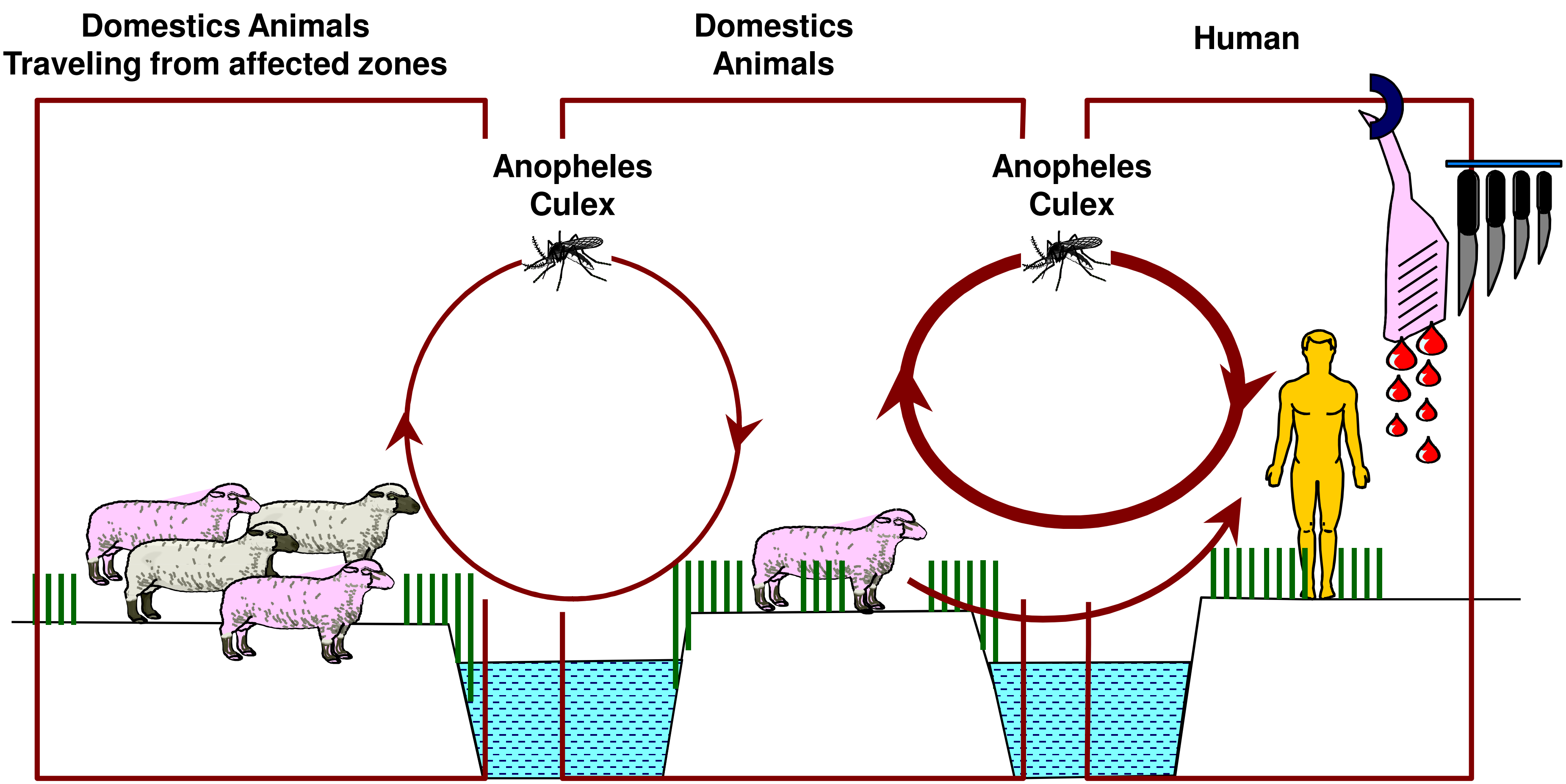
Irrigation scheme



P. Formenty


Madagascar
Carion
Image © 2008 DigitalGlobe
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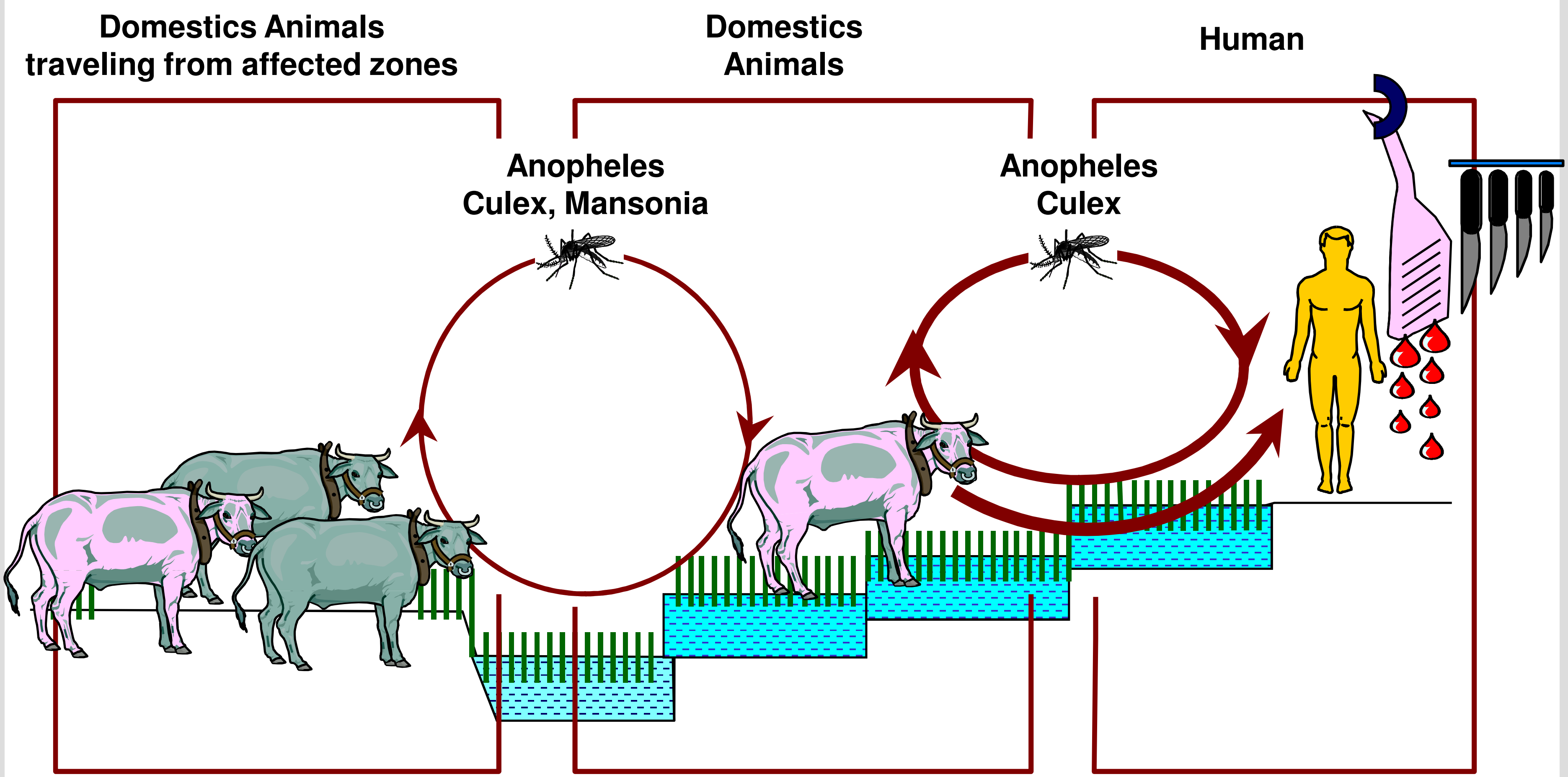
Madagascar
March 2008, Carion: 50 human confirmed cases
All exposed to one Zebu

Madagascar Rice irrigation system



P. Formenty


Madagascar
Casoumangue
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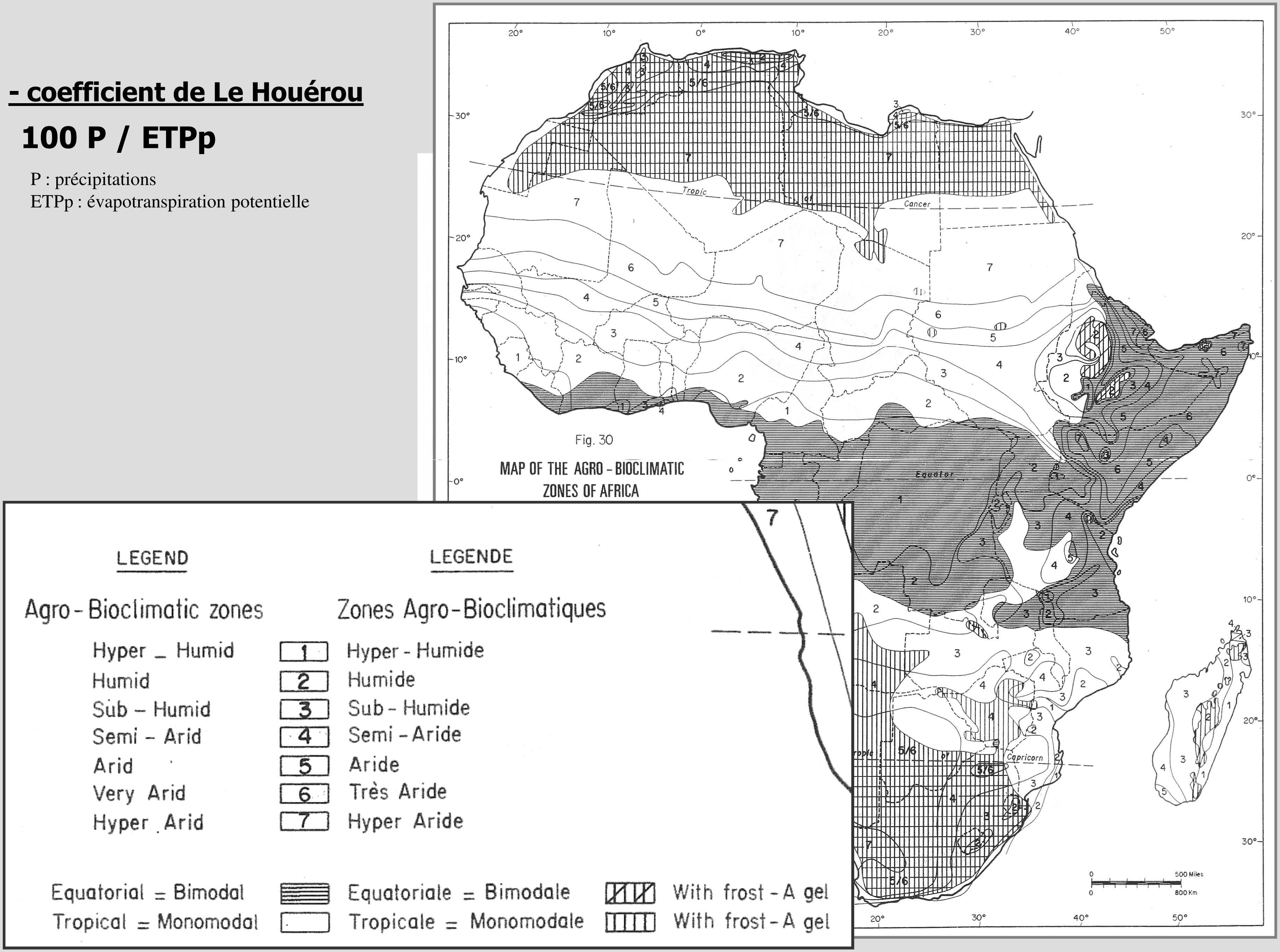
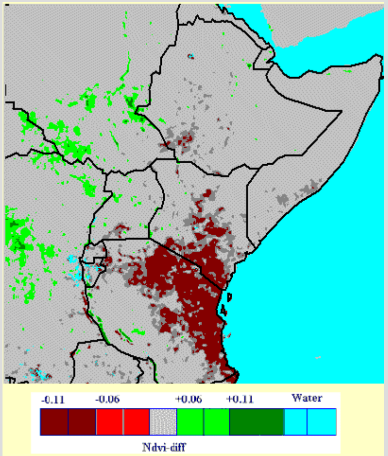
Madagascar
May 2008, Antananarivo, Casoumange: 2 human confirmed cases
In the capital city, both exposed to seven Zebu

- coefficient de Le Houérou

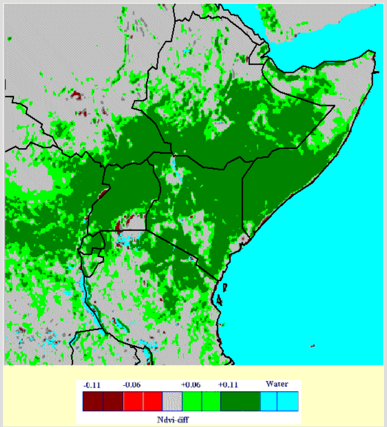
100 P / ETPp

P : précipitations
ETPp : évapotranspiration potentielle

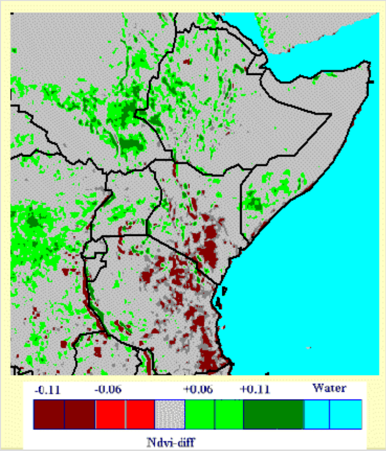




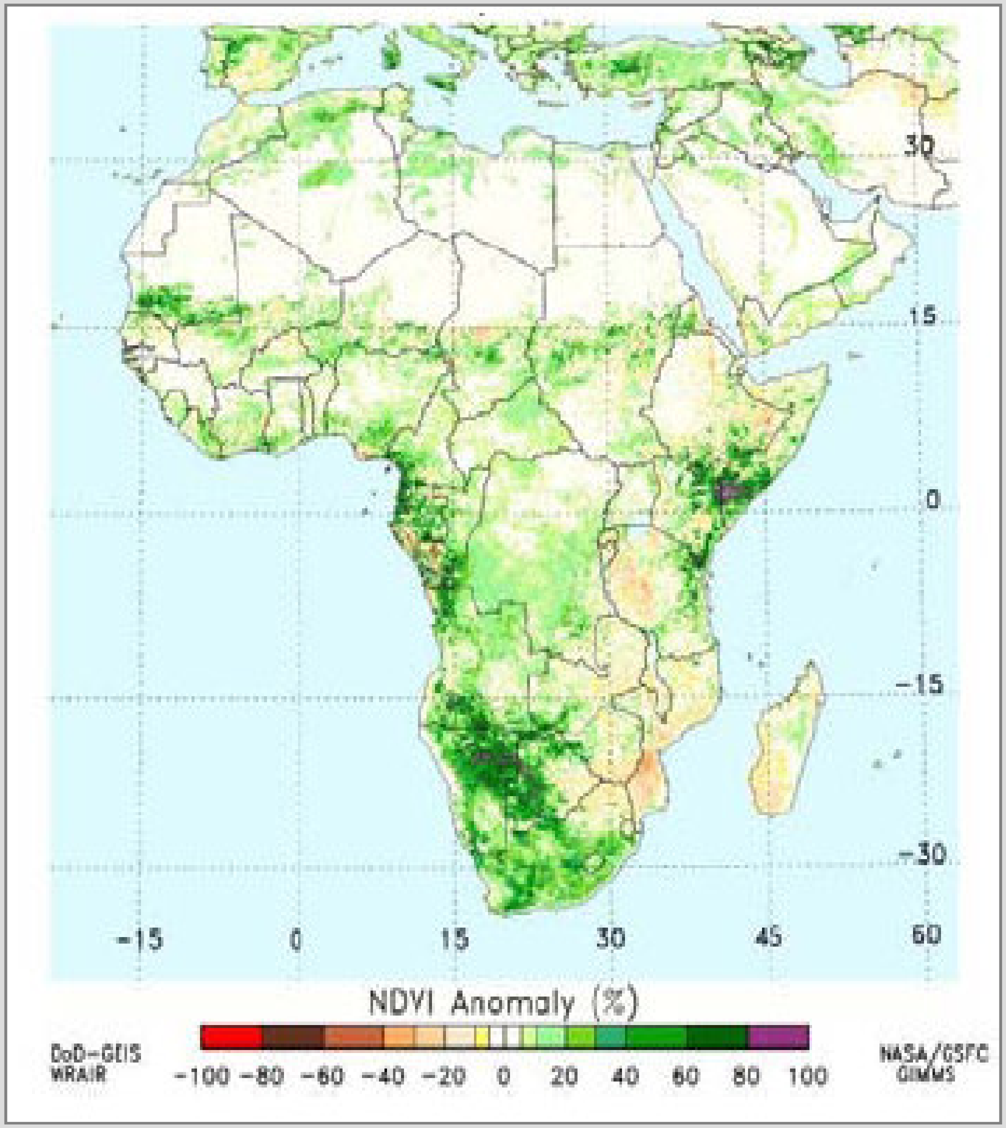
January 1997



January 1998

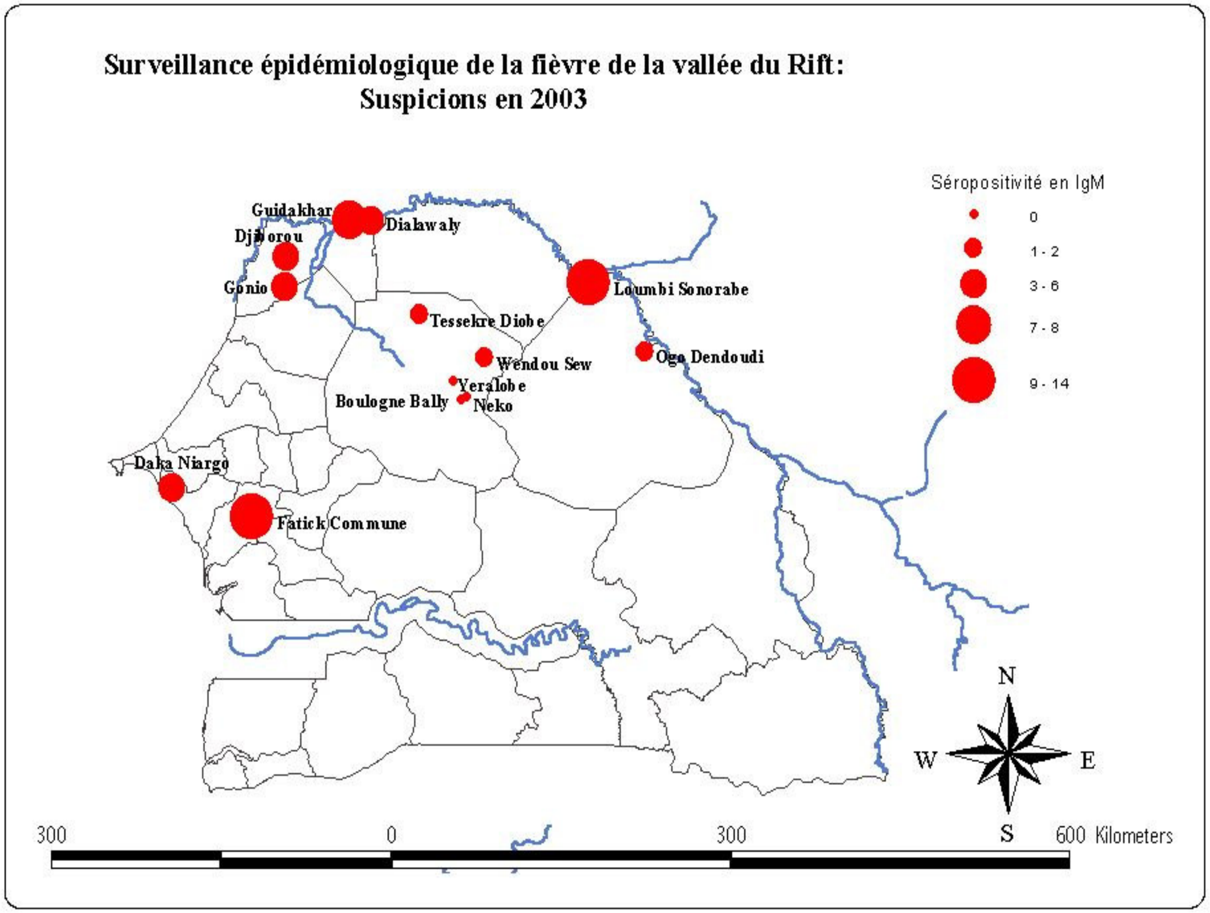


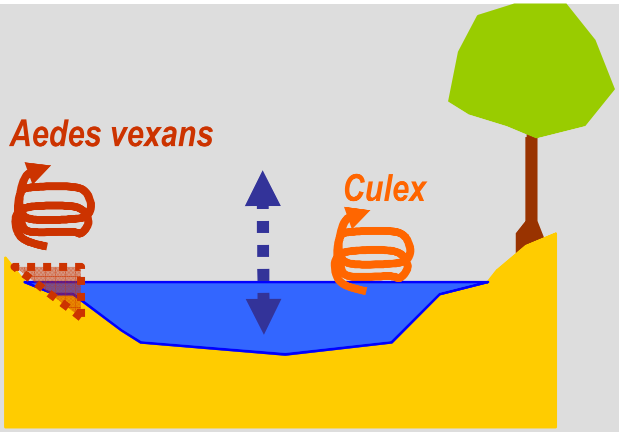
January 1999

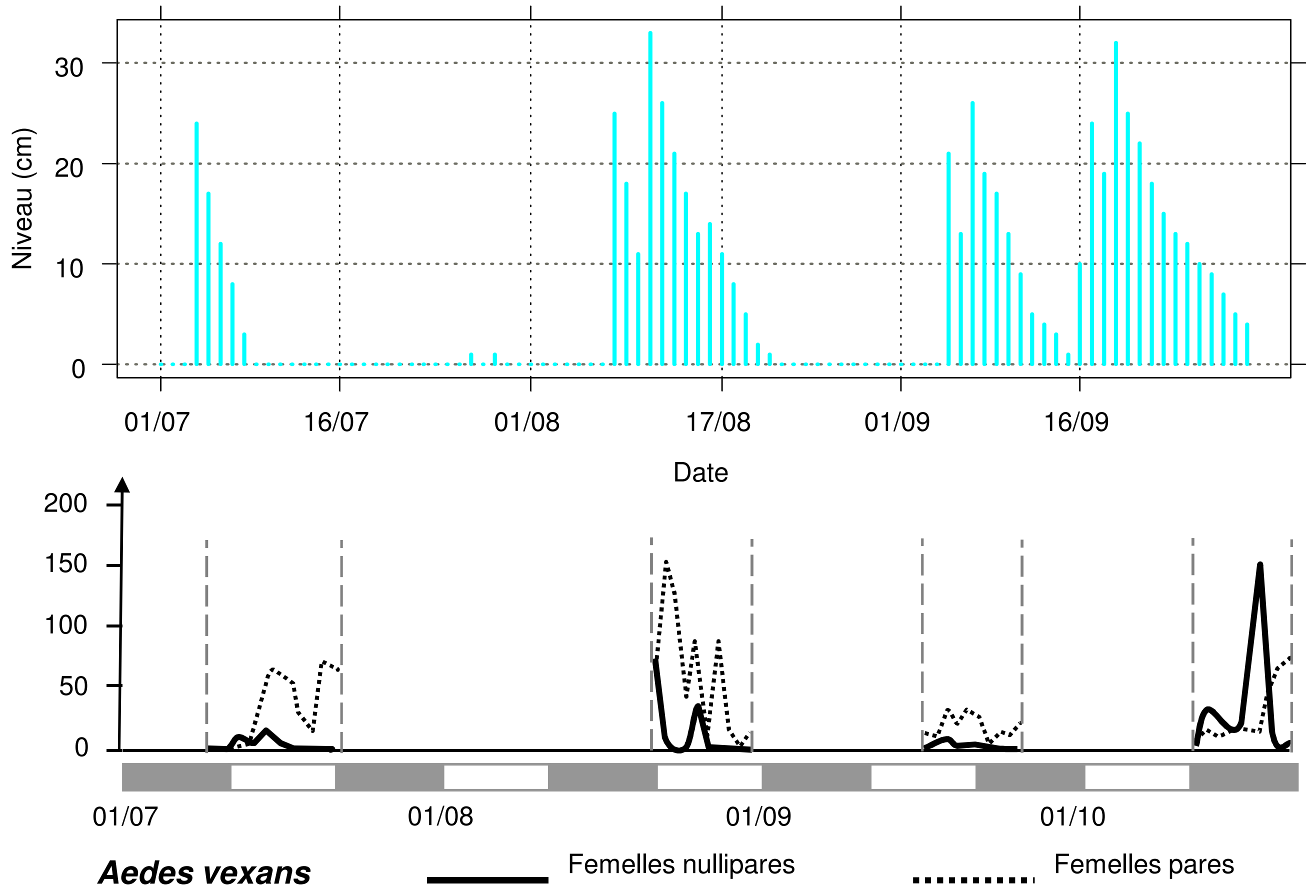


Normalized Difference Vegetation Index (NDVI)
Données brutes issues du satellite NOAA
FAO / Nasa

Foyers et Contrôle de la fièvre de la vallée du Rift en Afrique de l'Ouest

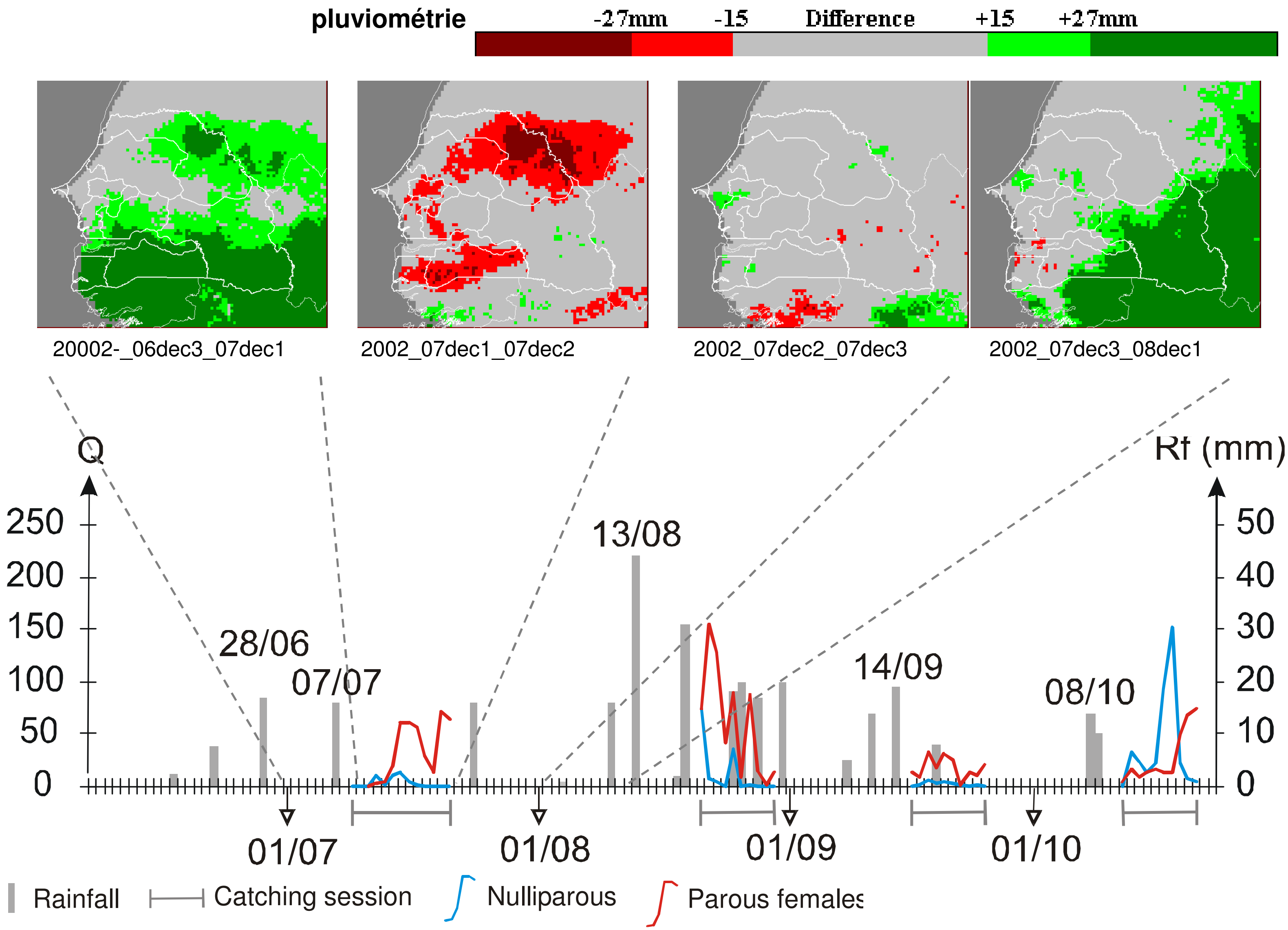




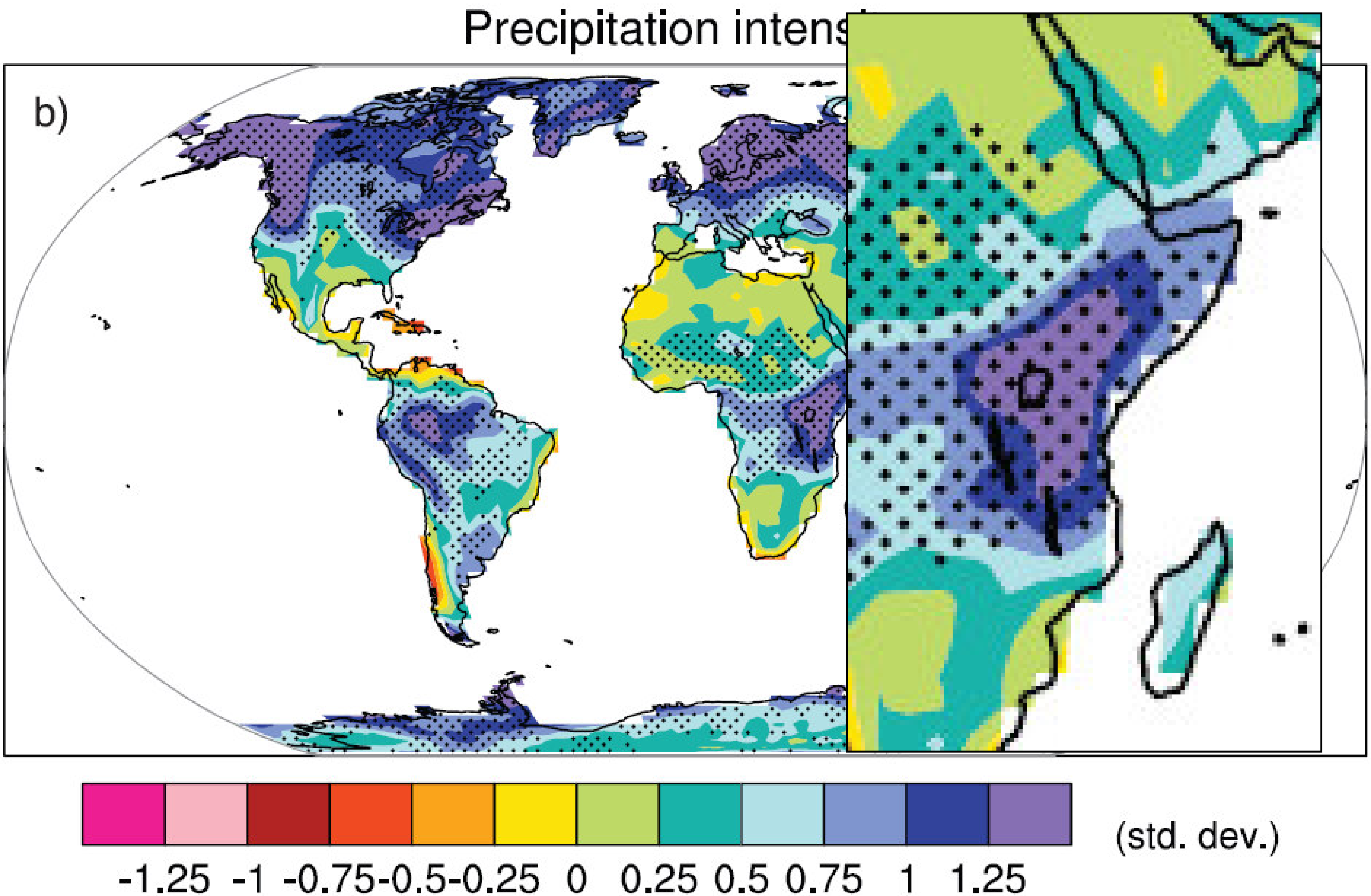


Mondet et al, 2005, Journal of Vector Ecology

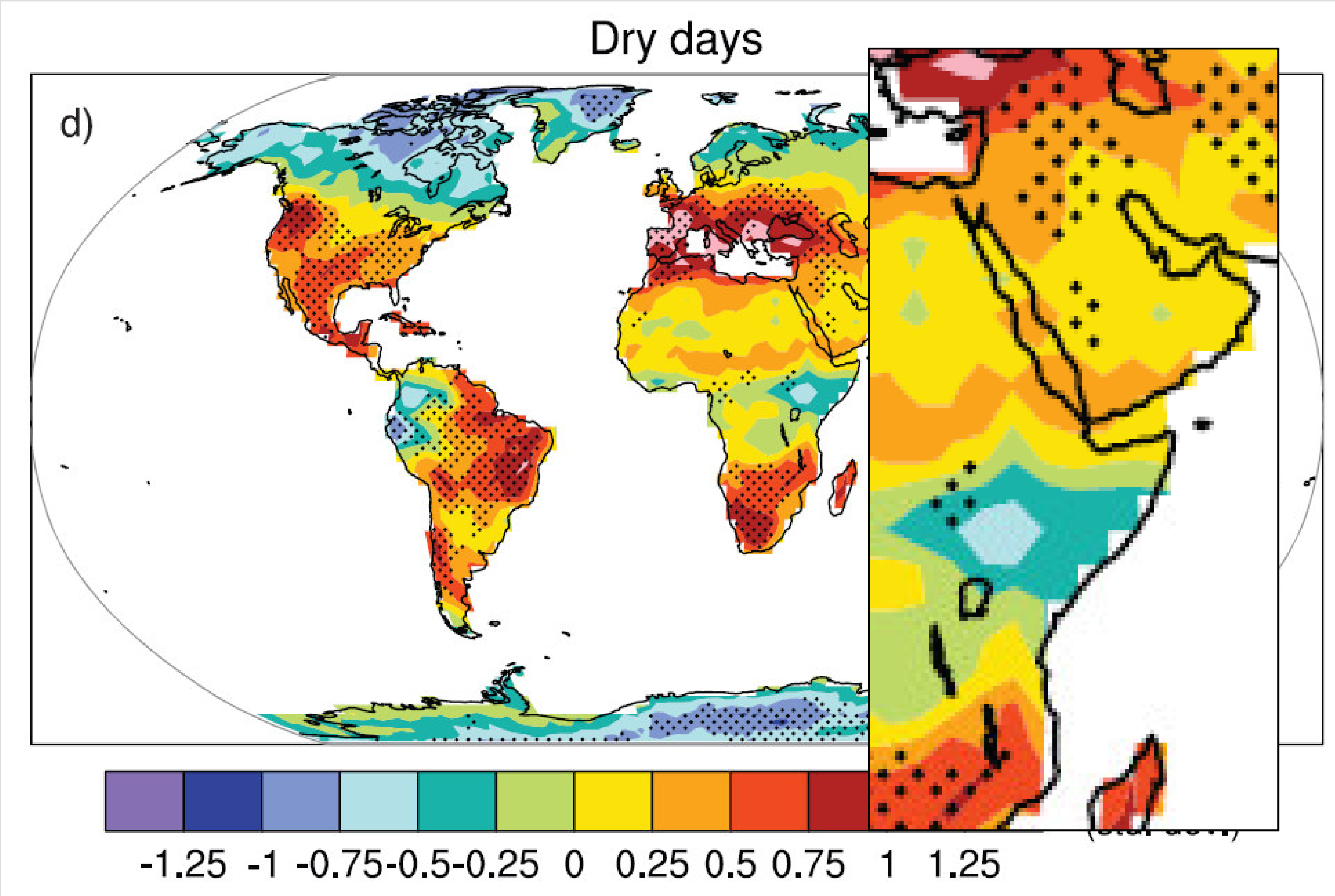
Variation des pluies



De La Rocque et coll, Vet Italia, 2007



Changes in spatial patterns
between two 20-year means (2080–2099 minus 1980–1999) for the A1B scenario



Changes in spatial patterns of simulated dry days (annual maximum number of consecutive dry days) between two 20-year means (2080–2099 minus 1980–1999) for the A1B scenario

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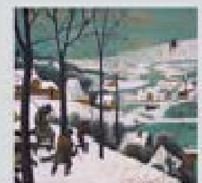
OIE

Climate change: the impact on the epidemiology and control of animal diseases

Changements climatiques : Impact sur l'épidémiologie et les stratégies de contrôle des maladies animales

Cambios climáticos: influencia en la epidemiología y las estrategias de control de enfermedades animales



Revue scientifique et technique

Vol. 27 (2), 2008

Rev. sci. tech. Off. int. Epiz., 2008, 27 (2), 413-426

The impact of climate change on the epidemiology and control of Rift Valley fever

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(3) International Research Institute for Climate and Society, the Earth Institute, Columbia University, Palisades, New York, United States of America
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Summary
Climate change is likely to change the frequency of extreme weather events, such as tropical cyclones, floods, droughts and hurricanes, and may destabilise and weaken the ecosystem services upon which human society depends. Climate change is also expected to affect animal, human and plant health via indirect pathways: it is likely that the geography of infectious diseases and pests will be altered, including the distribution of vector-borne diseases, such as Rift Valley fever, yellow fever, malaria and dengue, which are highly sensitive to climatic conditions. Extreme weather events might then create the necessary conditions for Rift Valley fever to expand its geographical range northwards and cross the Mediterranean and Arabian seas, with an unexpected impact on the animal and human health of newly affected countries. Strengthening global, regional and national early warning systems is crucial, as are co-ordinated research programmes and subsequent prevention and intervention measures.

Keywords
Climate change – Early warning system – Rift Valley fever – Vector-borne disease.

Global warming and emerging vector-borne diseases

Certain diseases are associated with particular environmental conditions, seasons and climates (14). Some of these diseases are transmitted by vectors, such as arthropods (mosquitoes, lice, ticks) or rodents, which are sensitive to changes in climatic conditions, especially temperature and humidity. Local climatic parameters therefore play a central role in determining the distribution and abundance of these vector organisms, either directly or indirectly, through the effects of such parameters on the host animals. The distribution of vector-borne diseases is restricted by, among other things, the climate tolerance limits of their vectors. Abiotic factors have a direct impact on the bionomics of arthropods and, thus, on the dynamics of their populations. There is also a minimum temperature for arthropods to complete their extrinsic incubation period and this is a limiting factor for infection transmission in many temperate areas. In addition, biological restrictions that limit the survival of the infective agent in the vector population also determine the limits for disease transmission.

Rev. sci. tech. Off. int. Epiz., 2008, 27 (2), 551-562

Climate change and animal health in Africa

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Summary
Climate change is expected to have direct and indirect impacts on African livestock. Direct impacts include increased ambient temperature, floods and droughts. Indirect impacts are the result of reduced availability of water and forage and changes in the environment that promote the spread of contagious diseases through increased contact between animals, or increased survival or availability of the agent or its intermediate host. The distribution and prevalence of vector-borne diseases may be the most significant effect of climate change.
The potential vulnerability of the livestock industry will depend on its ability to adapt to such changes. Enhancing this adaptive capacity presents a practical way of coping with climate change. Adaptive capacity could be increased by enabling the African livestock owner to cope better with animal health problems through appropriate policy measures and institutional support. Developing an effective and sustainable animal health service, associated surveillance and emergency preparedness systems and sustainable disease control and prevention programmes is perhaps the most important strategy for dealing with climate change in many African countries.

Keywords
Africa – Climate change – Control – Disease – Health – Livestock.

Climate change in Africa

Current climatic zones

Africa is a vast continent with a wide variety of climate regimes. The continent is predominantly tropical, hot and dry but there are small regions of temperate, rather cool climate in the extreme north and south and at higher altitudes. Large parts of West and Central Africa are humid throughout the year. North and south of these areas are sub-humid regions with seasonal rainfall. Polewards from this zone is a large area of semi-arid climates, where rainfall is unreliable and water sources are scarce. Most of the human and animal populations occur in the sub-humid and semi-arid zones. The African continent can be divided into climate-related, eco-climatic zones and their associated livestock production systems. These livestock production systems are usually shaped by prevailing biophysical and socio-cultural conditions and most of them are in equilibrium with their environment (38).

Climate change and variability

There is great uncertainty about how climate might change at the sub-regional level in parts of Africa and, especially, how this might be influenced by human-associated and other factors (20). Moreover, the size and geographical diversity of sub-Saharan Africa make climate change predictions particularly challenging. Nevertheless, observations show that the African continent is warmer than 20 years ago, with an average rate of warming of about 0.05°C per decade (17). Moreover, the African climate has, during the 20th Century, experienced wetter and drier intervals than during previous centuries. Projections for the rates of change in temperature and precipitation for the 21st Century vary but, irrespective of this uncertainty, future annual warming is expected to be highest in the interior of the semi-arid regions of Saharan and central southern Africa, resulting in desertification. Future changes in rainfall are more uncertain (5, 16). Despite this, there is general consensus that East Africa will become wetter, south-east Africa will become dryer and