Update on Sea Level Rise & Climate Science

Scientific and Technical Working Group

Maryland Climate Change Commission

Don Boesch

Coast Smart Council Meeting

September 1, 2016

University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

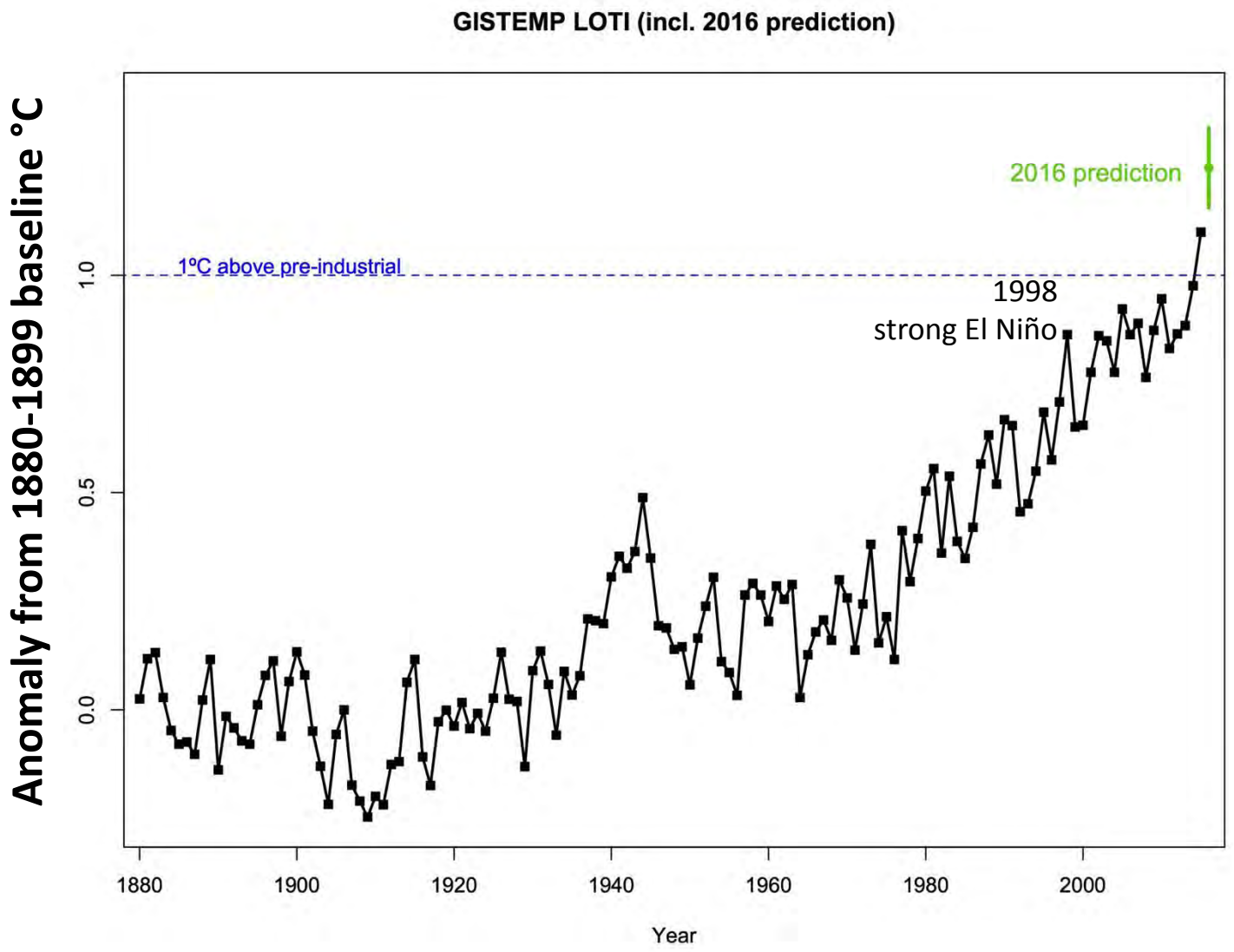
MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Maryland Climate Change Commission

- Created by Executive Order in 2007
- Maryland *Climate Action Plan* in 2008
- Greenhouse Gas Emission Reduction Act 2009
- Commission codified into law in 2015
- Recommendations basis of GGRA 2016
- Provides recommendations for reducing greenhouse gas emissions and adapting to impacts of climate change
- 26 members, including, MDE, DNR, MDOT secretaries, Treasurer & UMCES President
- Working Groups: Mitigation, Adaptation & Response, Scientific & Technical, Education-Communication-Outreach

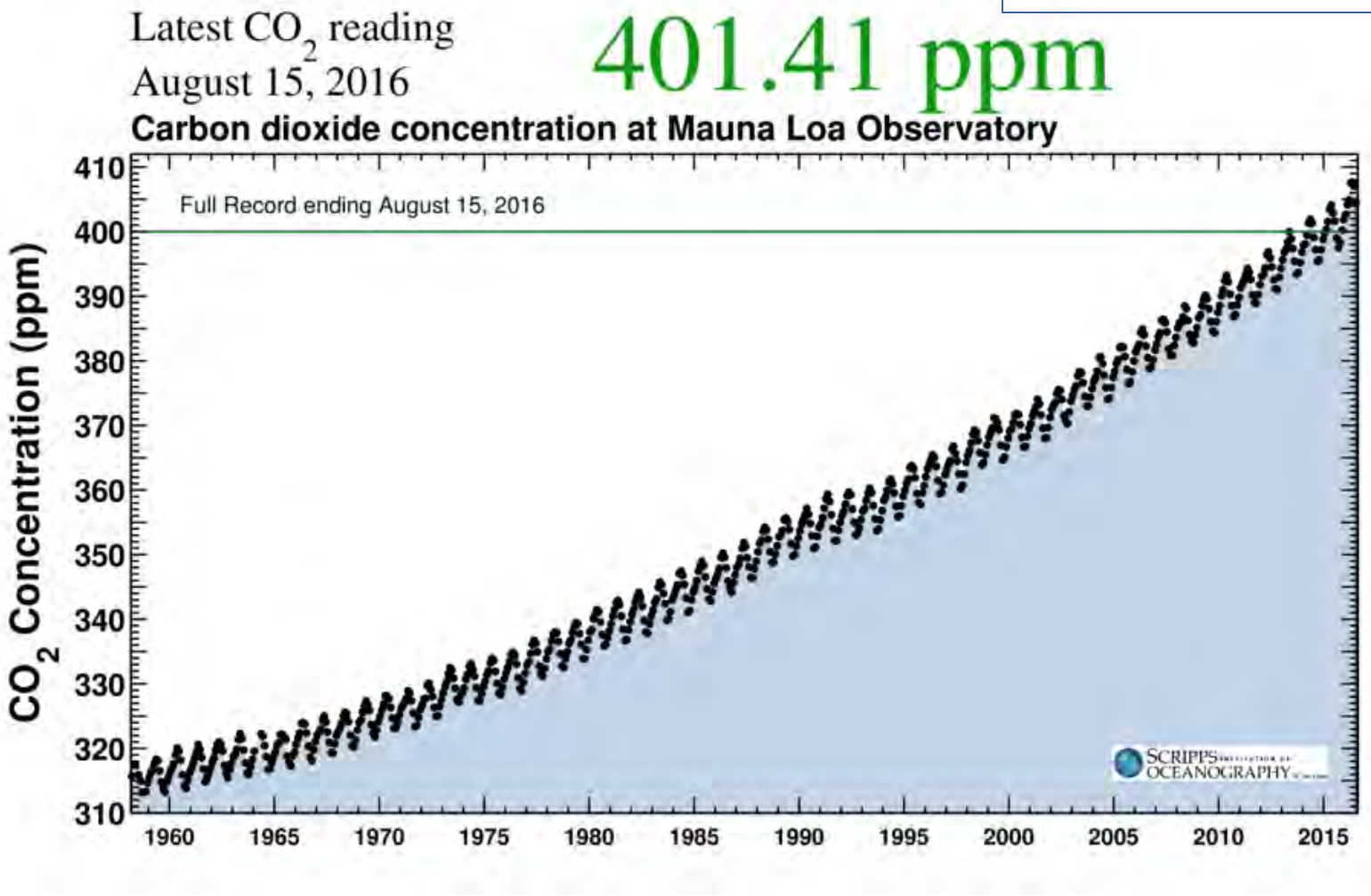
MARYLAND

Global Warming Continues Without Pause



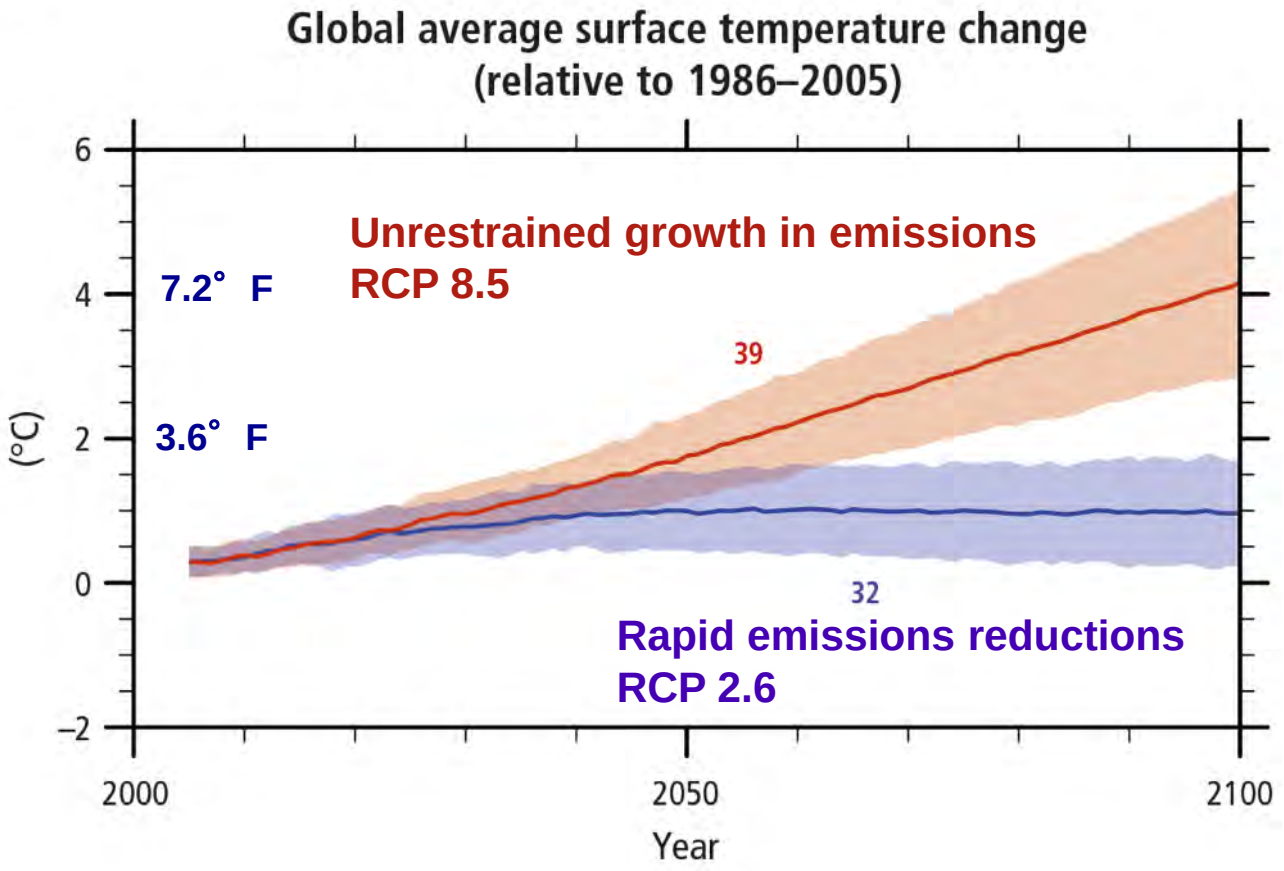
As Atmospheric Greenhouse Gases Increase

43.5% increase over pre-industrial concentrations



How Much Will Earth Warm?

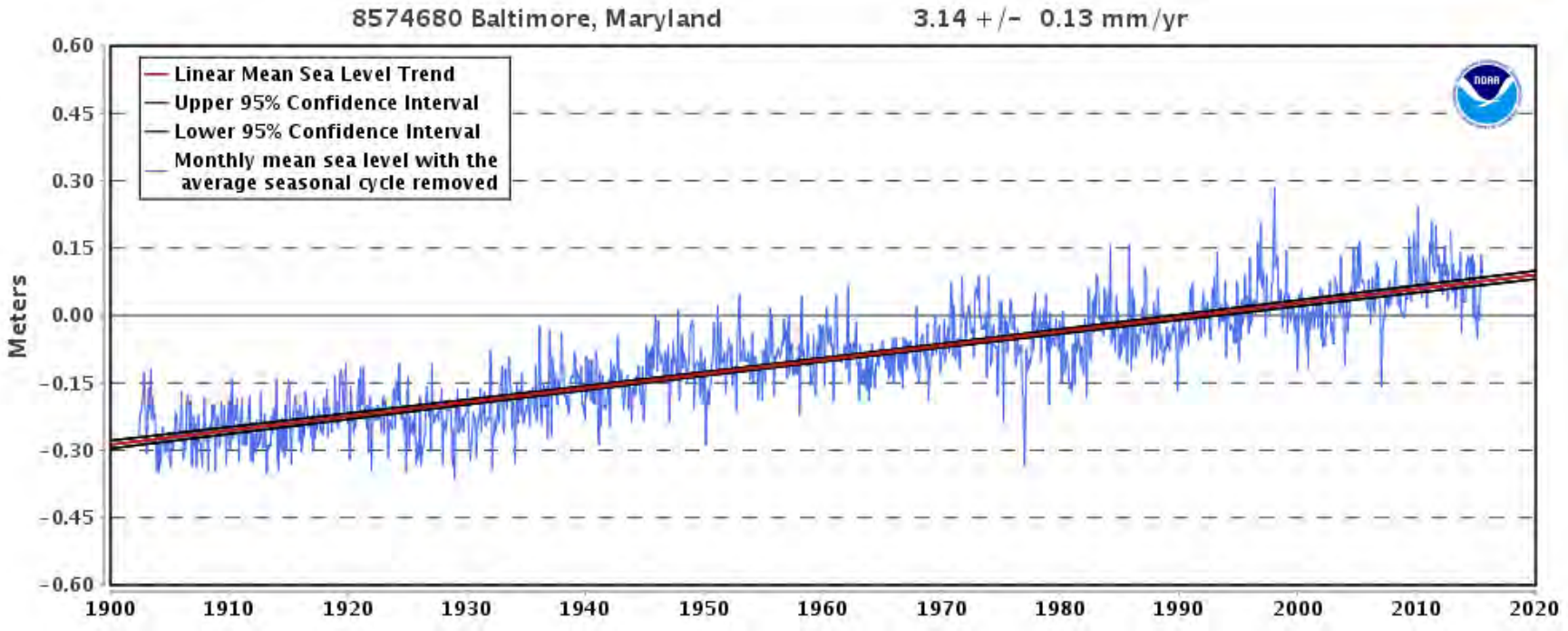
It mainly depends on how much greenhouse gases we emit.



www.ipcc.ch

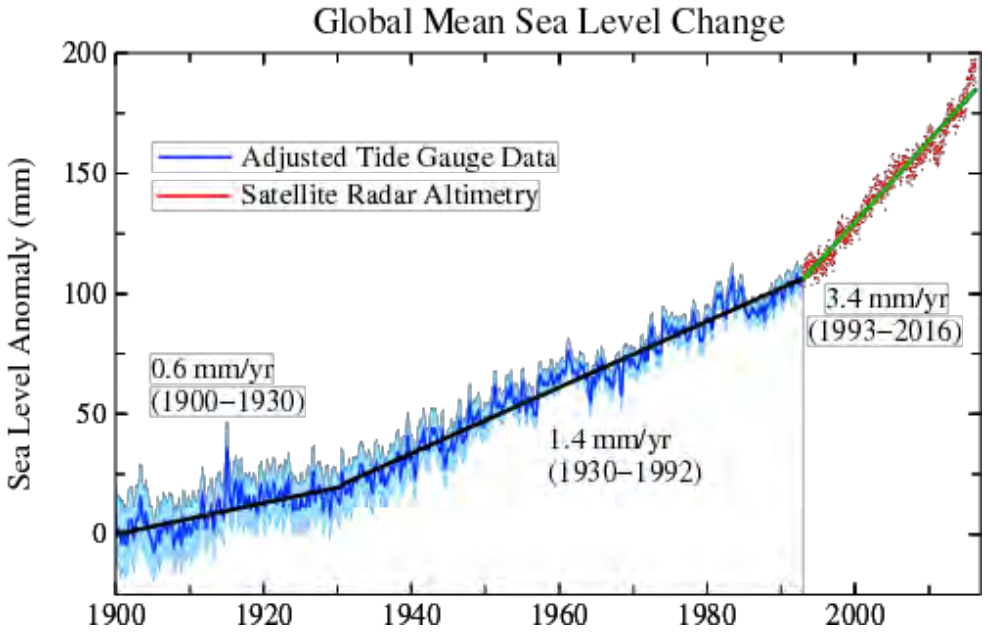
Sea-Level Has Been Rising Since 19th Century

Baltimore tide gauge

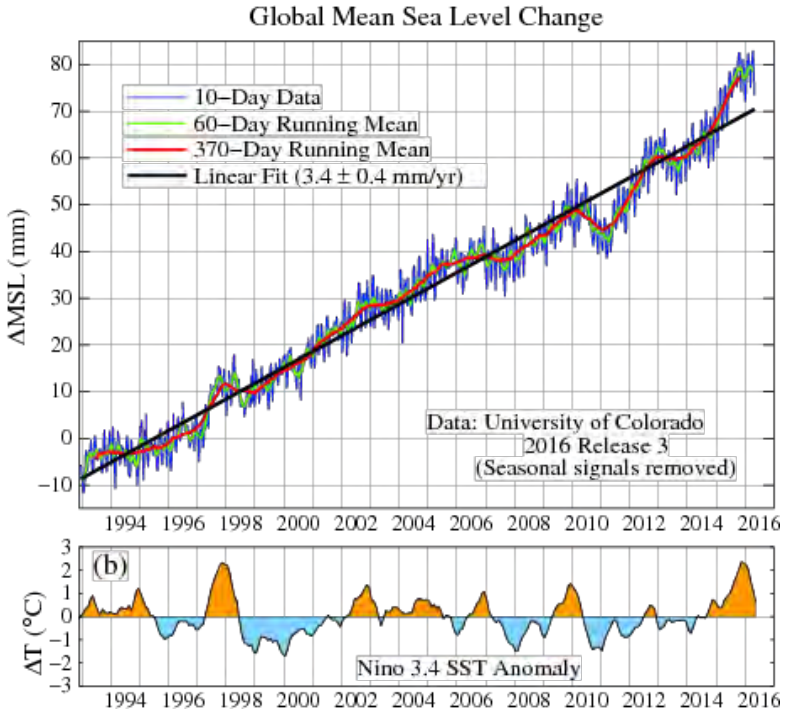


Rate of Global Sea-Level Rise Increased

Tide gauge and satellite data

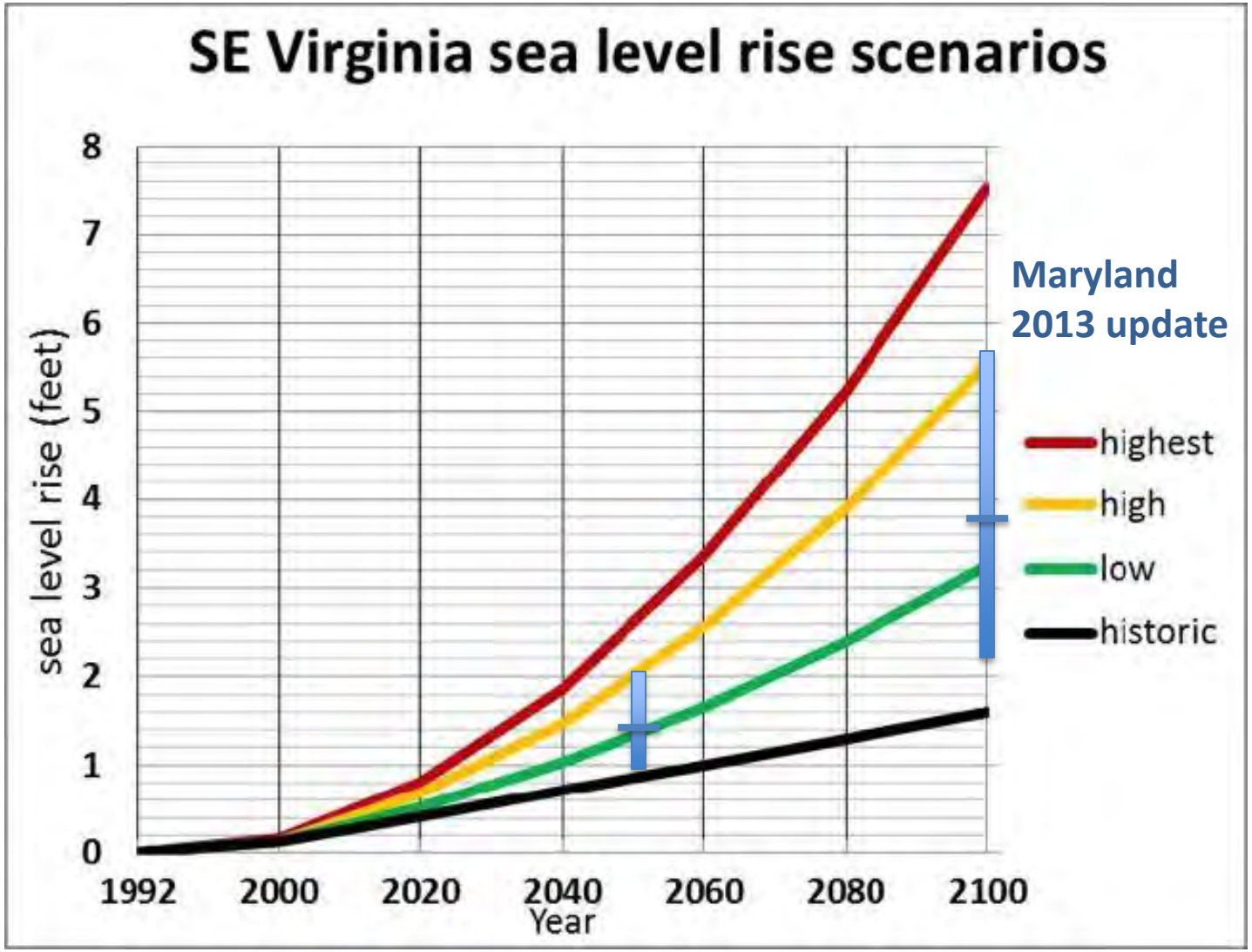


Satellite data



http://www.columbia.edu/~mhs119/SeaLevel/

Sea-Level Projections: Scenario Approach

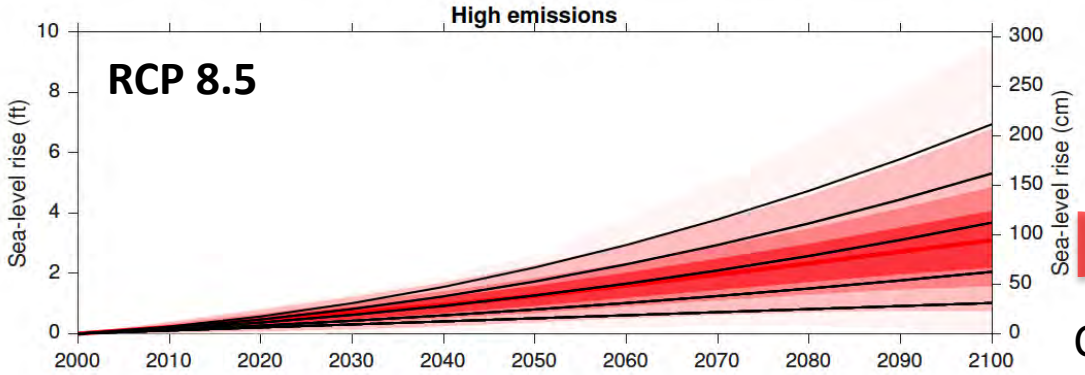


VIMS 2013 (modified from National Climate Assessment)

Probabilistic Sea-Level Projections

Baltimore, Maryland

High Emissions

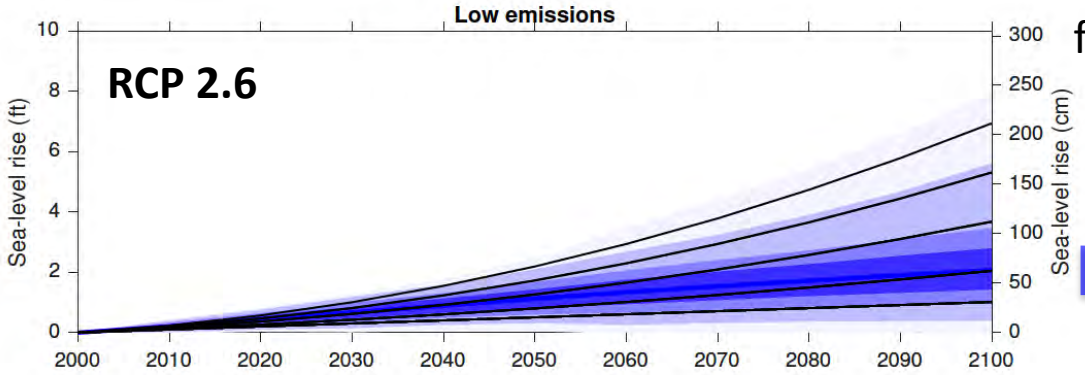


Likely: 17th-83rd percentile

2.2-4.1 feet

Compared to five DOD sea-level rise scenarios, adjusted for vertical land movement

Low Emissions < 2°C warming



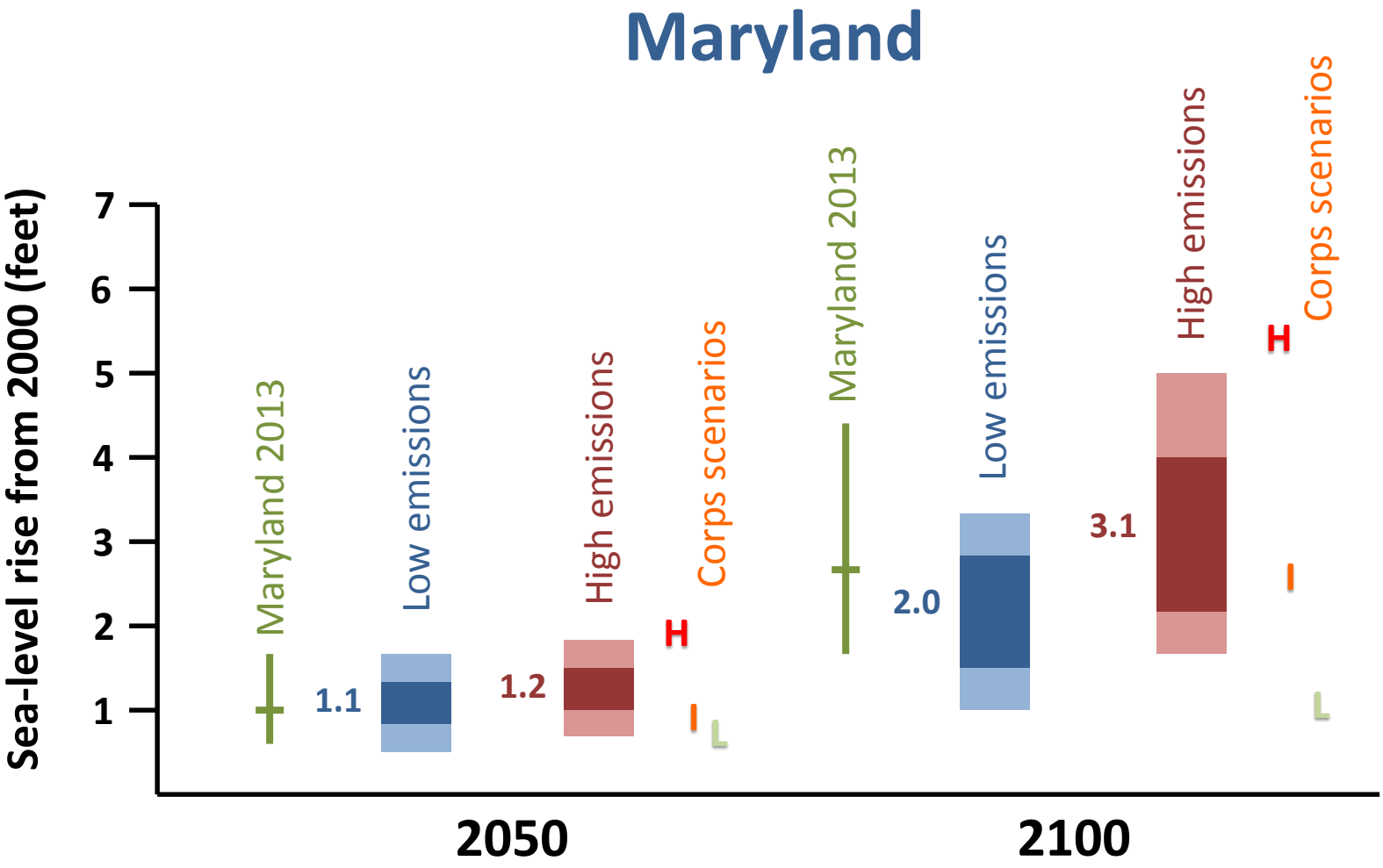
1.4-2.8 feet

Dark = likely (17th-83rd percentile range)
Medium = 5th-95th percentile range
Medium-Light = 0.5th-99.5th percentile range
Very light = 0.1st-99.9th percentile range

Bob Kopp, Rutgers University, based on Kopp et al. 2014. *Earth's Future*

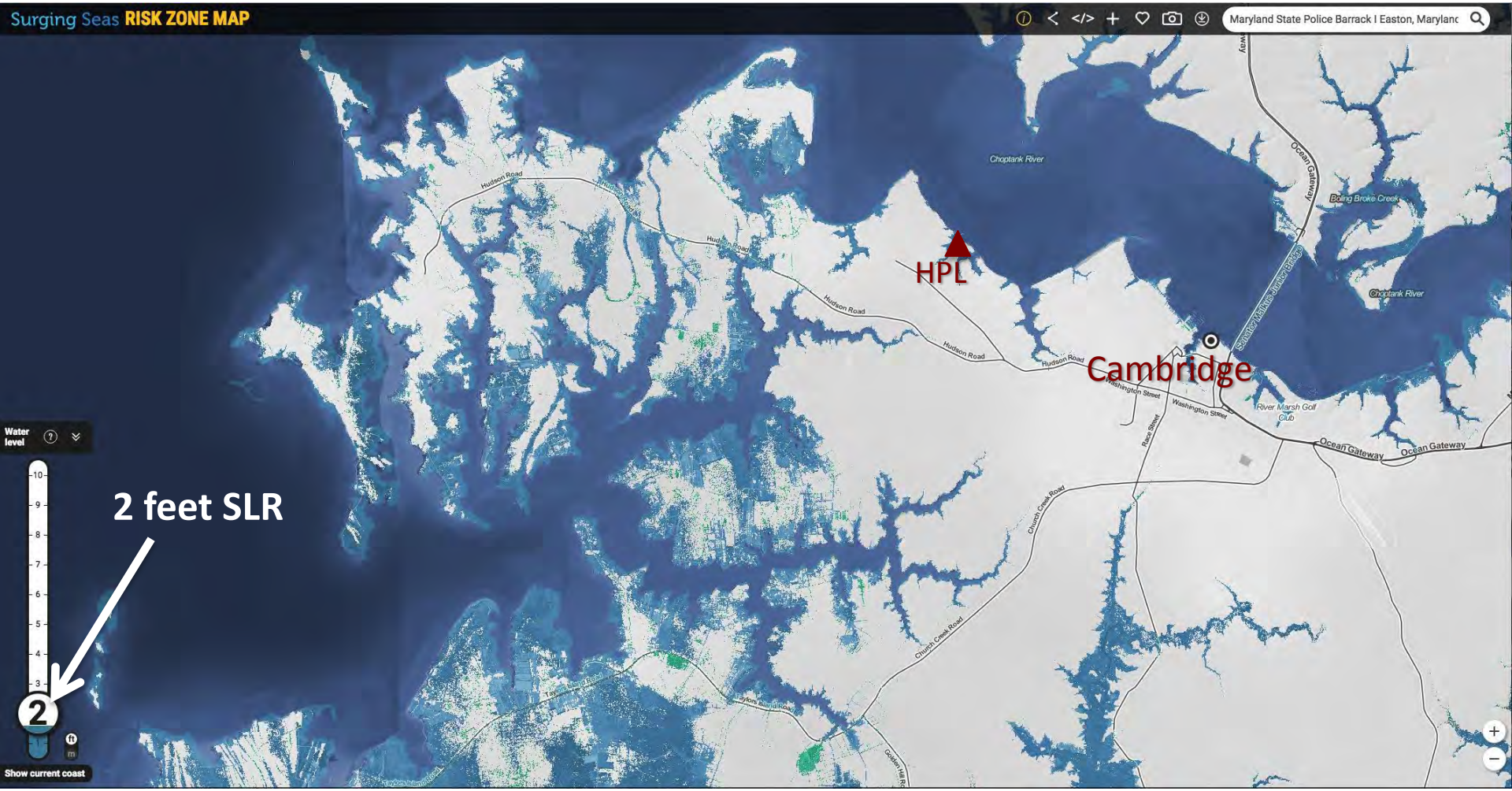
Wild Card: Antarctic Ice Shelves

Comparison of Sea-Level Projections



Comparison of Maryland 2013 update, probabilistic estimates under low (RCP 2.6) and high (RCP 8.5) emissions scenarios, and Corps of Engineers 2013 Regulation (H, I, L)

Global Emissions Will Have Large Effect



Climate Central *Surging Seas* http://sealevel.climatecentral.org/maps

Global Emissions Will Have Large Effect

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Tidal Flooding Not the Only Climate Risk

Lessons from Summer 2016

Questions or Comments?

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