

Modelling the impact of large dams on flows and hydropower production of the Sekong, Sesan and Srepok Rivers in the Mekong Basin

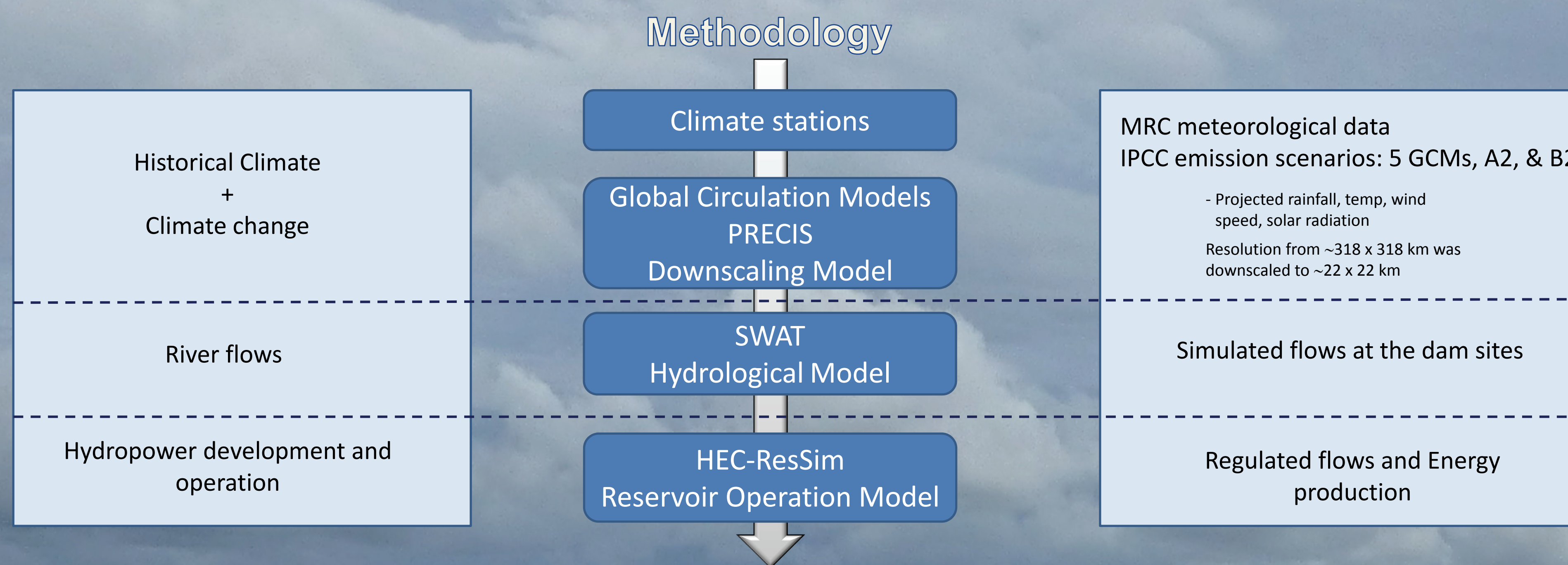
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The 3S Rivers and Basin

- Key tributaries contributing 17-20% of Mekong flows •
- Hydropower development is accelerating •
- Important transboundary river basin shared between Lao PDR, Cambodia and Viet Nam •
- Rivers provide an important contribution of aquatic biodiversity and ecosystem services: fish, habitats, and migration routes •

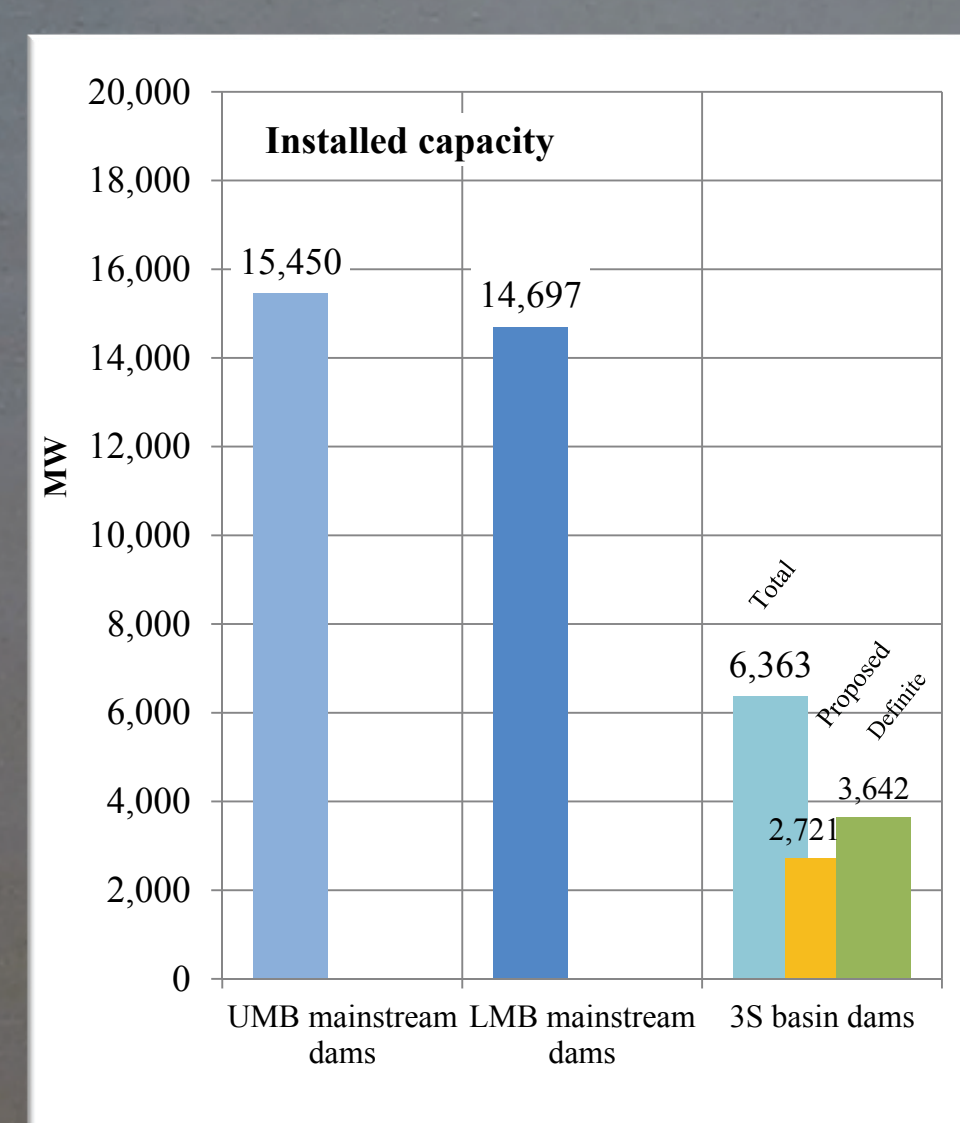
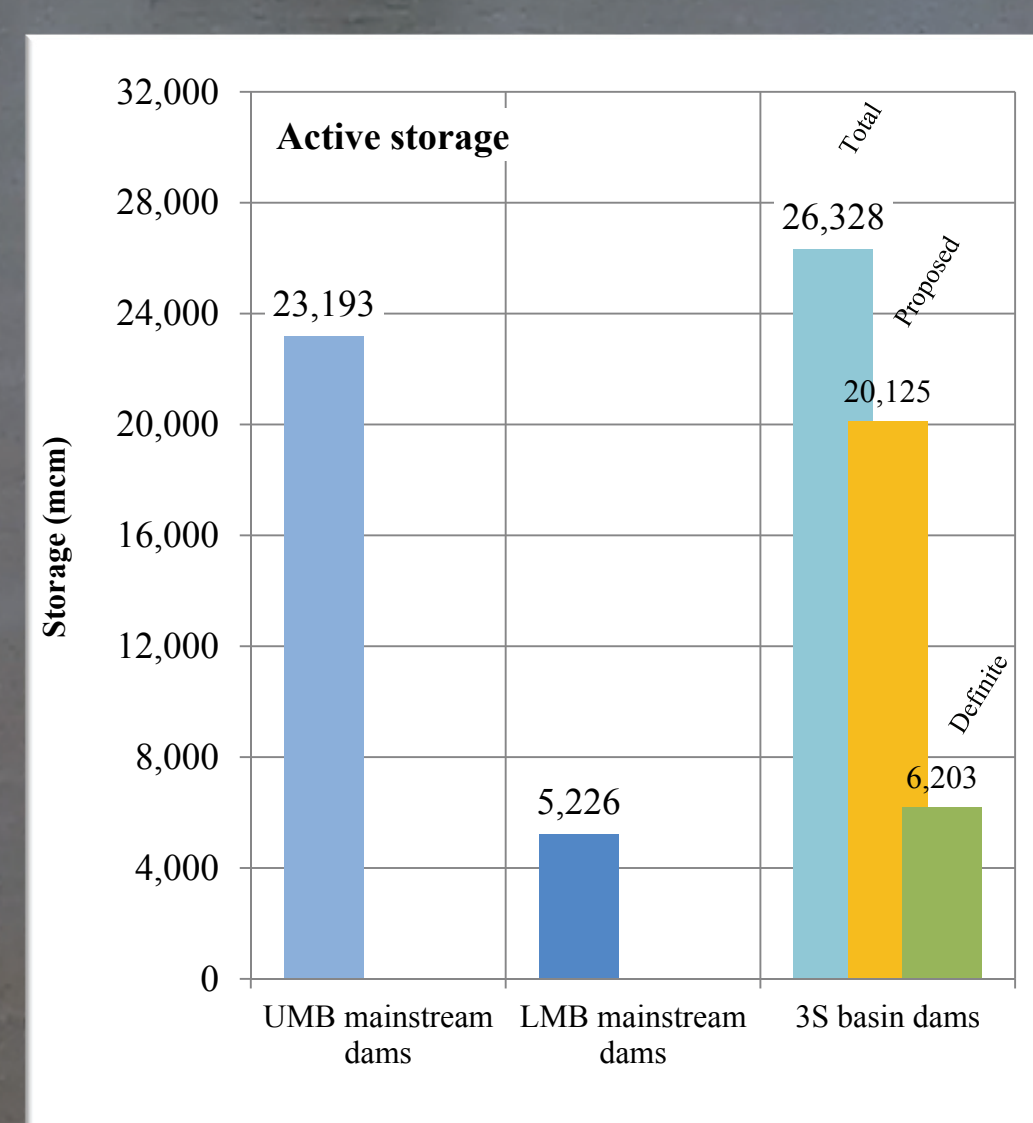
Key Messages

- Impact of hydropower >> climate change ...and it might happen sooner •
- Flow alteration may lead to downstream impacts and transboundary conflicts •
- Location, size, and operation of dams is critical •
- Research needed on – sediment, nutrients, food web, biodiversity •
- Coordination and cooperation necessary among developers and countries to maximize basin benefits •



Sekong, Sesan and Srepok Rivers

Storage and Capacity

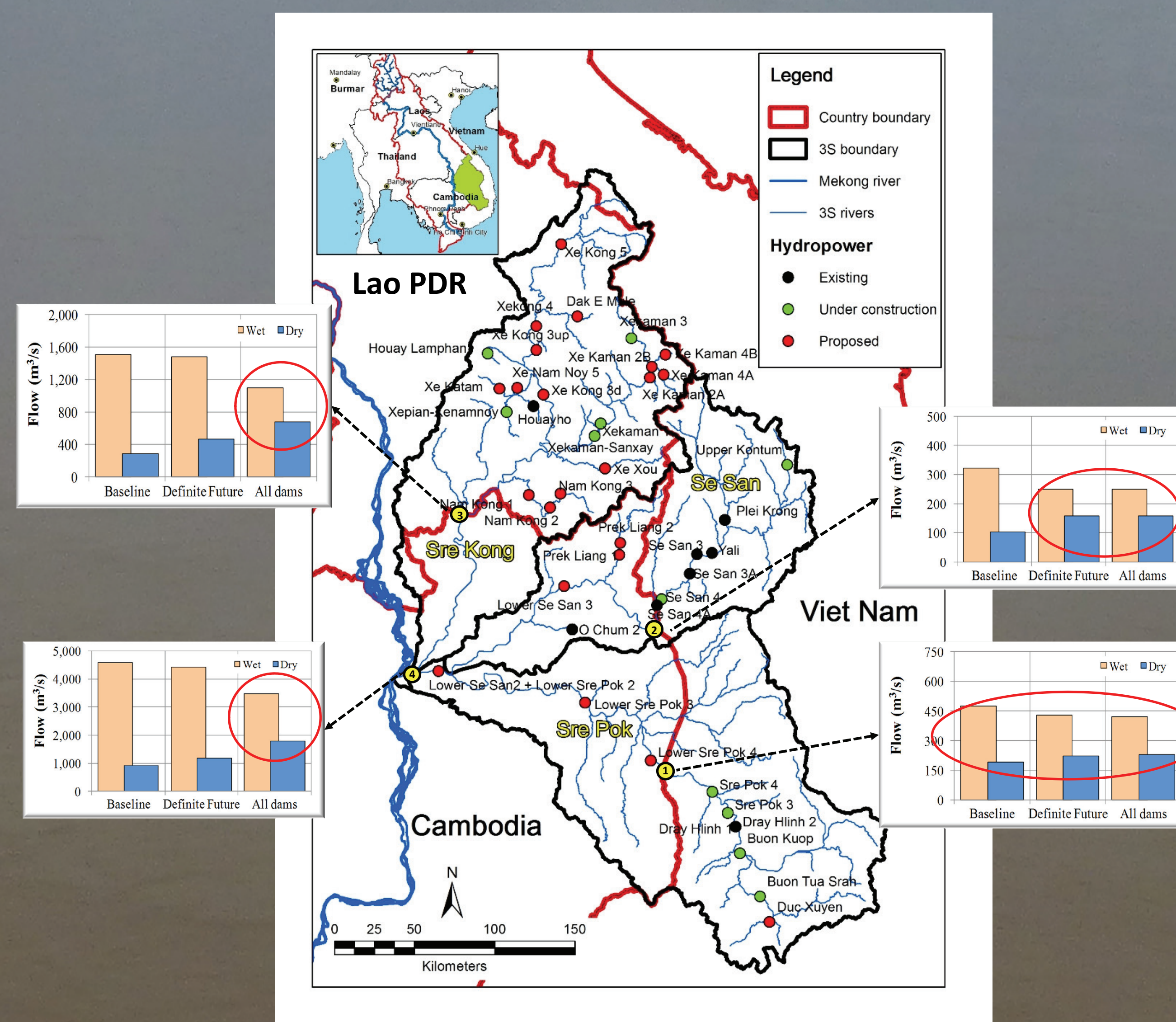


Active storage in 3S similar to the Upper Mekong Basin (UMB) dams, and much greater than the Lower Mekong Basin (LMB) mainstream dams

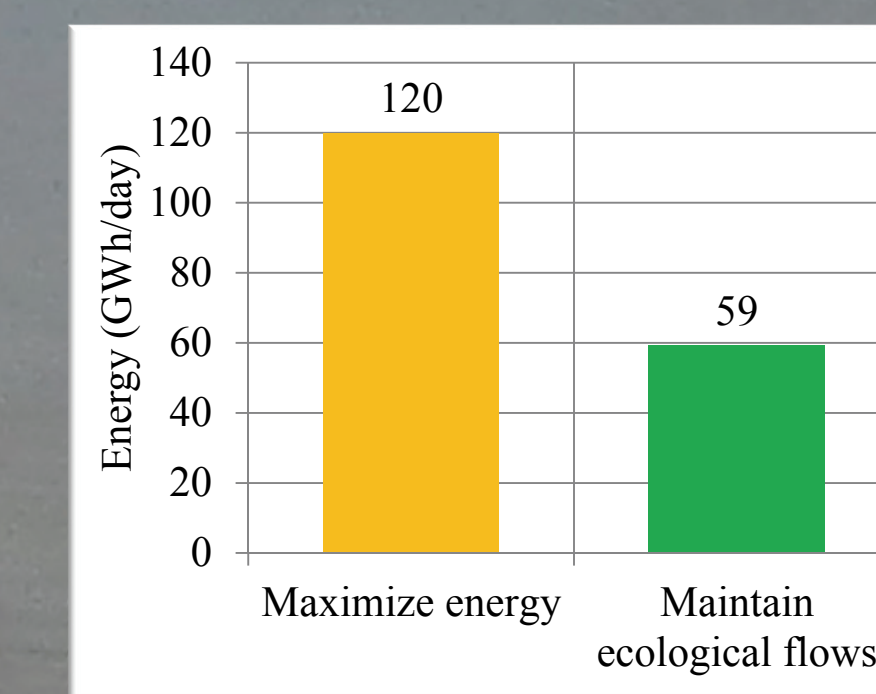
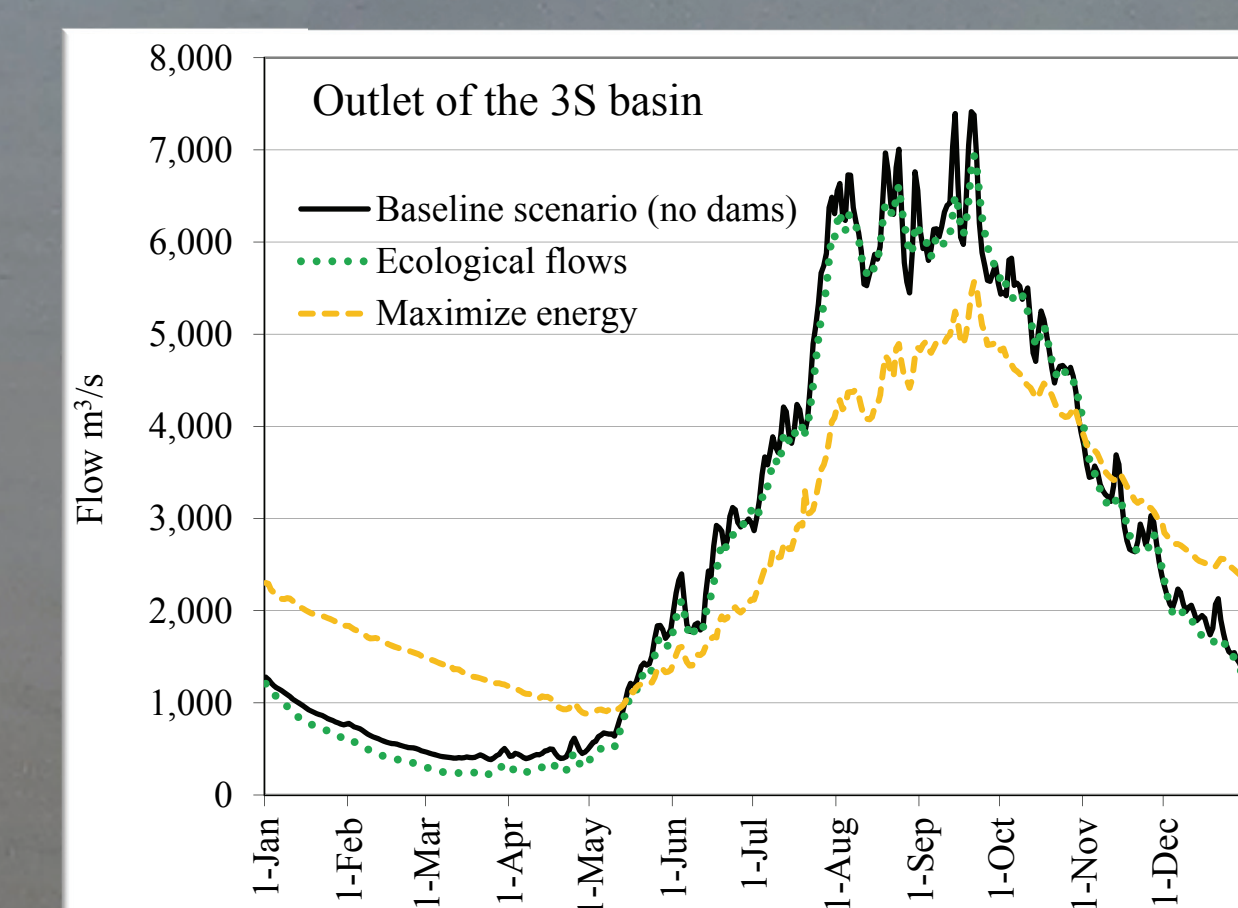
New hydropower proposals in 3S are:

- low energy
- high impact

Flow changes



Operations and Energy



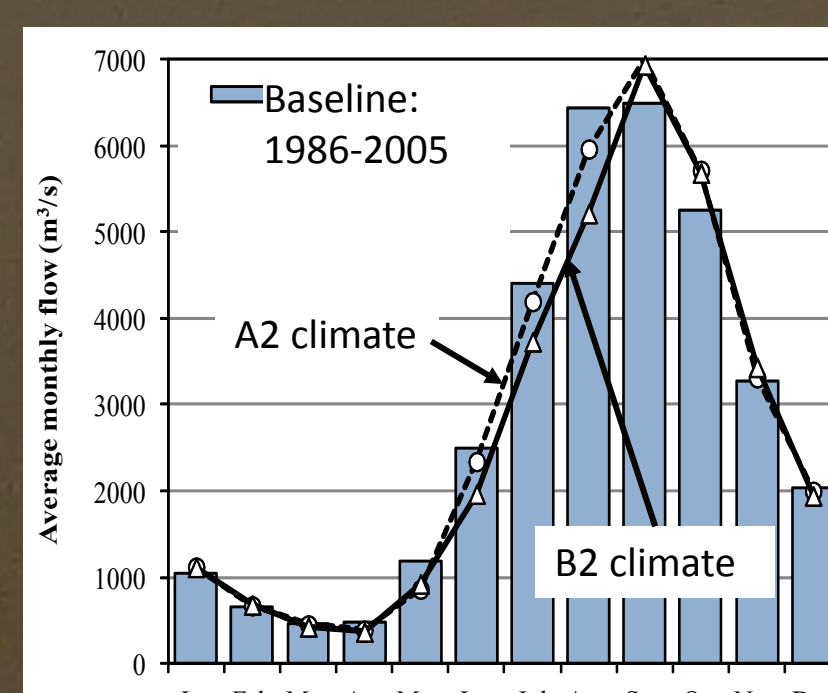
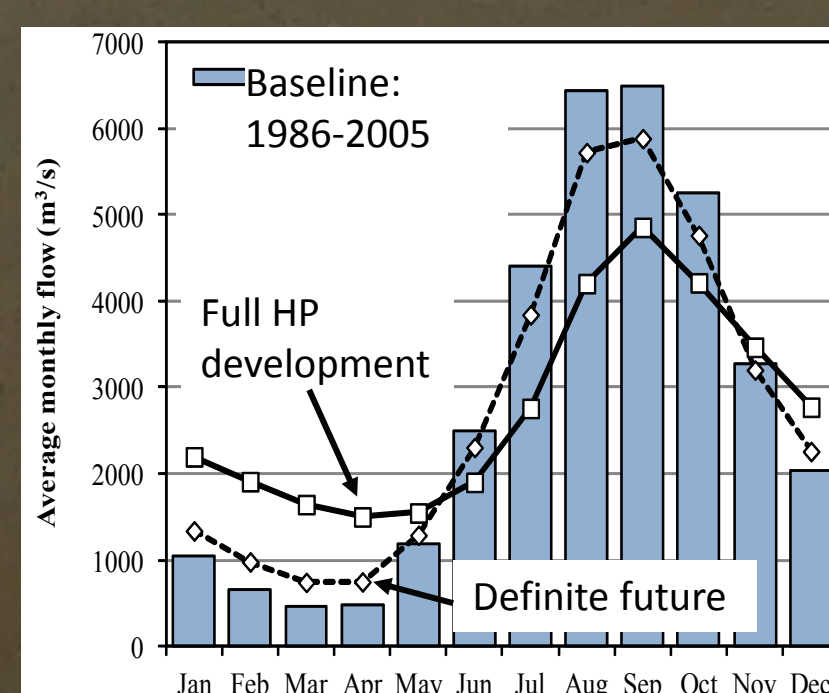
Hydropower operation scenarios:

- Ecological flows: operate reservoirs to maintain natural (ecological) flows
- Maximize energy: maximize energy production

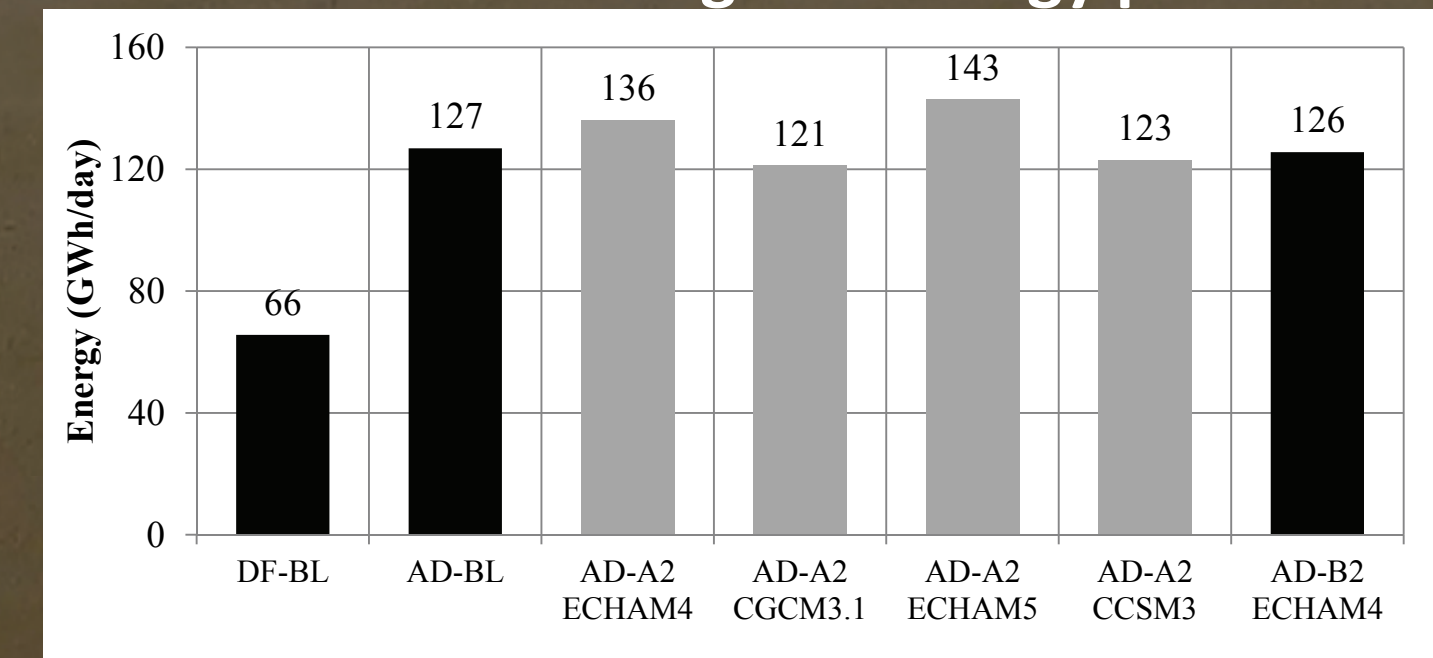
Ecological operations result in half energy generation.

Need to find the optimal operation regime to balance energy production and downstream ecosystem services

Hydropower vs. climate change



Effect of climate change on energy production



DF: definite future dams
AD: all dams in 3S

BL: baseline climate
A2, B2: climate change scenarios for GCM's

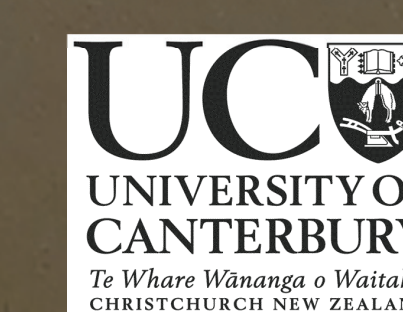
About 55% of dry season flow changes will be caused by the seven largest proposed dams.

- Lower Srepok 3
- Lower Srepok 4
- Lower Sesan 3
- Lower Sesan and Srepok 2
- Xekong 5
- Xekong 4
- Xe Xou

Hourly flow alterations can be significant due to intra daily reservoir operations and warrant further study as well as impact of landuse change and climate change on flows and hydropower operations.



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