[DT113] Plans and Prospects for an RHP in the United States: Creating a Regional "Digital Twin"

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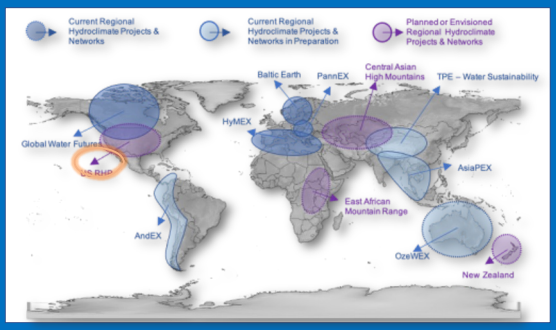
Water, energy, and carbon cycles in the Anthropocene

Regional Hydroclimate Projects (RHPs)



RHPs are a means to bridge from globally-driven climate changes to actionable regional scales.

US-RHP Themes

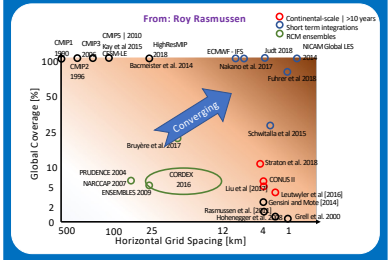
- **Major sections in science plan = Working Groups**

Convergent Science

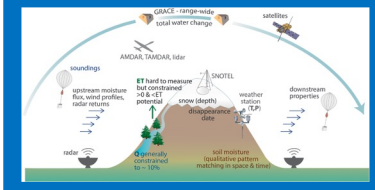
- Social Science
- Mountain Hydrology
- Land-atmosphere processes & coupling
- Impactful extremes
- Organized convection and precipitating systems
- Coastal (TBD ???)
- Crosscutting: Advancing observational systems

Bridging Scales

Modeling approaches are converging:



Our models are "outstripping" the observations; but are the models right?



*Lundquist et. al., 2019: Our Skill in Modeling Mountain Rain and Snow is Bypassing the Skill of Our Observational Networks. Bull. Amer. Meteor. Soc., **100**, https://doi.org/10.1175/BAMS-D-19-0001.1*

A Complex, Coupled System

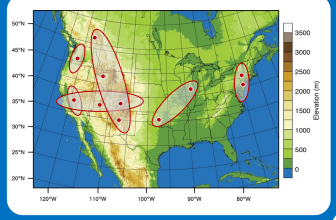
Water: $P + Q_{in} = ET + \Delta S + Q_{out}$
Energy: $R_n + G = \lambda ET + H$

Refine estimates of these terms; quantify their uncertainties; understand how will they change.

The *Carbon Cycle* most directly ties in through the "R_n" (energy) and "ET" terms.

Anthropogenic influences are manifold and impact all of these cycles through GHG emissions; land use/land cover change; and water resource management.

US-RHP Domain with *Notional* Obs. Transects



Timeline

2019-Present
- Build Foundation
- Engage US Agencies (continuous)

June 2021
- Broaden Community Engagement
- Affinity Group Est.

July '22
- Pan-GEWEX Meetings

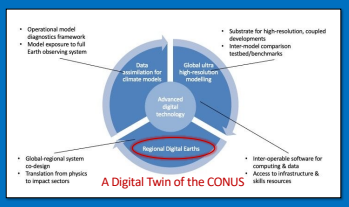
Fall '22
- Draft Science Plan, V0.0

Winter '22
- Basic Governance
- Working Science Plan

Winter 2022-2023+
- Become Initiating RHP

WCRP Lighthouse Digital Earth

https://www.wcrp-climate.org/digital-earths



How to Get Involved

Join the US-RHP Affinity Group: