Towards a Sea Level Rise Prediction System from Days to Decades

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Towards a Flood Risk Prediction System from Days to Decades

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Ocean Eddy Resolving Coupled Predictability and Prediction

• **CESM**
  – Atmosphere: 0.5x0.5
  – Ocean: 0.1x0.1 [HRC] vs. 1x1 [LRC]

• **Newly Resolved Sub-Seasonal-to-Decadal Variability**
  – Air-Sea Feedbacks: Who is Forcing Who
  – Predictability (Decadal) – and Prediction
    • SEUS Rainfall, SST and SSH
  – Prediction (Sub-Seasonal to Inter-Annual)
Rainfall: HRC, and LRC

Rainfall: Observational Estimate
Natural Decadal Variability

SODA SSTa ST-EOF Extreme

OBS

GBR - 10yr

CHR - 8.3yr

HRC

GBR - 8.5yr

CHR - 7yr

LR SSTa ST-EOF Extreme (3yr)

LRC

HighRes

LowRes

Power

30 yr

5 yr

1 y

Frequency (year^-1)

HR EEOF1 Lag 0 OHCa

correlation

-0.8

0.8
CMIP5 Class Resolution (1 Degree):  
Ocean Eddy Resolving (0.1 Degree)!
Natural Decadal Variability
Greenland Ice Melt: Water Hosing Experiments
Cummulative contributions to sea level rise at Key West, Florida

- Ocean Circulation
- Ice Melt
- Thermal Expansion
- Vertical Land Movement
Individual contributions to sea level rise at Key West, Florida

- Terrestrial Water
- Vertical Land Movement
- Thermal Expansion
- Ice Melt
- Ocean Circulation
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LR and HR Simulated COLD WSSA Events
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Composite HR-LR Retrospective Forecasts
Days 15-25

Ics: 1 Jan 1985, 99, 00
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