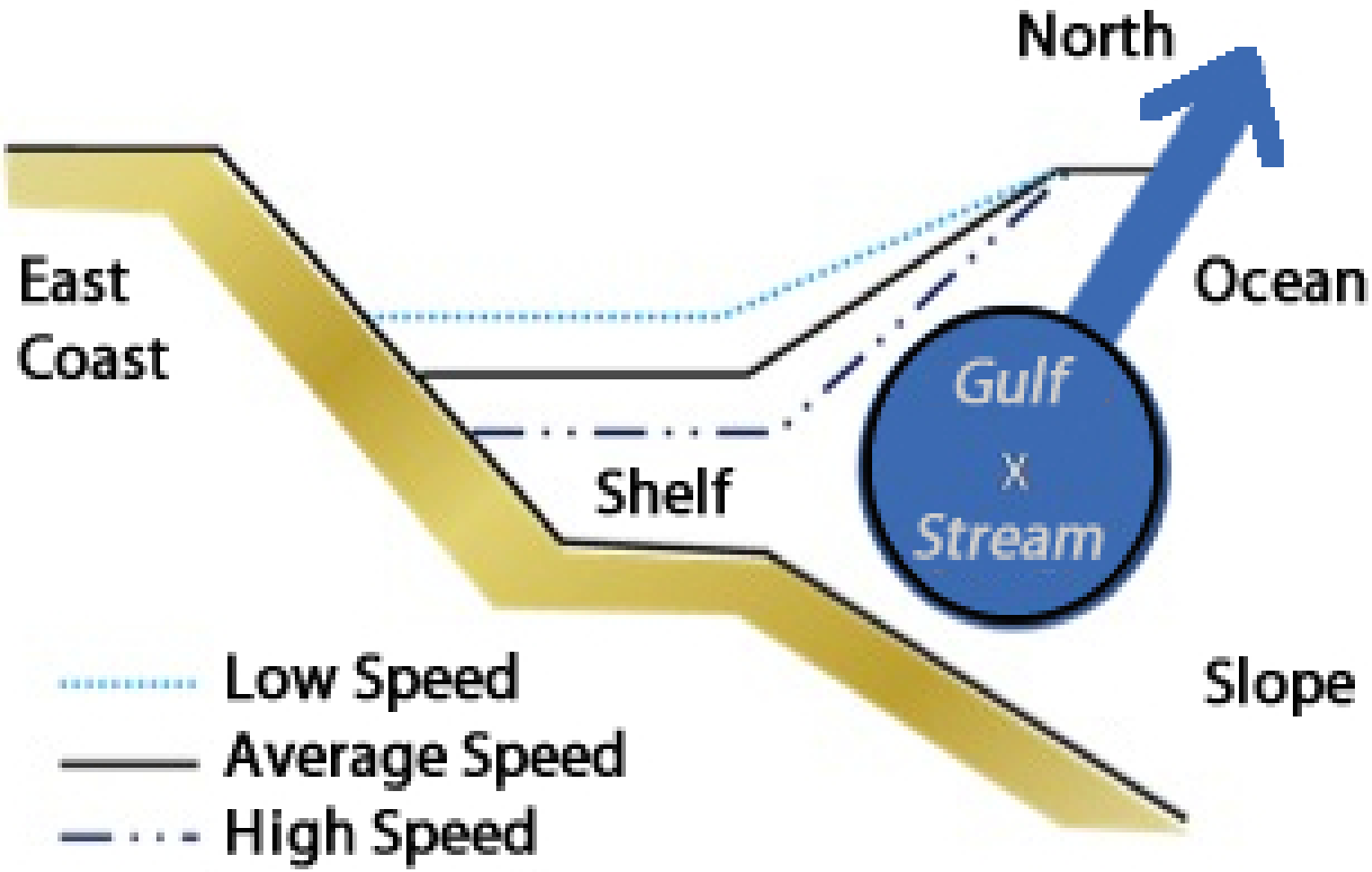


The ENSO (ONI-derived) Effect: It's Compounding



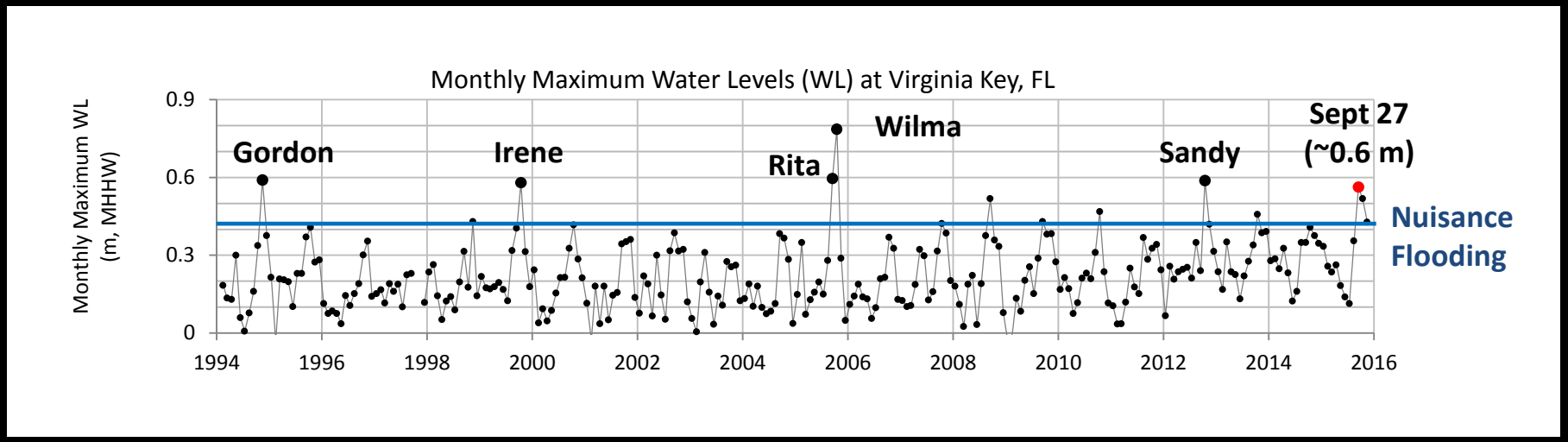
(Sweet and Park, 2014)

Gulf Stream (measured by AOML Undersea Cable) Induced Changes in Sea Level

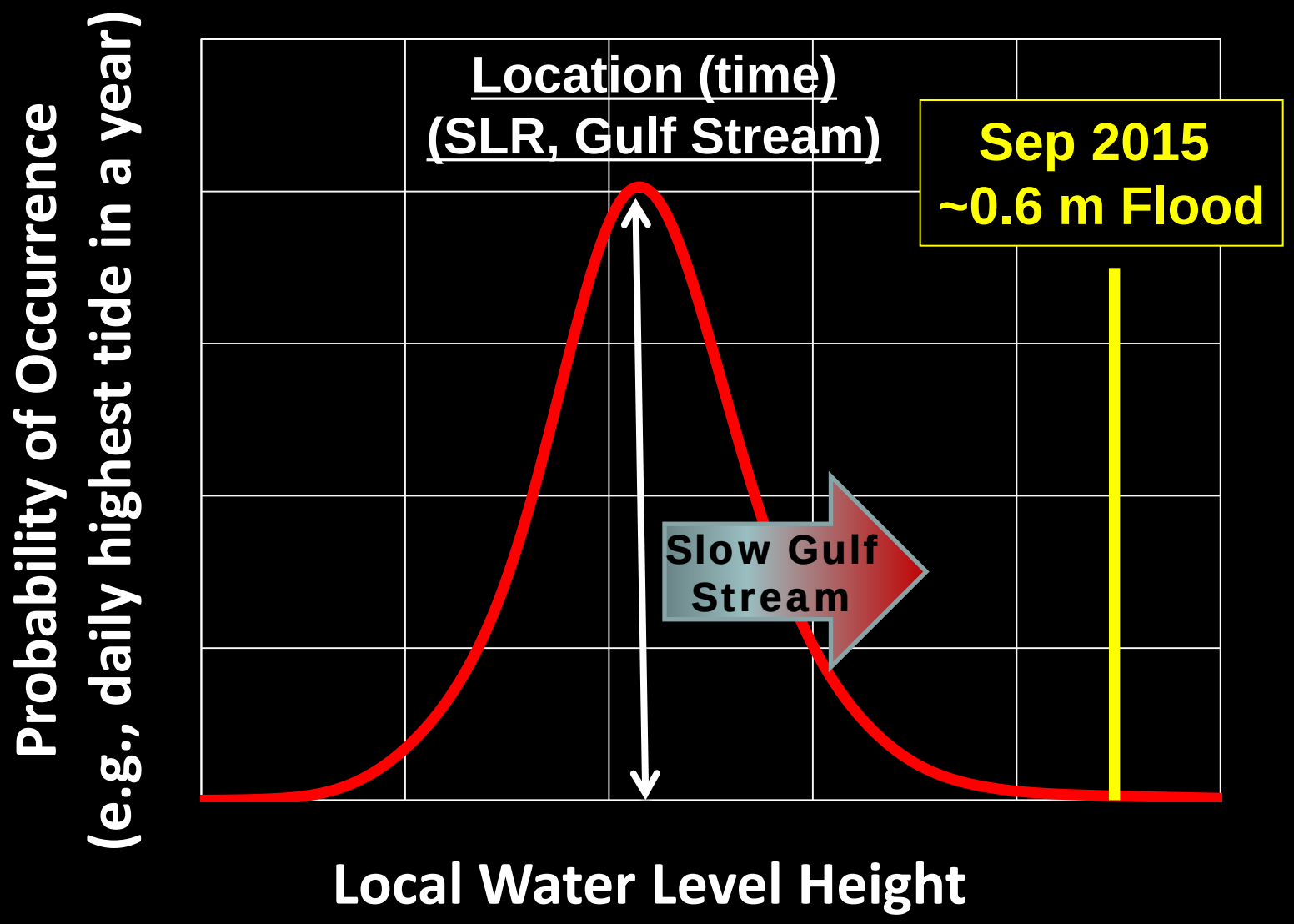


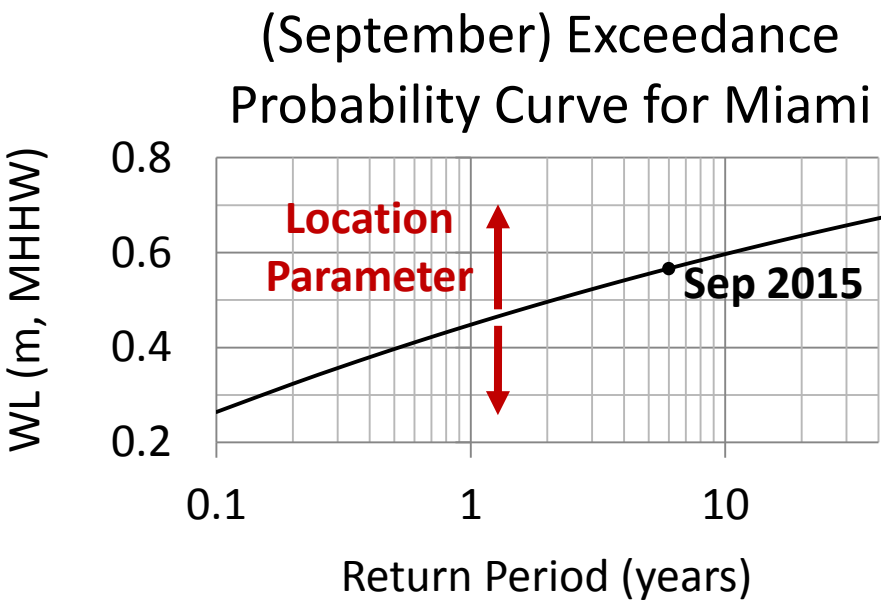
Adapted from Sweet et al. (2009)

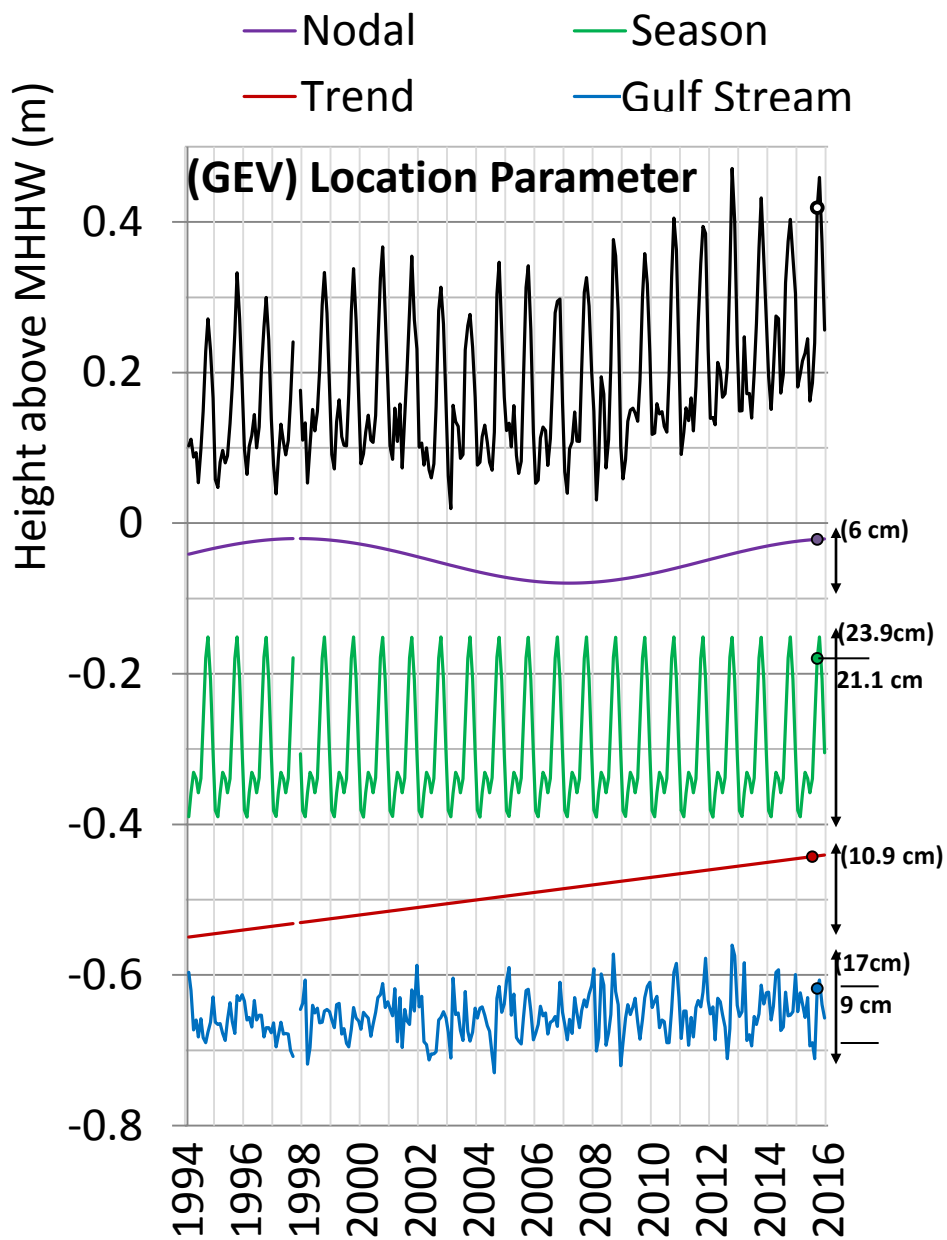
South Florida Tidal Flood Probabilities



South Florida Tidal Flood Probabilities







- **0.9 cm water level increase per 1 Sv decline (total collapse~0.3 m)**
- **During a September, if Gulf Stream at higher transport, 30-year event (350% change) instead of 6-yr event**
- **Trend (~SLR) in monthly max of about 11 cm since 1994: 40-yr event in 1994 (500% increase)**