Tuesday, August 8

08:00	Welcome	Mike Patterson (US CLIVAR), Sonya Legg (Princeton U.)
08:25	International CLIVAR	Annalisa Bracco (Georgia Tech)
08:50	Agency manager engagement	Eric Lindstrom (NASA), Sandy Lucas (NOAA), Eric Itsweire (NSF), Renu Joseph (DOE)
09:30	Break	
10:00	Special session: Advances & challenges in understanding & predicting climate teleconnections	
10:00	Introduction	Emanuele Di Lorenzo (Georgia Tech), Dan Vimont (U. Wisconsin)
10:05	High-latitude teleconnection to tropical mean climate: Observations vs. mdoels	Alyssa Atwood (Georgia Tech/U. California-Berkeley)
10:25	Teleconnections & regional impacts under anthropogenic forcing	Daniel Swain (U. California-Los Angeles)
10:45	ENSO diversity, teleconnections and impacts	Antonietta Capotondi (NOAA Earth System Research Lab.)
11:05	Methods to quantify uncertainty in coupled climate models teleconnections	Samantha Stevenson (NCAR)
11:25	Facilitated discussion	
12:00	Lunch	
13:15	Panel breakout sessions (see Panel agendas below)	
15:15	Break	
15:30	Panel breakout sessions (see Panel agenda below)	
17:00	Break	
17:45	Special session: Polar ocean & sea ice interactions	
17:45	Introduction	Sonya Legg (Princeton U.)
17:50	Recent changes in Arctic sea ice and ocean circulation	Ron Kwok (NASA Jet Propulsion Lab.)
18:10	An Arctic Ocean in transition	Julienne Stroeve (U. College London/ National Snow and Ice Data Center)
18:30	Improving our understanding of Antarctic sea ice with NASA's Operation IceBridge and upcoming ICESat-2 mission	Alek Petty (U. Maryland/NASA Goddard Space Flight Center)
18:50	What processes drive Southern Ocean sea ice variability and trends?	Aaron Donohoe (U. Washington)
19:10	Facilitated discussion	
19:45	Adjourn	

Wednesday, August 9

07:30	Check-in/Breakfast	
08:00	Plenary Session: Coupled data assimilation & reanalysis	
08:00	Introduction	Tony Lee (NASA Jet Propulsion Lab.)
08:05	What we need from observations and modelers to make coupled data assimilation the new standard for prediction and reanalysis	Steve Penny (U. Maryland/NOAA National Centers for Environmental Prediction)
08:35	Facilitated discussion	
09:45	Break	
10:00	Panel breakout sessions (see Panel agenda below)	
12:00	Lunch	
13:30	Panel breakout sessions (see Panel agenda below)	
15:15	Break	
15:30	Panel breakout sessions (see Panel agenda below)	
17:30	Adjourn	

Thursday, August 10

07:30	Check-in/Breakfast	
08:00	Panel breakout sessions (see Panel agenda below)	
10:00	Break	
10:30	Panel breakout reports (20 mins/each)	Panel co-chairs
11:30	Conclusions and next steps	Sonya Legg (Princeton U.)
12:00	Summit adjourns	
12:15	SSC Post-Summit Meeting	
1:45	SSC meeting adjourns	

POS Panel Breakout Session
Tuesday, August 8

13:15	POS Panel business • Summary of POS and past year's accomplishments • Introductions of new and existing panel members • Overview of agenda and discussions	Renellys Perez (U. Miami/NOAA AOML), Emanuele Di Lorenzo (Georgia Tech)
14:00	Teleconnections	Co-chairs: Emanuele Di Lorenzo (Georgia Tech), Samantha Stevenson (NCAR)
14:00	Recent observed changes or insights in teleconnection dynamics	Alyssa Atwood (Georgia Tech/U. California-Berkeley)
14:20	Advancing the representation of teleconnections in climate models	Samantha Stevenson (NCAR)
14:40	Discussion	
15:15	Break	
15:30	Observational and synthesis requirements for characterizing contemporary sea level rise and predictability ***Joint POS and PPAI Session***	Co-chairs: Aneesh Subramanian (Scripps), Shane Elipot (U. Miami), John Nielsen-Gammon (Texas A&M)
15:30	Reports from the WCRP/IOC sea level 2017 conference	Nadya Vinogradova (Cambridge Climate Institute)
15:50	Global perspective	Eric Leuliette (NOAA NESDIS)
16:10	Regional and coastal perspective	Mark Merrifield (U. Hawaii)
16:30	Stakeholder perspective	Matt Campo (Rutgers U.)
16:50	Discussion	
17:00	Break	

Wednesday, August 9

10:00	High-latitude circulation, ocean-sea ice interface ***Joint POS & PSMI Session***	Co-chairs: Jamie Morison (U. Washington), Janet Sprintall (Scripps)
10:00	Southern Ocean SOCCOM review	Alison Gray (U. Washington)
10:15	Biogeochemistry in the Southern Ocean	Taka Ito (Georgia Tech)
10:30	Arctic Ocean effects on global climate	Jamie Morison (U. Washington)
10:45	Discussion	
11:00	Atlantic Meridional Overturning Circulation ***Joint POS & PSMI Session***	Co-chairs: Renellys Perez (U. Miami/NOAA AOML), Greg Foltz (NOAA AOML), Victoria Coles (U. Maryland)
11:00	What we've learned from the AMOC observational network about AMOC processes and its role in weather and climate	Shane Elipot (U. Miami)
11:20	What we've learned from AMOC modeling efforts about AMOC processes and its role in weather and climate	Rong Zhang (NOAA GFDL)
11:40	Discussion	

12:00	Lunch	
13:30	Health of the climate observing system, Part 1	Co-chairs: Carol Anne Clayson (WHOI), Fred Bingham (U. North Carolina-Wilmington)
13:30	Tropical ocean	Renellys Perez (U. Miami/NOAA AOML)
13:50	Subtropical ocean	Carol Anne Clayson (WHOI), Fred Bingham (U. North Carolina-Wilmington)
14:10	Polar ocean	Jamie Morison (U. Washington)
14:30	Coastal ocean	Victoria Coles (U. Maryland)
14:50	Discussion	
15:15	Break	
15:30	Health of the climate observing system, Part 2	Co-chairs: Kyla Drushka (U. Washington), Alison Macdonald (WHOI)
15:30	Atmospheric, troposphere/stratosphere interactions	Yolande Serra (U. Washington)
15:50	Air-sea interface from satellite observations	Kyla Drushka (U. Washington), Carol Anne Clayson (WHOI)
16:10	Surface mixed layer and upper ocean	Greg Foltz (NOAA AOML)
16:30	Intermediate and deep ocean	Gregory Johnson (NOAA PMEL)
16:50	Discussion	
17:30	Break	

Thursday, August 10

08:00	POS Panel business (recap & future directions) • Discussion of important themes from the breakout sessions • Identify recommendations and actions items for the next year	Co-chairs: Renelys Perez (U. Miami/NOAA AOML), Emanuele Di Lorenzo (Georgia Tech)
10:00	Break (return to plenary)	

PSMI Panel Breakout Sessions
Tuesday, August 8

13:15	PSMI Panel business	Kris Karnauskas (U. Colorado-Boulder), Maria Flatau (Naval Research Lab.)
14:00	Teleconnections ***Joint PSMI & PPAI session***	Co-chairs: Kris Karnauskas (U. Colorado-Boulder), Simon Wang (Utah State U.), Muyin Wang (U. Washington/NOAA PMEL)
14:00	Summary of Arctic-Midlatitude workshop/white paper	Judah Cohen (AER)
14:15	Discussion	
14:25	Global warming influence on extreme events	Daniel Swain (U. California-Los Angeles)
14:33	Tropical impact - ENSO signature	Antonietta Capotondi (NOAA ESRL)
14:40	Discussion	
15:15	Break	
15:30	PSMI Panel business	Kris Karnauskas (U. Colorado-Boulder), Maria Flatau (Naval Research Lab.)
17:00	Break	

Wednesday, August 9

10:00	High-latitude circulation, ocean-sea ice interface ***Joint POS & PSMI session (see POS agenda for details)***	Co-chairs: Jamie Morison (U. Washington), Janet Sprintall (Scripps)
11:00	Atlantic Meridional Overturning Circulation ***Joint POS & PSMI session (see POS agenda for details)***	Co-chairs: Renellys Perez (U. Miami/NOAA AOML), Greg Foltz (NOAA AOML), Victoria Coles (U. Maryland)
12:00	Lunch	
13:30	Tropical Pacific Observing Systems (TPOS) 2020	Co-chairs: Kris Karnauska (U. Colorado-Boulder), Maria Flatau (Naval Research Lab.)
13:30	TPOS2020 and process studies	Billy Kessler (NOAA PMEL)
14:00	Discussion	
15:15	Break	
15:30	Decadal variability: 5-year-ahead scale for water and other sectors ***Joint PSMI & PPAI session***	Co-chairs: Rob Burgman (Florida International U.), Kevin Reed (Stony Brook U.)
15:30	Decadal climate prediction in CMIP6	Rob Burgman (Florida International U.)
15:45	Decadal variability and potential predictability in the Atlantic	Rong Zhang (NOAA GFDL)
16:00	Pacific decadal variability	Emanuele Di Lorenzo (Georgia Tech)
16:15	High-resolution climate modeling: A tool to study extreme weather on decadal timescales	Kevin Reed (Stony Brook U.)
16:30	The role of ocean eddies in decadal predictability in the North Atlantic	Ben Kirtman (U. Miami)

16:45	Towards the application of decadal climate predictions in water management	Erin Towler (NCAR)
17:00	Discussion	
17:30	Break	

Thursday, August 10

08:00	Stratosphere	Chair: Maria Flatua (Naval Research Lab.)
08:00	Introduction	Maria Flatau (Naval Research Lab.)
08:05	Using the stratosphere for extended range prediction	John McCormack (Naval Research Lab.)
08:35	Stratospheric observations, processes, and reanalysis	Craig Long (NOAA CPC)
09:05	Discussion	
09:30	Panel wrap-up	Kris Karnauska (U. Colorado-Boulder), Maria Flatau (Naval Research Lab.)
10:00	Break (return to plenary)	

PPAI Panel Breakout Session
Tuesday, August 8

13:15	PPAI Panel business	Simon Wang (Utah State U.), Emily Becker (NOAA CPC)
14:00	Teleconnections ***Joint PSMI & PPAI Session (see PSMI agenda for details)***	Co-chairs: Kris Karnauskas (U. Colorado-Boulder), Simon Wang (Utah State U.), Muyin Wang (U. Washington/NOAA PMEL)
15:15	Break	
15:30	Observational and synthesis requirements for characterizing contemporary sea level rise and predictability ***Joint POS and PPAI Session (see POS agenda for details)***	Co-chairs: Aneesh Subramanian (Scripps), Shane Elipot (U. Miami), John Nielsen-Gammon (Texas A&M)
17:00	Break	

Wednesday, August 9

10:00	Subseasonal-to-seasonal session, Part 1: extremes and predictability	Co-chairs: Chris Castro (U. Arizona), Andy Wood (NCAR)
10:00	S2S Task Force	Paul Dirmeyer (George Mason U.)
10:20	Current and future S2S modeling strategies	Surajana Saha (NOAA NCEP)
10:40	Discussion	
11:00	Statistical modeling of climate-extreme linkages	Balaji Rajagopalan (U. Colorado-Boulder)
11:20	Predictability of flooding extremes	Marty Ralph (Scripps)
11:40	Discussion	
12:00	Lunch	
13:30	Subseasonal-to-seasonal, Part 2: climate-ocean linkage with fishery and marine ecosystems	Chair: Enrique Curchitser (Rutgers U.)
13:30	Seasonal climate predictions for marine resource management: progress and challenges	Charlie Stock (NOAA GFDL)
14:15	Discussion	
15:15	Break	
15:30	Decadal variability: 5-year-ahead scale for water and other sectors ***Joint PSMI & PPAI Session (see PSMI agenda for details)***	Co-chairs: Rob Burgman (Florida International U.), Kevin Reed (Stony Brook U.)
17:30	Break	

Thursday, August 10

08:00	CMIP6 horizon	Chair: Scott Weaver (EDF)
08:00	NA-CORDEX: Overview and data availability	Chris Castro (U. Arizona)
08:15	The Vulnerability, Impacts, Adaptation, and Climate Services (VIACS) Advisory Board for CMIP6: A bridge between modeling and applications	Alex Ruane (NASA GISS)
08:30	Decadal prediction aspects of CMIP6	Rob Burgman (Florida International U.)
08:45	The half a degree additional warming, prognosis, and projected impacts (HAPPI): Background and experiment design	Scott Weaver (Environmental Defense Fund)
09:00	Discussion	
09:30	Panel wrap-up	Simon Wang (Utah State U.), Emily Becker (NOAA CPC)
10:00	Break (return to plenary)	

Agenda Addendum

Plenary Sessions

Advances & challenges in understanding & predicting climate teleconnections
Chairs: Emanuele Di Lorenzo, Dan Vimont

- Which observations and modeling approaches are required to establish robust relationship between teleconnection dynamics and changes in mean state (e.g. decadal and climate change)?
- How predictable are the impacts of teleconnections (e.g. ENSO) on regional and coastal systems (e.g. extreme events, droughts, marine heatwaves)? Are these impacts being influenced by global climate change?
- Which approaches and methods are best suited to diagnose teleconnection dynamics and impacts in climate models, and perform comparisons to observations?

Polar ocean & sea ice interactions
Chair: Sonya Legg
Rapporteur: Janet Sprintall

Broad Questions:
- How well does the existing/planned observing network capture sea-ice/ocean interactions? What observing system improvements might be needed?
- What are the important processes in sea-ice/ocean interactions? What is the relative role of atmospheric v. oceanic processes in sea-ice variability? How well are these processes understood/represented in current models? What process studies might be needed to fill gaps in our understanding?
- How does ocean/sea-ice/atmosphere interaction influence predictability of sea-ice and/or boundary layer fluxes? Which sea-ice metrics show sensitivity to ocean/ice/atmosphere interactions?

Data assimilation & reanalysis
Chair: Tony Lee
Rapporteur: Aneesh Subramanian

Broad Questions:
- What are the observational needs and gaps for coupled assimilation and the related prediction?
- What the most critical improvement needed for the forward coupled models?
- What aspects of data assimilation need to be improved for coupled assimilation?

POS Panel Breakout Sessions

Climate Teleconnections
Chairs: Emanuele Di Lorenzo, Samantha Stevenson
Rapporteur: Renellys Perez

Broad Questions:
- Which observations and modeling approaches are required to establish robust relationship between teleconnection dynamics and changes in mean state (e.g., decadal and climate change)?
- How predictable are the impacts of teleconnections (e.g., ENSO) on regional and coastal systems (e.g., extreme events, droughts, marine heatwaves)? Are these impacts being influenced by global climate change?
- Which approaches and methods are best suited to diagnose teleconnection dynamics and impacts in climate models, and perform comparisons to observations?

Expected Outcomes:
- Assessment of observations relevant to constrain teleconnections
- Understanding of model performance regarding teleconnection processes
- Recommendations on future community experiments/improvements to observational network

POS/PPAI joint session: Observational and synthesis requirements for characterizing contemporary sea level rise and predictability
Chairs: Aneesh Subramanian, Shane Elipot, John Nielsen-Gammon
Rapporteur: Samantha Stevenson

Broad Questions:
- What are the observational gaps for characterizing global, regional, and coastal contemporary sea level rise?
- What are the lesser known dynamical processes affecting global and regional sea level? How do these processes affect our ability to model and predict global and regional sea level rise?
- What type of information (in terms of forecasts or observations (nowcasts)) would be most useful for stakeholders in terms of inputs for decision making?

Expected Outcomes:
- Highlights from sea level conference 2017
- Observational gaps for characterizing global, regional and coastal contemporary sea level rise
- Lesser known processes affecting our ability to model and predict global sea level rise, hence future requirements

POS/PSMI joint session: High-latitude circulation, ocean-sea ice interface
Chairs: Jamie Morison, Janet Sprintall
Rapporteur: Kyla Drushka

Broad Questions:
- What changes are we noticing in high-latitude ocean circulation?
- What is the role of the ocean in ice sheet loss and contribution to global sea level?
- How does the polar ocean contribute to carbon uptake now and into the future?

Expected Outcomes:
- An improved understanding of the importance the two-way connections between the high latitude sea ice, ocean circulation, and atmospheric circulation and global climate. What observational gaps are there?
- Variables and time/ space scales that might better inform model development of the high latitude processes.

POS/PSMI joint session: Atlantic Meridional Overturning Circulation
Chairs: Renellys Perez, Victoria Coles, Gregory Foltz
Rapporteur: Fred Bingham

Broad Questions:
- What have we learned from the AMOC observational network about AMOC mechanisms and water mass pathways?
- What are key fields to compare across the AMOC observational network to assess connectivity of AMOC across the Atlantic? How long do we need to observe them to see coherent signals between the different regimes (subtropical South Atlantic, tropical Atlantic, subtropical North Atlantic, subpolar North Atlantic)?
- Are we using the right metrics and fingerprints to understand the link between AMOC, weather and climate variability?
- Where are the models (and reanalyses) able to correctly simulate AMOC processes, and where are they not? What are the key shortcomings that need to be addressed in models?
- What are models and longer-term observations telling us about the link between AMOC, weather and climate?

Expected Outcomes:
- Identify observational gaps in the AMOC observational network
- Recommendations for model improvements needed to more realistically simulate AMOC

Health of the climate observing system, part 1
Chairs: Carol Anne Clayson, Fred Bingham
Rapporteur: Alison Macdonald

Broad Questions:
- What is the status of the current system?
- What elements are there?
- How robust is in terms of funding and technology?
- Where might it be expanded and what might be gained?
- What are the gaps?
- What are some unobserved key weather/climate processes that could be addressed with an expanded observing system, and what would we need for this?

Expected Outcomes:
- Identify gaps in the global observational network
- Identify areas that are vulnerable to funding cuts
- Examining interactions between the elements

Health of the climate observing system, part 2
Chairs: Kyla Drushka, Alison Macdonald
Rapporteur: Aneesh Subramanian

Broad Questions:
- What measurements are being and/or should be made?
- Are there links/dependencies with other observing system components (e.g., for calibration/ validation, filling in spatial/temporal gaps, or for data assimilation or model validation)?
- What are the current or potential future gaps in the observing system?

Expected Outcomes:
- Identify gaps in the global observational network
- Identify links in the global observational network
- Identify vulnerable programs

PSMI Panel Breakout Sessions

POS/PSMI joint session: High-latitude circulation, ocean-sea ice interface
Chairs: Jamie Morison, Janet Sprintall
Rapporteur: Kyla Drushka

Broad Questions:
- What changes are we noticing in high-latitude ocean circulation?
- What is the role of the ocean in ice sheet loss and contribution to global sea level?
- How does the polar ocean contribute to carbon uptake now and into the future?

Expected Outcomes:
- An improved understanding of the importance the two-way connections between the high latitude sea ice, ocean circulation, and atmospheric circulation and global climate. What observational gaps are there?
- Variables and time/ space scales that might better inform model development of the high latitude processes.

POS/PSMI joint session: Atlantic Meridional Overturning Circulation
Chairs: Renellys Perez, Victoria Coles, Gregory Foltz
Rapporteur: Fred Bingham

Broad Questions:
- What have we learned from the AMOC observational network about AMOC mechanisms and water mass pathways?
- What are key fields to compare across the AMOC observational network to assess connectivity of AMOC across the Atlantic? How long do we need to observe them to see coherent signals between the different regimes (subtropical South Atlantic, tropical Atlantic, subtropical North Atlantic, subpolar North Atlantic)?
- Are we using the right metrics and fingerprints to understand the link between AMOC, weather and climate variability?
- Where are the models (and reanalyses) able to correctly simulate AMOC processes, and where are they not? What are the key shortcomings that need to be addressed in models?
- What are models and longer-term observations telling us about the link between AMOC, weather and climate?

Expected Outcomes:
- Identify observational gaps in the AMOC observational network
- Recommendations for model improvements needed to more realistically simulate AMOC

Tropical Pacific Observing Systems (TPOS) 2020
Co-chairs: Kris Karnauskas, Maria Flatau

Broad Question:
- What physical processes will be most important over the next decade (e.g., for model development, or to devise effective ongoing sampling strategies that will depict the processes from sustained monitoring)?

PSMI/PPAI joint session: Decadal variability: 5-year-ahead scale for water and other sectors
Co-chairs: Rob Burgman, Kevin Reed
Rapporteur: Scott Weaver

Broad Questions:
- What is the current skill of CMIP6-class models for decadal predictability?
- What advancements are being made to improve this skill (in both atmosphere and ocean models)?
- Is the current state-of-the-art skill sufficient for informing relevant public and private sectors?

Stratosphere
Chair: Maria Flatau

Broad Questions:
- What is the impact of stratospheric circulations on climate/extended weather prediction?
- How good are models in predicting stratospheric circulations?
- What processes are critical for these predictions?
- What are the data /understanding gaps that should be addressed to represent these processes?
- Are there any field projects current and planned that address these questions?

PPAI Panel Breakout Sessions

POS/PPAI joint session: Observational and synthesis requirements for characterizing contemporary sea level rise and predictability
Chairs: Aneesh Subramanian, Shane Elipot, John Nielsen-Gammon
Rapporteur: Samantha Stevenson

Broad Questions:
- What are the observational gaps for characterizing global, regional, and coastal contemporary sea level rise?
- What are the lesser known dynamical processes affecting global and regional sea level? How do these processes affect our ability to model and predict global and regional sea level rise?
- What type of information (in terms of forecasts or observations (nowcasts)) would be most useful for stakeholders in terms of inputs for decision making?

Expected Outcomes:
- Highlights from sea level conference 2017
- Observational gaps for characterizing global, regional and coastal contemporary sea level rise
- Lesser known processes affecting our ability to model and predict global sea level rise, hence future requirements

PSMI/PPAI joint session: Decadal variability: 5-year-ahead scale for water and other sectors
Co-chairs: Rob Burgman, Kevin Reed
Rapporteur: Scott Weaver

Broad Questions:
- What is the current skill of CMIP6-class models for decadal predictability?
- What advancements are being made to improve this skill (in both atmosphere and ocean models)?
- Is the current state-of-the-art skill sufficient for informing relevant public and private sectors?

CMIP6 horizon
Chair: Scott Weaver
Rapporteur: Andy Wood

Broad question:
- How does PPAI connect with and utilize CMIP6 data, including the new decadal prediction project, HiResMIP, and CORDEX?