Going seamless for impacts: Experiences from the FP7 QWeCI project

Session C3
Poster W205B

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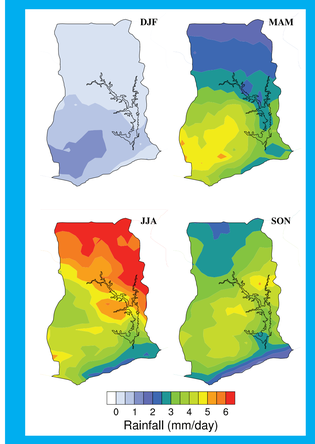
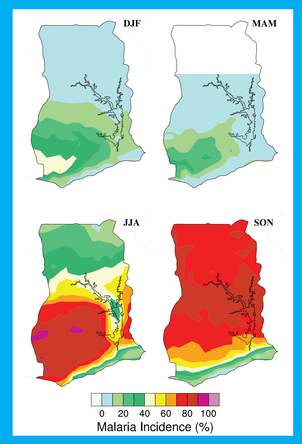
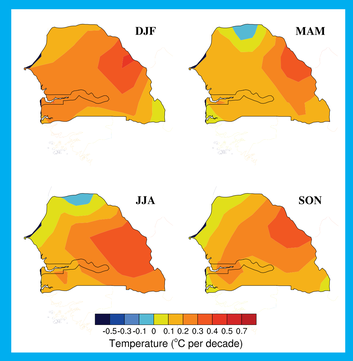
CLIMATE AND MALARIA EXAMPLES



Mean rainfall over Ghana, 1998-2010



Health impact examples: Malaria Incidence over Ghana, 1999-2008



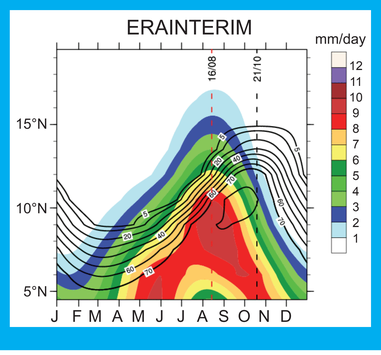
Mean Temperature trend over Senegal

Temperature trend (°C) per decade based on CRUTS2.1 data for the period 1950-2002.

Temperatures have increased by about 0.3 -0.4°C per decade, the warming being more pronounced over the eastern part of the country. The largest warming occured in winter.

Mean seasonal cycle, rainfall and malaria in West Africa, 1990-2007

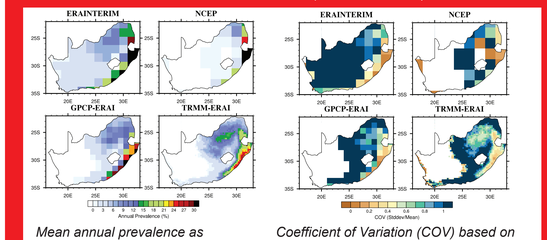
Hovmoeller like diagram (zonal average between 16°W and 16°E) Shading: Rainfall Contours: Malaria Incidence



MALARIA VARIABILITY

Simulated Malaria over South Africa

Under estimation in northern Limpopo.
Malaria over estimated in the south-west (malaria control).

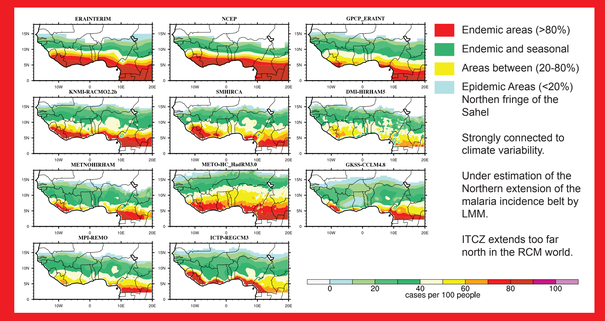


Mean annual prevalence as simulated by the LMM driven by different streams of observed data sets.

Coefficient of Variation (COV) based on simulated malaria prevalence. The COV is defined as the ratio between one standard deviation of the prevalence divided by the mean.

Mean Annual Malaria Modelled Incidence, 1990-2007

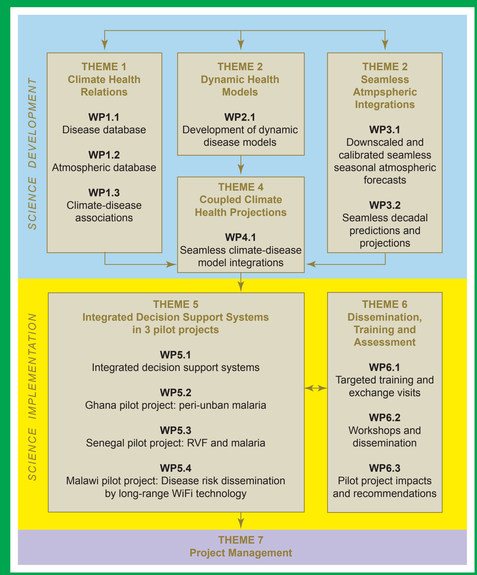
Driven by 'Observed datasets' and the ENSEMBLES RCM ensemble.



QWeCI: THE FOUR CORE AIMS

- Target important diseases with clear climate drivers.
- Evaluate and develop state of the art dynamical disease models driven by climate models and incorporate these in state-of-the-art health EWS and climate impact on health projections.
- Use the very best weather and climate prediction systems across a range of forecast timescales in a seamless way; focus on ensemble prediction systems.
- Bring in health-care end-users and stakeholders to ensure research results have potential to feed into operational systems on the ground.

QWeCI Senegal visit, October 2010



PARTNERS

- University of Liverpool
- Centre de Suivi Ecologique
- Consejo Superior de Investigaciones Cientificas
- European Centre for Medium Range Weather Forecasts
- Institut Català de Ciències del Clima
- The Abdus Salam International Centre for Theoretical Physics
- International Livestock Research Institute
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- Kwame Nkrumah University of Science and Technology
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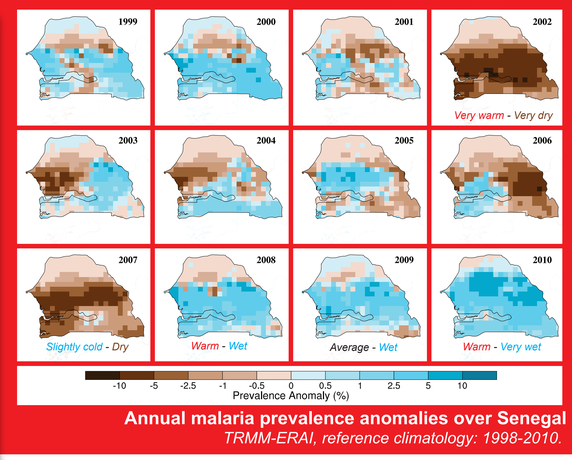
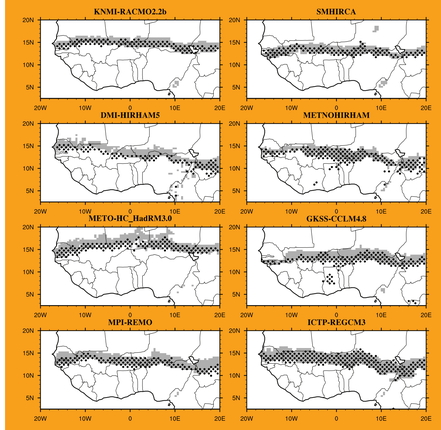


Annual malaria prevalence anomalies over Senegal

TRMM-ERAI, reference climatology: 1998-2010.

EPIDEMIC MALARIA FUTURE CLIMATE



Shift of the epidemic belt 2030-2050 vs 1990-2010

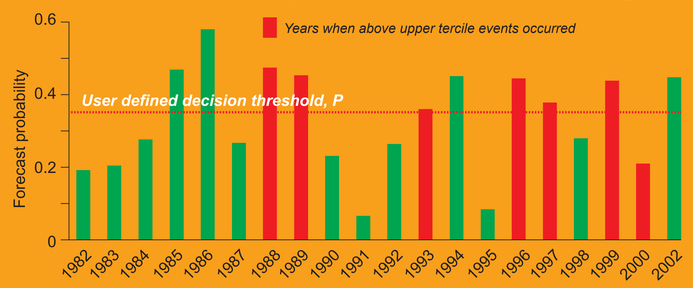
- *Location of the epidemic belt 1990-2010*
- *Future location of the epidemic belt 2030-2050*

The epidemic belt location is defined by the coefficient of variation. Note, southward shift of the epidemic belt over West Africa to more populated areas.

QWeCI CONSISTS OF
13 partners from 9 countries
(7 from Africa)
Budget 3.5M euros
Completes July 2013

FRINGES AND DISEASE TRANSMISSION

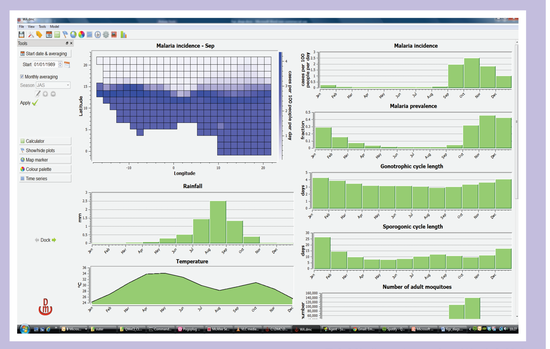
Botswana variability with seasonal scale predictions
Seasonal prediction of malaria in Botswana using LMM



DEMETER multi-model-driven malaria forecasts for above upper tercile malaria, Botswana, November forecast months 4-6 (FMA), compared to observed anomalies from 1982-2001 published index.

(After Jones and Morse, 2010).

LIVERPOOL MALARIA MODEL DISEASE MODELLING CRADLE (LMM-DMC)



DMC front end with LMM

One of the most dramatic and immediate impacts of climate variation is that on disease, especially the vector-borne diseases that disproportionally affect the poorest people in Africa. Although we can clearly see that, for example, an El Nino event triggers Rift Valley Fever epidemics, we remain poor at understanding why particular areas are vulnerable and how this will change in coming decades, since climate change is likely to cause entirely new global disease distributions. This applies to most vector borne disease. At the same time, we do not know currently the limit of predictability of the specific climate drivers for vector-borne disease using state-of-the-art seasonal forecast models, and how best to use these to produce skilful infection-rate predictions on seasonal timescales.

The QWeCI project thus aims to understand at a more fundamental level the climate drivers of the vector-borne diseases of malaria, Rift Valley Fever, and certain tick-borne diseases, which all have major human and livestock health and economic implications in Africa, in order to assist with their short-term management and make projections of their future likely impacts. QWeCI will develop and test the methods and technology required for an integrated decision support framework for health impacts of climate and weather. Uniquely, QWeCI will bring together the best in world integrated weather/climate forecasting systems with heath impacts modelling and climate change research groups in order to build an end-to-end seamless integration of climate and weather information for the quantification and prediction of climate and weather on health impacts in Africa.