



An Overview of the Activities of the NASA Sea Level Change Team (N-SLCT)

Steve Nerem (team lead), University of Colorado

On behalf of the N-SLCT

N-SLCT Solicitation

This solicitation called for proposals to support the following:

- Interdisciplinary research required to improve the accuracy and spatial resolution of current and future sea level change estimates;
- Development of a web portal to serve as a central hub for the effort, including communicating results in a simplified manner to the scientific community and general public; and
- Establishment of the NASA Sea Level Change Team (N-SLCT) to foster this work.

N-SLCT Solicitation

This program is intended to integrate research results, data sets, and model output to improve the accuracy and spatial resolution of sea level change estimates, and communicate these results in a simplified manner to the scientific community and general public. It is focused on the following four subelements, chosen because these areas are critical to improved understanding of sea level change, but lack adequate support:

- Proposals sought to address one or more of 4 elements:
 - Sea level rise and its regional variation
 - Improved knowledge of ice mass change
 - New sea level datasets
 - A NASA web portal for sea level change

Selected N-SLCT Investigations

- Carmen Boening/Jet Propulsion Laboratory
 - “A NASA Web Portal for Sea Level Change”
- James Davis/Lamont-Doherty Earth Observatory
 - “Bayesian Integration of Multiple Geodetic Data Types for Investigation of the Coupled Impact of Climate Change on Earth Systems”
- James Famiglietti/University of California, Irvine
 - “Land Contributions to Regional and Global Mean Sea Level Rise”
- Patrick Heimbach/Massachusetts Institute of Technology
 - “Data and Forcing Integration for Improved Estimation of Spatial Sea Level Patterns and Their Uncertainties, With Extended Diagnostics for Closed Budget Analysis”
- Erik Ivins/Jet Propulsion Laboratory
 - “Ice Sheet Basal Conditions and Sea Level Rise: Interface with Earth Structure Models and GIA”
- Steve Nerem/University Of Colorado, Boulder
 - “Observation-Driven Projections of Future Regional Sea Level Change”
- Richard Ray/Goddard Space Flight Center
 - “Past, Present, and Future Sea Level from Observations and Models”
- Eric Rignot/University of California, Irvine
 - “Mass Balance and Bed Topography Datasets of Ice Sheets for Sea Level Studies”

N-SLCT Team Members from Other Awards

- Anthony Arendt, University of Alaska, Fairbanks
 - GRACE, ICESAT, Icebridge
- Helen Fricker, Scripps Institution of Oceanography
 - ICESAT, ICESAT-2
- Ichiro Fukumori, Jet Propulsion Laboratory
 - Estimating mechanisms of the trend and decadal variability of sea level using an ocean general circulation model constrained by satellite altimeter observations
- Alex Gardner, Jet Propulsion Laboratory
 - Contributions of mountain glaciers to sea level change
- Ian Joughin, University of Washington
 - MEASURES PI, ice sheet velocities, cryospheric science
- Eric Larour, Jet Propulsion Laboratory
 - Ice sheet modeling

N-SLCT Team Members from Other Awards

- Bob Leben, University of Colorado
 - Sea level reconstructions
- Eric Leuliette, NOAA
 - NOAA climate and operational applications of satellite altimetry
- Scott Luthcke, NASA Goddard Space Flight Center
 - GRACE, ice mass contributions to sea level
- Sophie Nowicki, NASA Goddard Space Flight Center
 - Ice sheet modeling
- Ted Strub, Oregon State University
 - Processes connecting coastal to basin-scale ocean circulation
- Josh Willis, Jet Propulsion Laboratory
 - MEASURES PI, satellite altimetry, thermosteric sea level

First N-SLCT PI Meeting Scripps, Oct 14-16, 2014



New frontiers of Altimetry –
Lake Constance, Germany - October 2014

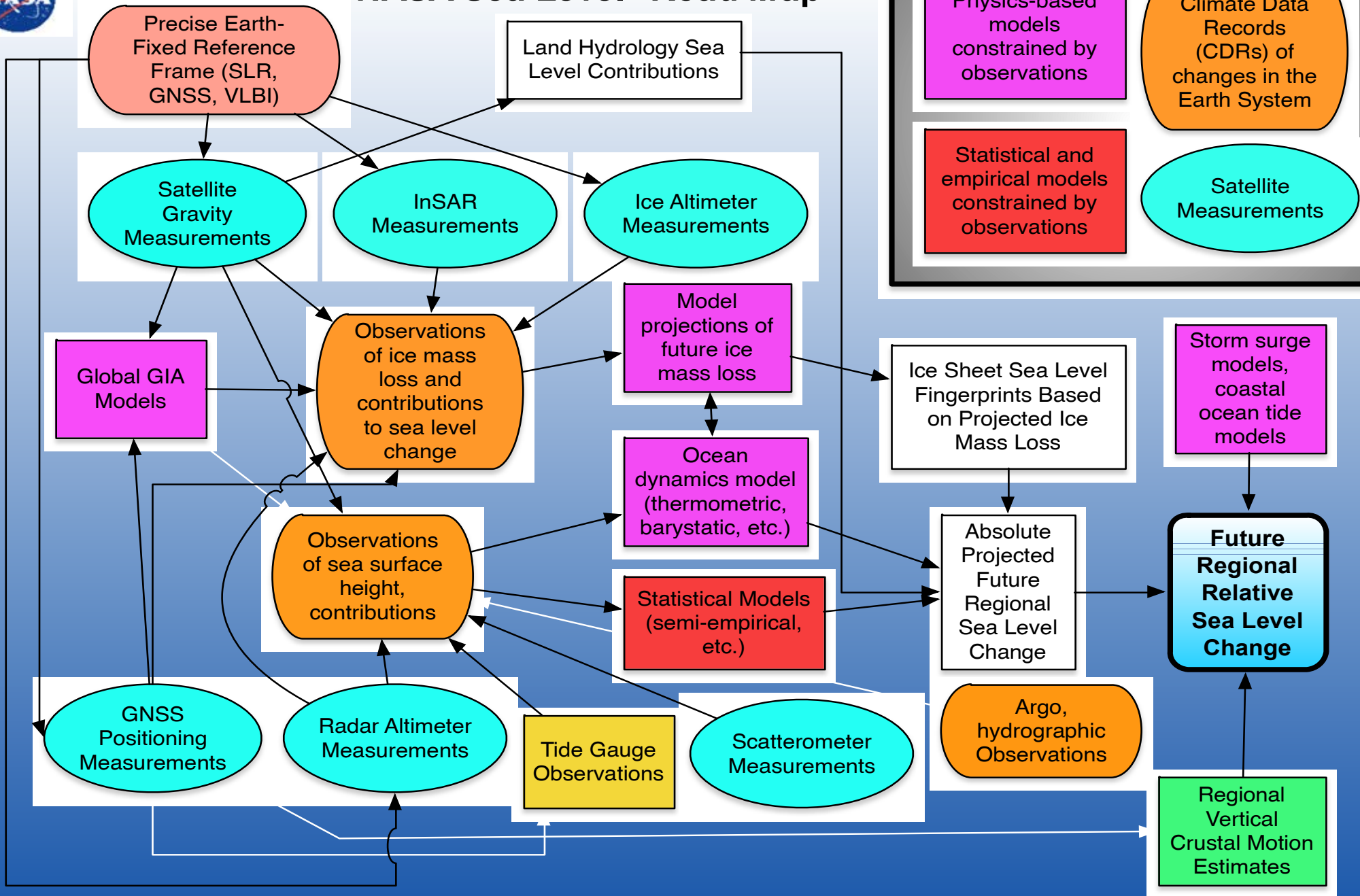
>OSTST meeting

Grand Challenge Problems

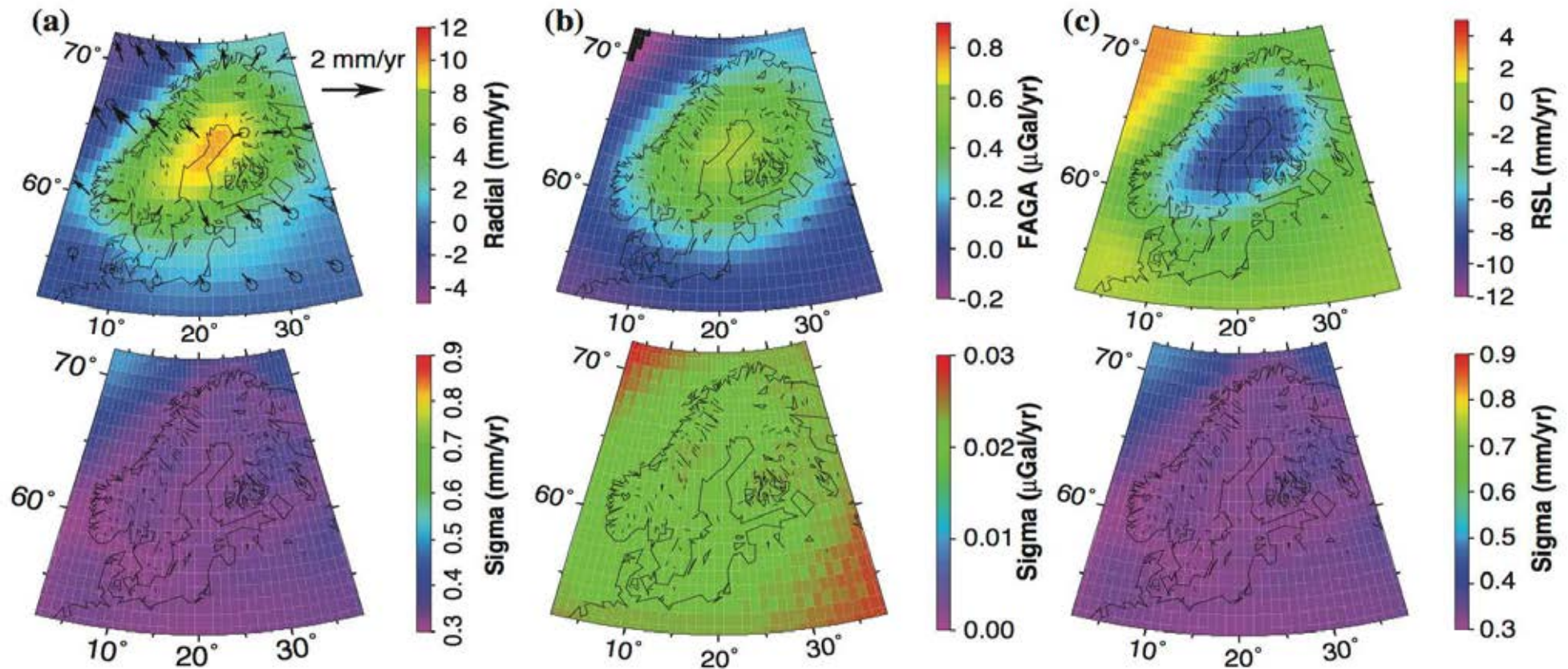
- Can we understand the last 20 years of ice (and sea level) measurements on timescales longer than a year?
- What are the driving uncertainties for projections of future regional sea level change?
- Can we better understand ocean-ice interactions and how these processes may accelerate ice mass loss?
- What are the dominant controls (ocean, atmosphere, bathymetry, etc.) on future ice mass loss?



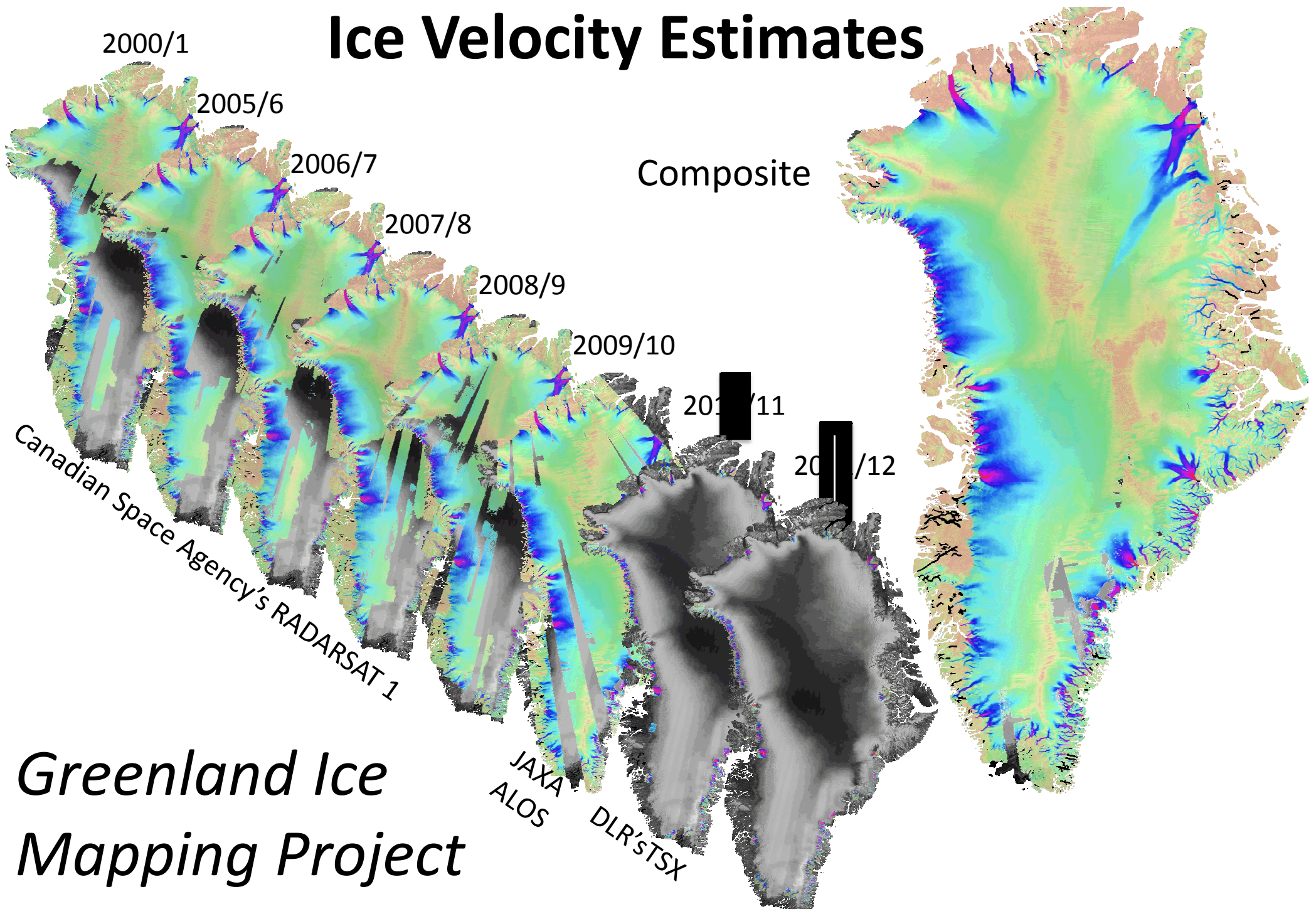
NASA Sea Level "Road Map"



New GIA Models



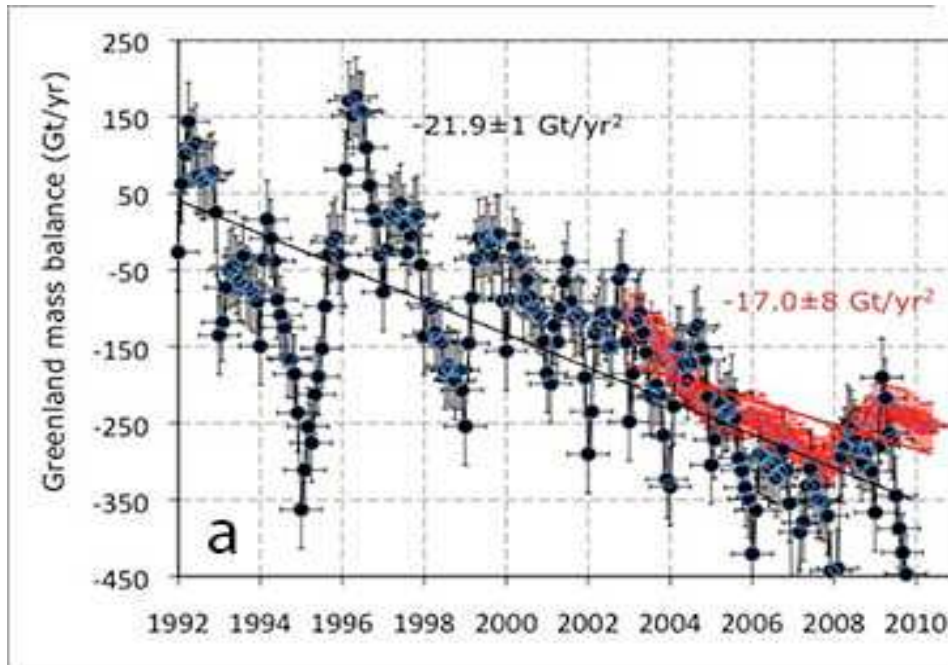
Ice Velocity Estimates



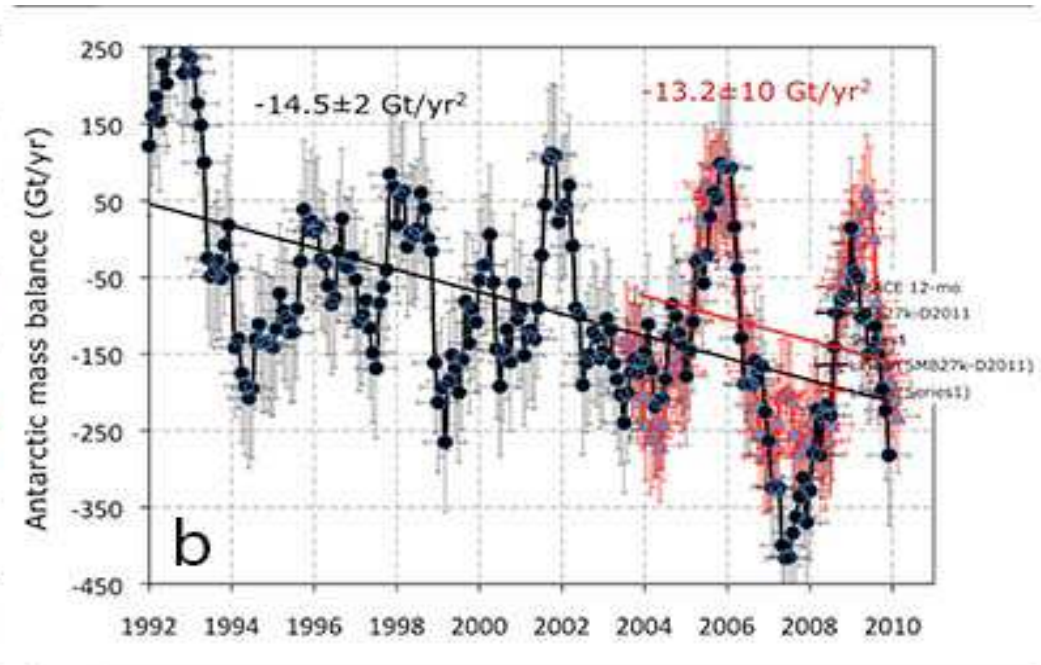
*Greenland Ice
Mapping Project*

Ice Sheet Mass Balance

Greenland



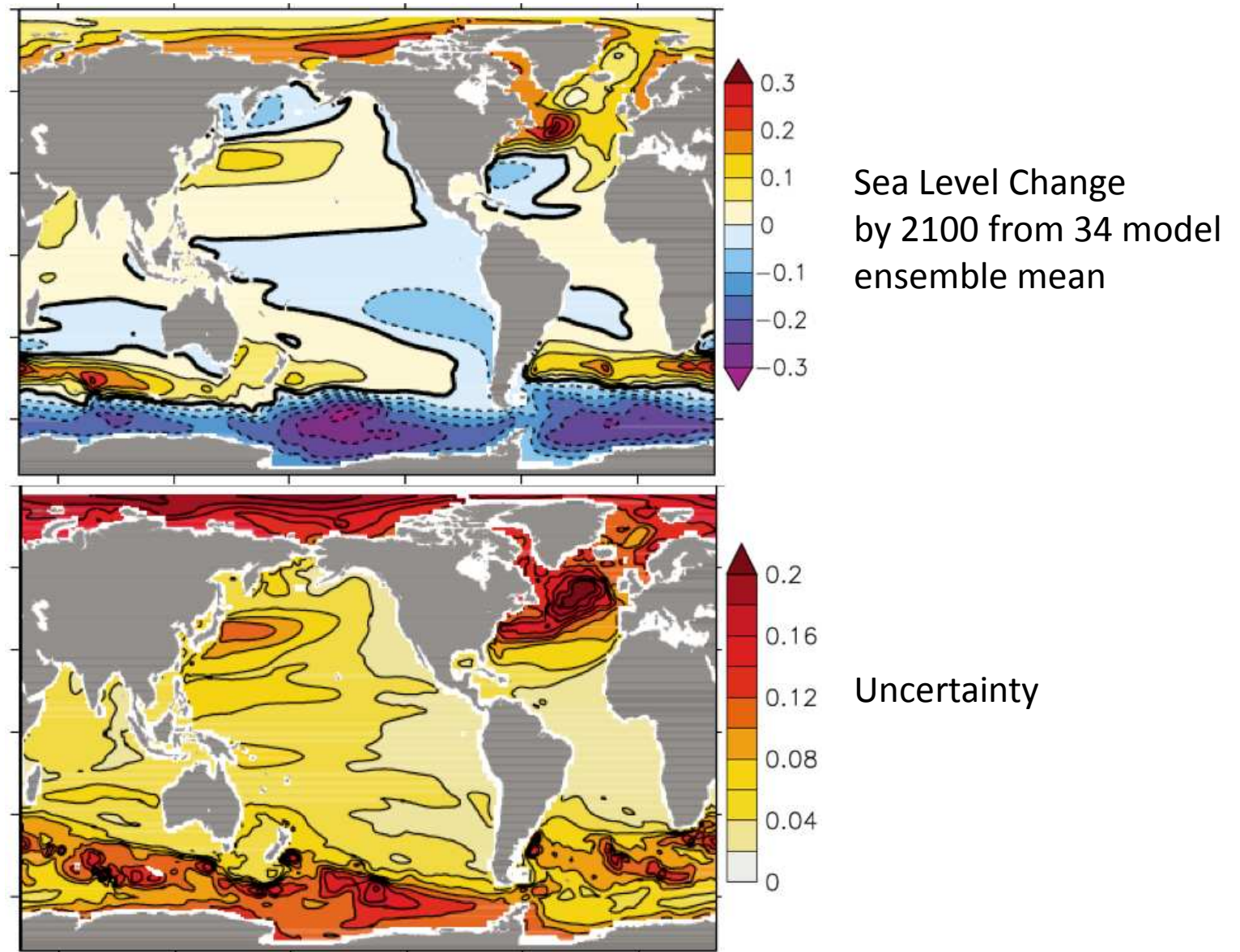
Antarctica



GPS-Based Crustal Motion Estimates



Regional Sea Level Projections



Sea Level Change Web Portal

Portal Lead: Carmen Boening, JPL

- The Sea Level Change Portal will serve as **central hub** for enabling collaboration between the **NASA Sea Level Change Team** as well as distributing and communicating science results.
- The ultimate goal of the Sea Level Change Portal is to provide scientists and the general public with a “**one-stop” source for current sea level change information and data**, including interactive tools for accessing, viewing, and analyzing regional data, and ongoing updates on sea level research that will help to facilitate **interdisciplinary investigations** and **highlight NASA’s sea level science**.

N-SLCT Questions?

- Eric Lindstrom, Steve Nerem, Richard Ray, Bob Leben, Josh Willis, Eric Leuliette, Ted Strub