



Regional Sea Level Change and Coastal Impacts Grand Challenge

43rd Session of the WCRP Joint Scientific Committee

David Behar, Co-Chair and Climate Program Director, San Francisco Public Utilities Commission

June 27, 2022

Online



Structure and organization



Robert Nicholls



Roderik van deWal



David Behar



Kathy McInnes

WP1: An integrated approach to paleo time scale sea level estimates

WP2: Quantifying the contribution of land ice to near-future sea level rise

WP3: Causes for contemporary regional sea level variability and change

WP4: Projections of regional sea level

WP5: Sea level science for coastal zone management

WP6: Sea level budget

N Gomez, M Tamisea, T James

S Nowicki, H Goelzer, B Otto-Bliesner, B Marzeion

R Ponte, B Meyssignac, M Marcos, B Hamlington

A Slangen, M Palmer

J. Hinkel J Lowe D. Behar, K. McInnes

A Cazenave, B Meyssignac, J Chen, M Horwarth

Progress and achievements

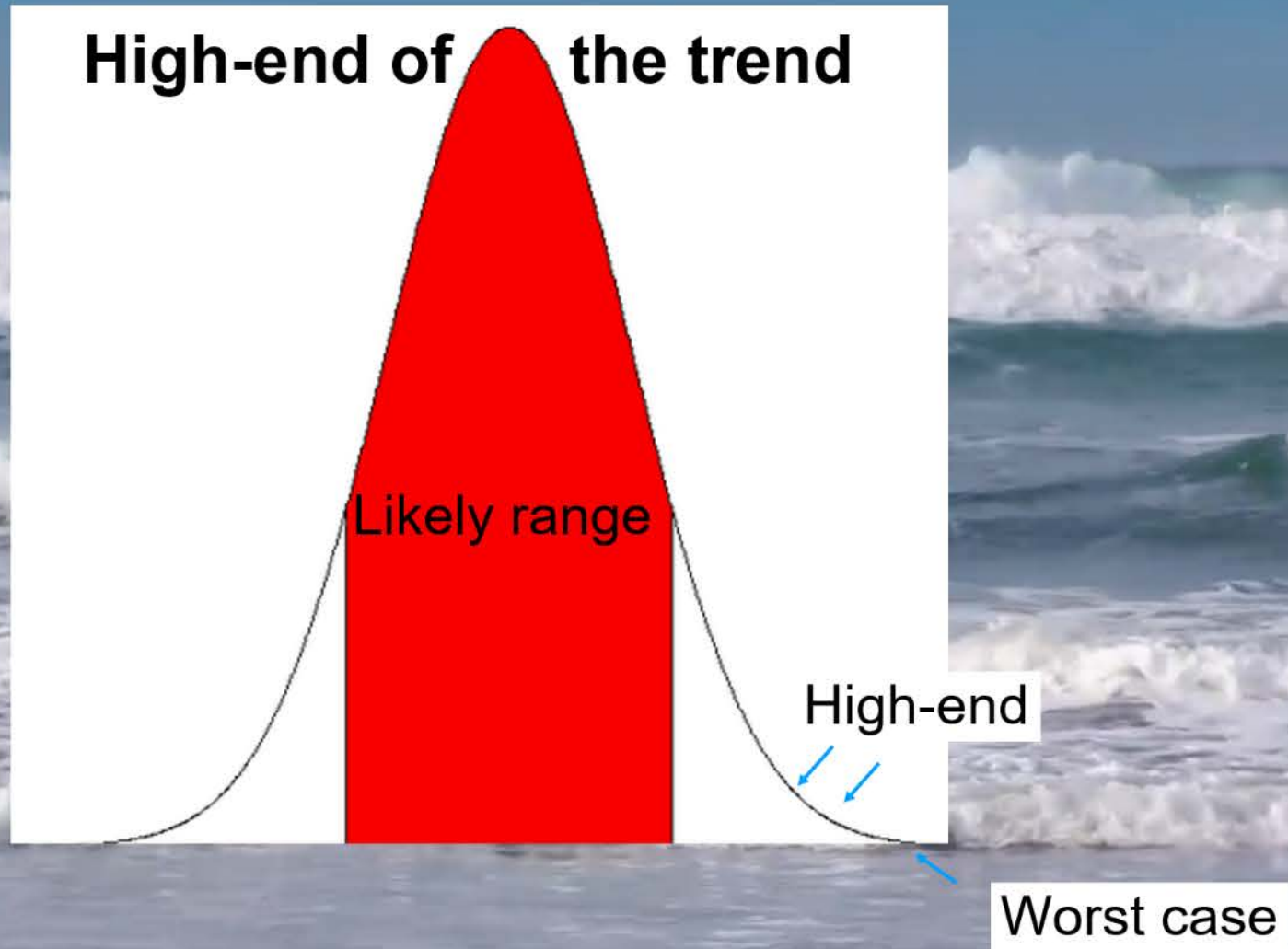
- Special Issue on ‘Coastal Climate Services’ in *Frontiers in Marine Science*, comprising 16 papers (2021) – based on a conference held at BGRM, Orleans
<https://www.frontiersin.org/research-topics/13632/climate-services-for-adaptation-to-sea-level-rise>
- A high-end estimate of sea-level rise for practitioners (2022) – a community approach which is in review *Earth’s Future*
- Assessment of subsidence for practitioners in *Nature Climate Change* (2021)
- Global survey of sea-level rise scenarios in practise (2022) – under review, *Communications Earth & Environment*
- Practitioner workshops on sea-level science and its use – being developed for publication and preparation for Sea Level (2022)
- Singapore Conference: Sea Level 2022, 12-16 July 2022 (closure of the Grand Challenge)



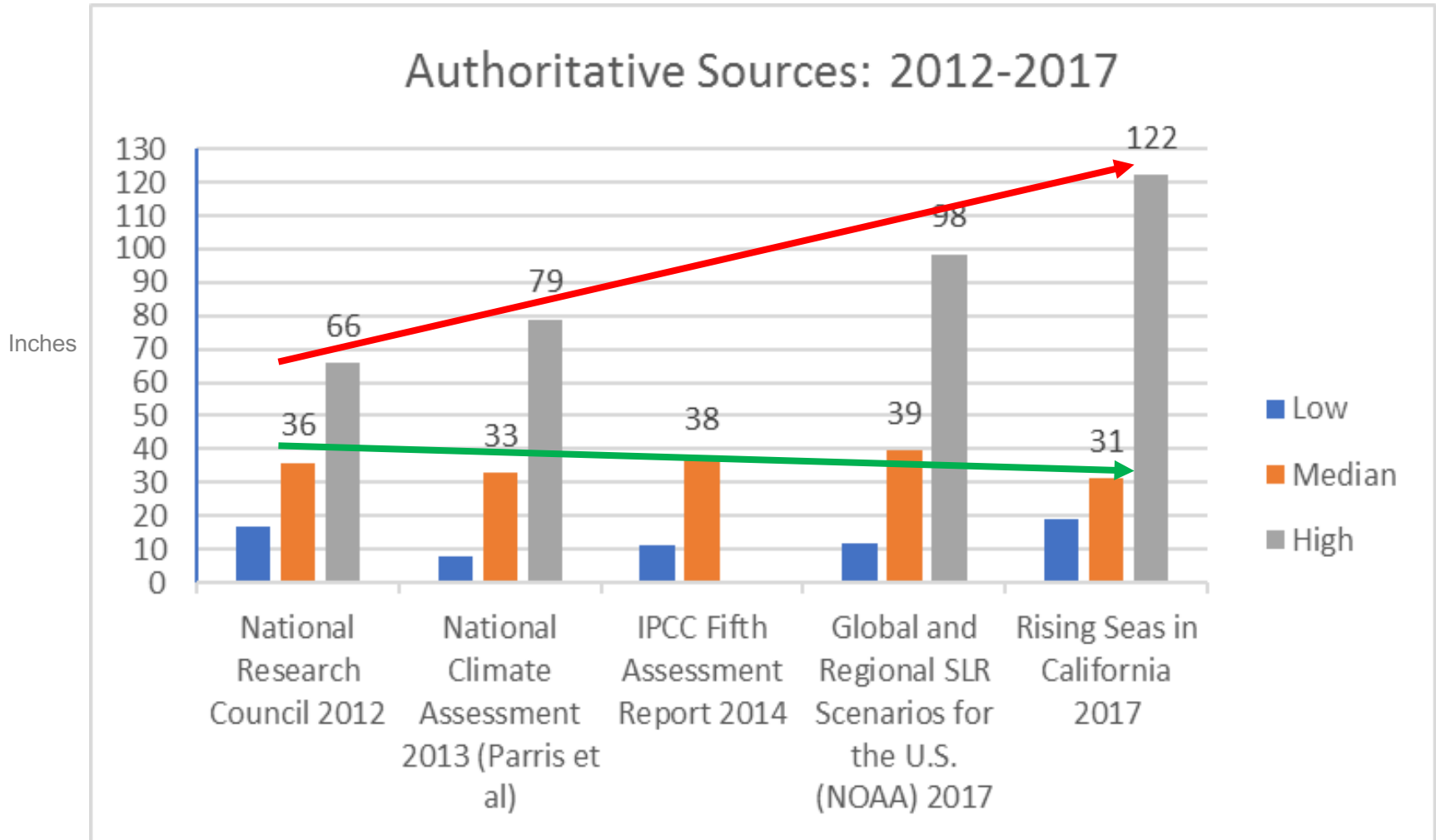
International
Science Council



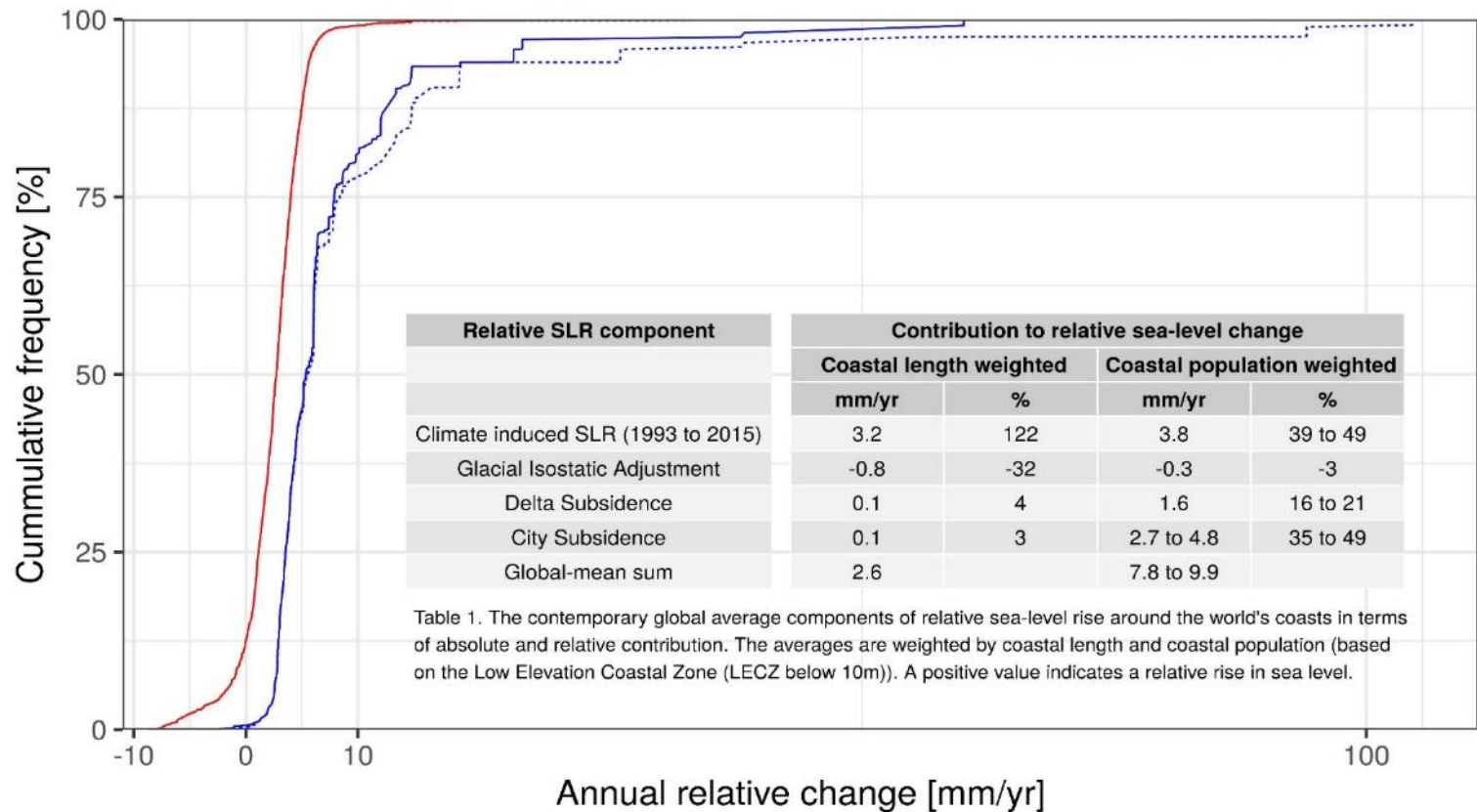
A high-end estimate of sea-level rise for practitioners



Trends: Median vs. High End Projections



Global Effects of Subsidence: Length-Weighted vs Population Weighted Relative Sea-Level Rise



— Coastal relative sea level — Population weighted coastal relative sea level
 — lower estimate - - - upper estimate

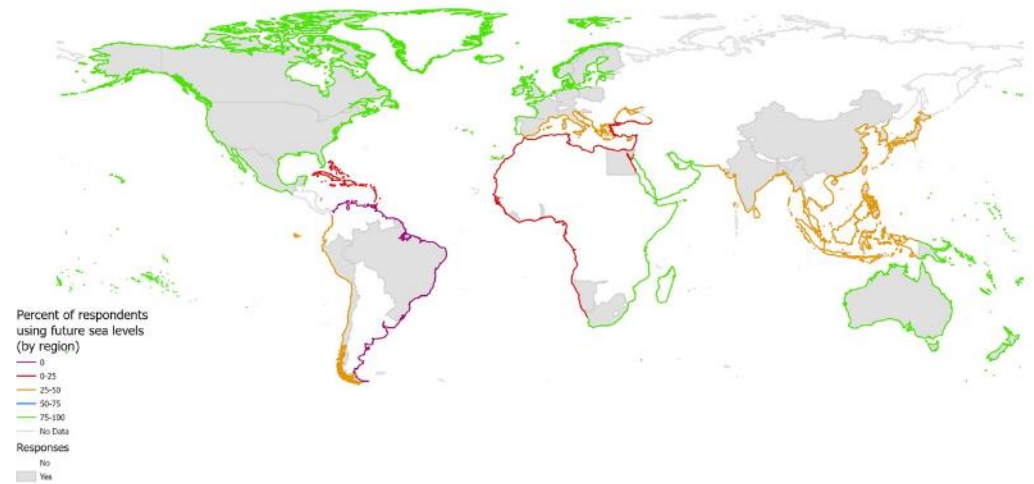
Source: Nicholls et al 2021,
Nature Climate Change

Survey on sea-level rise scenarios in practice

Surveying practitioners who use sea-level rise information on current practise:

- What scenarios do they use?
- Where does this knowledge come from?
- What improvements would they like?

More than 300 questionnaires completed across the world. Paper in prep and presentation at Singapore



Percent of respondents by coastal region who are using sea-level rise in coastal planning processes and the countries (in grey) that provided responses (Hirschfield et al., in prep)

A Practitioner-led Workshop to Advance Resilience to Sea Level Rise: Leading Practices and Current Challenges

February 14, 15, 16

Africa, Caribbean, Central America, Europe, Middle East,
North America, South America

February 22, 23, 24

Asia, Oceania, Pacific Islands



WCRP Sea Level 2022 Conference: Advancing Science, Connecting Society

Hosted by



Supported by



WCRP SEA LEVEL CONFERENCE

12 - 16 July 2022 | Singapore



WCRP Sea Level 2022 Conference

Singapore, 12-16 July 2022

- Major support from Singapore Government, WCRP. Asian Development Bank, US CLIVAR and others
- 169 abstracts submitted --> 21 invited talks; 32 orals; 114 posters
- Mixture of Keynotes, Talks and Posters (Final timetable to be decided)
- Daily themes:
 - ✓ Day 1: Opening and Scene-Setting
 - ✓ Day 2: Paleo Sea Level and GIA/ Contribution of Land Ice to Future Sea Level Rise
 - ✓ Day 3: Practitioner Day/ Adaptation/ Practitioner Needs from Science
 - ✓ Day 4: Sea Level Budget, Regional Sea Level and Sea Level Variability
 - ✓ Day 5: Sea Level Projections/ Prognosis and Next Steps



Sea Level 2022 Conference

Programme at a Glance (www.sealevelconference.org)

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
	INTRODUCTION TO THE CONFERENCE	RISKS AND ADAPTATION	PRACTITIONER PERSPECTIVES ON SEA-LEVEL SCIENCE	COASTAL SEA LEVEL VARIABILITY	COASTAL SEA LEVEL VARIABILITY PROGRESS AND CHALLENGES FOR REGIONAL SEA LEVEL, INCLUDING PROJECTIONS AND APPLICATIONS
AM	Opening	PLENARY ORAL SESSION	PANEL 1: The Use of Science and Science Translation in Planning	PLENARY ORAL SESSION	PLENARY ORAL SESSION
	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK
	PLENARY ORAL SESSION State of the Art from Science (Part 1)	POSTER SESSION	PANEL 2: Surveying the Leading Edge: Adaptation Action	POSTER SESSION	PLENARY ORAL SESSION The Way Forward: Next Steps in SLR Science over the Critical Decade
					PLENARY ORAL SESSION The Way Forward: Next Steps in Transforming SLR Science Information to Practitioners
	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
PM	PLENARY ORAL SESSION State of the Art from Science (Part 2)	PLENARY ORAL SESSION Paleo Sea-Level and Glacial Isostatic Adjustment	PANEL 3: Typologies in Adaptation Practice: Island and Delta Contexts	PLENARY SESSION Quantifying The Contribution of Land Ice to Near-Future Sea-Level Rise and Sea-Level Budget	
	PLENARY ORAL SESSION State of the Art from Stakeholders: Adaptation Leading Practices				
	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	
	PLENARY ORAL SESSION Southeast Asian Perspective - Examples From Work in Singapore And Southeast Asia	POSTER SESSION	PANEL 4: Typologies in Adaptation Practice: Large Cities	POSTER SESSION	



1700 - 1730	<p>INVITED TALK</p> <p>WCRP Safe Landing Climates Lighthouse Activity and Sea Level Bette OTTO-BLIESNER Senior Scientist, National Center for Atmospheric Research</p>
1730 - 1800	<p>INVITED TALK</p> <p>WCRP Regional Information for Society Bruce Hewitson, Climate System Analysis</p>

Instruction to practitioner participants:

Speak to the scientists present,
enter their world and link it to your own,
as they have invited you to do in Singapore:

*As the science enterprise advances over the next decade,
how could that enterprise, and its products,
best help you address the threat of sea level rise and flooding
and create resilience for your communities?*



Practitioner Day (July 14)

Panel 1: The use of Science and Science Translation in Planning (Moderator: Angelique Melet)

Gordon Smith, Director of Planning, Province of Nova Scotia, Canada

Abby Sullivan, Senior Advisor for Climate Science and Risk Communication, City of Philadelphia, USA

Adam Parris, Senior Consultant – Climate Planning, ICF International, New York, USA

Panel Roundtable: What can WCRP do to assist adaptation planners?

Question and Answer with Audience

Panel 2: Surveying the Leading Edge: Adaptation Action (Moderator: Jochen Hinkel)

Thao Nguyen Danh, Vice President, Ho Chi Minh City University, Vietnam

Katherine Hagemann, Resilience Program Manager for Adaptation, Miami-Dade County, USA

Dilip Trivedi, Vice President, Moffat and Nichol, San Francisco, USA

Adam Robinson, Project Director, Boston Barrier, Environment Agency, United Kingdom

Panel Roundtable: How can the science enterprise best support your work planning community resilience?

Question and Answer with Audience



Practitioner Day (continued)

Panel 3: Typologies in Adaptation Practice: Islands Context (Moderator: Violet Wulf Saena)

Erin Derrington, Office of Planning, Commonwealth of the Northern Mariana Islands, USA

Luteru Agaali'i Tuvale, Director of Meteorology, Samoa

Laurice Jamero, Manila Observatory

Amon Martin, Assets and Planning Manager, Thames-Coromandel District Council, New Zealand

Panel Roundtable: How can the science enterprise best support your work planning community resilience?

Question and Answer with Audience

Panel 4: Typologies in Adaptation Practice: Large Cities (Moderator: Chan Eng Soon)

Felipe Cerbella Mandarino, City Information Coordinator, Rio de Janeiro, Brazil

Zahirul Hacque Khan, Institute of Water Modeling, Bangladesh

Karen Partington, Environmental Services Manager, City of Lake Macquarie, Australia

Chai Teck Ho, Deputy Director, Public Utilities Board, Singapore

Panel Roundtable: How can the science enterprise best support your work planning community resilience?

Question and Answer with Audience



Future plans

- SL GC to sunset in 2022.
- Continue its legacy through:
 - ✓ Possible connection to RfS with their experience in connecting with the user community;
 - ✓ Possible connection to Safe Landing Climate (SLC) and My Climate Risk (MCR) LHA, through:
 - 1) Sea Level WP & Safe Landing Pathways WP of SLC LHA
 - 2) A possible Sea Level Risk Hub under MCR LHA
 - 3) Interactions with newly formed SLR “Community of Practice
- Invite representatives from RfS, MCR and SLC to attend the Sea Level Conference in Singapore.

Emerging issues

Please let the JSC know of any emerging issues or problems that require action or the JSC to be aware of



Additional Slides



2017 Sea Level Conference New York

Eos Science News by AGU

SIGN UP FOR NEWSLETTER

ABOUT SPECIAL REPORTS TOPICS PROJECTS NEWSLETTER SUBMIT TO EOS

Sea Level 2017 Conference Looks to Coastal Sea Level Rise Impact

International World Climate Research Programme/Intergovernmental Oceanographic Commission (WCRP/IOC) Open Science Conference on Regional Sea Level Rise and Its Impacts; New York, New York, 10–14 July 2017

By D. Stammer, R. van de Wal, and R. J. Nicholls 5 January 2018



Sea level rise caused by climate change increases flooding hazards, as seen here at Assateague Island National Seashore, a protected area on a long barrier island off the coast of Maryland and Virginia, in the aftermath of Hurricane Sandy. Last summer, scientists met to showcase major advances in sea level research and address information needs for resilient ecosystems. Credit: U.S. National Park Service (public domain)



Summer courses

- FIO-WCRP Agreement (2018.1-2023.1): to host a CLIVAR-FIO Summer School on even years, beginning in 2018.



1st CLIVAR-FIO Summer School on Past, Present and Future Sea Level Changes. June 2018

Instructions

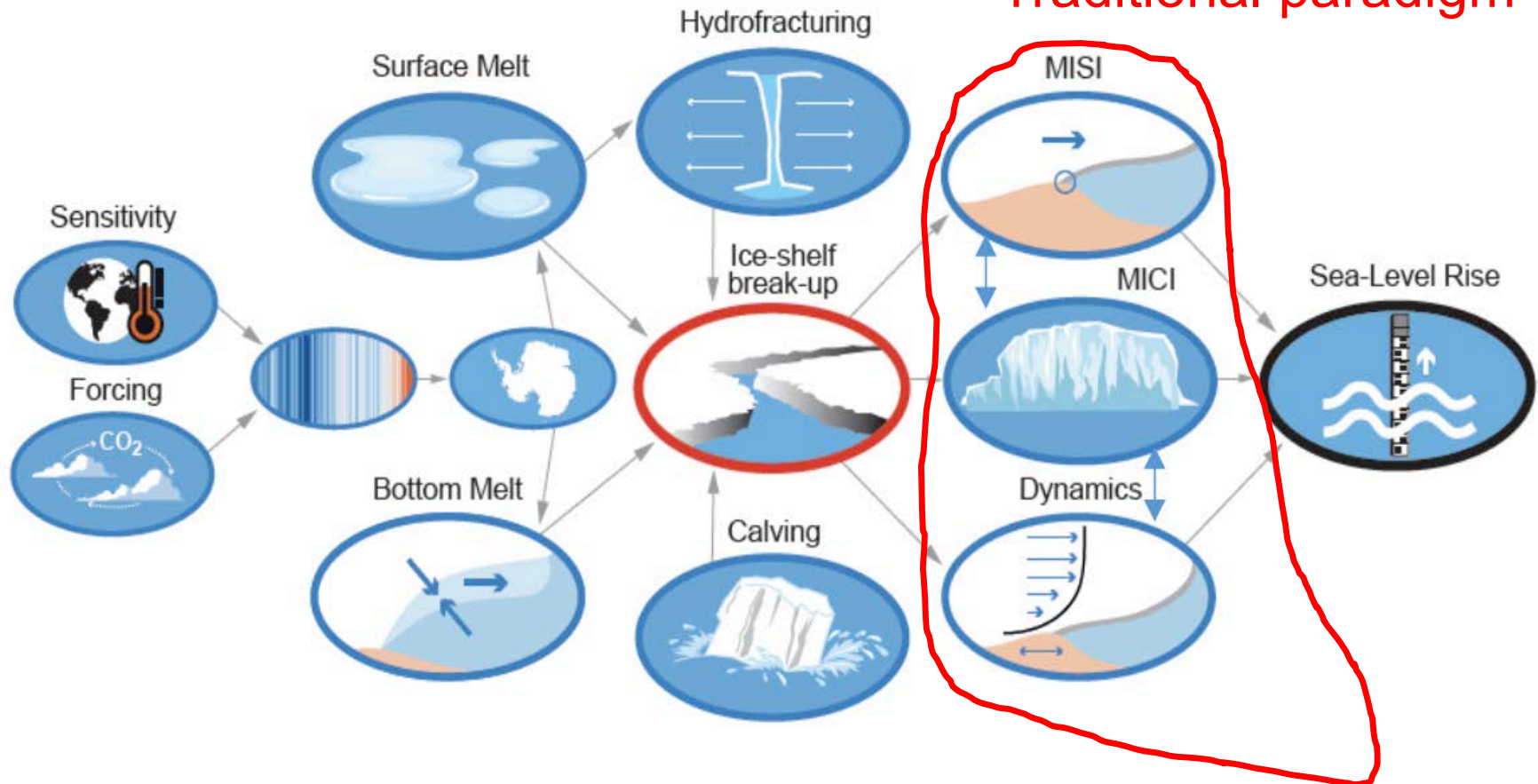
In order to assist our discussions at the JSC Session this year, we have put together a template for your presentations. If you prefer your own template, please feel free to use it and copy over the slide outlines. You are encouraged to add your own image at the top in place of the default.

- As a guideline, the main presentation content needs to contain:
 - Progress and achievements over the last year
 - Future plans (see specifics in the example slide)
 - Any emerging issues requiring the attention of the JSC
- At the end of your presentation please leave the slide on emerging issues visible to facilitate discussion. Introduction and thank you slides are not necessary.
- Additional slides in support any of the main slides can be added at the end of the presentation for reference.
- Unless otherwise requested, all presentations will be made available on the WCRP website prior to the meeting
- Please email your presentation to mssparrow@wmo.int in advance of the meeting (Deadline: June 14, 2022)

Antarctica High End

Physical understanding limited

Traditional paradigm



Source: Van de Wal et al.,
submitted, Earths Future