

A new representation of conventional hydropower in unit commitment economic dispatch models to support resource adequacy and reliability studies

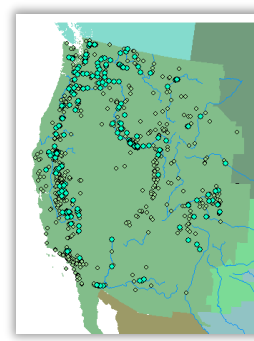
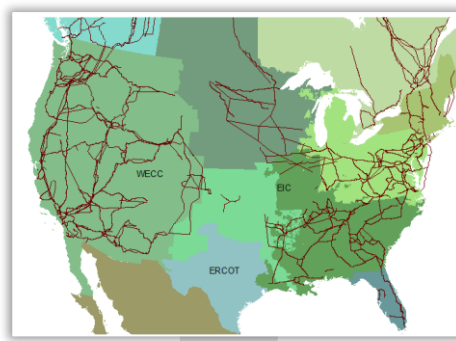
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One year of observed monthly hydropower

Reliability studies for large power grids require computational tradeoffs and typically encounter data scarcity leading to simplified representations of hydropower capabilities and availability.

Impact on reliability studies:

- Water year conditions impact grid-simulated seasonal hourly schedule; Summer is most impacted
- The weekly representation challenges the expectations on hydropower operations during evening ramping needs



New weekly representation

Spatially distributed hydrology + reservoir operations

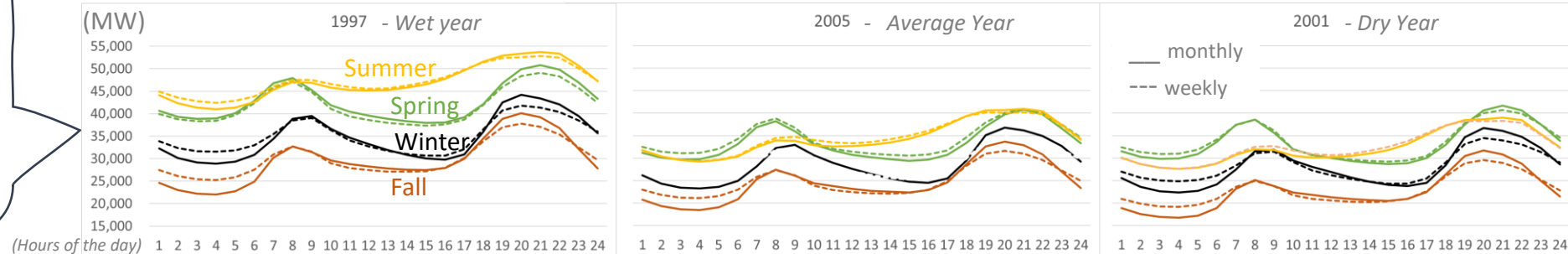
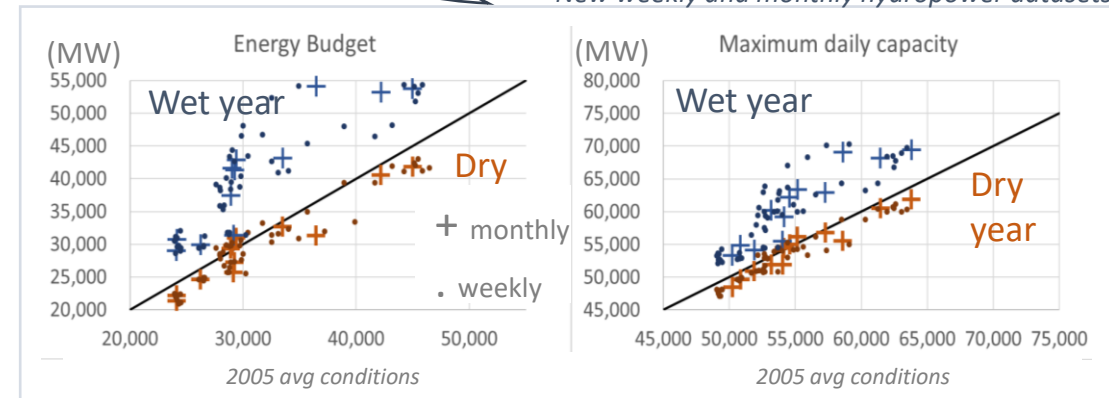
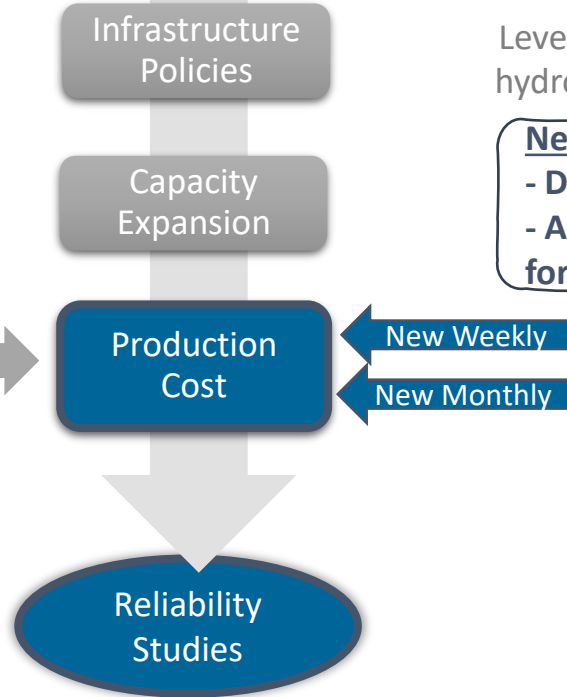
Statistical WEEKLY minimum and maximum generation and energy budget at individual power plants

Leveraging large scale hydrology modeling, we develop multi-year weekly hydropower datasets for input into a Western U.S. production cost model.

New hydropower datasets:

- Different water year conditions impact available hydropower & capacity
- A weekly resolution exposes opportunities & vulnerabilities that differ for wet or dry year conditions

New weekly and monthly hydropower datasets



Simulated hourly hydropower schedules for different water years