

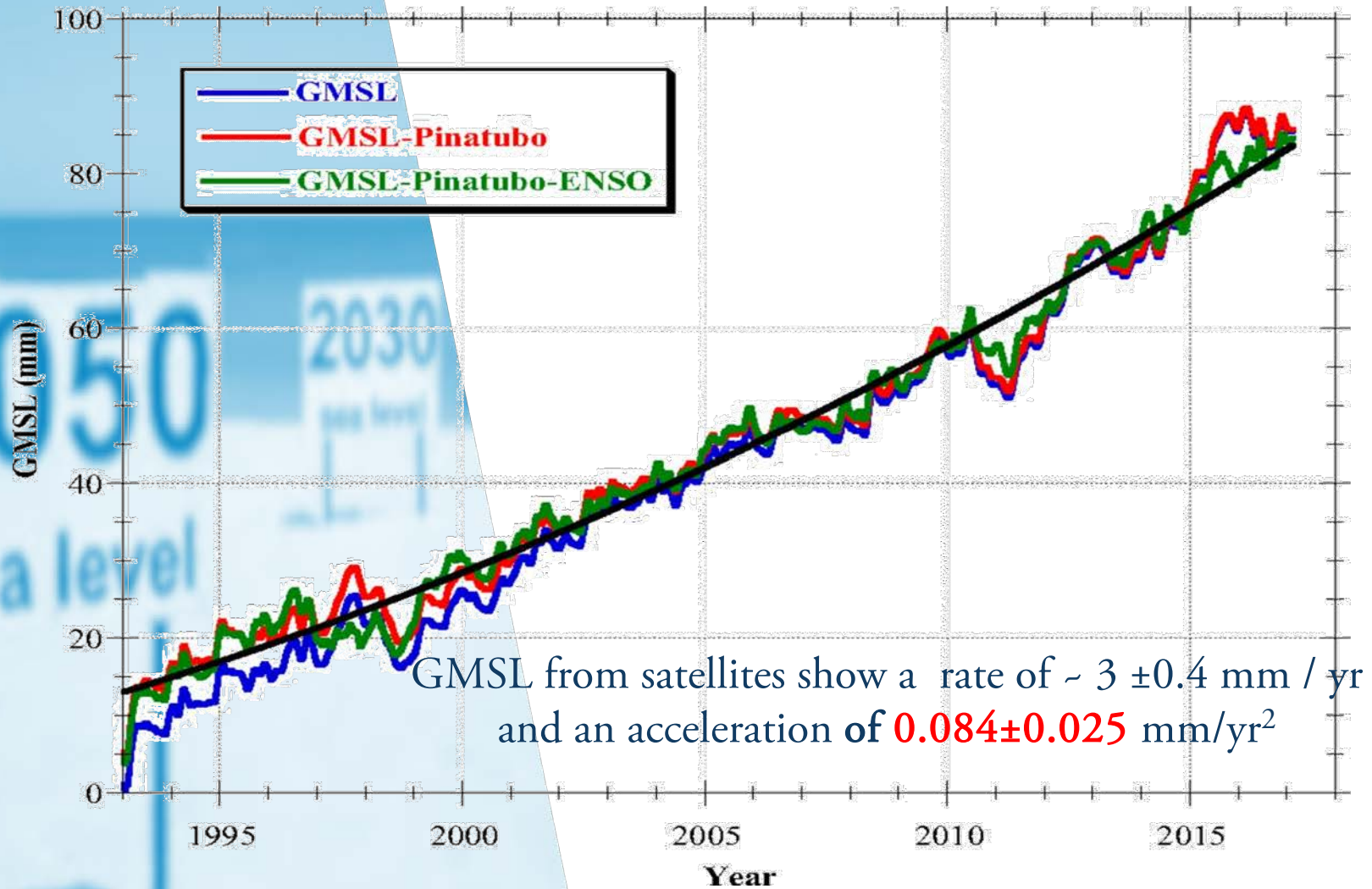


Lamont-Doherty Earth Observatory
COLUMBIA UNIVERSITY | EARTH INSTITUTE

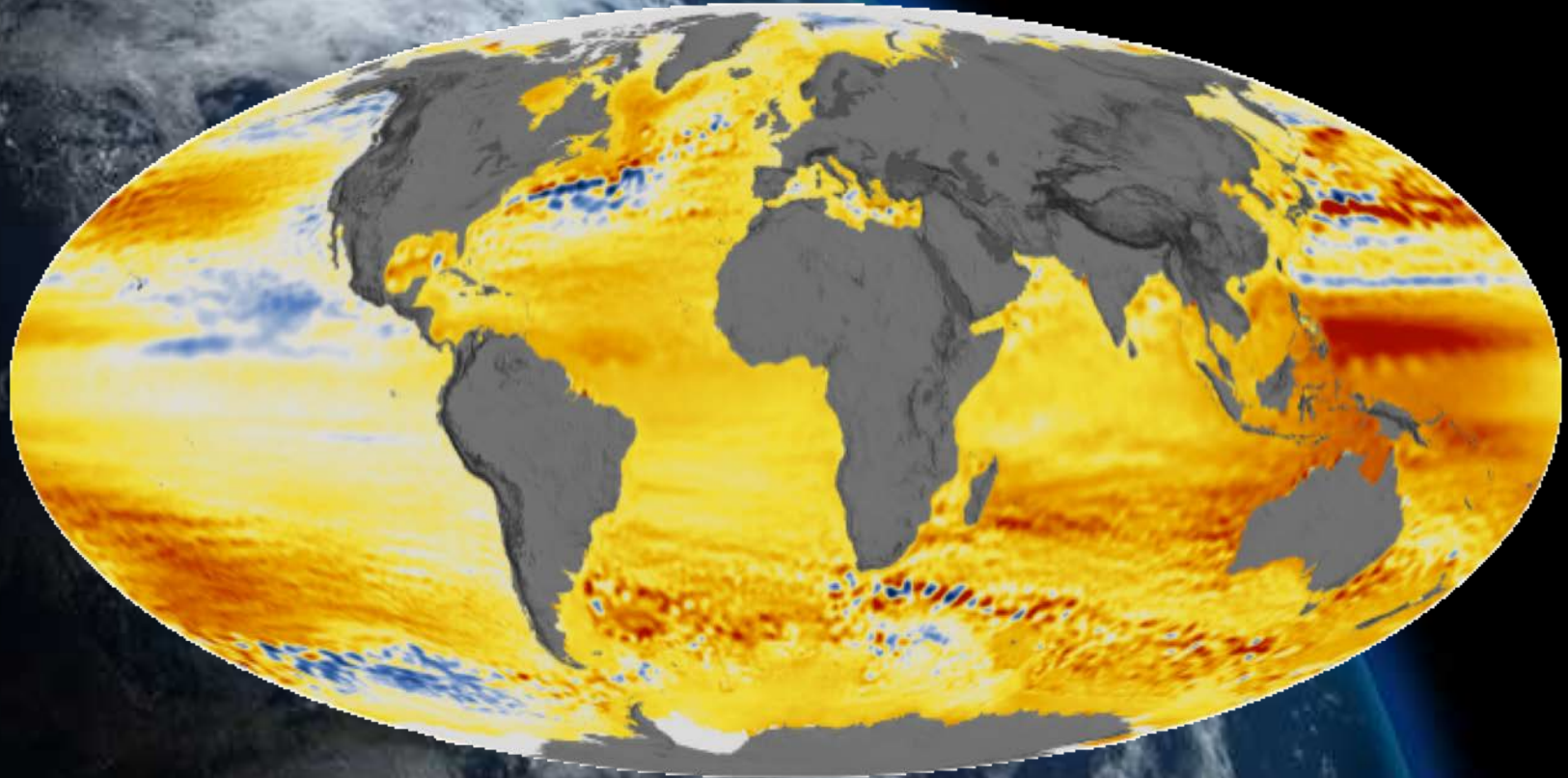
Melting ice sheets and sea level rise: Estimates, future projections and impacts

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Where are we now ?



Distribution of SLR



22 years SLR anomaly



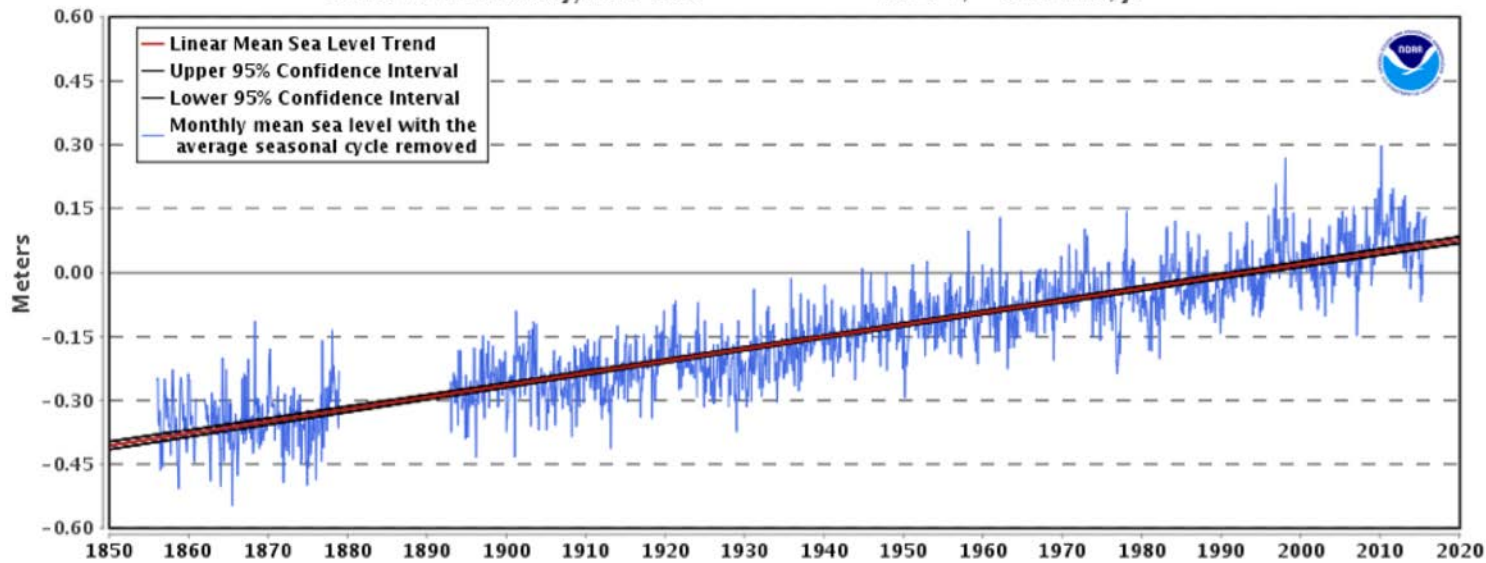
Nerem et al., 2018

Recorded Mean SLR @ NYC

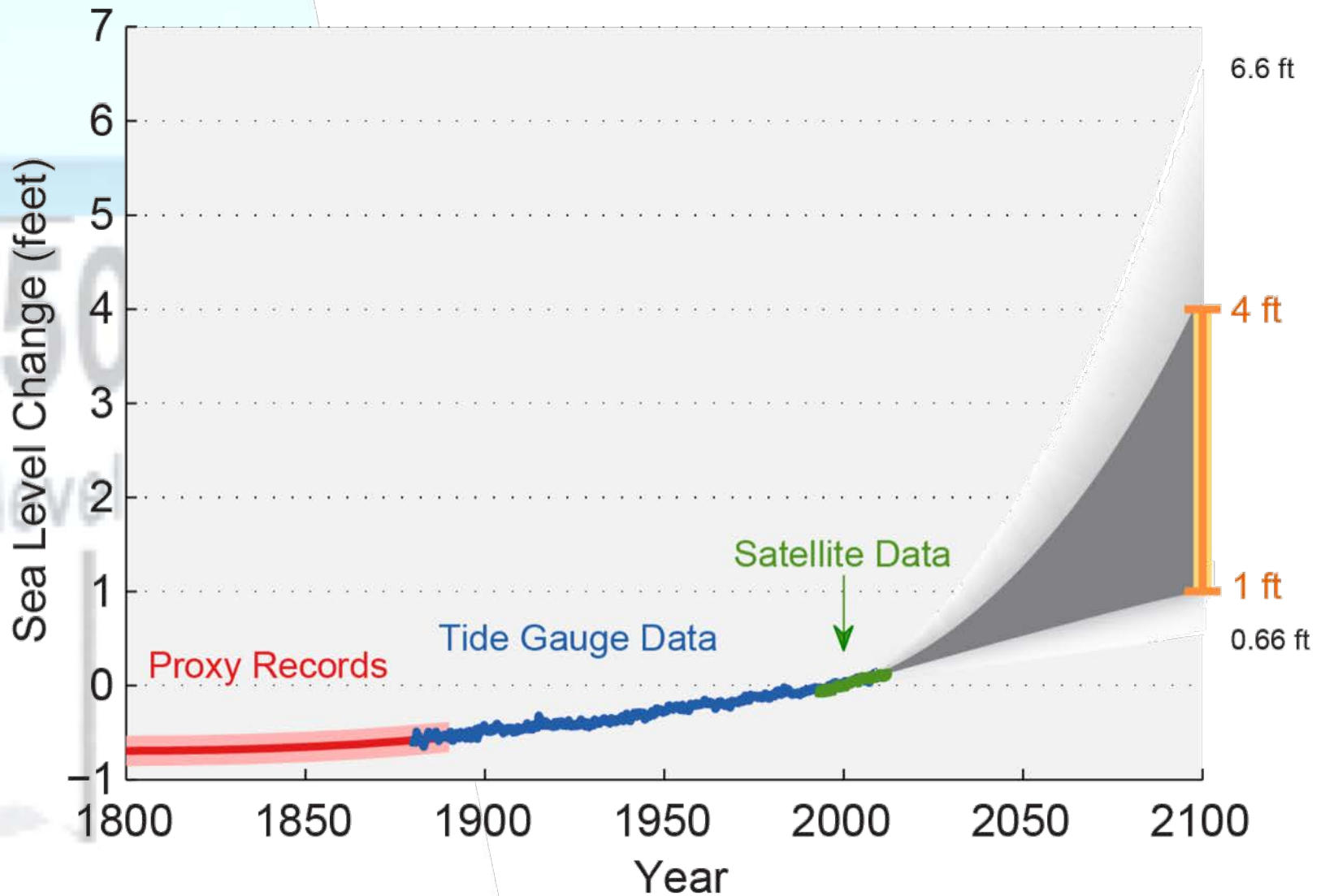
Mean Sea Level Trend
8518750 The Battery, New York

8518750 The Battery, New York

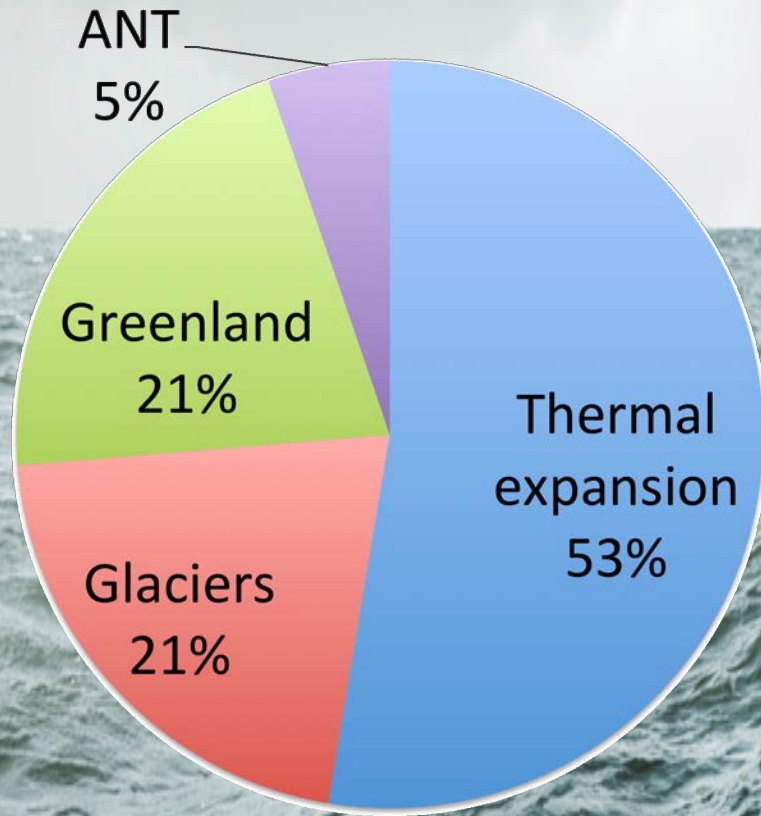
2.84 +/- 0.09 mm/yr



Where are we heading ?

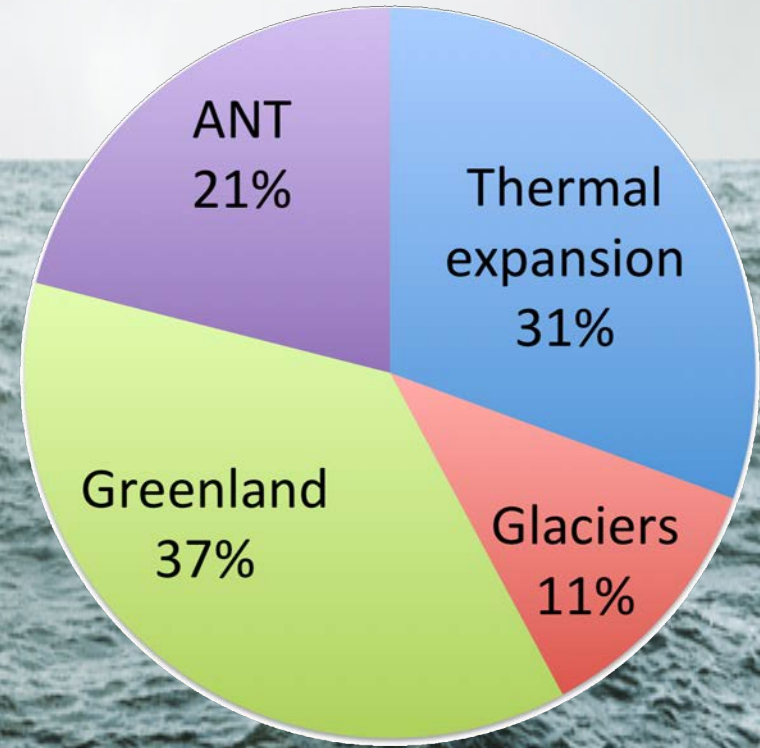


Relative contribution to SLR



Current

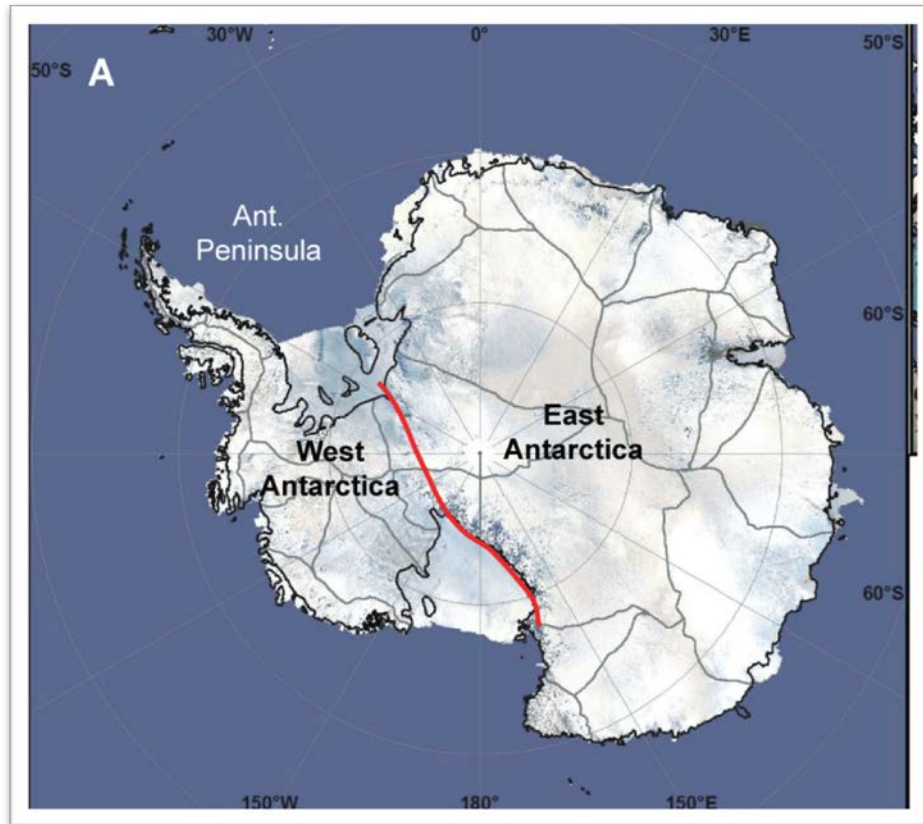
Source: Mengel et al., PNAS, 2016



Future (RCP 8.5)

(increased ANT contribution)

Sea Level Rise Potentials



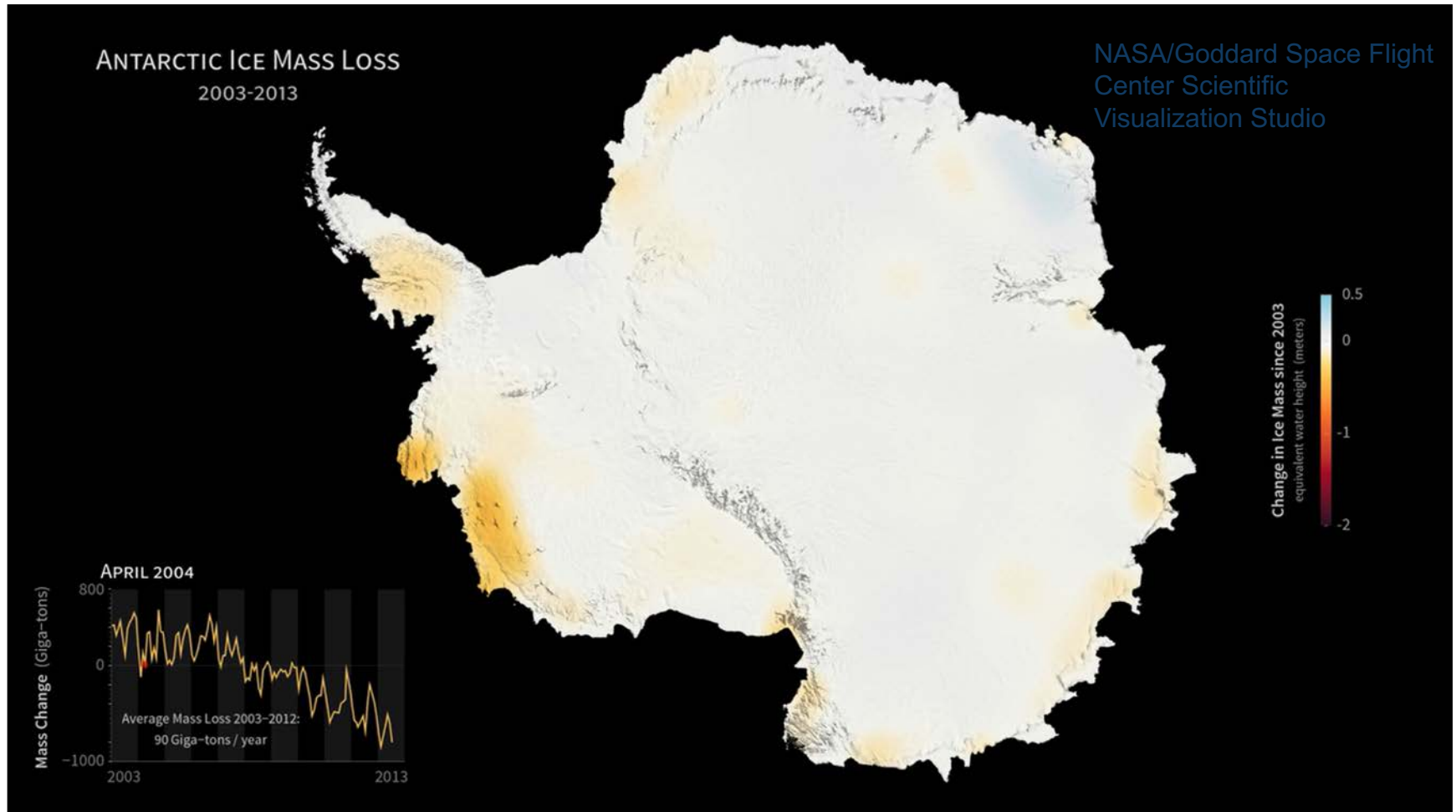
West Antarctica – 6 m (21 ft.)
East Antarctica – 52 m (170 ft.)

Greenland 7 m (24 ft.)

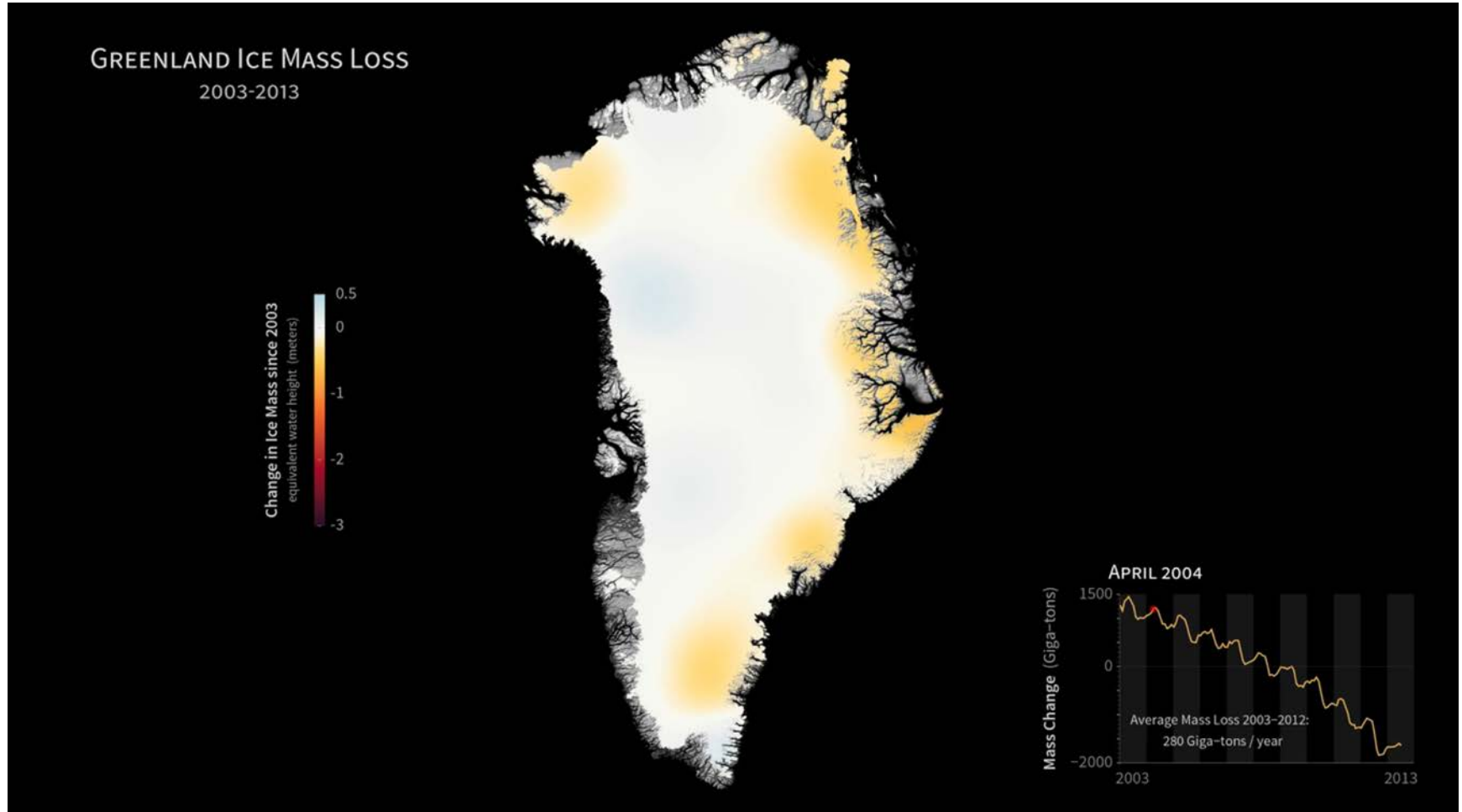




Antarctica mass loss



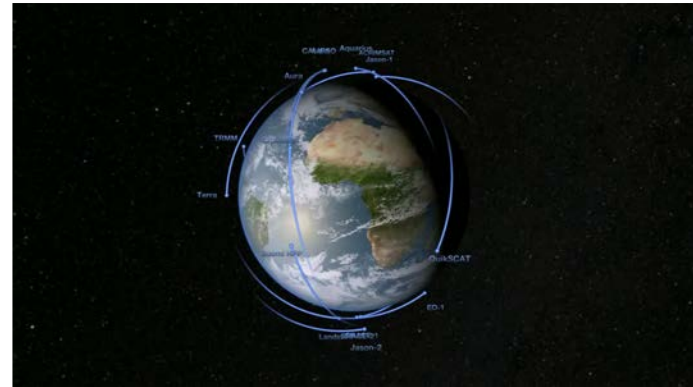
Greenland mass loss





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Models



Satellites



Fieldwork

How do we study the big ice sheets ?

The Icepod

















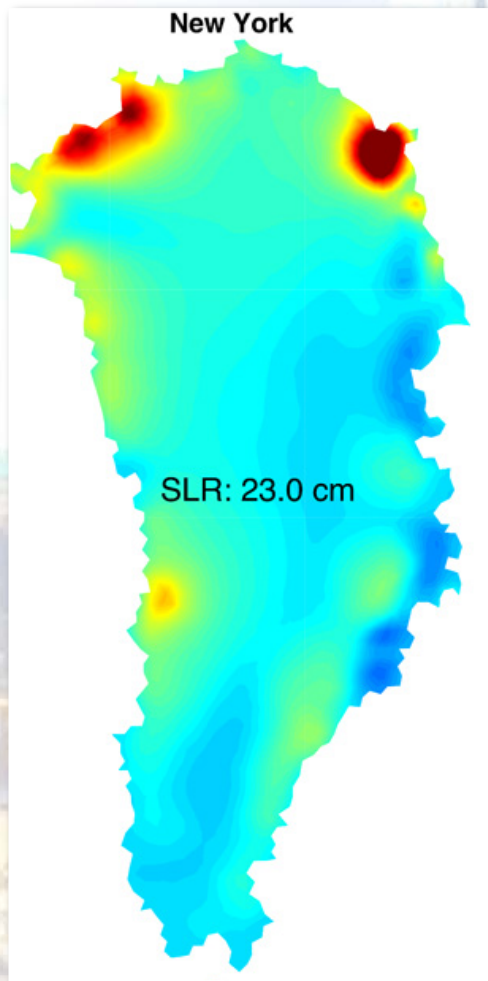




From Greenland ... to our coastlines



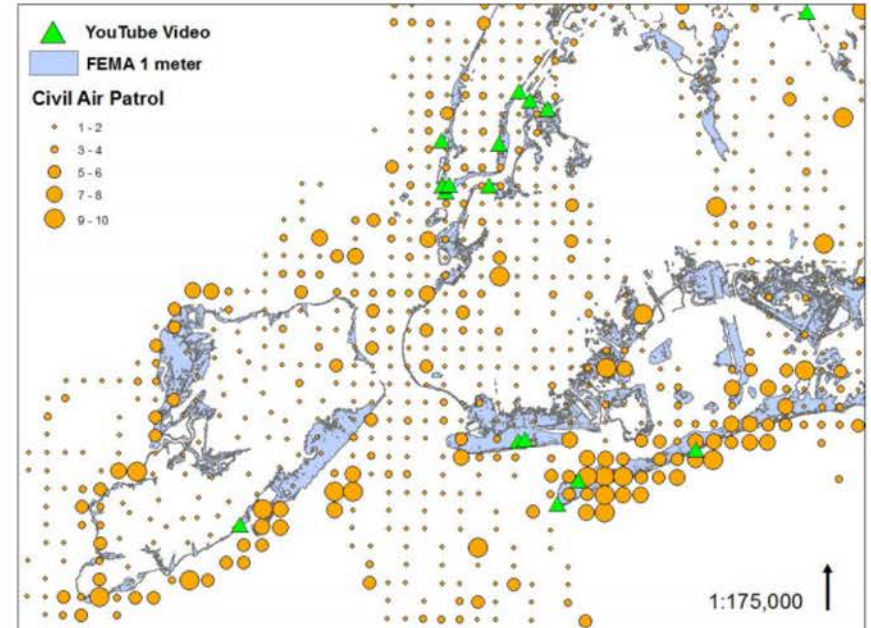
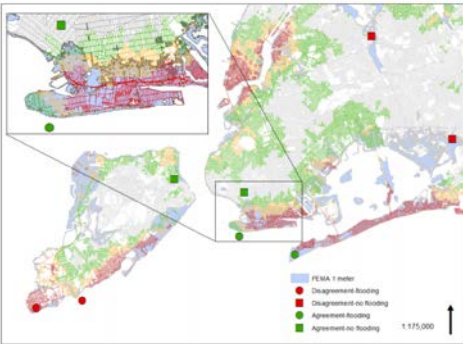
The Sea Level Threat To Cities Depends On Where The Ice Melts — Not Just How Fast



In New York, LSL change predictions are greatly sensitive to changes in the northeastern portions of the GrIS.

Projected contribution of GrIS to SLR in New York based on the SeaRISE experiments (Larour et al., 2018)

Hurricane Sandy response: merging satellite data, social media and YouTube videos



Improved response to floods and historical database creation using Twitter, Facebook, YouTube and Satellite data



Thank you !