



HyCRISTAL: Intergrating Hydro-Climate Science into Policy Decisions for Climate-Resilient Infrastructure and Livelihoods in East Africa

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East Africa is developing rapidly, with many decisions being taken now which will have consequences for decades to come. Due to climate change, we do not expect the weather and climate in the coming decades to be the same as those in the past, which must be accounted for in decision making. For many of these long-term decisions, and for sustainable development, availability and management of water is fundamental. However, this vital resource and the livelihoods it supports are already under stress from steady growth in population, land degradation, inadequate sanitation and drainage systems, pollution and overfishing. Climate change adds to these challenges, greatly increasing the vulnerability of the poorest people in the region.

HyCRISTAL is a consortium within the 'Future Climate for Africa' (FCFA) programme funded by the UK Department for International Development (DFID) and Natural Environment Research Council (NERC). HyCRISTAL focuses on tropical East Africa. HyCRISTAL is supported by the East African Community (Uganda, Kenya, Tanzania, Rwanda, Burundi and South Sudan) with climate science addressing a wider region including Somalia and Ethiopia. It is linked to the World Meteorological Office GEWEX project HyVic.

HyCRISTAL is working with the region's decision makers to integrate information on climate change into current long-term planning and decision making. HyCRISTAL's main pilots on the use of climate change information in long-term decision making focus on the Lake Victoria basin, addressing: (1) Rural communities that rely on agriculture and fishing; (2) Urban populations where water supply and sanitation are under pressure, and (3) Water management – linking with urban and rural water use. Smaller linked-projects address (4) tea production in Kenya and the (5) climate change in Lake Victoria lake levels for the transport sector (HyTpp).

HyCRISTAL's climate science aims to understand and ultimately reduce sources of uncertainty in decision-relevant climate information for East Africa. It addresses drivers not accounted for in CMIP projections, as well as processes such as moist convection that are known to be both key to climate impacts and poorly captured in global climate models. Here we present some key results from HyCRISTAL. We focus on the climate science, including new understanding of the causes of variability in CMIP projections, changes in onset and cessation, and the role of aerosols. The FCFA IMPALA project has produced the first convection-permitting Pan-African simulations run for both current and future climate, and early analysis of these is used to show how parametrisation affects projections of extreme rainfall.