

MISSION: PROGRAMMATIC SCIENCE TEAM MEETING



2, 2017

Austin, Texas

GRACE SCIENCE OBJECTIVES IN POLAR REGIONS AND THE ANNOYING PROBLEM OF GIA UNCERTAINTY

ROLOGY
AN SCIENCES
ADVANCEMENTS

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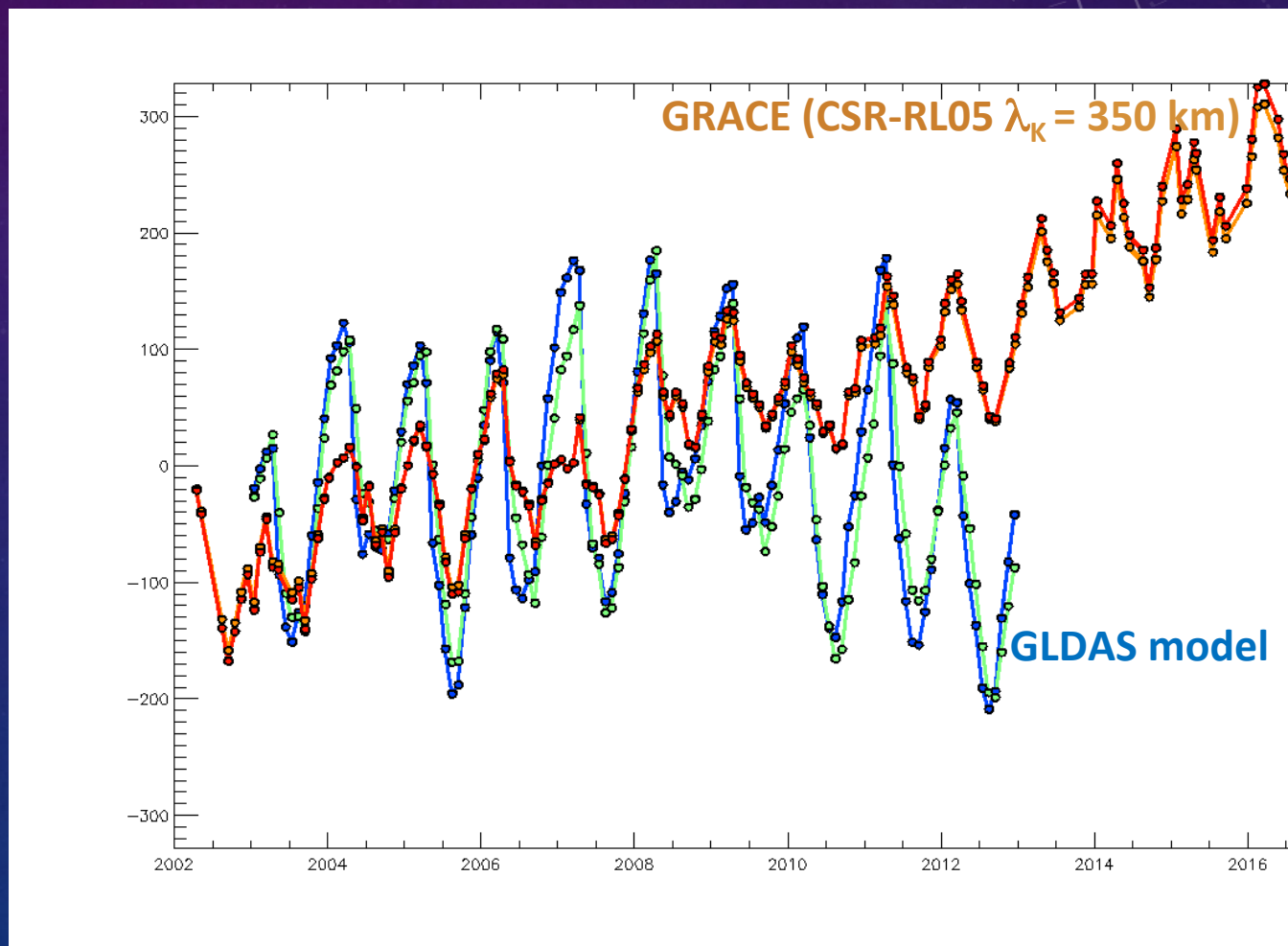
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GIA CORRECTIONS: EXAMPLE 1: HYDROLOGY

Terrestrial Water Storage
 Station # 1056 north just of the St.
 Lawrence Sea Way
 Data for Calibration of model
 Improvements for inter-annual
 variability
 Final GIA correction models are
 #G-VM#

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LINEAR CLUES TO SEPARATE GIA

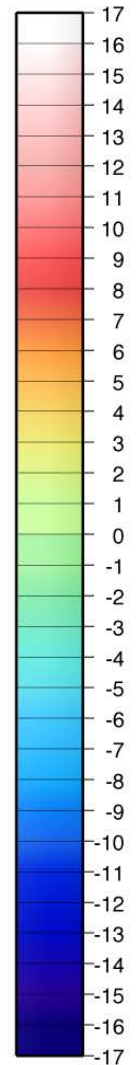
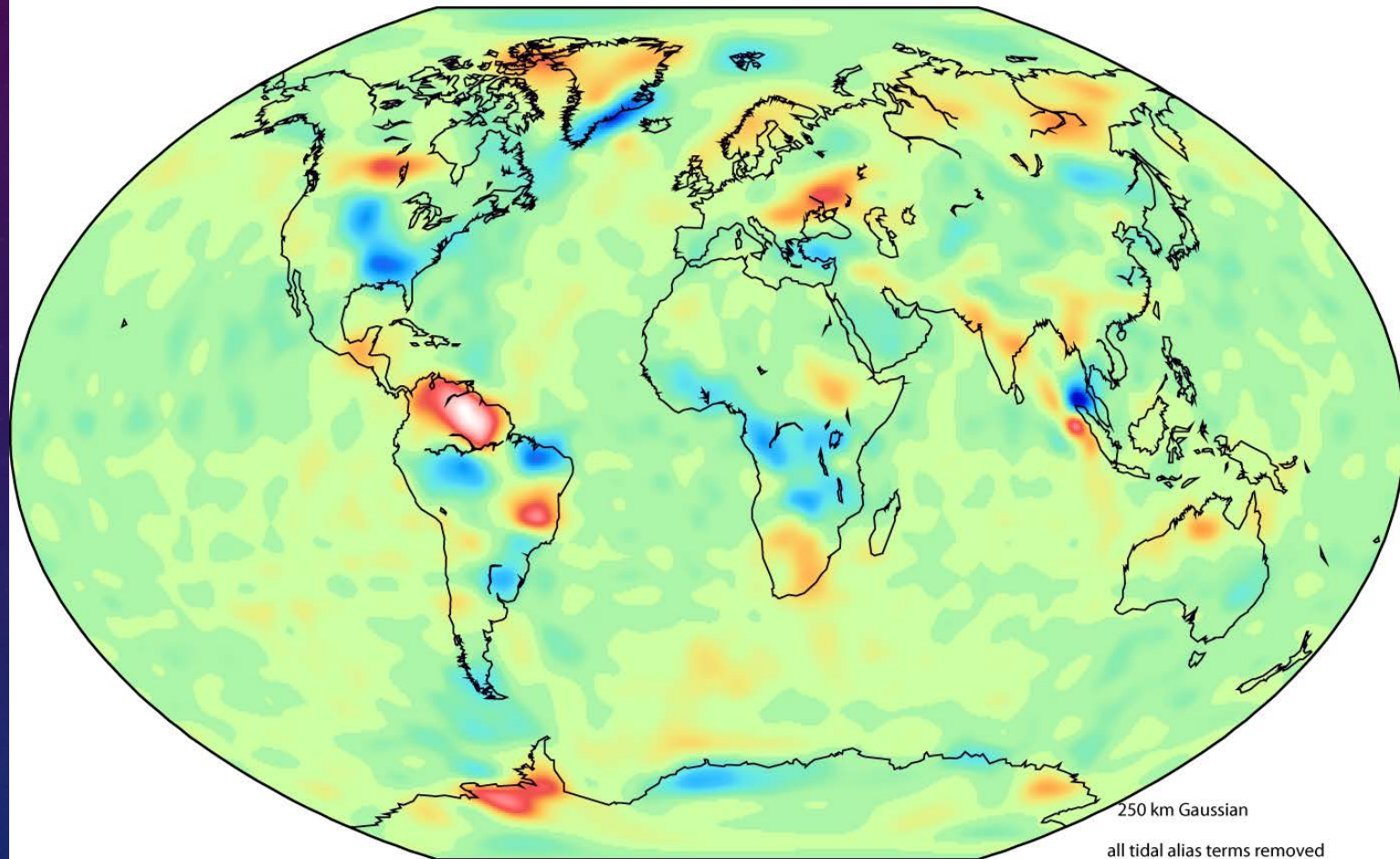
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October 10-12, 2017

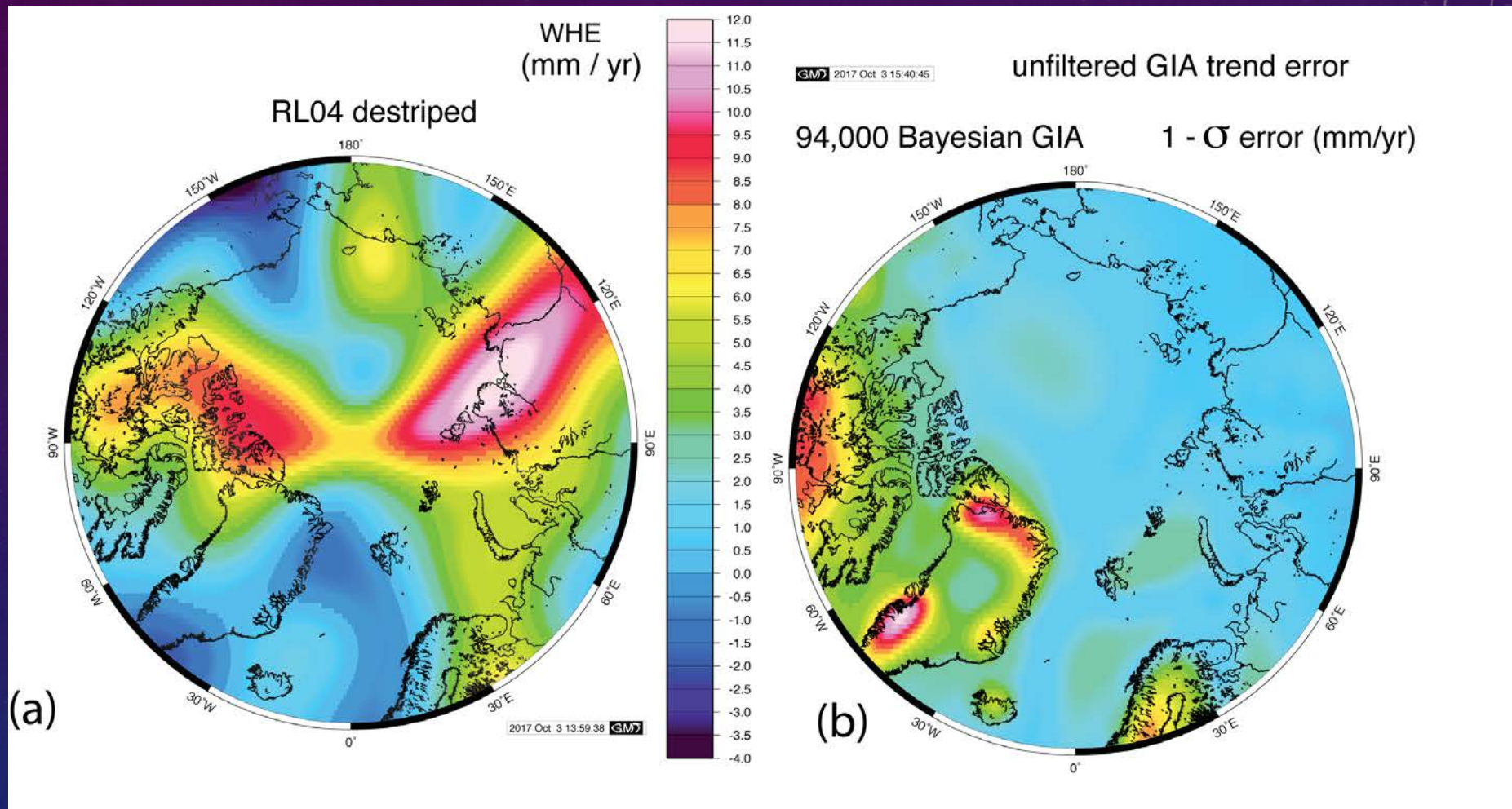
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GRACE JPL Mascon 74 - 86 month trend in cm WEH

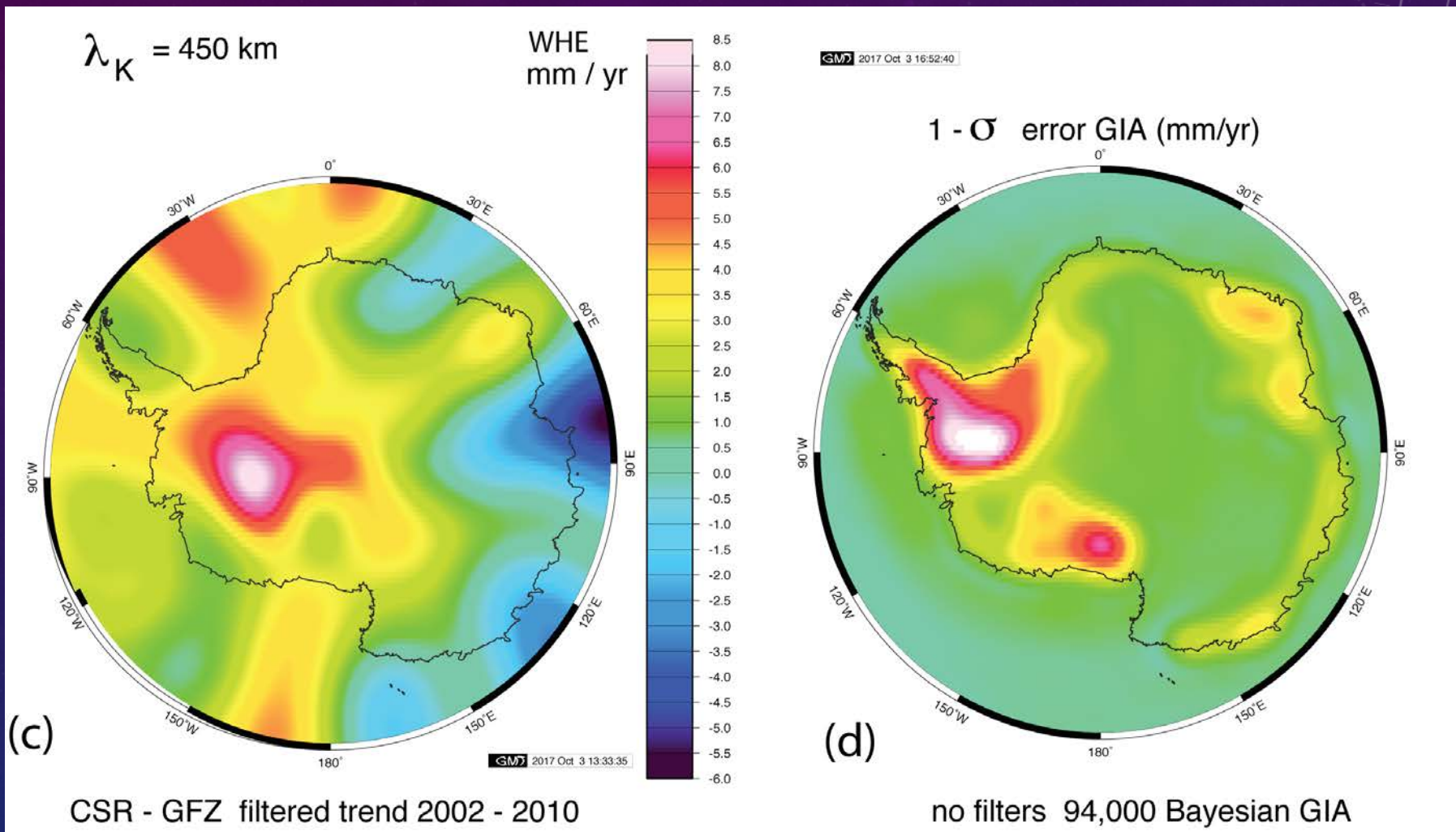


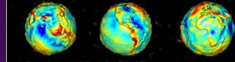
cm/yr

R REGIONS: LAND, ICE & OCEAN (NORTH OF 62.5°N



R REGIONS: LAND, ICE & OCEAN (SOUTH OF 62.5°S)





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OCEAN SCIENCES

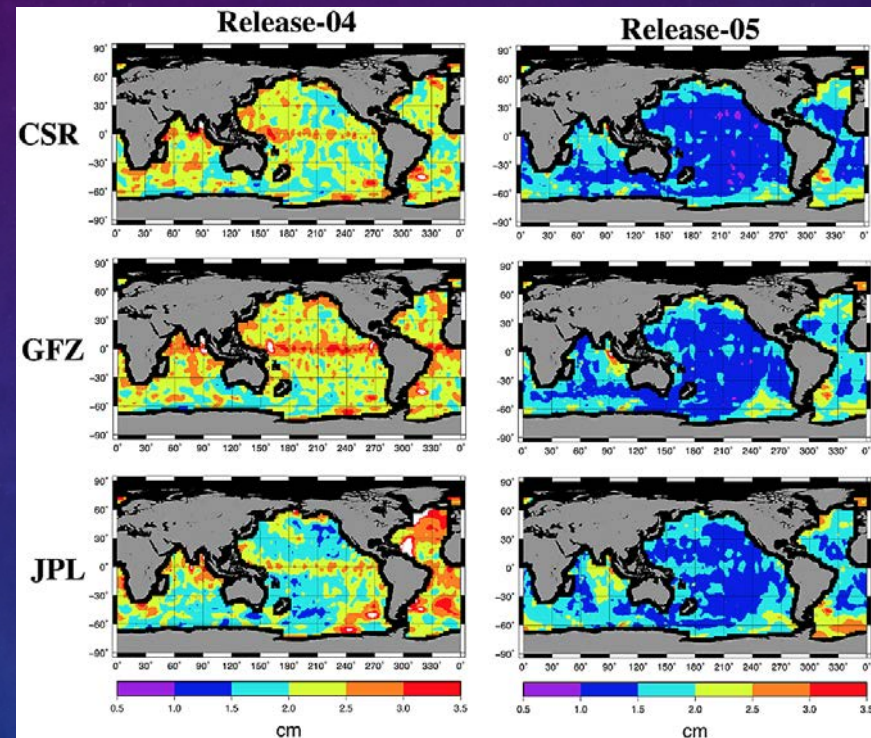
SL uncertainty due to GIA:

Quinn and Ponte (2010): $\Delta \xi^{\text{GIA}} = \pm 0.5 \text{ mm/yr}$

Llovel, Willis, Landerer, Fukumori (2014): $\Delta \xi^{\text{GIA}} = \pm 0.4 \text{ mm/yr}$

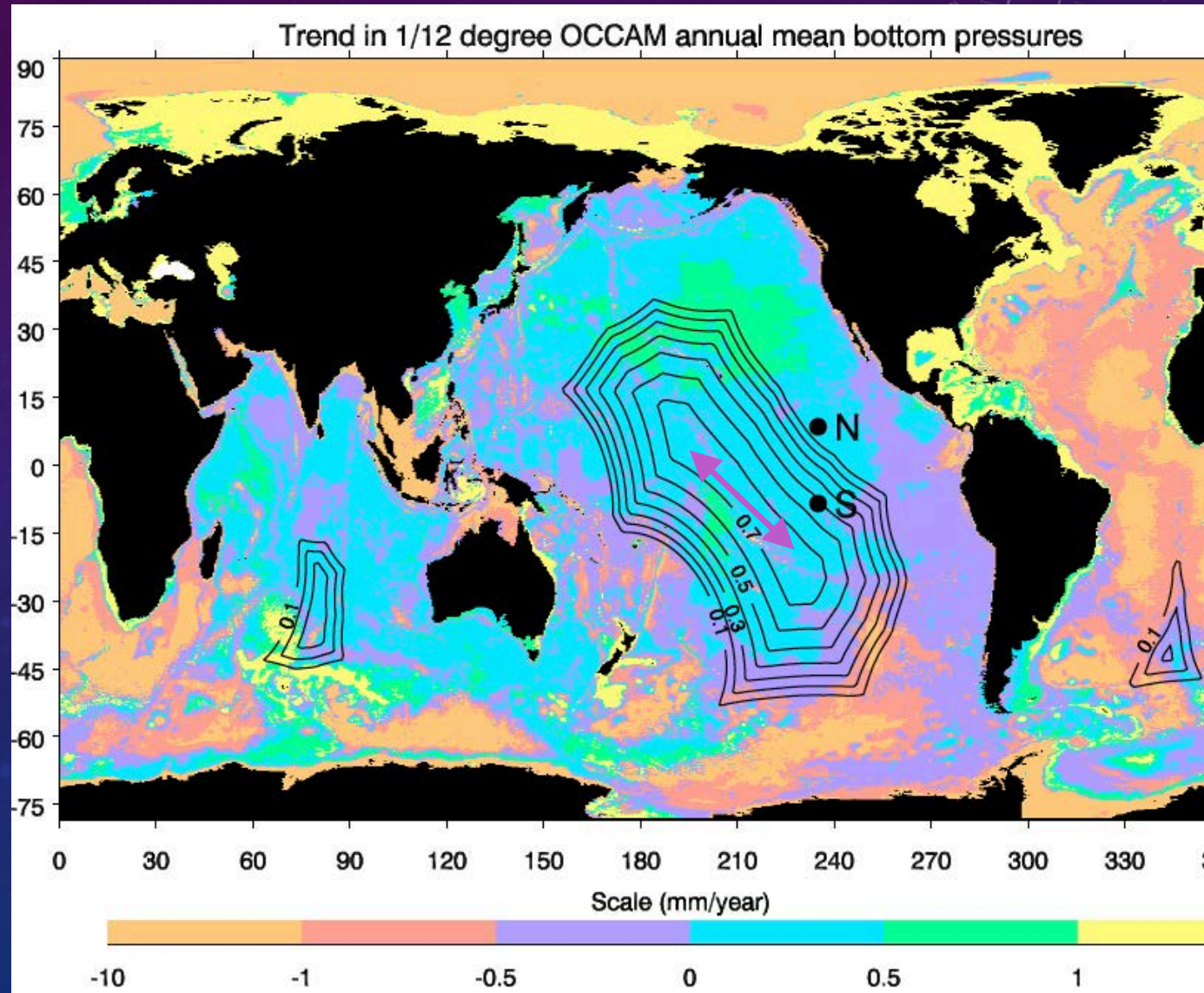
Impact of RL04 -> RL05 is significant (e.g. Chambers and Bonin, *Ocean Sci.*, 8, 859–868, 2012)

SLS variance to JPL ECCO model



AN SCIENCES: SEA LEVEL CHANGES

Optimal location for OPB
Measurement
Trends reduced to 0.28 mm/yr after
years (natural fluctuations)
Accounted amplification factors of
Ice mass allowed to flow from
Continents to ocean



ESIAN GIA

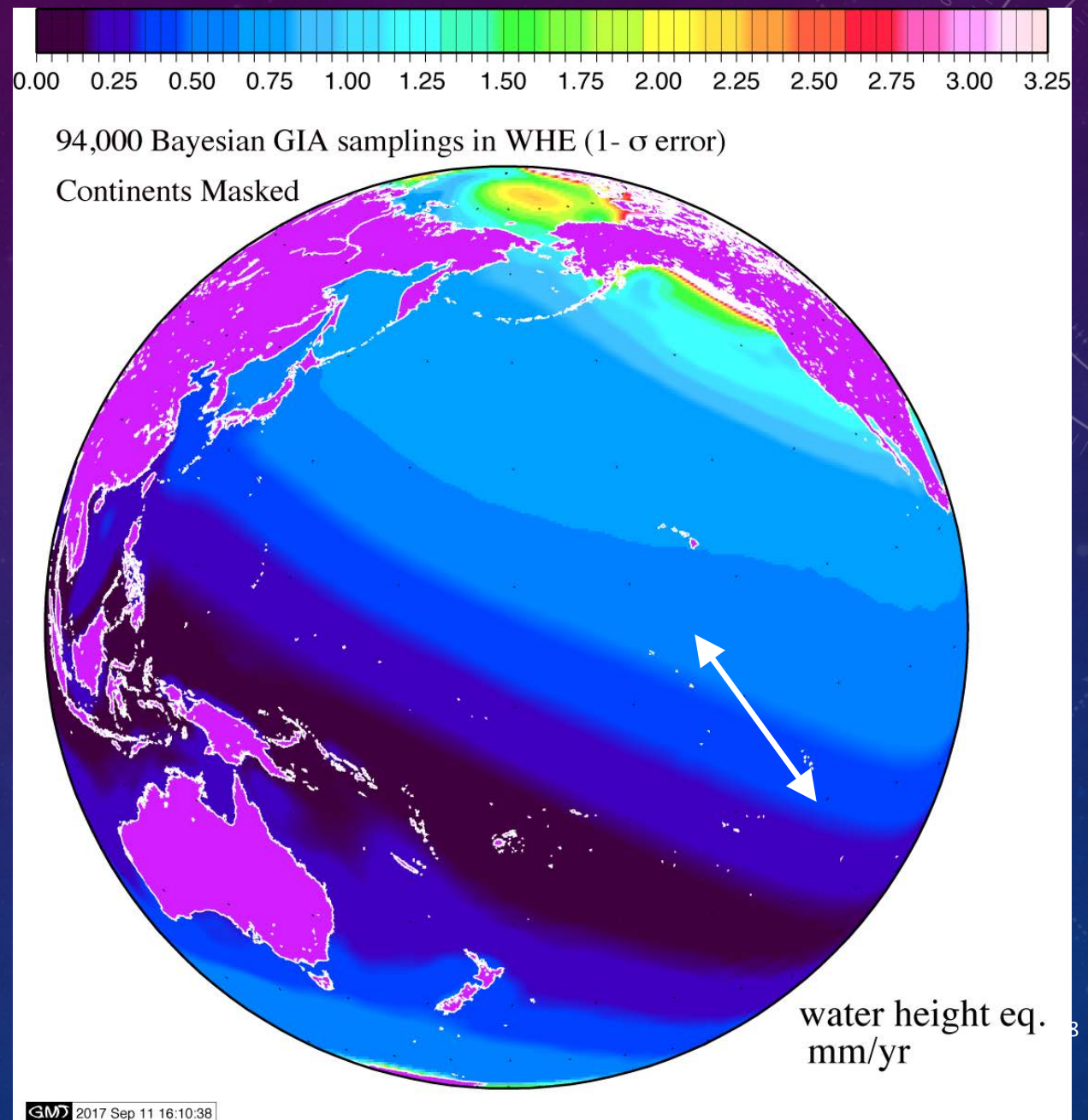
Uncertainty

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PALEOCLIMATE STUDIES

Last Ice Age:

Can GIA models close the mass budget using relative sea level (RSL) data & dated landforms that define former ice sheet boundaries?

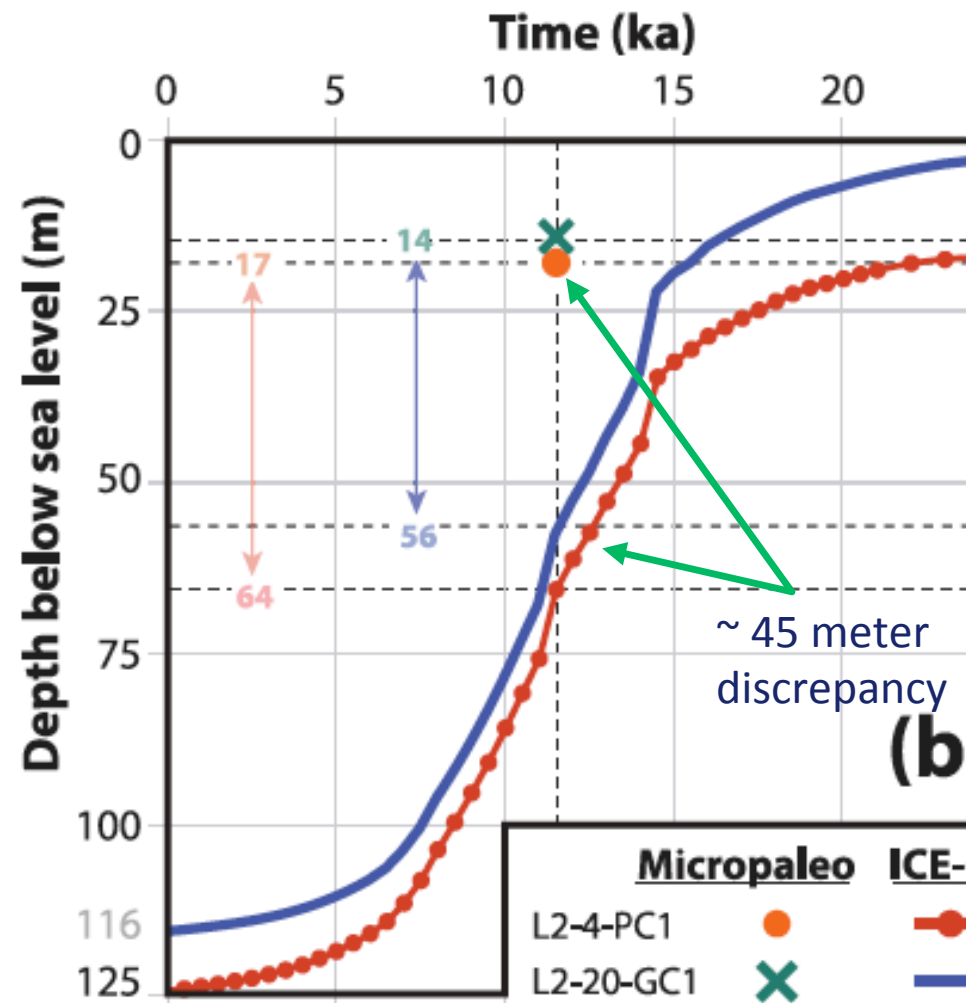
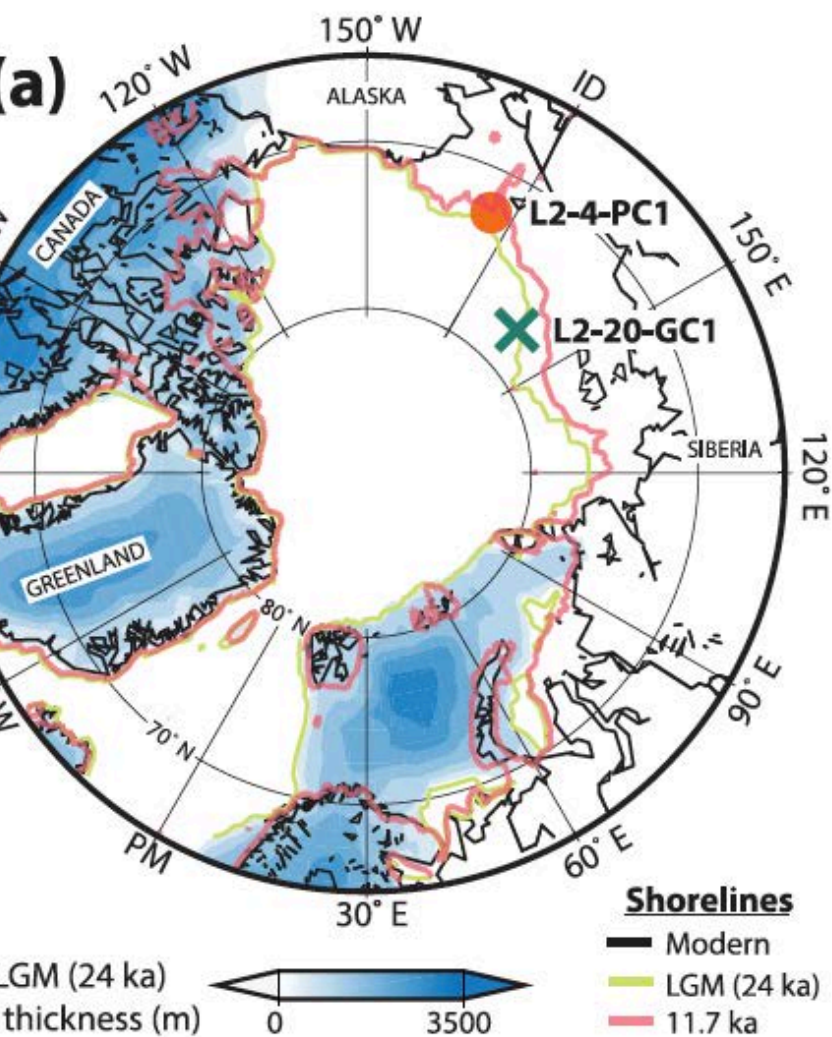
The size and shape of ice domes?

“Wet” or “dry” basal conditions

Missing pieces?

Missing mass? (short ~ 10%)

SIBERIA



WHAT LAMBERT CARON WILL PRESENT: ERROR STATISTICS WITH STATE-OF-THE-ART GIA MODEL

