

'CWEX': Climate, Water and Energy eXchanges group within the USGCRP

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USGCRP Integrated Water Cycle Group (IWCG) Co-Chairs: Sandra Connors (EPA), Gary Geernaert (DOE), Wayne Higgins (NOAA)

Climate, Water Energy Exchanges Subgroup: Jared Entin (NASA, Vice Chair), Jin Huang (NOAA), Renu Joseph (DOE, Vice Chair), Sally McFarlane (DOE), Jielun Sun (NSF), Raha Hakimdavar (USDA), Tanya Spero (US EPA)



U.S. Global Change Research Program

USGCRP comprises **13 Federal agencies** that conduct or use research on global change and its impacts on society



*“... assist the Nation and the world to **understand, assess, predict** and **respond** to human-induced and natural process of global change.”*

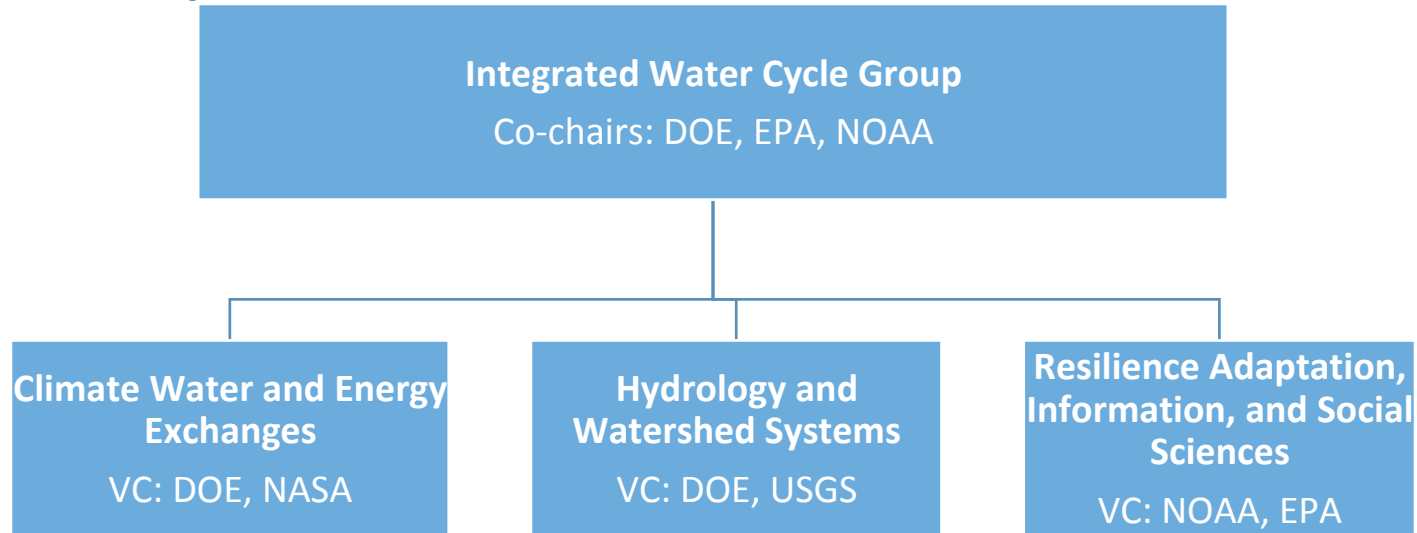
Global Change Research Act, 1990

Through USGCRP, agencies:

- Coordinate global change research and **advance science** across the U.S. government
- Use research results and products to **inform decisions and responses** to a changing climate
- **Deliver mandated products**, including the quadrennial National Climate Assessment (NCA)
- **Promote international cooperation** on global change research and coordinate U.S. activities with the programs of other nations and international organizations



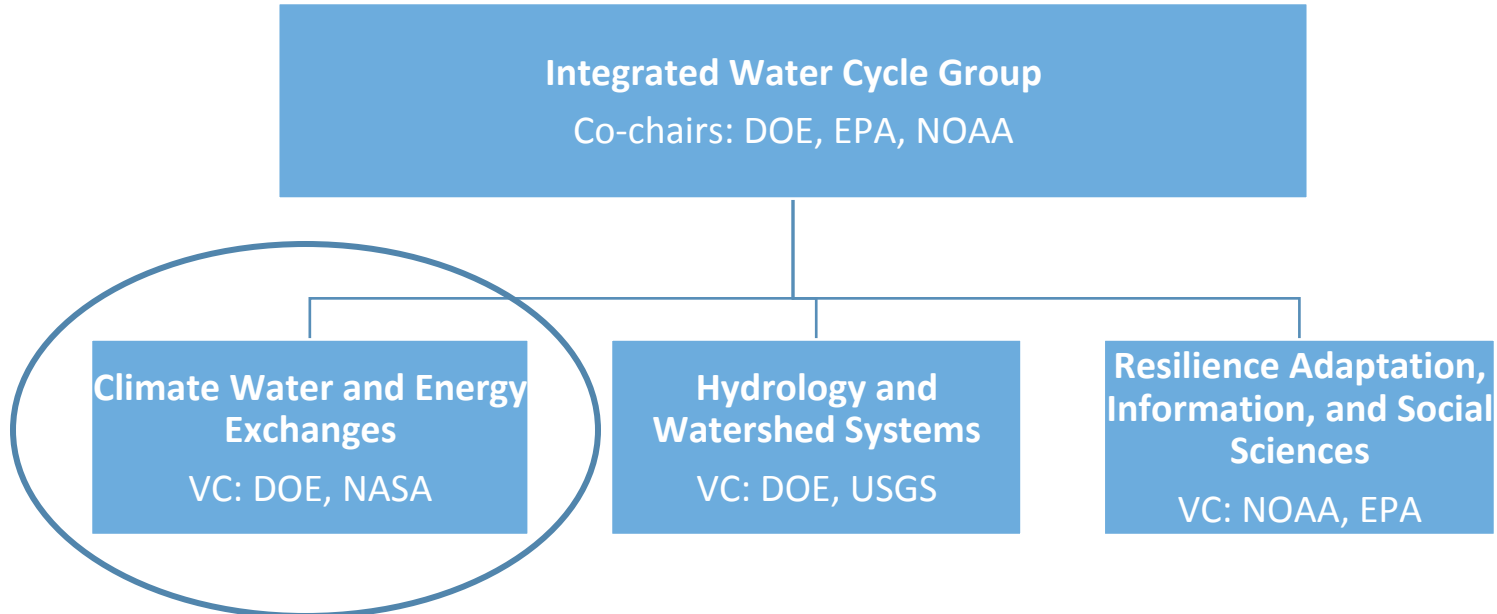
Integrated Water Cycle Group (IWCG)



- **Coordinates and integrates global-change relevant water cycle research;**
- **Advances capabilities and infrastructure** that support water cycle observation, modeling and predictability at a range of scales;
- **Develops approaches to apply and translate** our understanding and inform decisions surrounding preparedness and resilience;
- Pursues **interagency and end-to-end approaches** across the Program.



Integrated Water Cycle Group (IWCG)



Climate, Water, and Energy Exchanges (CWEX)

- Vice Chairs: Jared Entin (NASA), Renu Joseph (DOE)
- Provides a focal point for coordinating interagency collaborative research and capabilities on **water's and energy's coupled roles in a changing global climate system**
- Provides a space for agencies and programs to coordinate interactions with relevant efforts of the World Climate Research Program (WCRP), e.g. GEWEX



Recent Activities - CWEX

- Officially formed in April 2018
- Information sharing, agency and expertise representation
- Science Planning
- Input to USGCRP Strategic Planning (3 year update)
- Input to USGCRP International Science Planning (Dec 2018 workshop)
- AGU Town Hall – IWCG wide
- AGU Town Hall – Precipitation metrics, DOE Led
- AGU Poster Session: Integrative Approaches Toward Large Scale Water and Energy Cycle Investigations



Science Planning exercise

1. How can understanding and prediction of **water cycle extremes** and changes in the future be improved?
2. What are the roles of **land-atmosphere interactions** in water cycle and their changes in the future?
3. What are the **roles of cloud in the water cycle** and their changes in the future?
4. How can understanding of **the effects and uncertainties** of water and energy exchanges in the current and changing climate be **improved and conveyed**?
5. How do changes in the **high latitudes** affect the global water cycle?
6. What are the **impacts of integrated human-Earth system interactions** on water cycle?



Potential Areas

- Precipitation Metrics:
 - **Using Observationally Based Metrics to Evaluate and Improve Earth System Model Precipitation (DOE)**
- Soil Moisture – what can agencies do together to:
 - Increase awareness and accessibility of funded, disparate data
 - Increase understanding of utility and limitations of different types of data
 - Create opportunities for intercomparison and provide new paths forward for improvement and integration
- Land Atmosphere Interactions
 - 2018 workshop at Annual US Climate Modeling Summit

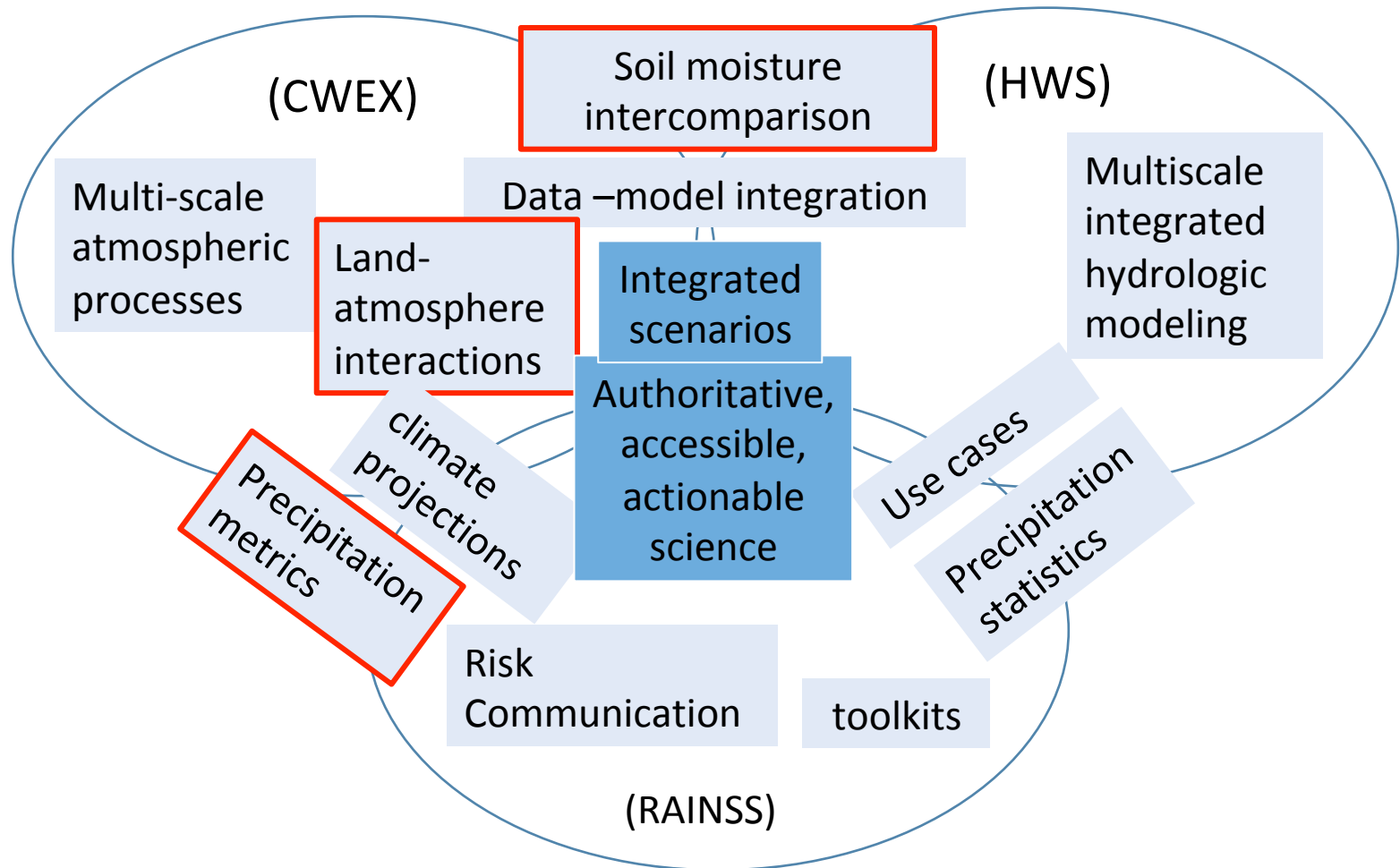


Connections Across USGCRP

- International Activities Working Group – convened workshop with international partners (WCRP, Future Earth, START), Dec 2018
 - Extremes, Land-Energy-Water Systems, Urbanization
 - Collaborative Actions and Topics (more soon)
- USGCRP's next update to its Strategic Plan (3 year cycle)
- Interagency Integrated Water Cycle Group – allows science focus on individual areas as needed, promotes integrated and collaborative approaches
 - Hydrology and Watershed Systems (HWS) - start from a local watershed perspective and expand into higher spatial and temporal scales.
 - Resilience, Adaptation, INformation, Social Sciences (RAINSS) - the translation of water cycle science information in ways that are responsive to user needs and the complex decision-making challenges they face.



CWEX focused and Integrated Activities



- Where do you see yourself and the GEWEX community contributing?
- Do you see gaps or more opportunity space?
- What are the emerging priorities and directions from the science community?



THANK YOU

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