Lake Victoria basin
east Africa- Africa
What we know and what Globe can do.

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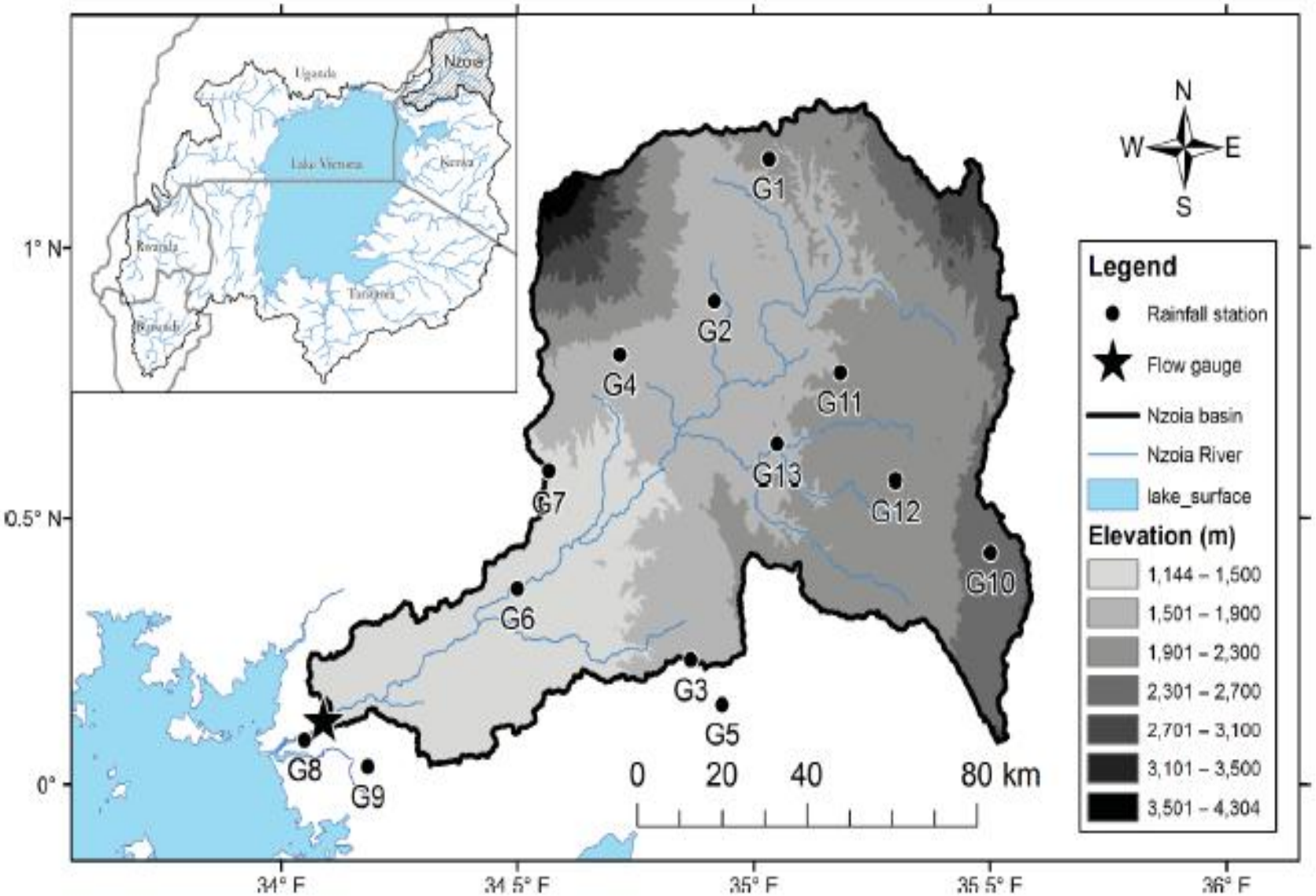
The Nzoia river basin



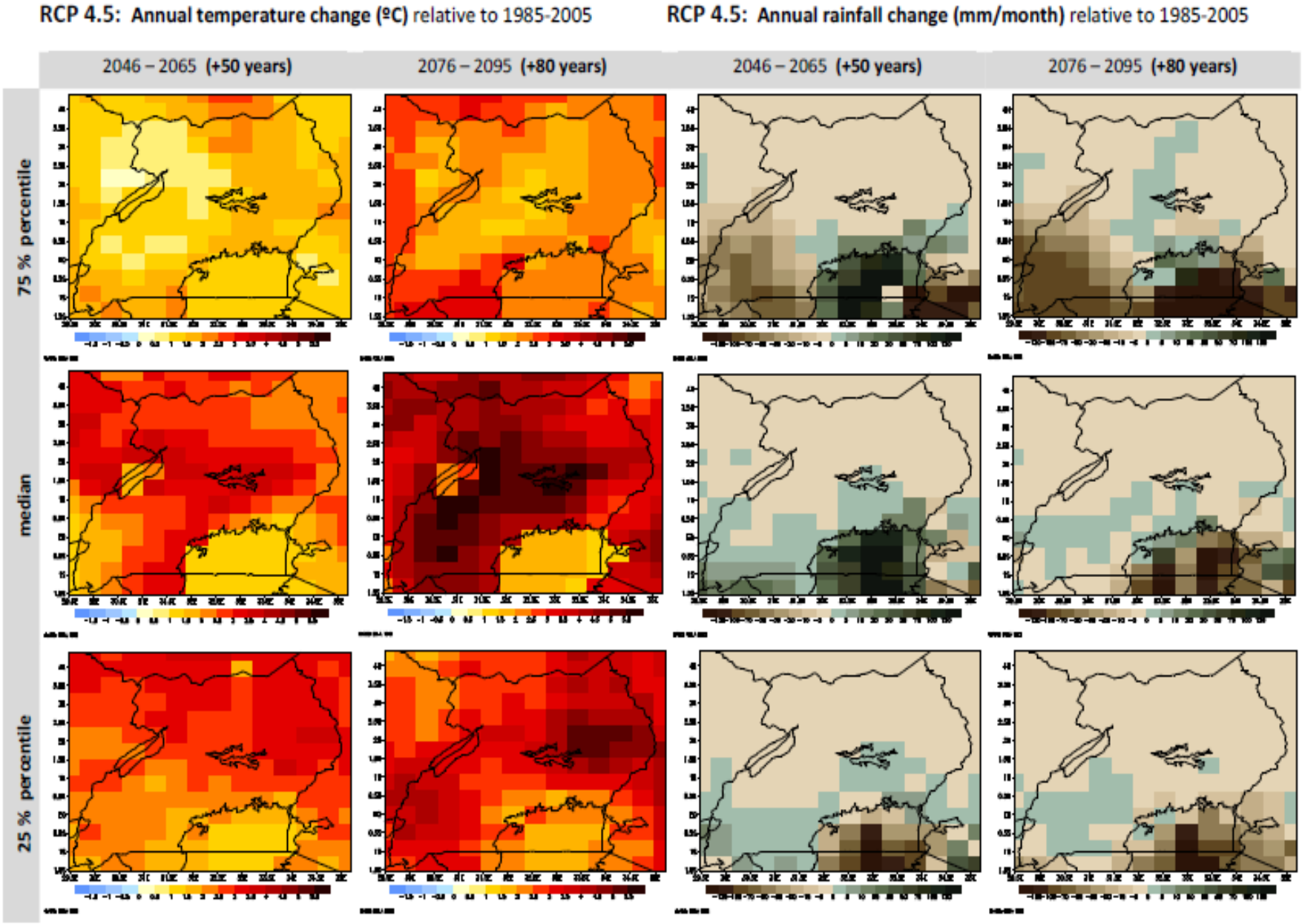


Fig 1: Annual mean near-surface (2m) temperature (°C) change (left two) and total rainfall (mm/month) change (right two) from the median (middle), 25% and 75% percentiles (bottom, top) projected over 50-years (average 2046-2065) and 80-years (average 2075-2095) from present (average 1985-2005) under the RCP 4.5 emission scenario.

RCP 4.5: Seasonal temperature change (ºC) for 2046 – 2065 (+50 years) - relative to 1985-2005

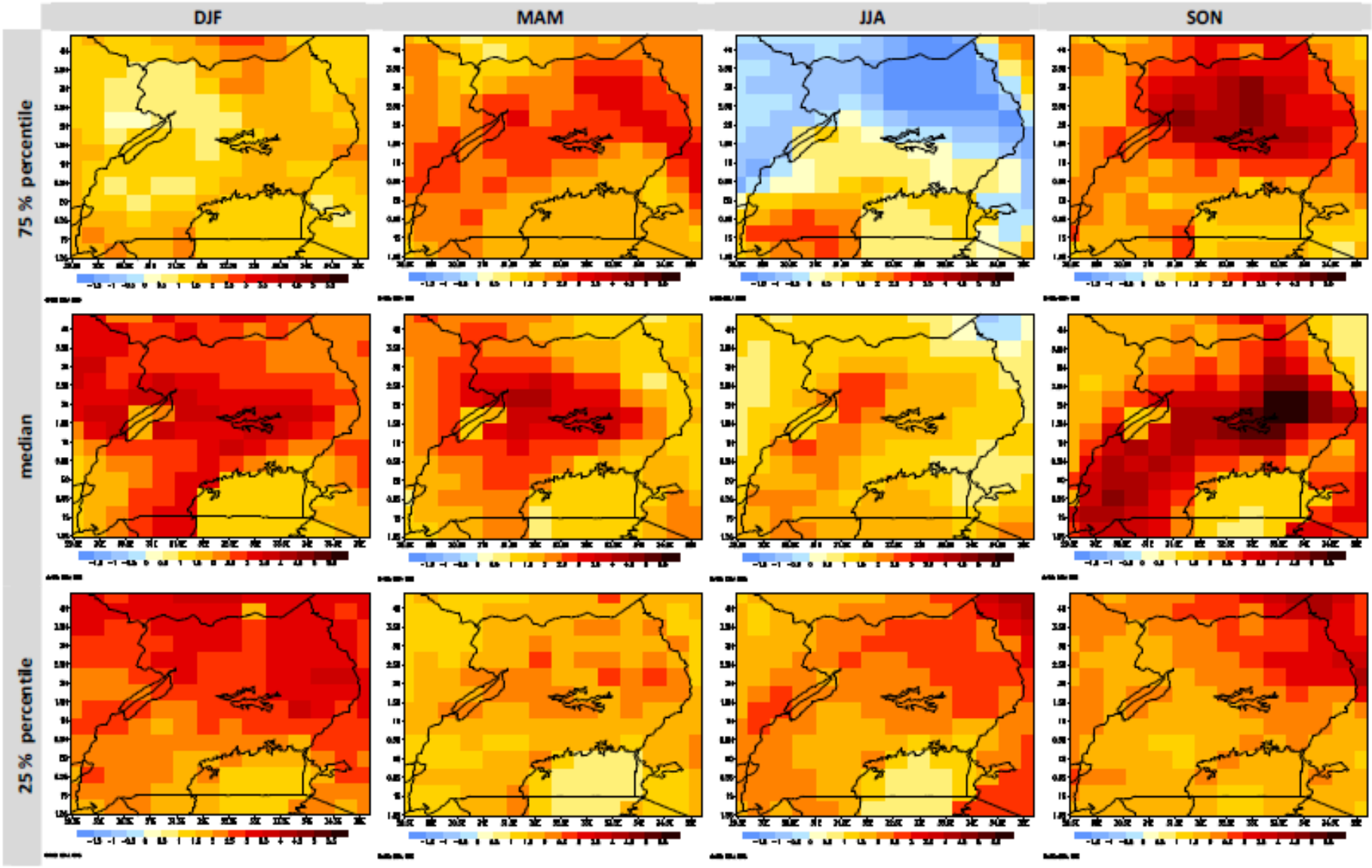


Fig 2: Seasonal (DJF, MAM, JJA, SON) mean near-surface (2m) temperature change (°C) from the median (middle), 25% and 75% percentiles (bottom, top) projected over 50-years (average 2046-2065) from present (average 1985-2005) under the RCP 4.5 emission scenario.

RCP 4.5: Seasonal rainfall change (mm/month) for 2046 – 2065 (+50 years) - relative to 1985-2005

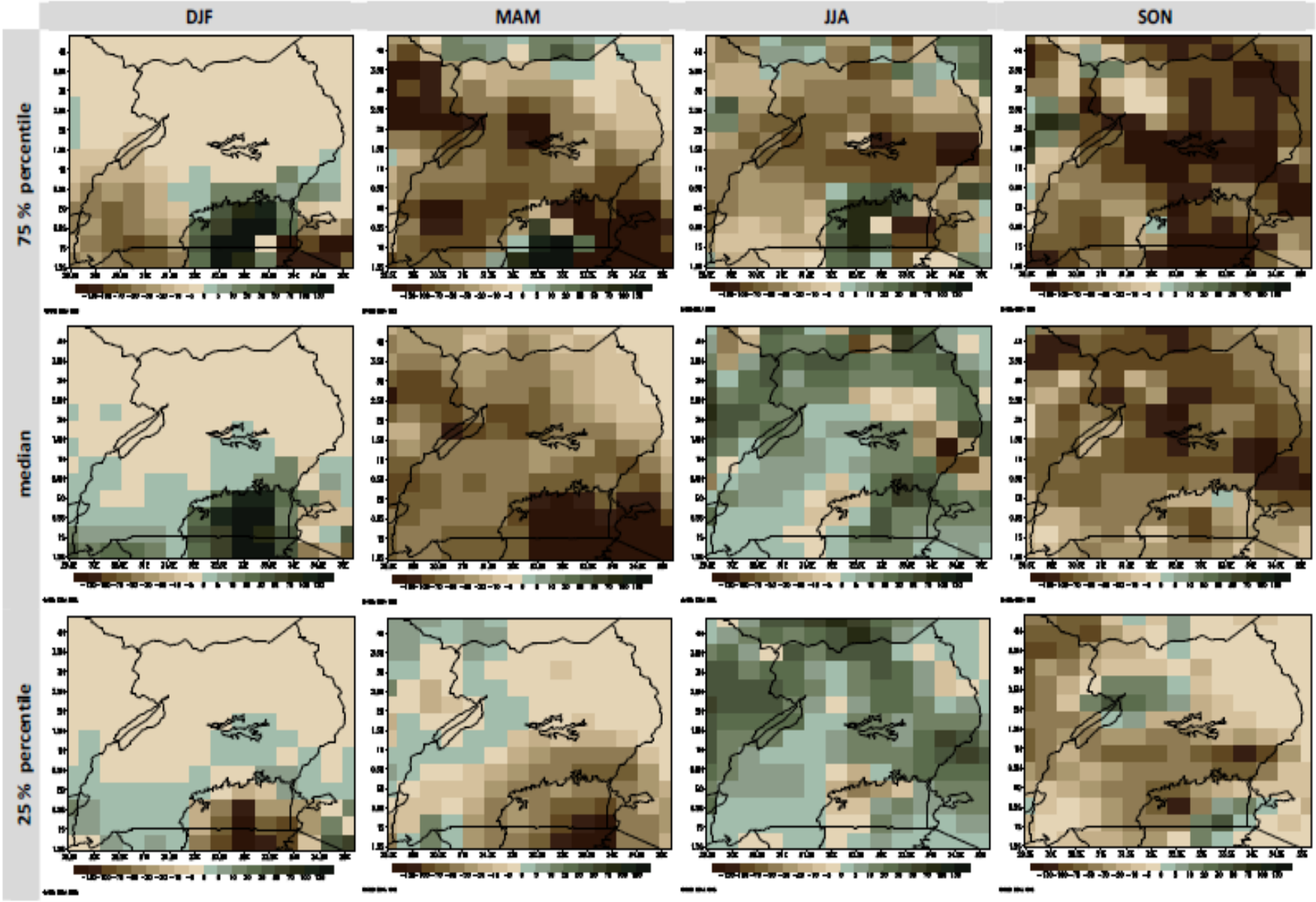
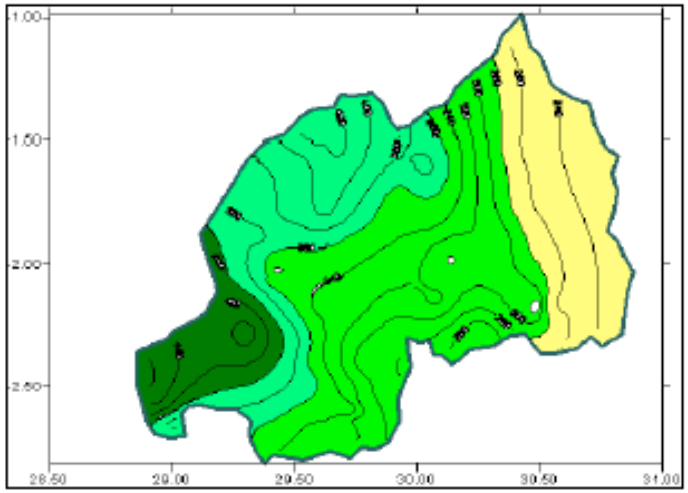
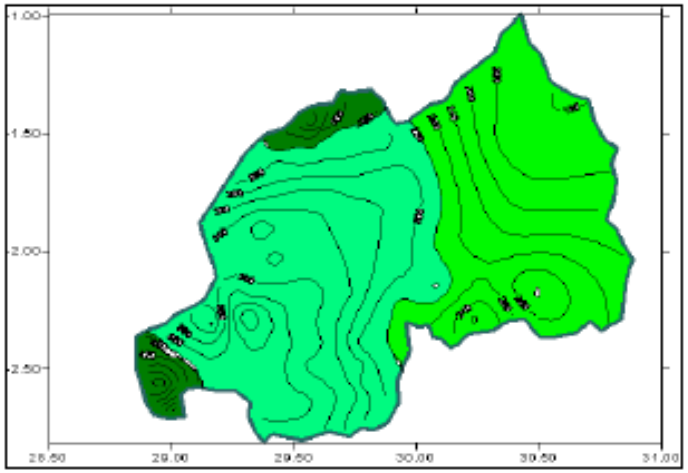


Fig 4: Seasonal (DJF, MAM, JJA, SON) total rainfall change (mm/month) from the median (middle), 25% and 75% percentiles (bottom, top) projected over 50-years (average 2046-2065) from present (average 1985-2005) under the RCP 4.5 emission scenario.

(a) March-May Seasonal rainfall

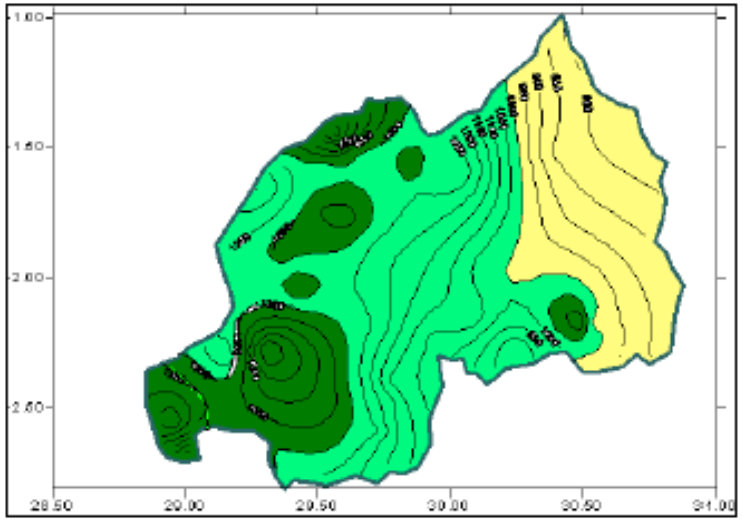


(b) Jun - Aug seasonal rainfall



(c) September-December season rainfall over Rwanda

(d) December-February season rainfall over Rwanda



(e) Spatial distribution of annual rainfall over Rwanda

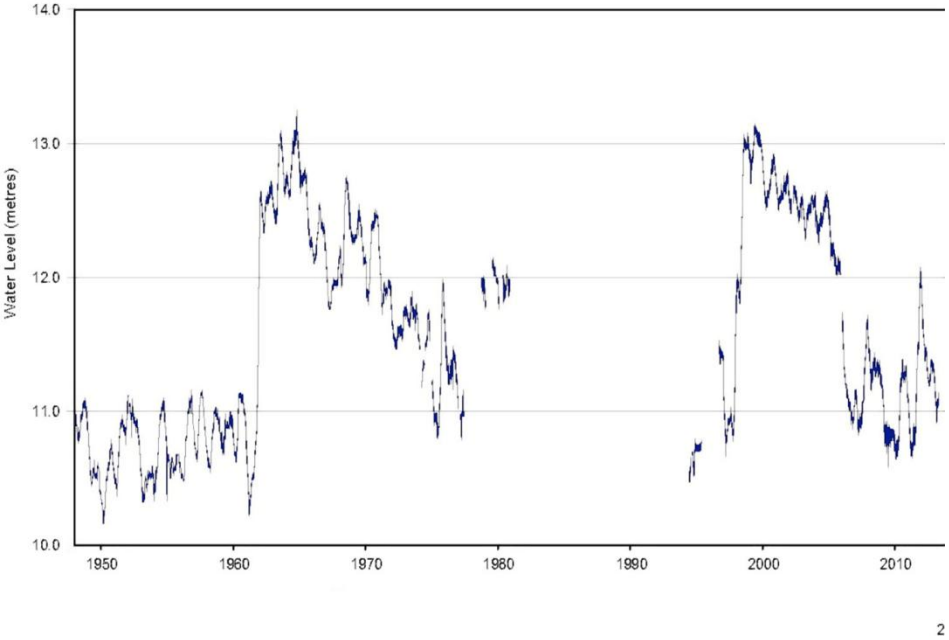
Figure 1 Spatial distribution of Seasonal rainfall over Rwanda

Issues, causes and impacts around Lake Victoria basin

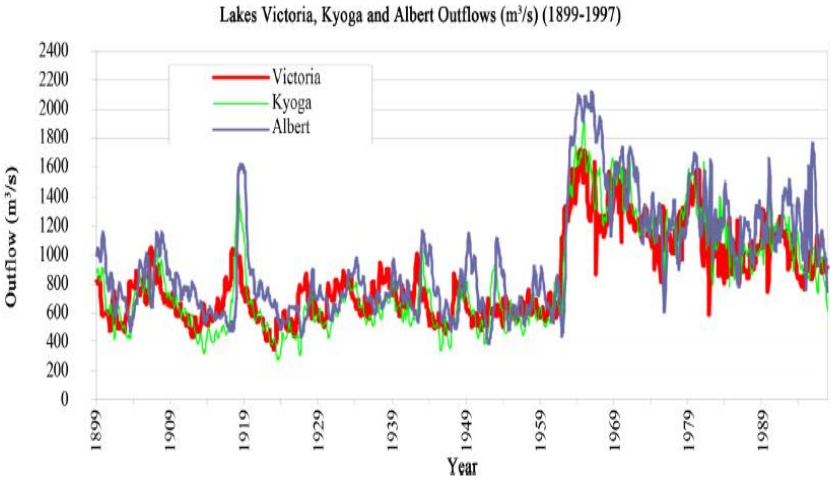
Issues	Causes	Impacts
Demographic related issues		
i) population growth	-migrations due civil strife -annual population growth rate	-inadequate service delivery -Increased use of natural resources. -Increasing water and land use conflicts.
ii) Poverty and ignorance	-lack of awareness. -failure to enforce laws -poor stakeholder involvement	degradation of natural resources -Increased degradation of natural resources -community not active in socio-economic activities
iii) Human and livestock diseases	-Overstocking of animals. -Irresponsible social behavior. -Uncontrolled migrations. -Seasonal changes -Availability of grass and water	Increased spending on health services -Loss of resource personnel. -Spread of diseases. -Increased conflicts -degradation of resource
iv) Migrations	Political instability Voluntary causes Search for water and other natural resources. Diseases Seasonal changes	- Pressure on resources -Conflicts -Increased population -Spread of diseases -encroachment on water shed.
Conflict in use of resources	Complex land tenure systems Unharmonised laws and policies Lack of trans-boundary institutions Conflicting institutional interests Poor governance (IWRM).	Forced migration which to lead to increased population pressure. Conflicts for resources
Catchment Management		
i) Deforestation	Population pressure Demand for agricultural land Un-harmonised policies	-Land degradation -Destruction of ecosystem diversity -Drying of streams and rivers overall poor water shed
ii) Drainage of wetlands	-population pressure -Lack of awareness -food security	-Loss of wetland ecosystem
iii) River Bank Cultivation	-un-harmonised laws and policies(country to country)	-Siltation and water quality degradation -floods
iv) Soil Erosion	-inappropriate land use practices.	-floods -Loss of soil productivity
Climatic variability	-human activity -global warming -pollution Natural variability	-Floods -Droughts
Base line studies	-lack of technical and financial resources -Lack of data& information sharing protocols -Lack of access to reliable water resources data and information.	Poor planning
Unfriendly colonial agreements need for a new regulation policy	-Poor planning -Civil society exploitation	-Destruction of the environment and watershed. -Loss of market and revenue from neighboring countries.
Unguided damming	-lack of a guiding policy	Impacts on downstream recipients
Encroachment on watersheds (utilization)	-Lack of awareness by stakeholders -Absences of harmonized laws	-Poor conservation and Management of the water shed. -Affects water quality. -Impacts on navigation -Destroys eco-tourism -Destroys ecosystems

Variations in water level in the basin Lakes.

Annual water level of lake Kyoga (1950-2013) measured at Bugondo pier. (DWRM,Entebbe)



Long-term variations in River Nile flows



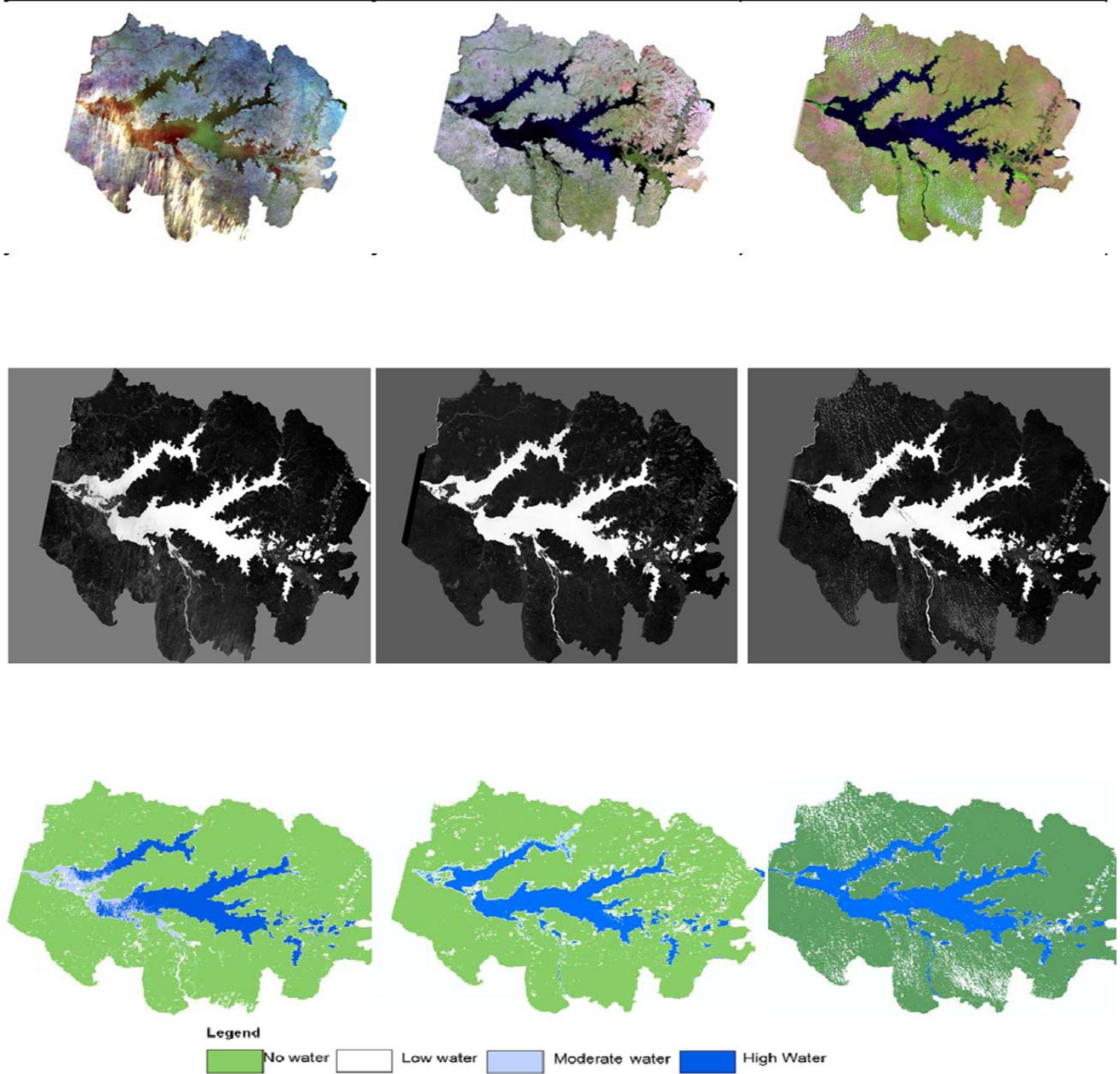


Fig. 5 Satellite output images prior to (**a**, **b**) and after calculating (**c**) change in surface water area of Lake Kyoga sub-basin. **a** Lake Kyoga sub-basin delineated from Landsat composite images for January 1986, 1995 and 2010 (*left to right*) using band combination 7, 4 and 2. **b** Enhanced images of Lake Kyoga sub-basin after applying the MDWI for 1986, 1995 and 2010 images (*left to right*). **c** Reclassified images of Lake Kyoga sub-basin for January 1986, 1995 and 2010 (*left to right*).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What Globe can do

- Water quality studies especially at the point where water gets into the lake at the inflow points
- Land use and land cover studies for the whole basin
- Climate fluxes over the lake
- Variations in water levels
- Providing real time data
- Baseline studies on lake resources (fish, primates..)
- Creating a Data base
- Studying mosquito prevalence and awareness.