



ipcc

INTERGOVERNMENTAL PANEL ON
climate change



IPCC AR6: The Reckoning

Baylor Fox-Kemper

Brown University

IPCC AR6 CLA, Chp 9,

"Ocean, Cryosphere, & Sea Level Change"

Winter OMWG. Feb 3, 2021

Thank you!!

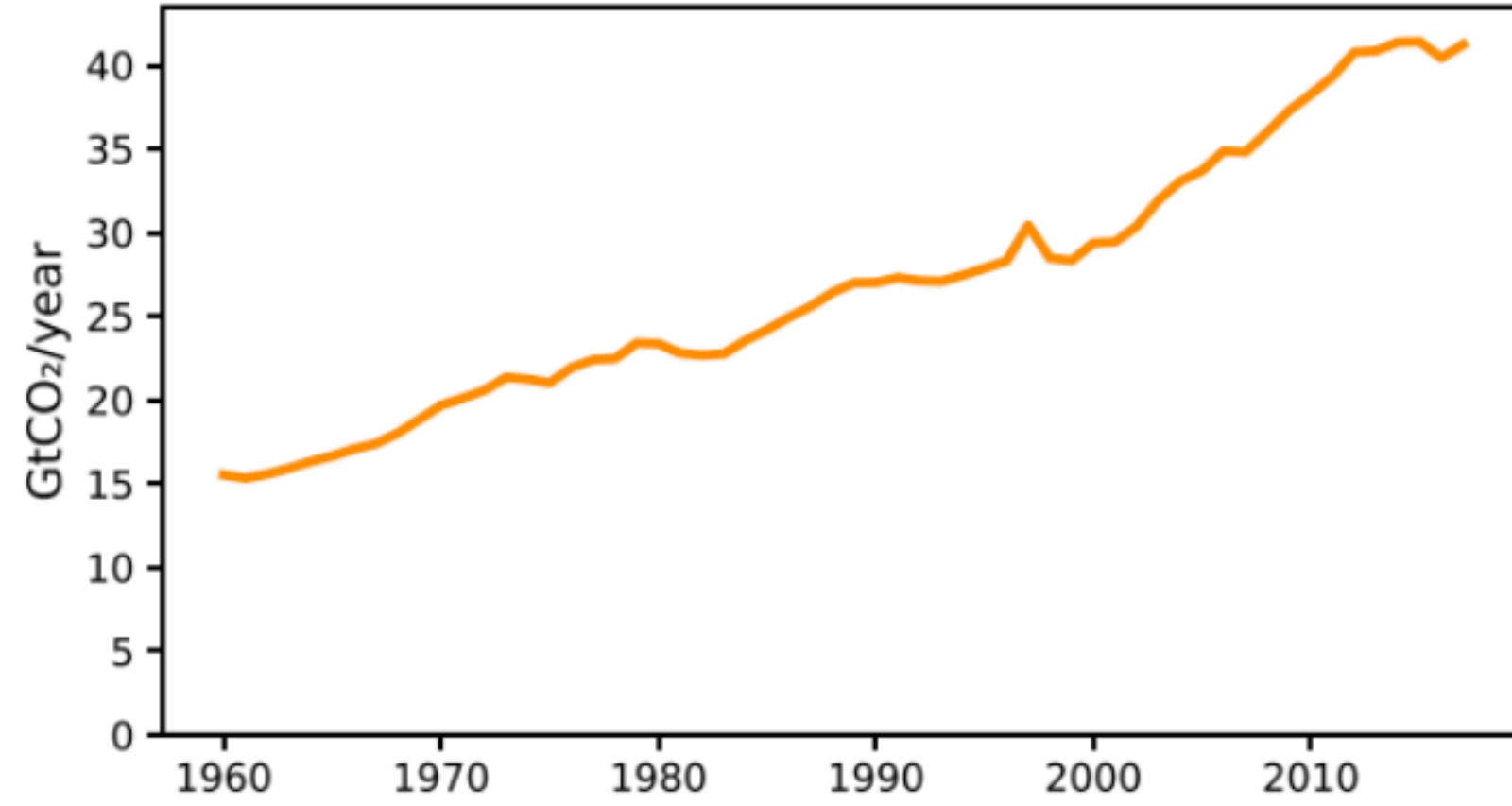
- Many of you have written papers, reviewed papers, or reviewed drafts of the AR6.
- This is critical work, and it really improves the end product.

Number of Pages

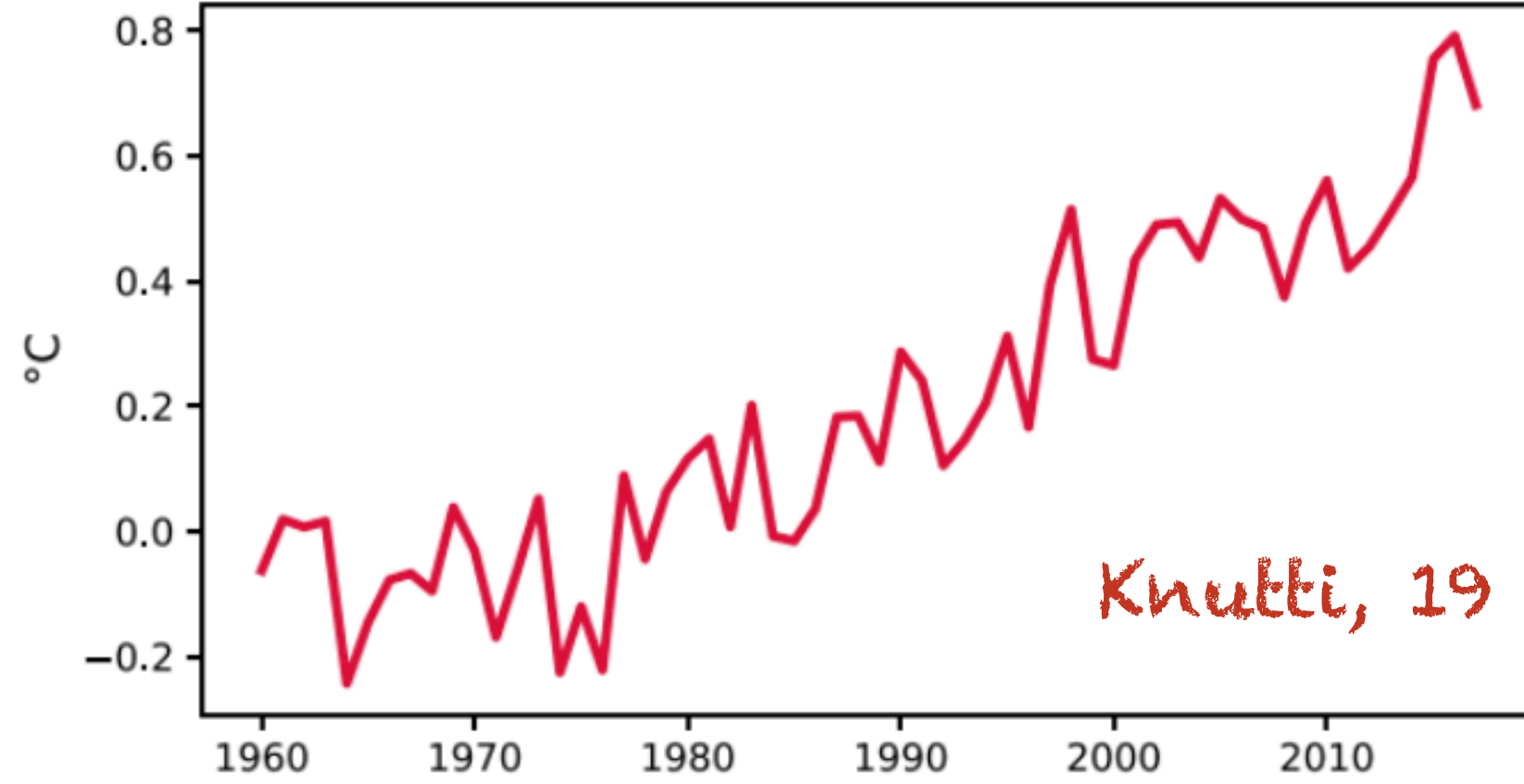


Ocean, Cryosphere, Sea Level Bibliography Pages

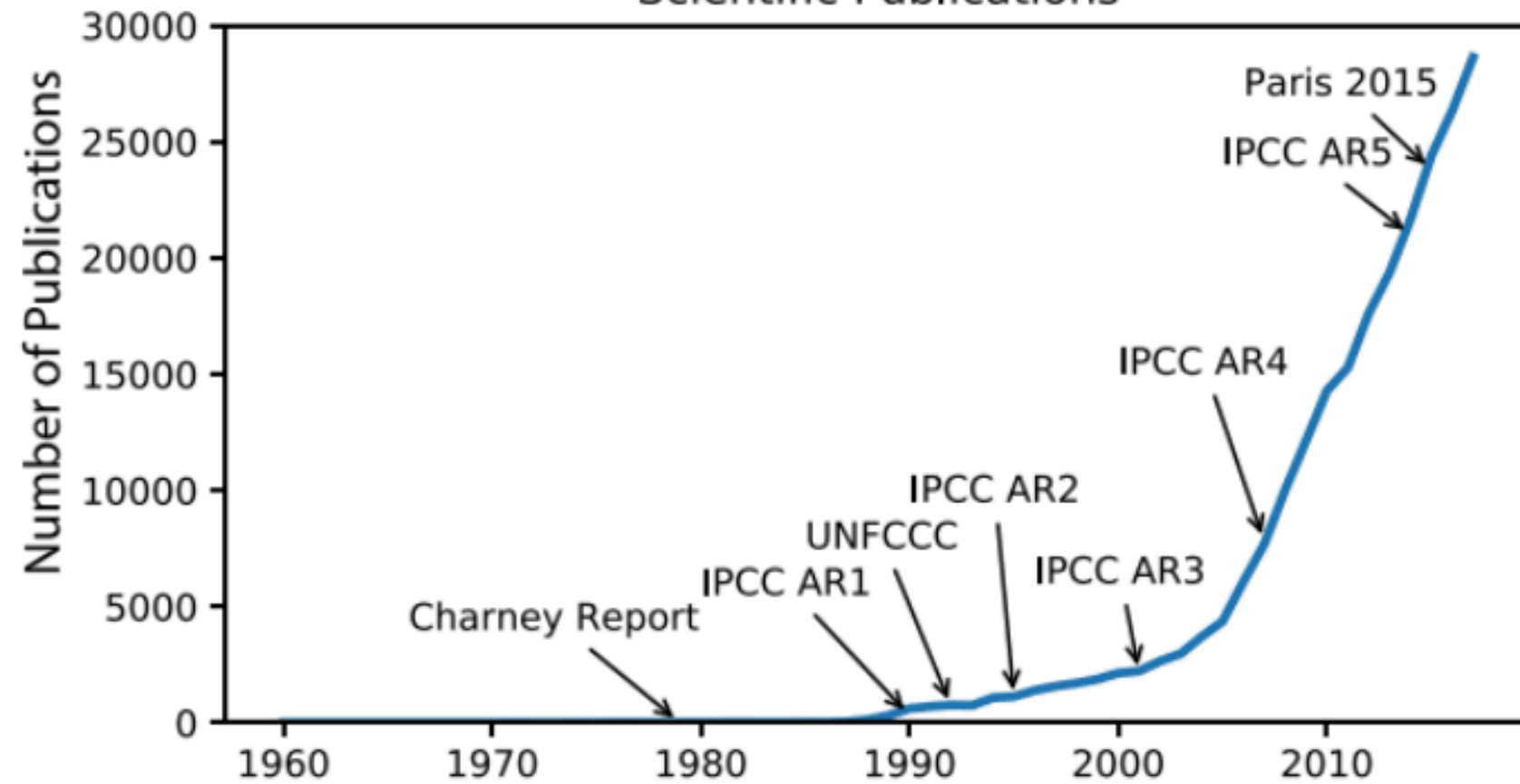
CO₂ Emissions



Temperature anomalies



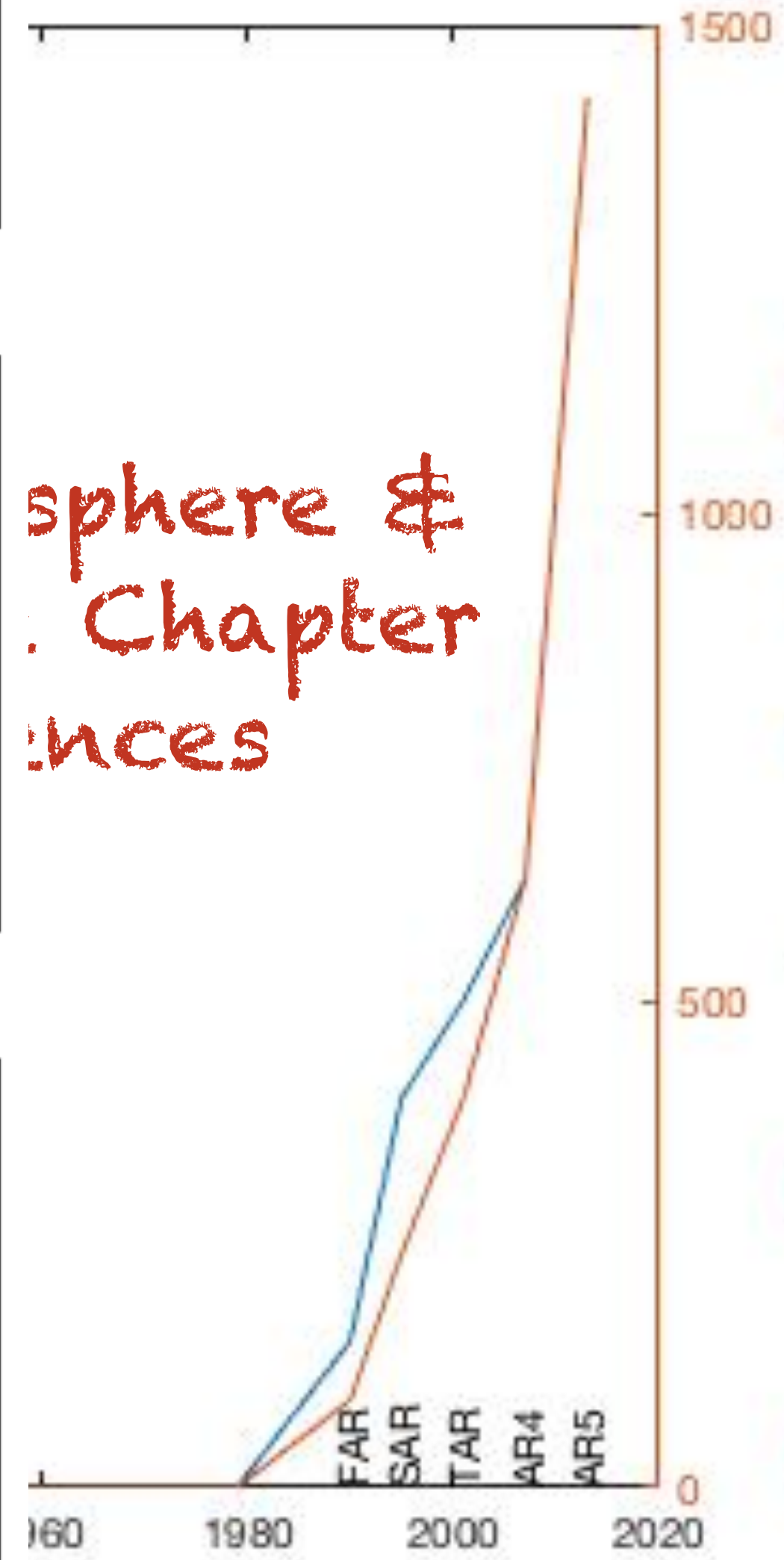
Scientific Publications



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sphere &
Chapter
ances

Ocean, Cryosphere, Sea Level References



If you've got an idea...

It's too late now!

The AR6 acceptance
deadline was 1/31/21

The Rodney & Otamatea Times

WAITEMATA & KAIPARA GAZETTE.

PRICE—10s per annum in advance

WARKWORTH, WEDNESDAY, AUGUST 14, 1912.

3d per Copy.

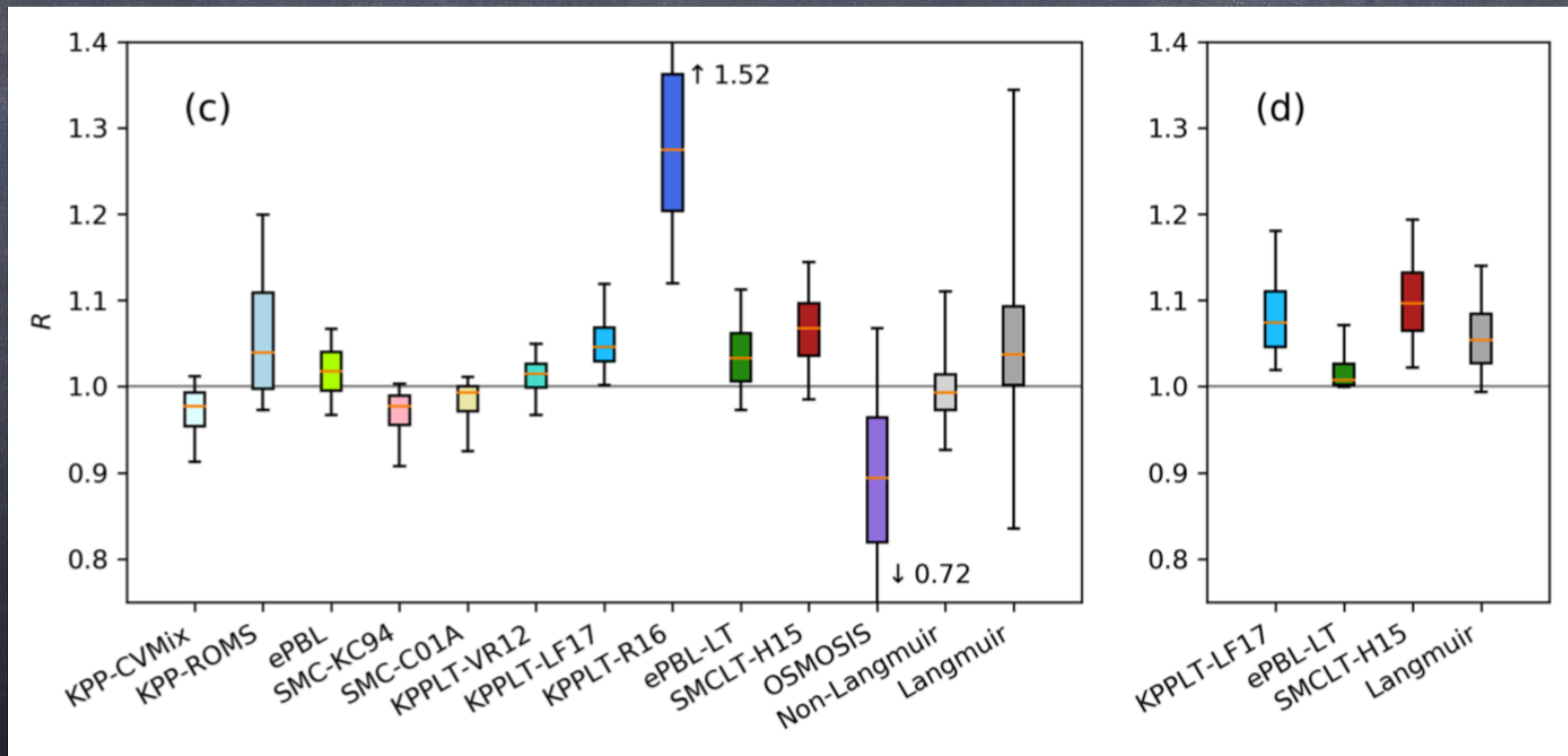
Science Notes and News.

COAL CONSUMPTION AFFECT- ING CLIMATE.

The furnaces of the world are now burning about 2,000,000,000 tons of coal a year. When this is burned, uniting with oxygen, it adds about 7,000,000,000 tons of carbon dioxide to the atmosphere yearly. This tends to make the air a more effective blanket for the earth and to raise its temperature. The effect may be considerable in a few centuries.

Models and Processes

To the extent possible, we build climate models from first principle understanding of the earth system, not from statistical modeling of past observations. Like the stock market—past performance is not indicative of future results because the climate is changing.



Grasping at straws?

Li et al., 2019

AR6 Structure

- Global Chapters (1-4)
- Process Chapters (5-9)
- Regional Chapters (10-12) & Atlas

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& Atlas

What Can OMWG Do to Elevate Process in Assessment?

- Use the DECK simulations & scenarios as a testbed, not a near-neighbor of your own design
- Develop & share diagnostics, so that multiple studies can be synthesized
- Use ensembles and multimodel ensembles to establish signal vs. noise/internal variability
- Address consequences in, e.g.,
 - ECVs: ESSENTIAL CLIMATE VARIABLES

Concepts and Terminology for Sea Level: Mean, Variability and Change, Both Local and Global

Jonathan M. Gregory^{1,2}  · Stephen M. Griffies³ · Chris W. Hughes⁴ · Jason A. Lowe^{2,14} · John A. Church⁵ · Ichiro Fukimori⁶ · Natalya Gomez⁷ · Robert E. Kopp⁸ · Felix Landerer⁶ · Gonéri Le Cozannet⁹ · Rui M. Ponte¹⁰ · Detlef Stammer¹¹ · Mark E. Tamisiea¹² · Roderik S. W. van de Wal¹³

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Geosci. Model Dev., 9, 3231–3296, 2016
www.geosci-model-dev.net/9/3231/2016/
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Geoscientific
Model Development
Open Access


Critically Important

Get the metrics right
And get them clear
And consistent

OMIP contribution to CMIP6: experimental and diagnostic protocol for the physical component of the Ocean Model Intercomparison Project

Stephen M. Griffies¹, Gokhan Danabasoglu², Paul J. Durack³, Alistair J. Adcroft¹, V. Balaji¹, Claus W. Böning⁴, Eric P. Chassignet⁵, Enrique Curchitser⁶, Julie Deshayes⁷, Helge Drange⁸, Baylor Fox-Kemper⁹, Peter J. Gleckler³, Jonathan M. Gregory¹⁰, Helmuth Haak¹¹, Robert W. Hallberg¹, Patrick Heimbach¹², Helene T. Hewitt¹³, David M. Holland¹⁴, Tatiana Ilyina¹¹, Johann H. Jungclaus¹¹, Yoshiaki Komuro¹⁵, John P. Krasting¹, William G. Large², Simon J. Marsland¹⁶, Simona Masina¹⁷, Trevor J. McDougall¹⁸, A. J. George Nurser¹⁹, James C. Orr²⁰, Anna Pirani²¹, Fangli Qiao²², Ronald J. Stouffer¹, Karl E. Taylor³, Anne Marie Treguier²³, Hiroyuki Tsujino²⁴, Petteri Uotila²⁵, Maria Valdivieso²⁶, Qiang Wang²⁷, Michael Winton¹, and Stephen G. Yeager²

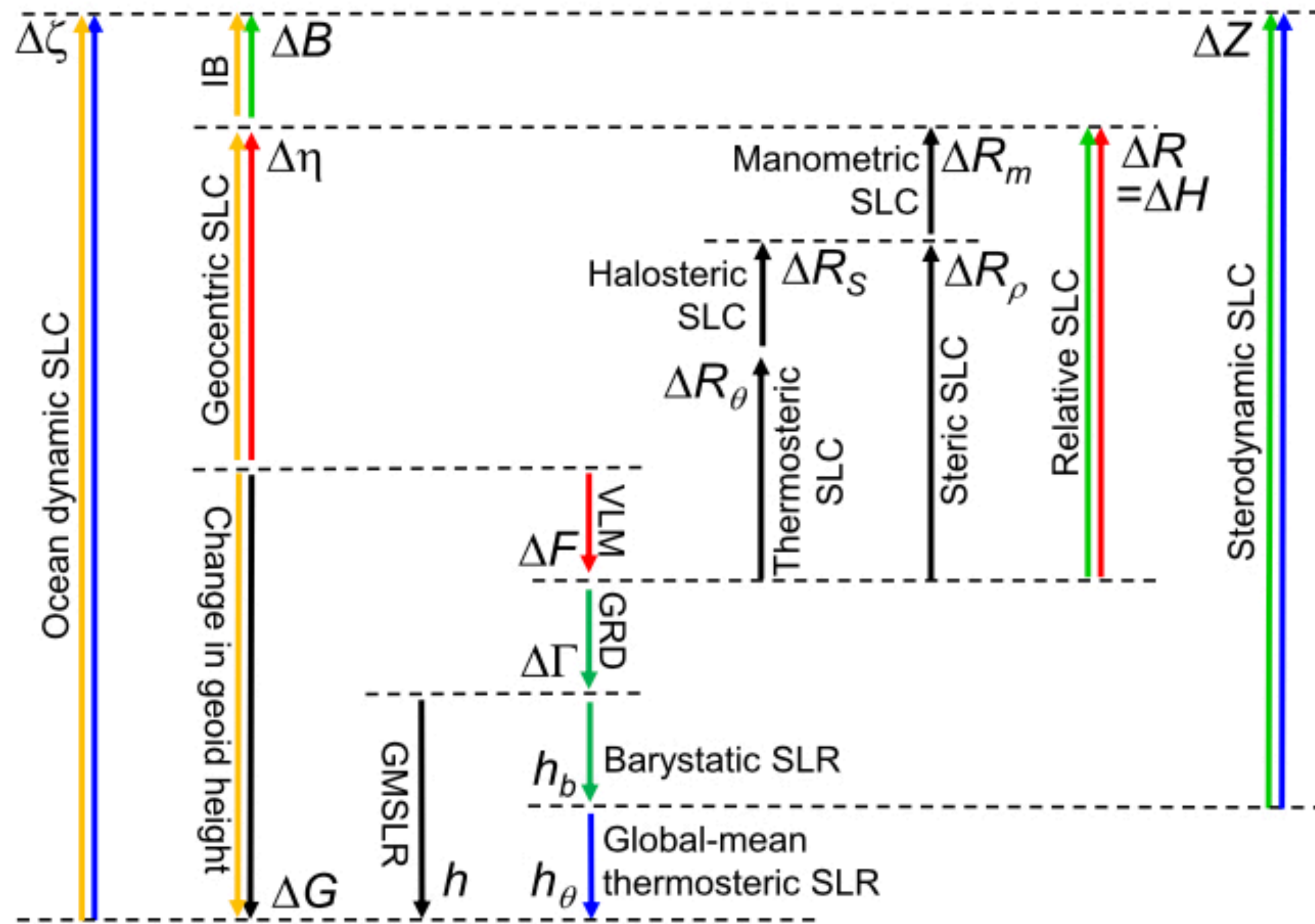


Fig. 3 Relationships between quantities, defined in Sect. 5, that determine changes in sea level. The lengths

MIPs are really valuable, but...

- They come very late in the game on the present schedule, because
- Many of the MIPs build on *completion* of the scenarios.
- But forcing delays, coding delays, tuning, machine downtime, etc., mean they start late.

Some Ocean & Cryo studies
that would've been nice to
have ...

- More extended runs beyond 2100
- More coupled ice sheet-AOGCM runs
- More on impacts of ocean-cryo interactions in ECVs
- More on impacts of parameterizations/numerics/
resolution on ECVs

Questions? Comments?

- The AR6 approval session is late this summer
- The expert review phases are mostly complete
- The literature acceptance date is past

- COVID has made everything harder