Towards better quantifications of the uncertainty in polar ice-sheet projections using the open source framework ISSM.

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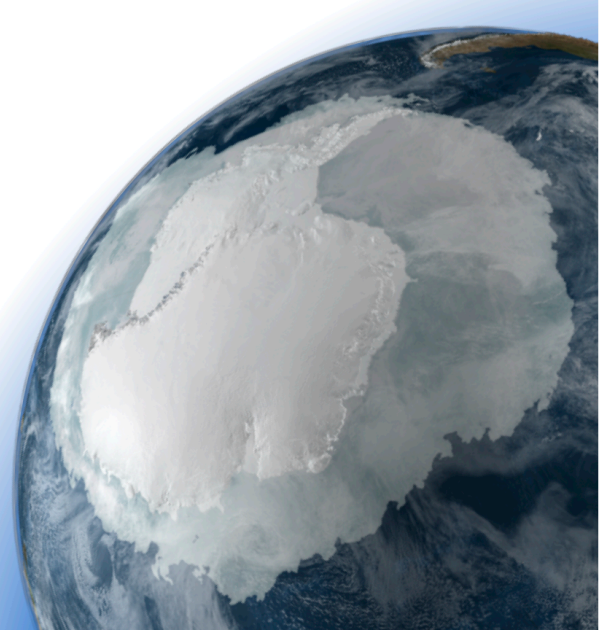


May 2014

Outline

Introduction

- Effects of Sea Level Rise:
  - Increased costal erosion
  - Flooding
  - Contaminated groundwater supply
- Consequences:
  - Infrastructure adaptation
  - Disappearance of entire nations (Maldives, Kiribati,âĂę)
  - Fresh water shortage
  - Impacts on bio-diversity

Potential coastline erosion for uniform sea level rise along US coastlines

Weiss and Overpeck, 2011.

- Potential contribution of ice sheets to Sea Level Rise:
  - Mountain Glaciers: 0.2 m (0.7 ft)
  - Greenland Ice Sheet: 7.3 m (24 ft)
  - Antarctic Ice Sheet: 56.6 m (185 ft)

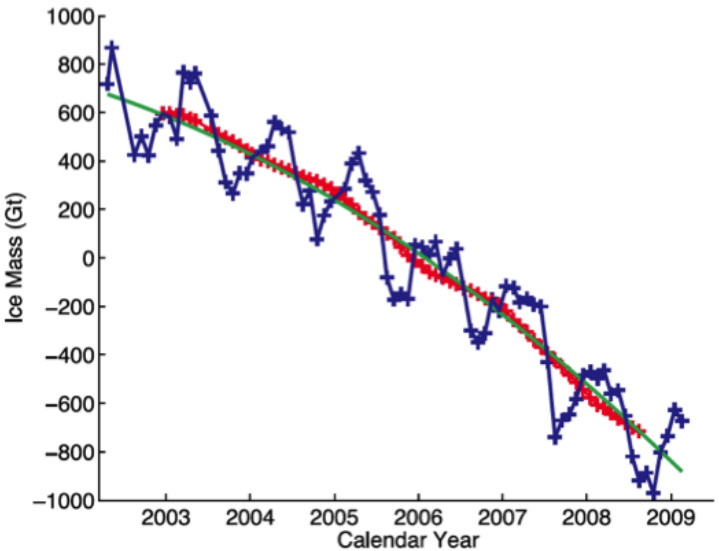
Greenland vs Australia

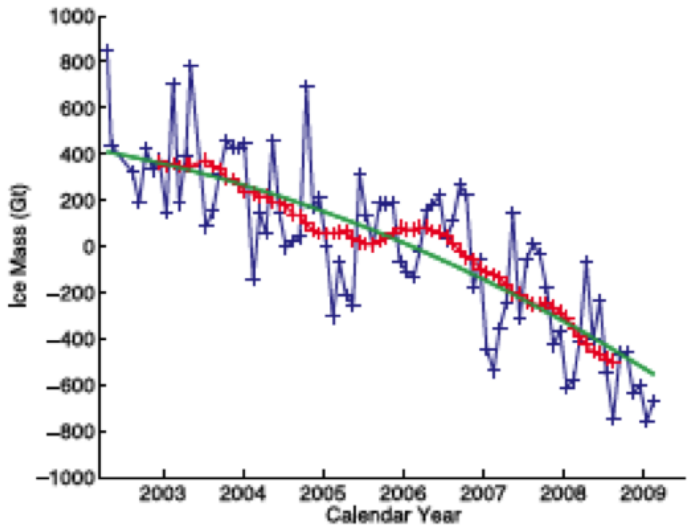
Antarctica vs USA

- Sea level rise contributors:
  - 50% Thermal expansion of the ocean
  - 50% Increased melting of land-based ice

Current assessment from GRACE data

Velicogna et al, 2009.





Combined contributions to sea level rise (SLR): $1.1 \pm 2 mm/yr$