

Water Resource Management in JULES

RIVERS Brazil: CSSP Brazil

Helen Baron, Douglas Clark, Robyn Horan, Virginie Keller, Alberto Martinez de la Torre, Clarissa Rizzo

Hydro-JULES

Helen Baron, Virginie Keller, Nathan Rickards, HJ team

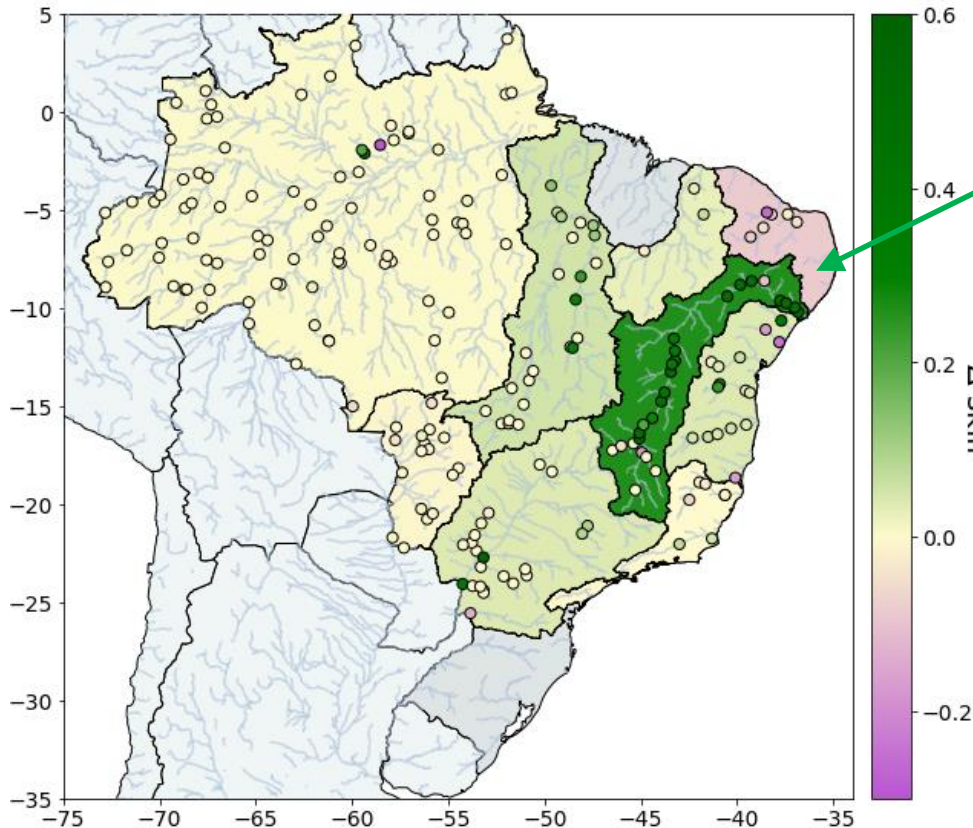
Net Zero plus

Helen Baron, Douglas Clark, tbc



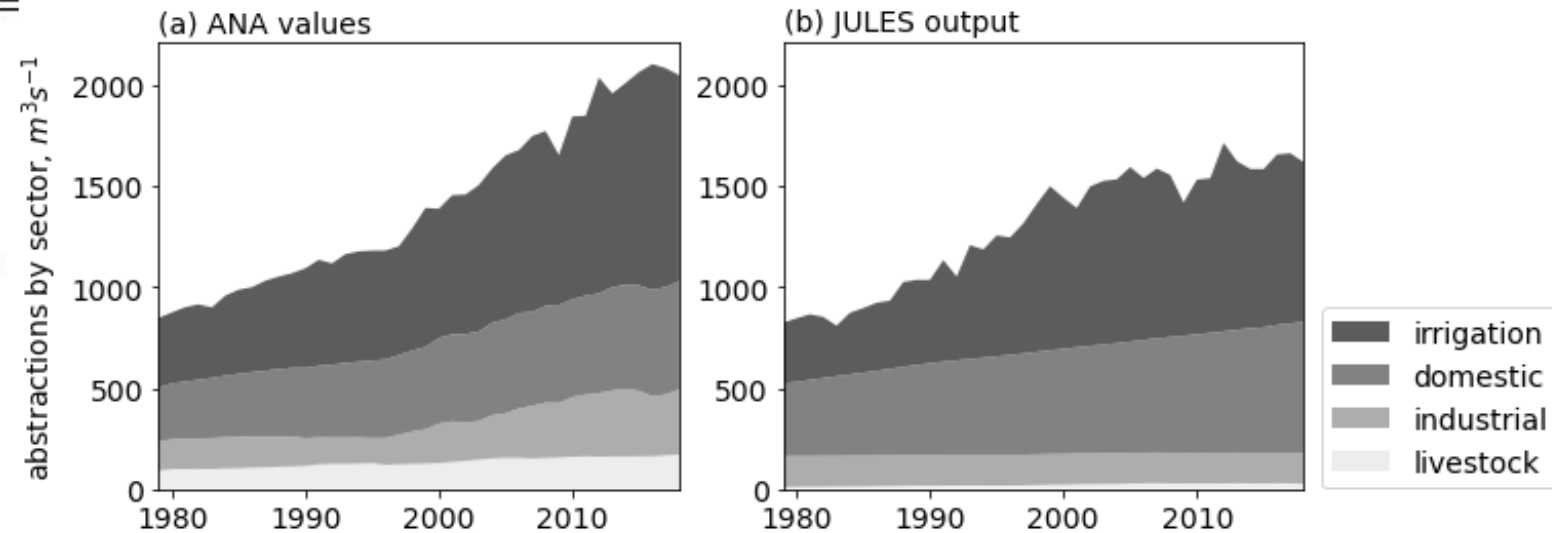
RIVERS Brazil: CSSP Brazil

Water resource management in JULES (being added to the trunk), inc:
abstractions, discharges, reservoirs, water transfers



Modelled river flows are improved in catchments that are highly managed, such as in eastern Brazil.

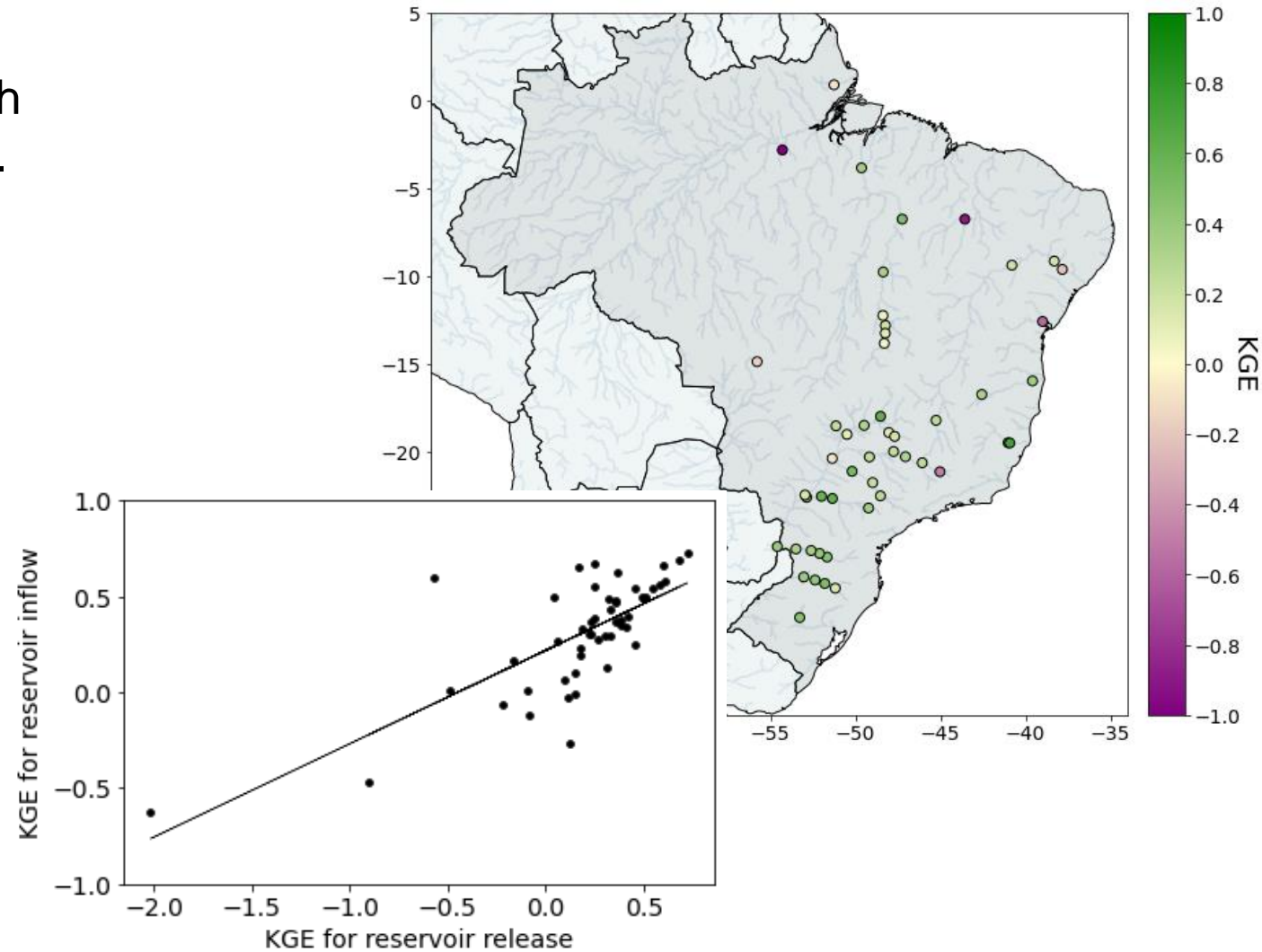
The new model gives a good reproduction of historical water abstraction in Brazil.



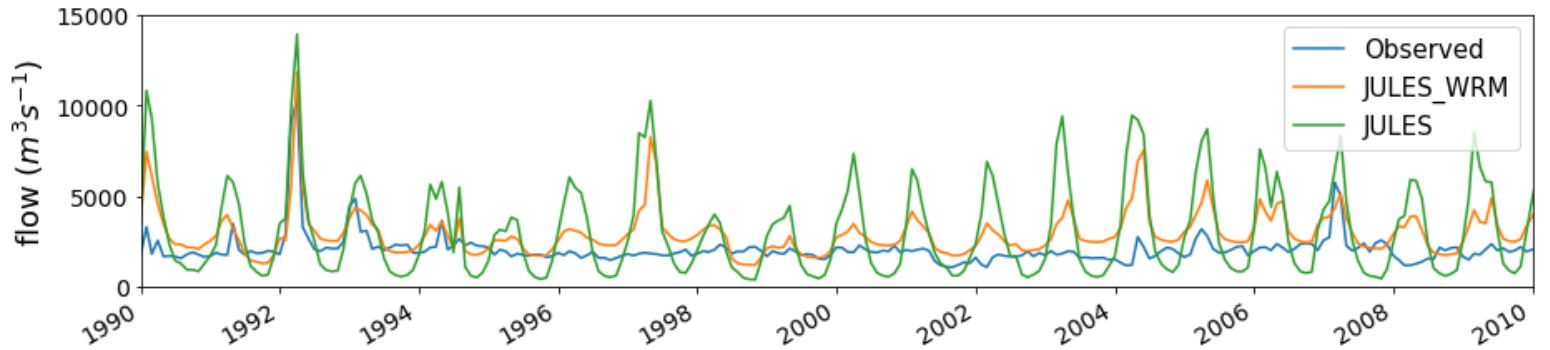
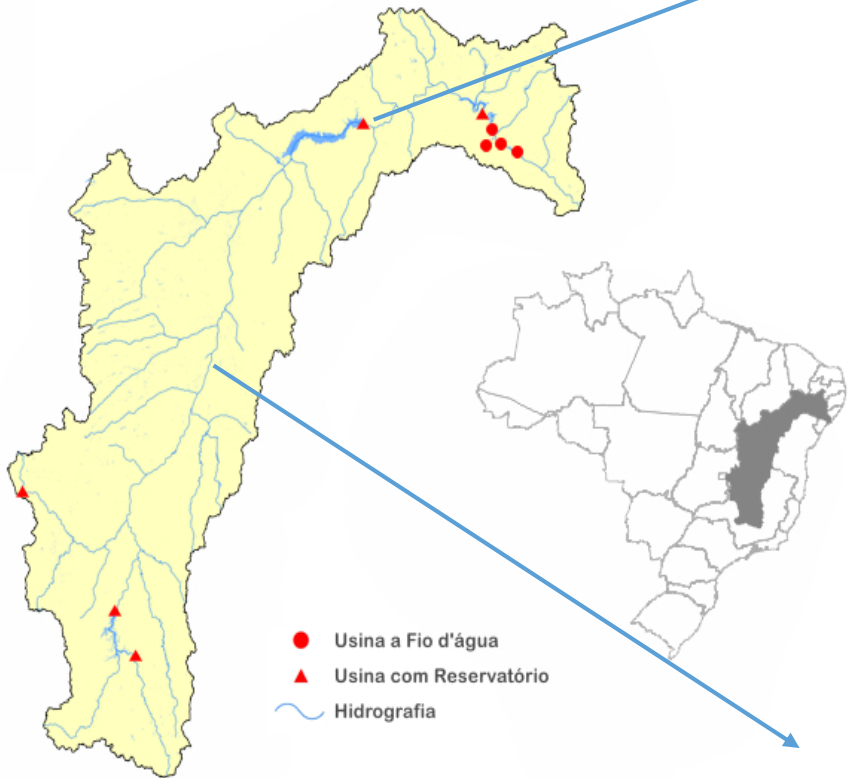
Simulated reservoir release agrees well with observed data for the majority of reservoirs.

Model performance for reservoir release is correlated with model performance for inflows

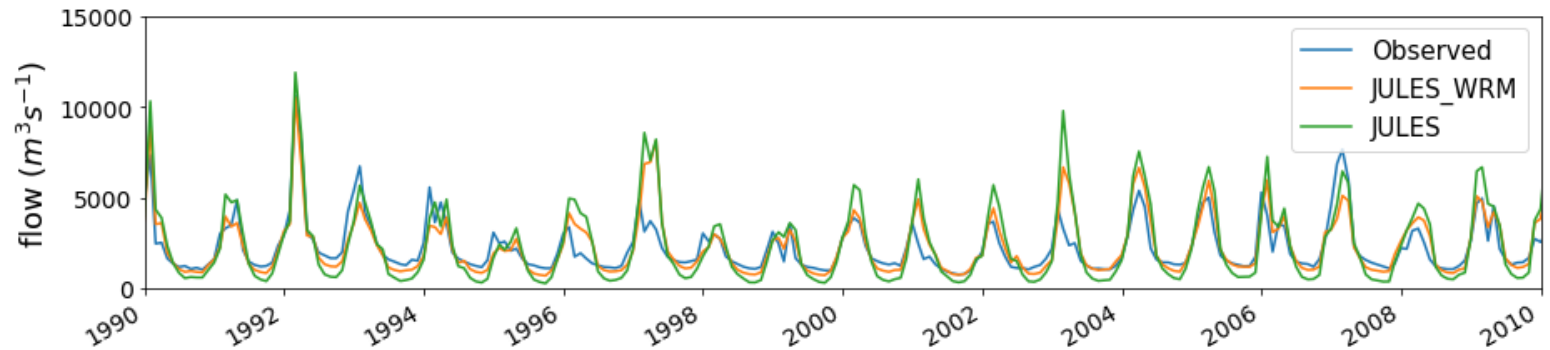
Observed data for reservoir release or storage/levels is often unavailable, making model validation challenging – we'll be exploring remote sensing options.



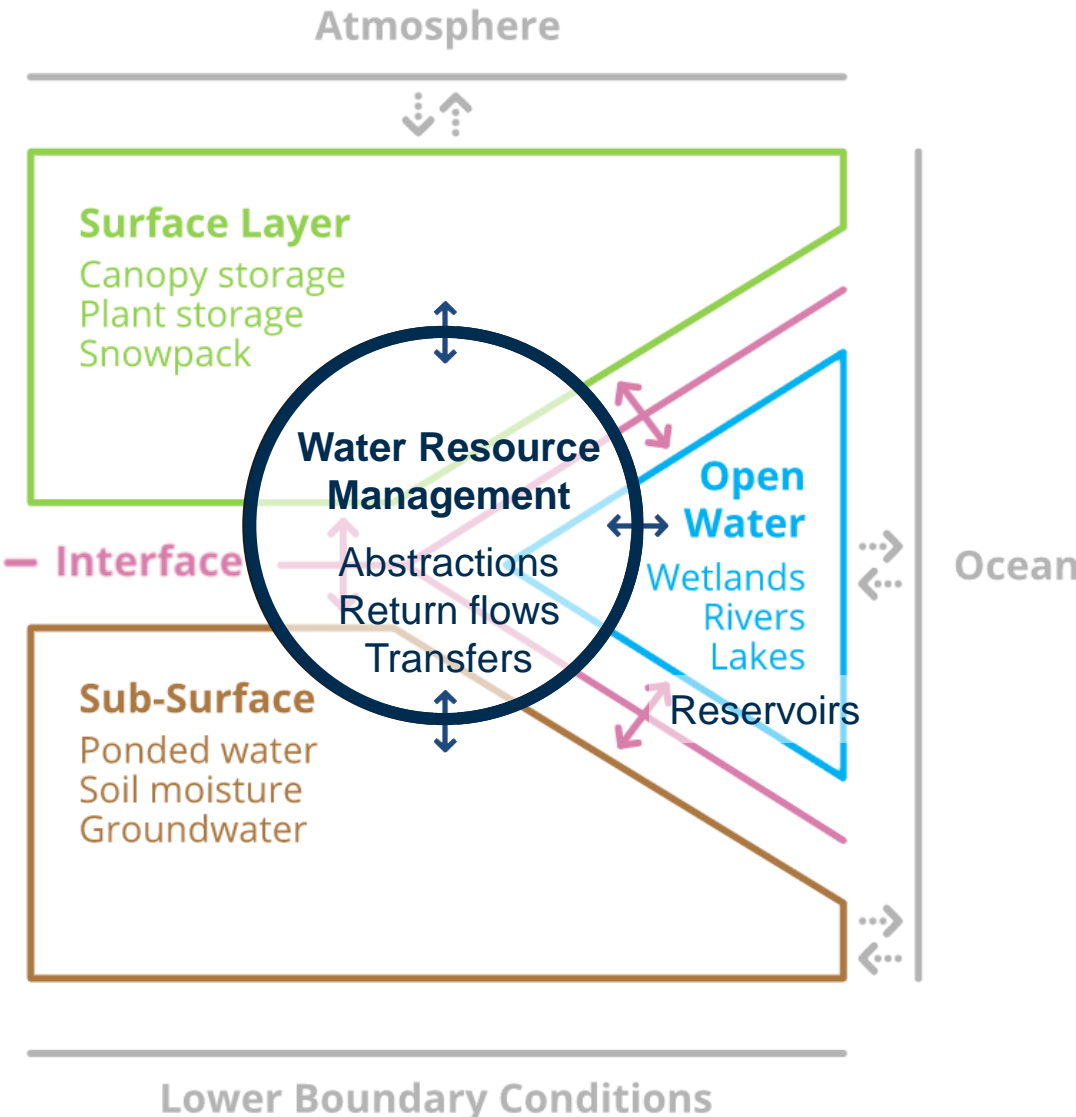
São Francisco



Modelled river flow at two locations in the São Francisco catchment.



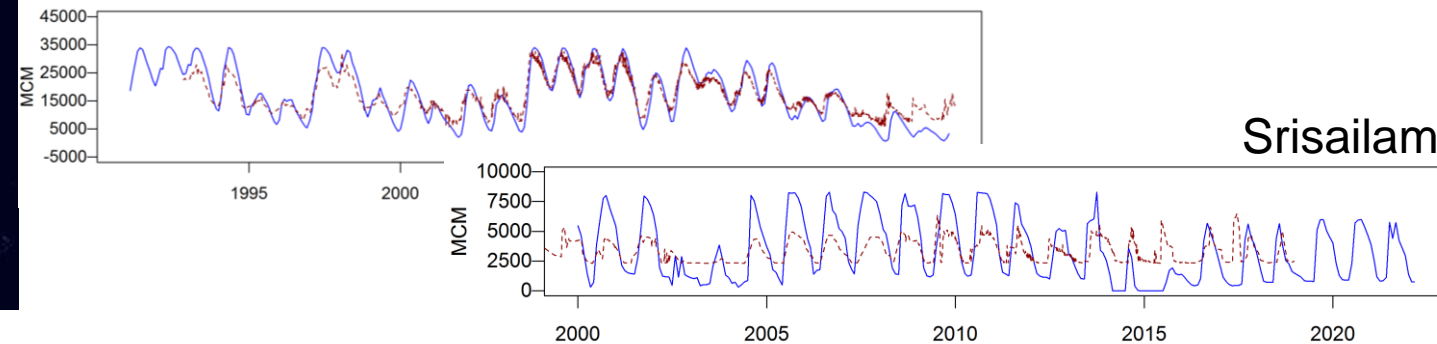
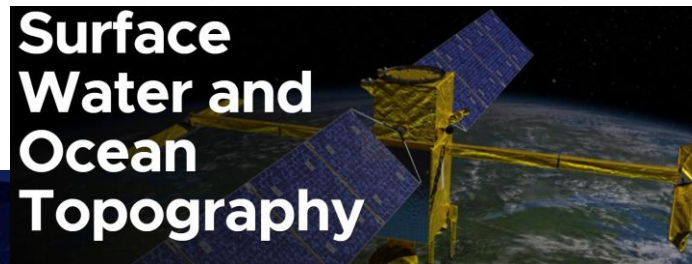
Hydro-JULES: Water Resources Management (WRM)



Net Zero plus

Include different irrigation methods to capture efficiency: flood (~60%), sprinkler (~75%), drip (~90%)

Explore remote sensing for data collection / processing



COMMENT

<https://doi.org/10.1038/s41467-022-30731-8>

OPEN

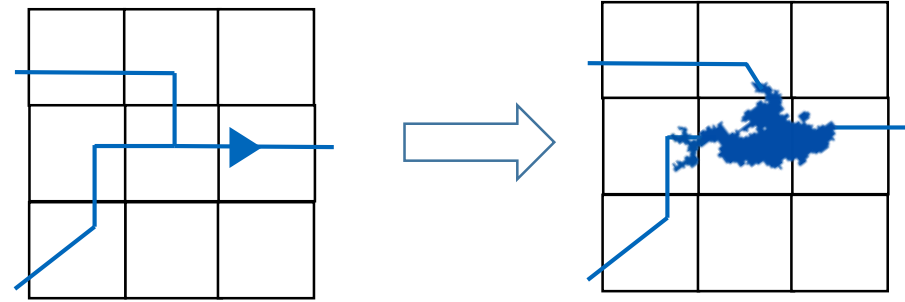
The delusive accuracy of global irrigation water withdrawal estimates

Arnald Puy^{1,2}, Razi Sheikholeslami^{3,4}, Hoshin V. Gupta⁵, Jim W. Hall³, Bruce Lankford⁶, Samuele Lo Piano⁷, Jonas Meier⁸, Florian Pappenberger⁹, Amilcare Porporato¹⁰, Giulia Vico¹¹ & Andrea Saltelli^{2,12}

Miscalculating the volumes of water withdrawn for irrigation, the largest consumer of freshwater in the world, jeopardizes sustainable water management. Hydrological models quantify water withdrawals, but their estimates are unduly precise. Model imperfections need to be appreciated to avoid policy misjudgements.

Future thoughts...

Connect reservoir storage change to level & surface area change (impacts on evaporation & recharge)



Add option for “coded” reservoirs (unifhy)

Link to water quality – both discharges & limiting abstractions

