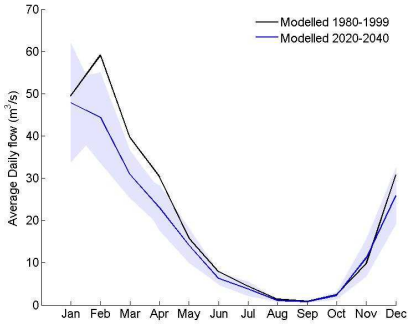
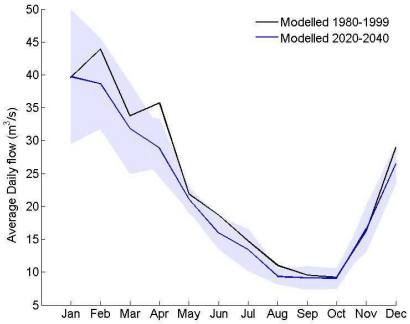
Streamflow projections for MAMMINASATA for 2020-2040

Changes in temperature and rainfall due to climate change are likely to change the streamflow in the catchments around Makassar, Indonesia. Understanding these changes are important to plan for the sustainability of water resources for the region.

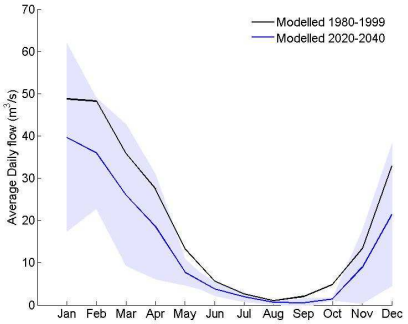
Modelled current and future streamflow[1]



Flow at Puca, near the Lekopancing weir, Maros river

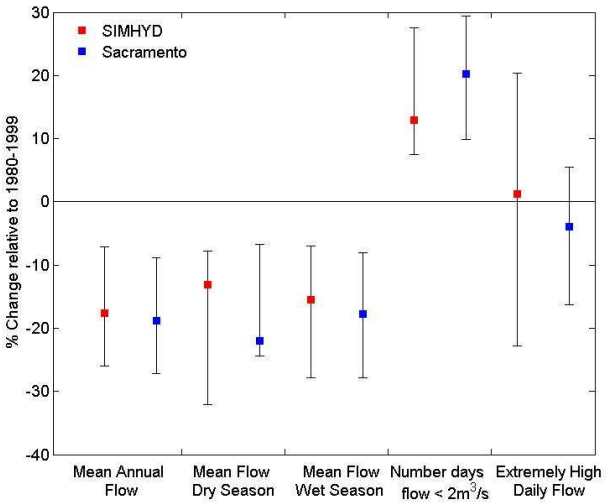


Flow into Bili-Bili dam, Jeneberang river



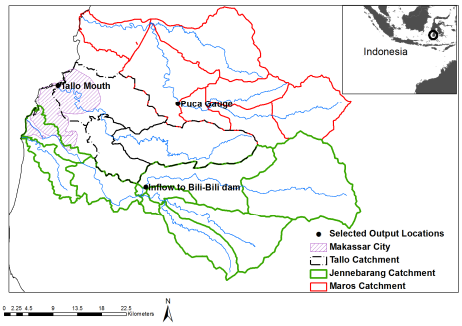
Flow at the mouth of Tallo river

Projected changes in streamflow characteristic at Puca[2]



What do these results tell us?

- Overall, the mean streamflow is expected to decrease by:
  - 17-19 percent for Puca
  - 4-7 percent for inflow to Bili-Bili dam
  - 34-39 percent for flow at the mouth of Tallo river
- The number of days with low flow may increase up to 20 percent
- A reduction in extremely high streamflow is projected



Notes:

[1] These figures show modelled daily average flow for period 2020-2040, compared to 1980-1999, based on the SIMHYD hydrological model. The black line represents modelled flows using historical rainfall. The blue line represents the best estimate (50th percentile of five climate models), while shaded corresponds to the range (10th and 90th percentiles).

[2] This figure shows projected changes in flow characteristics for the Puca gauge for the period 2020-2040 relative to the period 1980-1999. Colour symbols correspond to the best estimate (50th percentile of 5 climate models), while error bars represent the range (10th and 90th percentiles). Red and blue symbols correspond to SIMHYD and Sacramento hydrological models' results respectively.

How do we model the streamflow?

Two lumped daily rainfall-runoff models, SIMHYD and Sacramento, were used to estimate changes to streamflow due to climate change.

The models are conceptual representations of catchments, using a series of equations to represent the hydrological processes.

The rainfall runoff models used projected rainfall and potential evapotranspiration generated using statistical downscaling from five regional climate model simulations for MAMMINASATA (Kirono et al. 2010). More details can be found in Neumann et al. 2012.

FURTHER INFORMATION
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REFERENCES

Kirono DGC. et al. 2010. Regional climate change simulation and training workshop on climate change over eastern Indonesia and Vietnam. A Report.

Neumann LE. et al. 2012. Influence of modelling methodology on the estimation of climate change impacts on streamflows in the Maros catchment, Indonesia

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