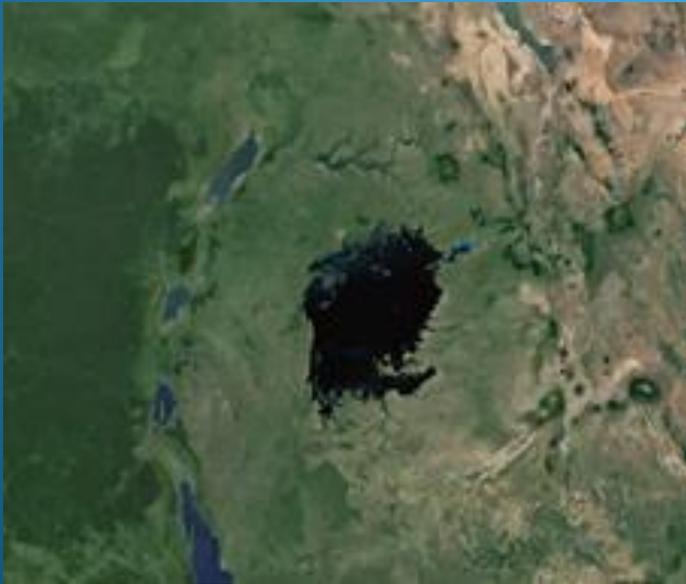


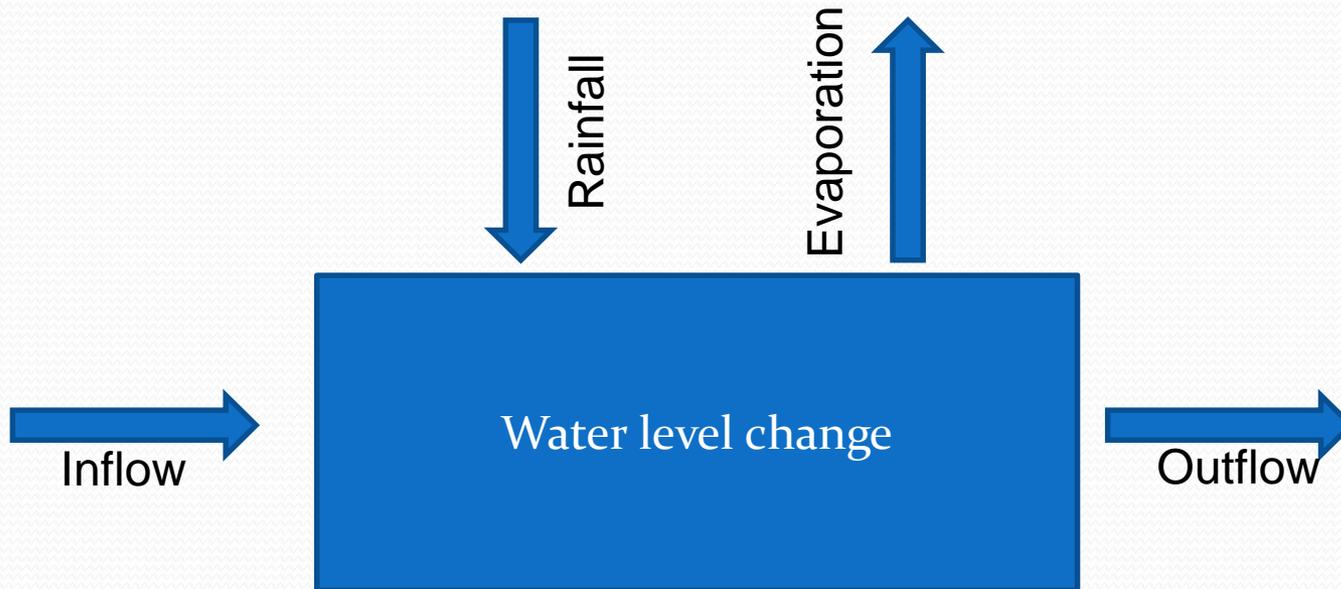
# Lake Victoria water balance

*- impacts of climate change -*

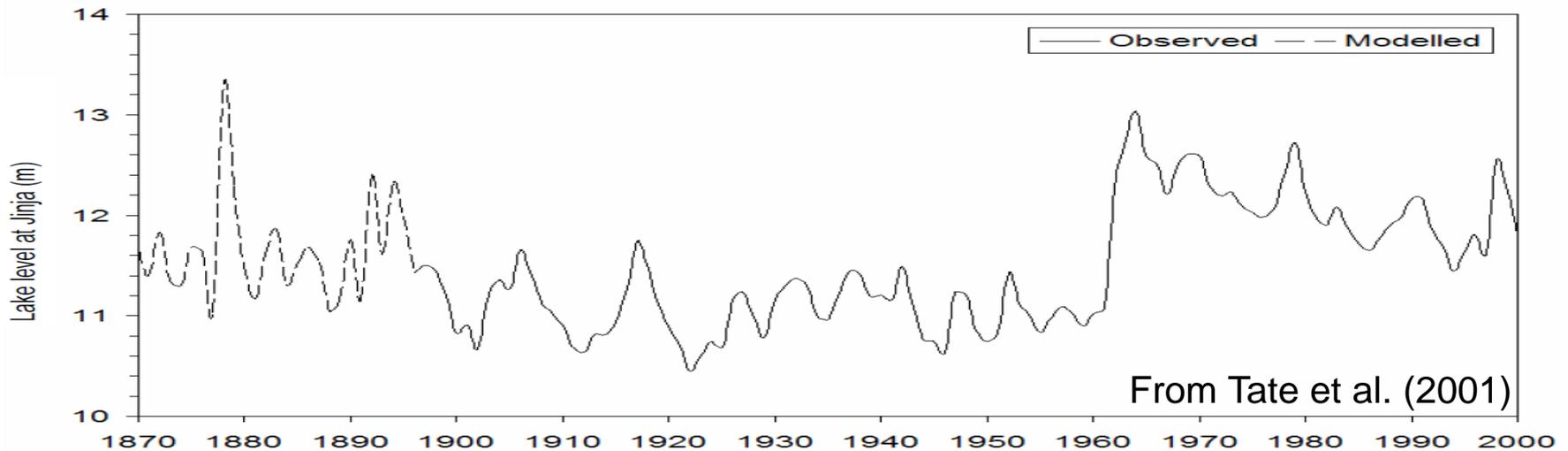
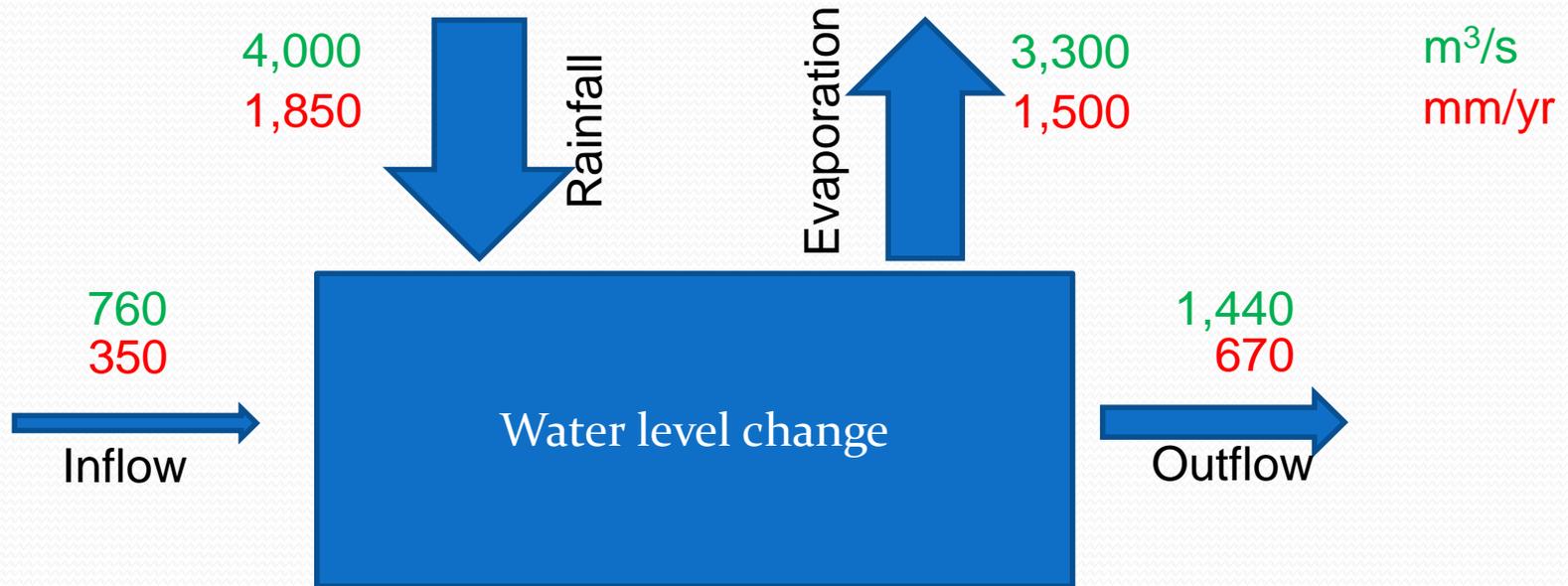


AGL Conference  
Entebbe 2 – 5 May 2017  
Peter Koefoed Bjornsen,  
O Z Jessen, J K Lørup  
UNEP-DHI Centre

# Water balance equation



# Water balance equation L V



# Impacts of changes

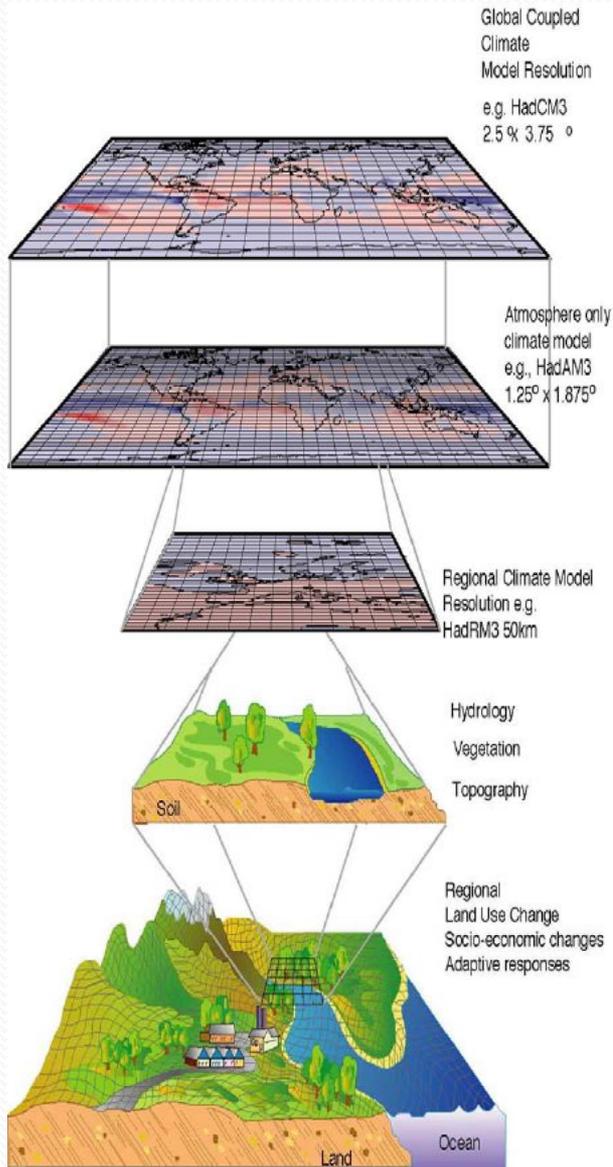
Net water balance =>

- Hydropower potential
- Downstream flow
- Water quality

Reduced water level =>

- Fisheries, navigation
- Habitats, biodiversity

# The scaling challenge



GCM projections: (UK MET office)



Dynamical  
Downscaling

RCM projections: (UK MET office)



Statistical Downscaling

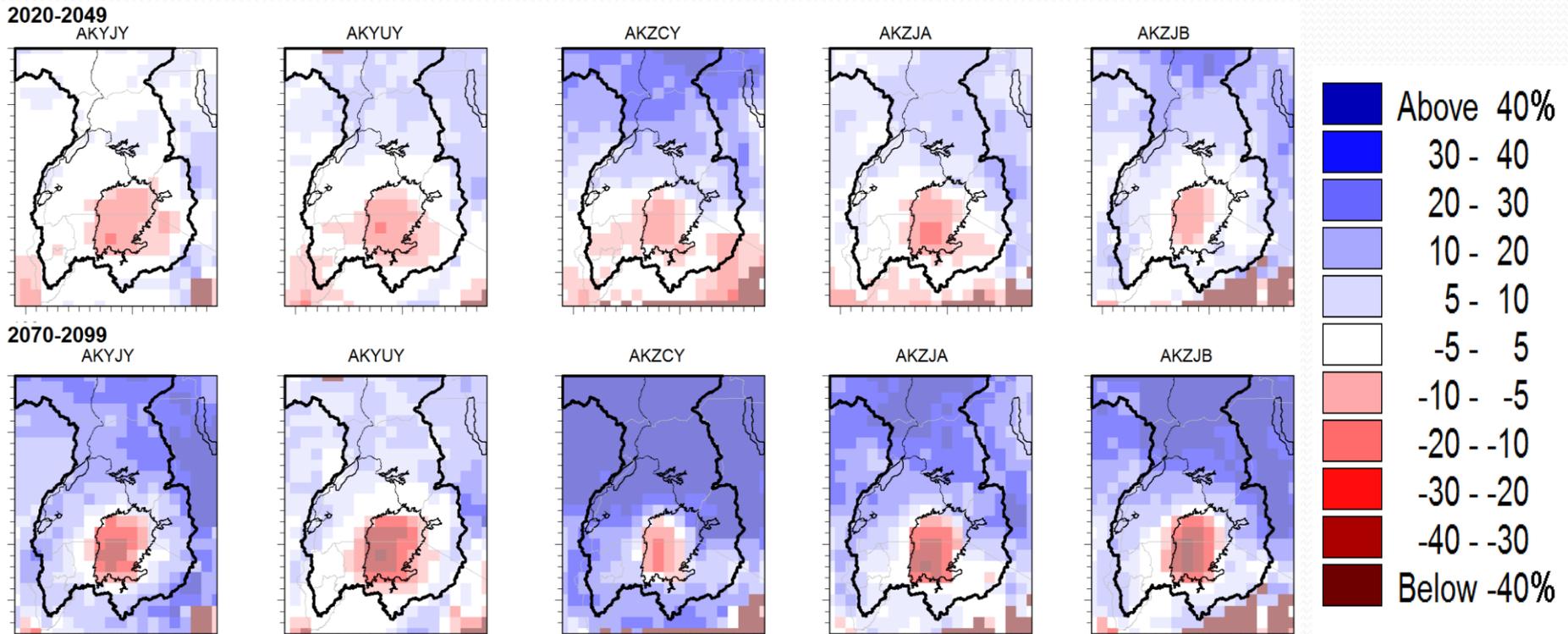
Basin Climate simulations  
(Change Factors)



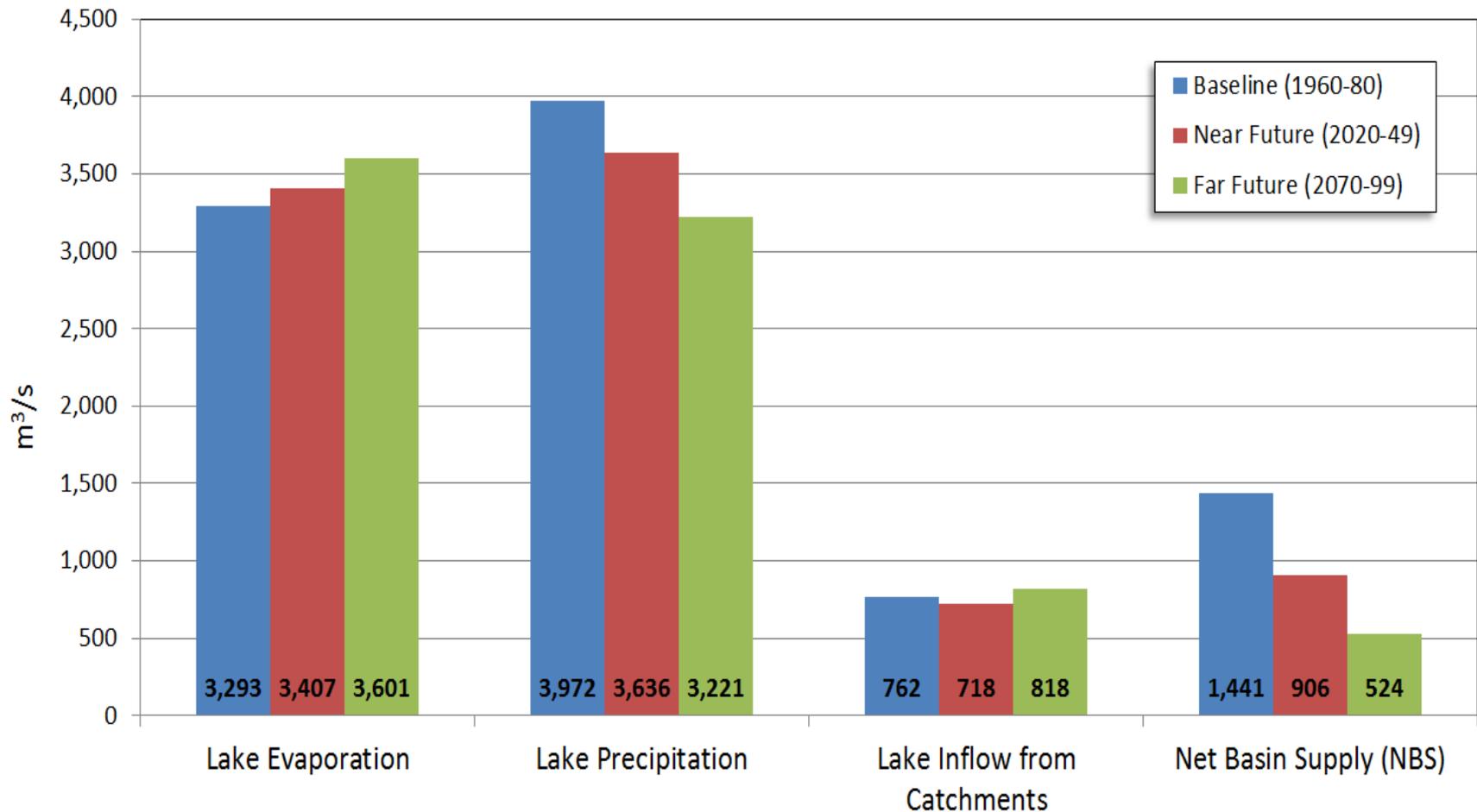
Basin Hydrological simulations

Local Hydrological simulations

# Rainfall projections under five different Climate Change ensembles



# Water balance projections

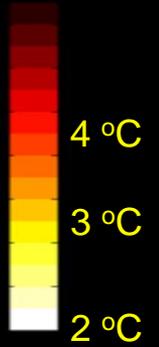
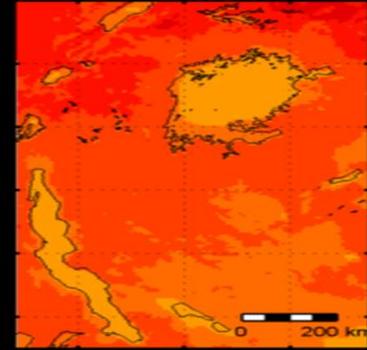
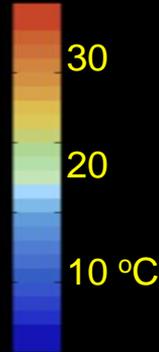
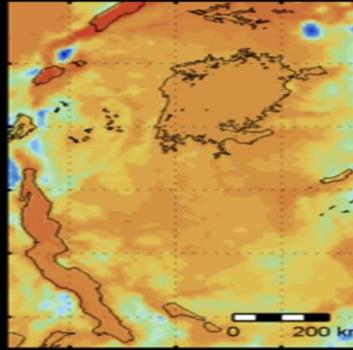
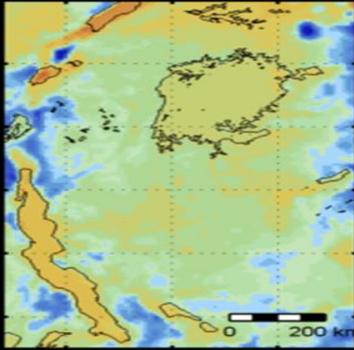


HIS (1981 – 2010)

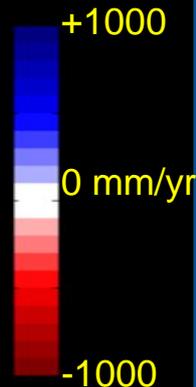
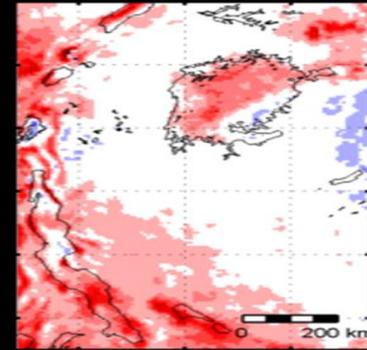
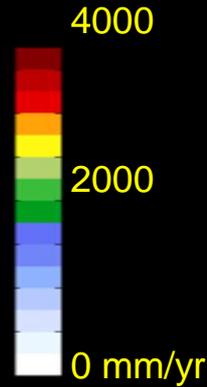
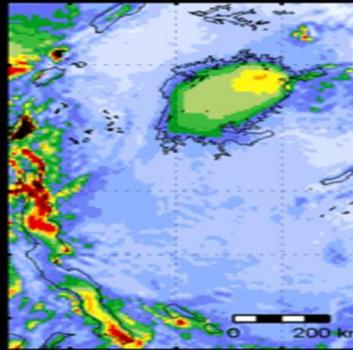
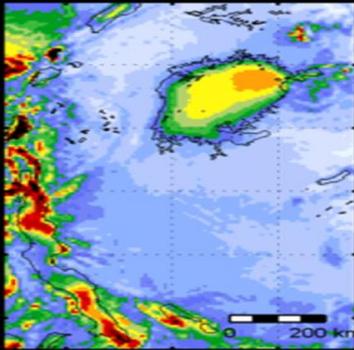
FUT (2071 – 2100)

Change (FUT – HIS)

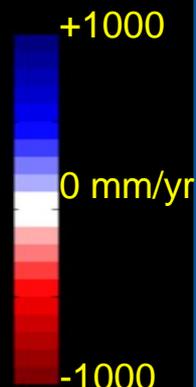
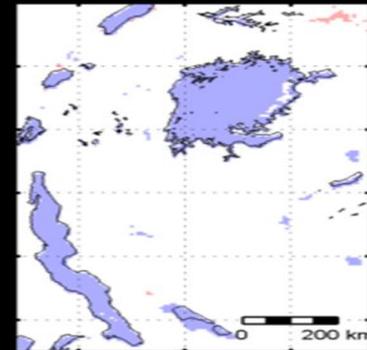
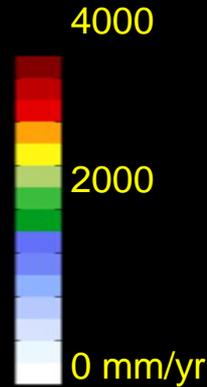
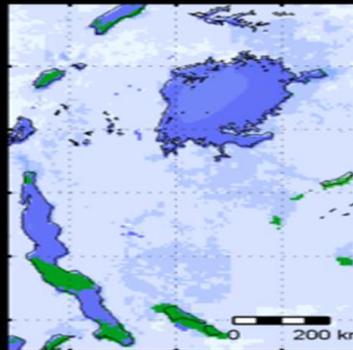
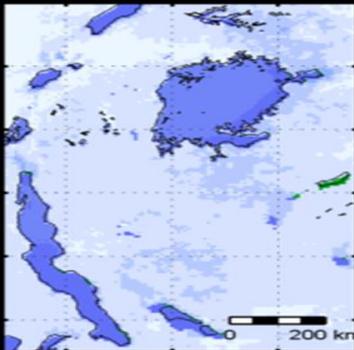
Temperature

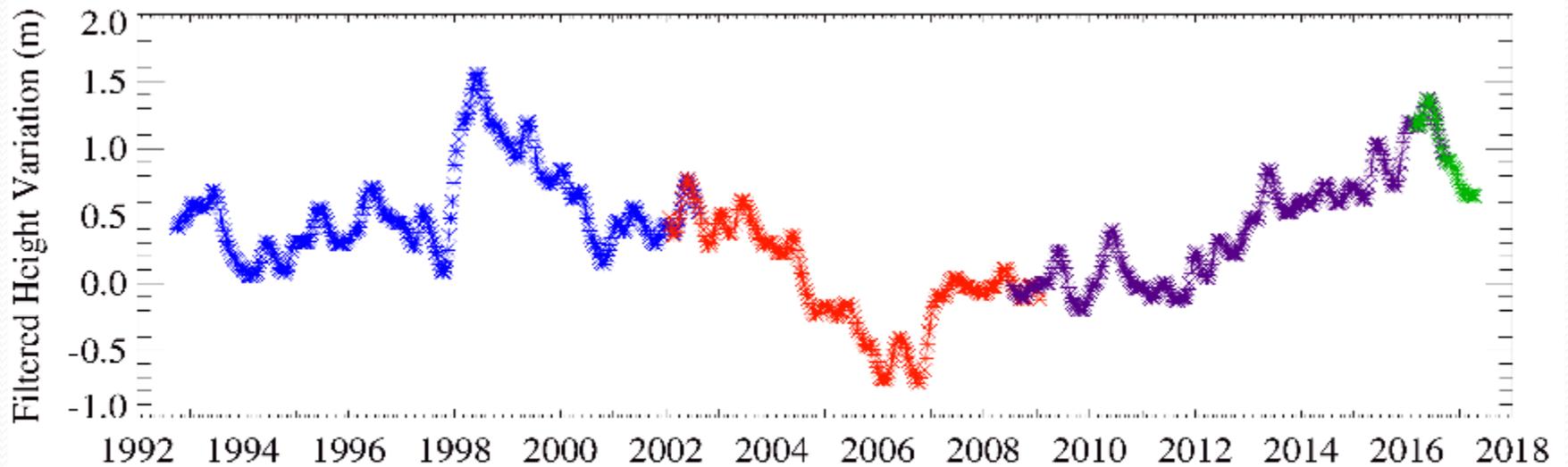
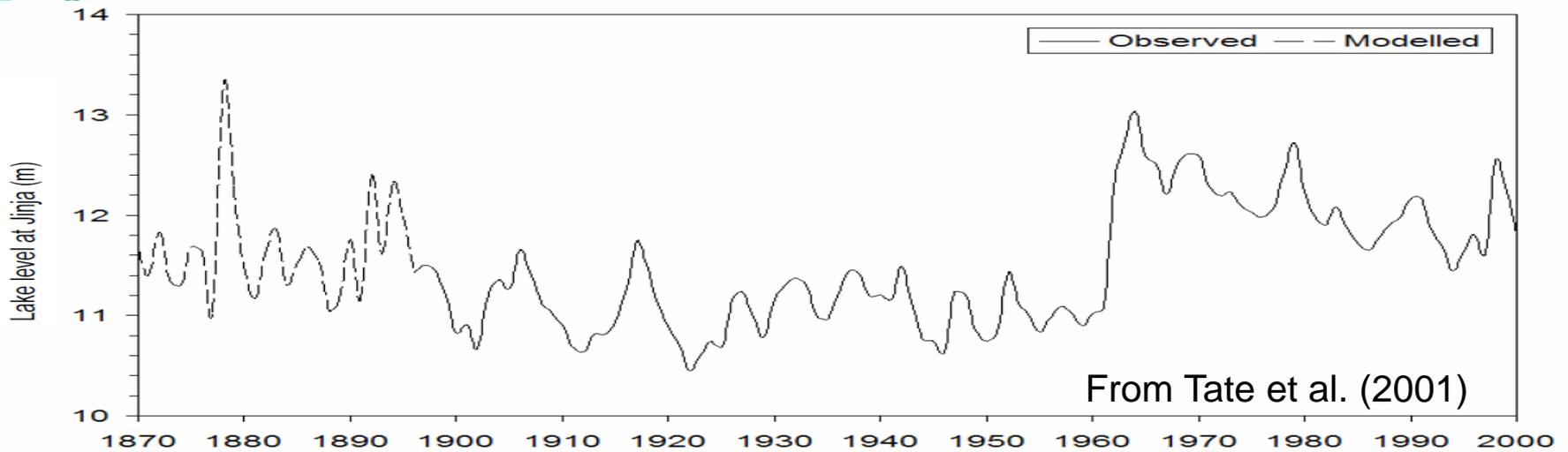


Precipitation



Evaporation





- \*\*\* TOPEX/Poseidon historical archive
- \*\*\* Jason-1 Interim GDR 20hz altimetry
- \*\*\* OSTM Interim GDR 20hz altimetry (ice retracker)
- \*\*\* Jason-3 Interim GDR 20hz altimetry (ice retracker)

Version TPJOJ.2.3  
 Last valid elevation: 13 Apr., 2017  
<https://www.pecad.fas.usda.gov/>





# Flood and Drought Portal



DATA AND INFORMATION

User: pkb

Wo

Data x

Analysis

Document

Select

Status

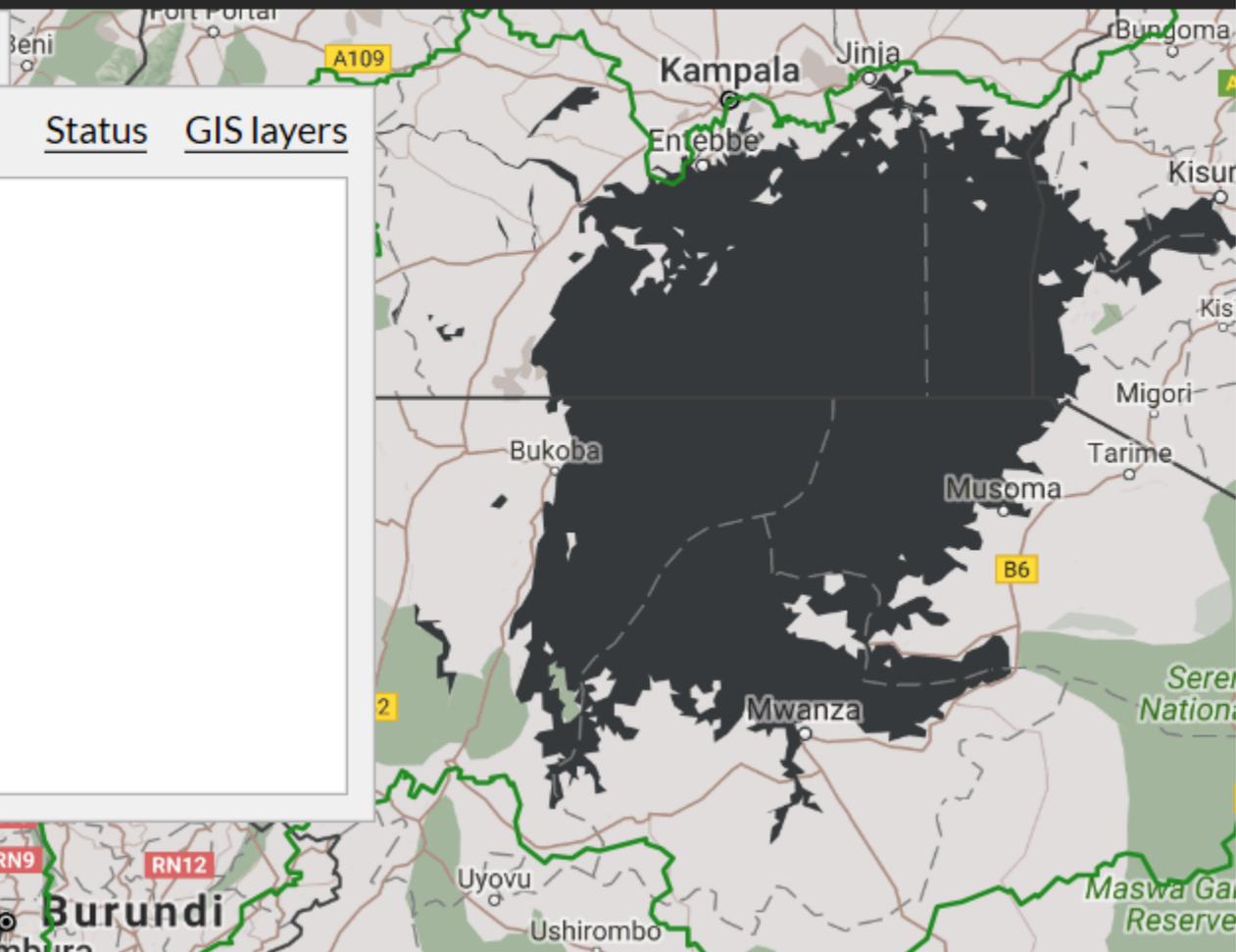
GIS layers

## Rainfall (CHIRPS)

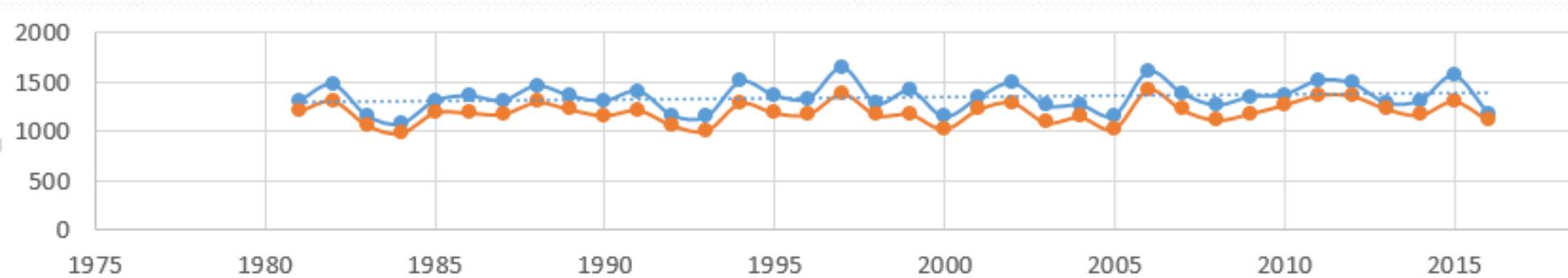
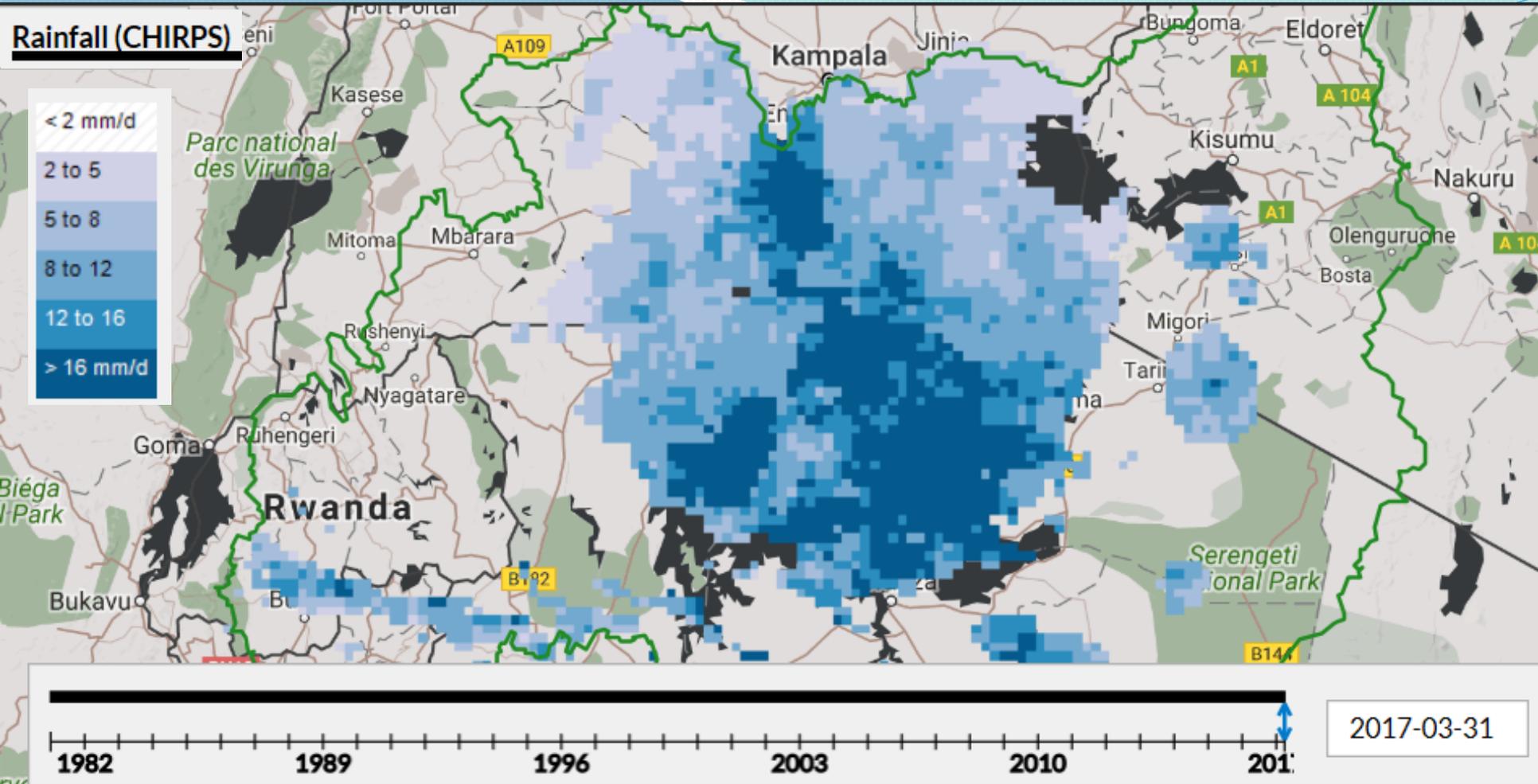
- Rainfall (CHIRPS)
- Historical ensemble
- Monthly mean

## Rainfall

- Rainfall (TRMM)
- Historical ensemble
- Monthly mean
- SPI 1 month
- SPI 3 month
- SPI 6 month
- Rainfall deviation (30 days)



26.68359, -3.51298



# Key messages

- Lake Victoria water balance very sensitive to CC
- Available model projections suggest reduced net water balance over the next century
- A reduced net water balance would have direct effects on hydropower and downstream water availability
- Strong need for more refined model projections of rainfall, evaporation and riverine inflows under CC scenarios
- Strong need for more observation data of rainfall, evaporation and water flows.