

Eco-systems of agricultural landscapes
and sustainable land use: Livestock systems

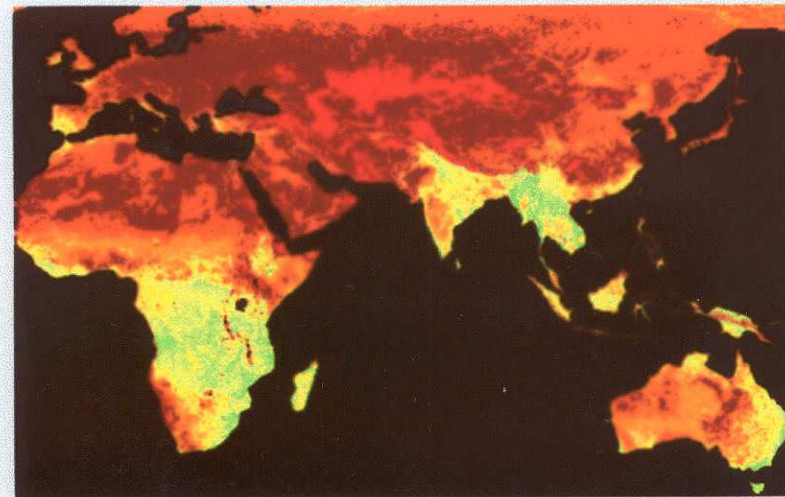
02 - Eco-Geography of Domestic Livestock - 2

The eco-zonal feed base for herbivorous livestock

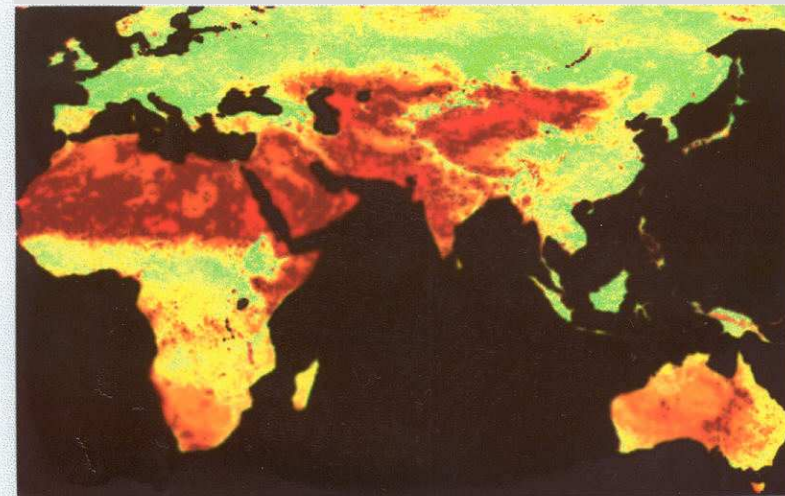


Presence of photosynthetically active vegetation observed at different times of the year in the old world, mapped using NOAA satellite data

January 2008



July 2009



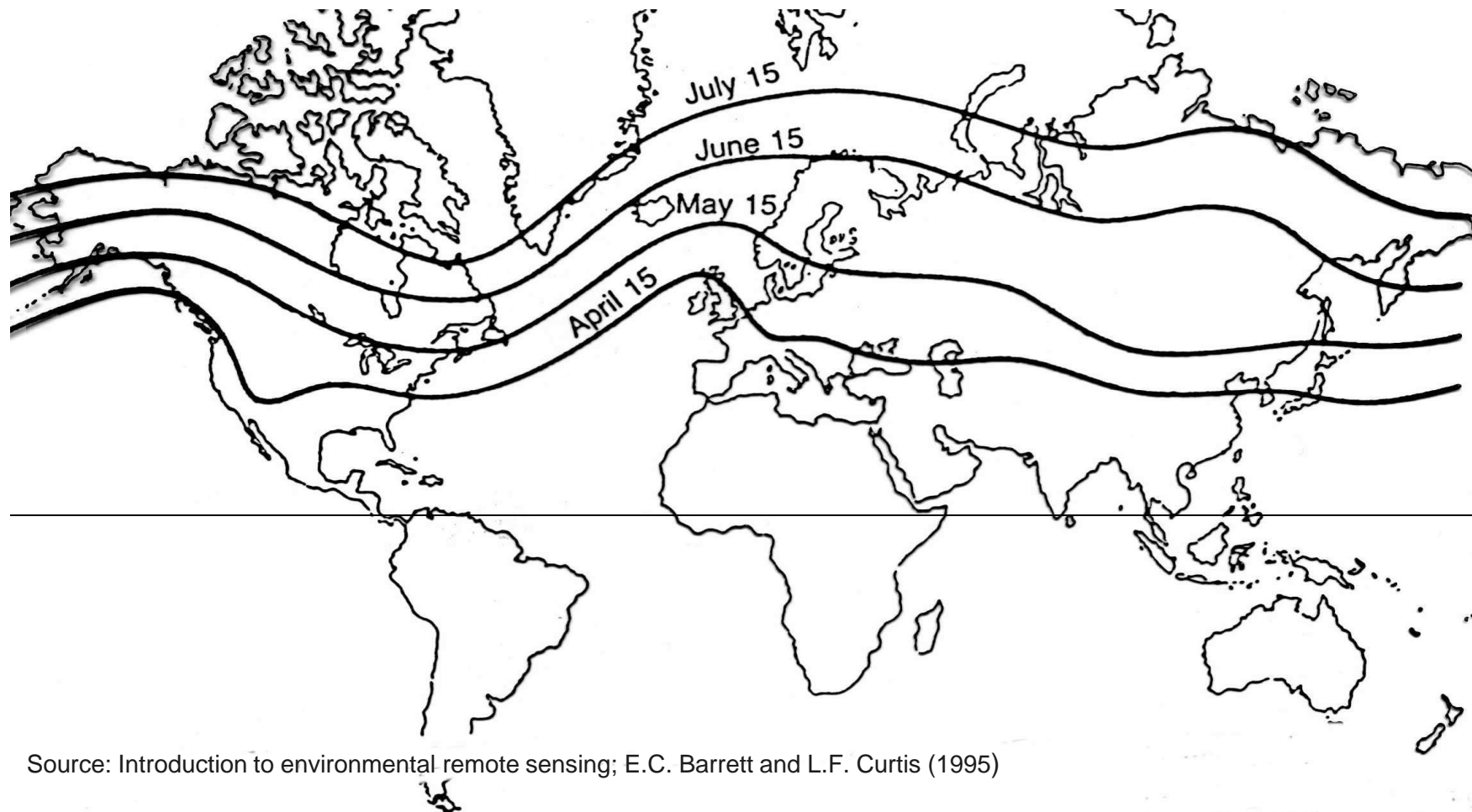
Low
NDVI



High
NDVI



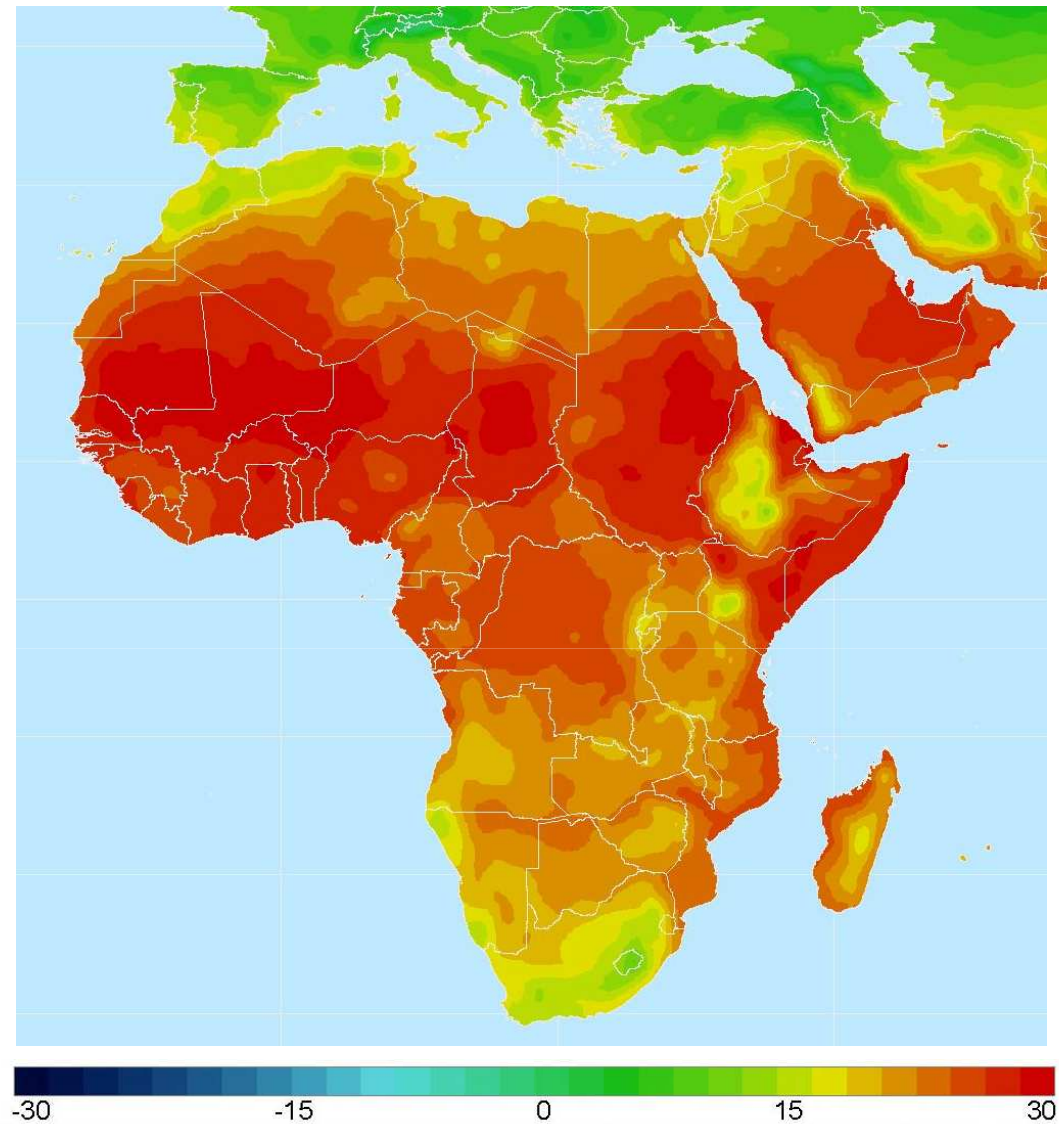
Average Date of the Green Wave Passage in the Northern Hemisphere



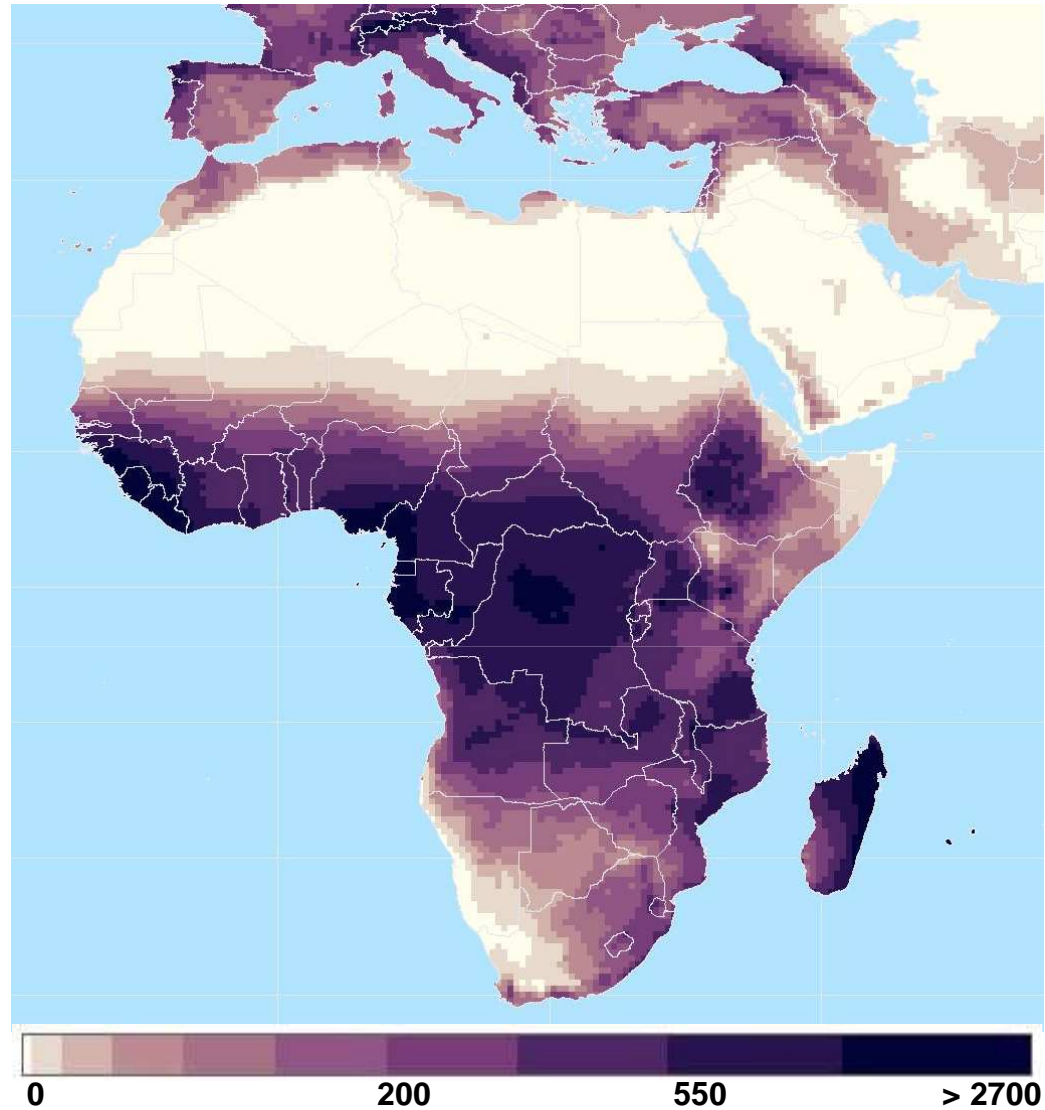
Source: Introduction to environmental remote sensing; E.C. Barrett and L.F. Curtis (1995)



Africa mean annual temperature [°C]

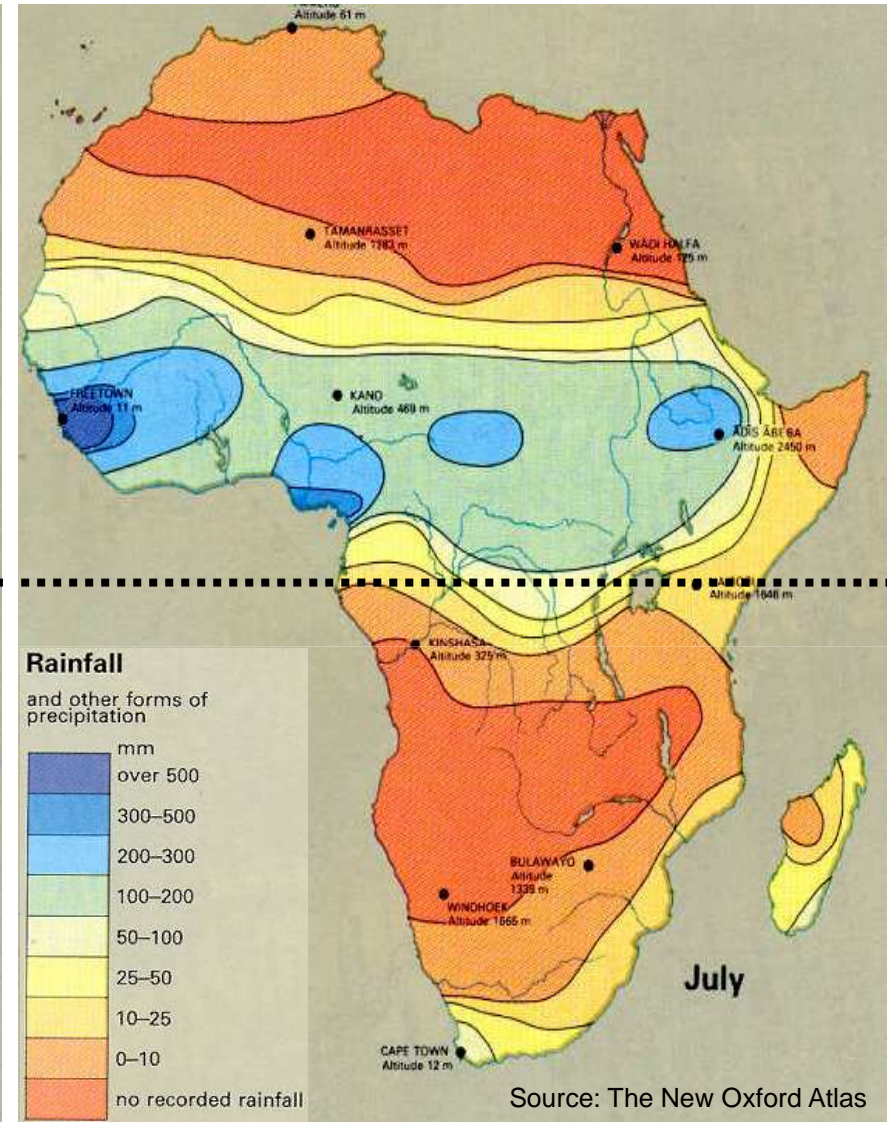
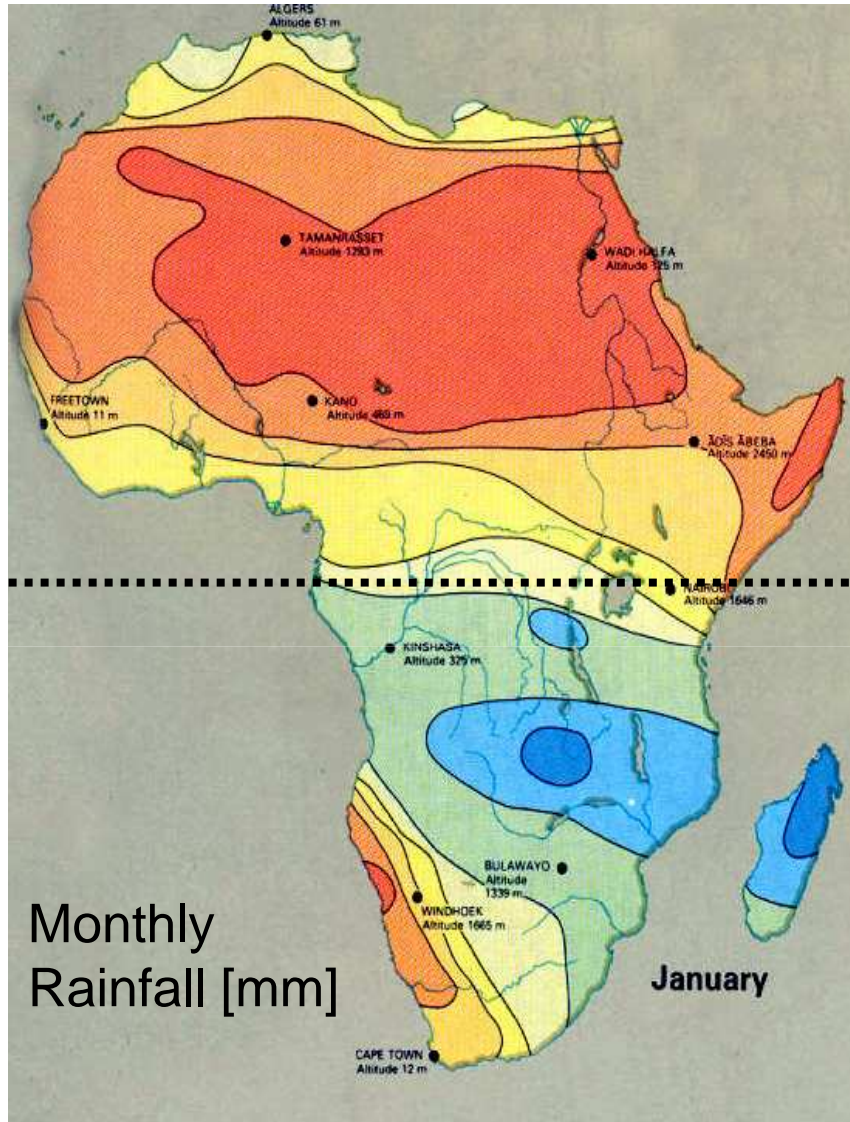


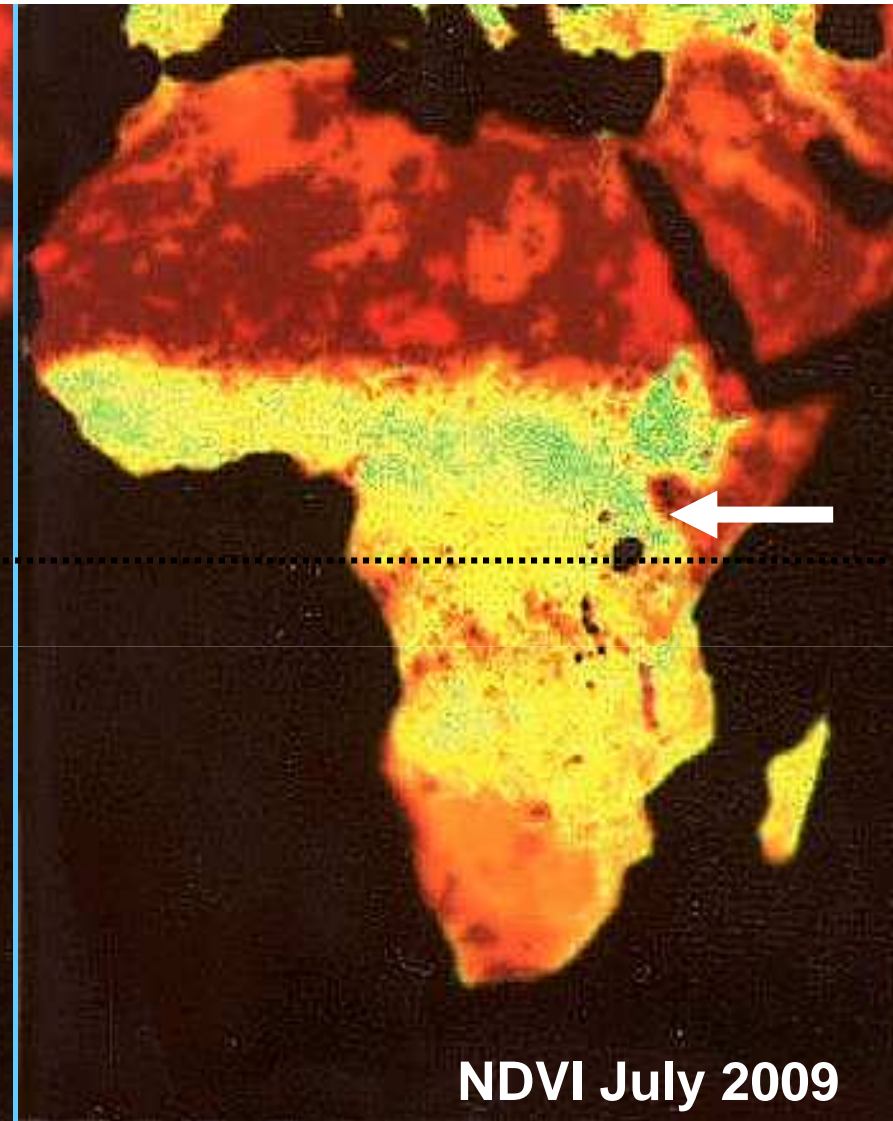
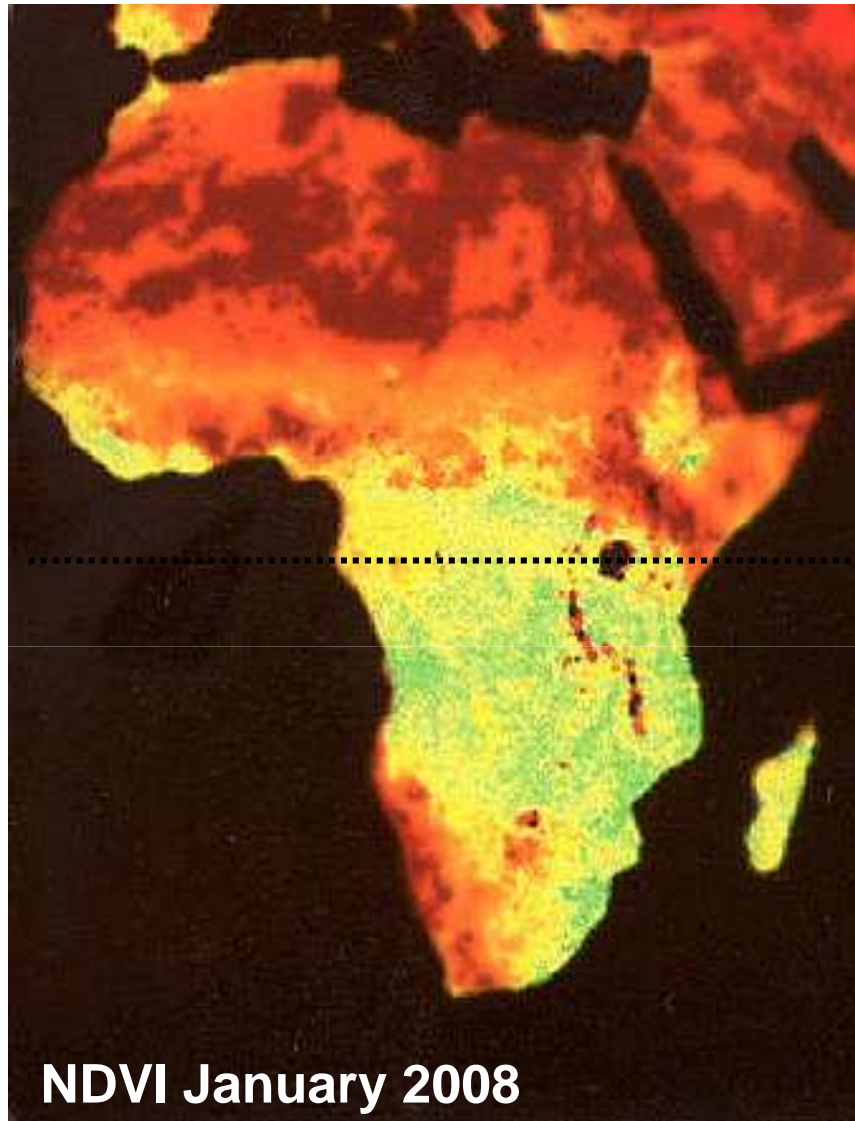
Africa mean annual rainfall [mm]

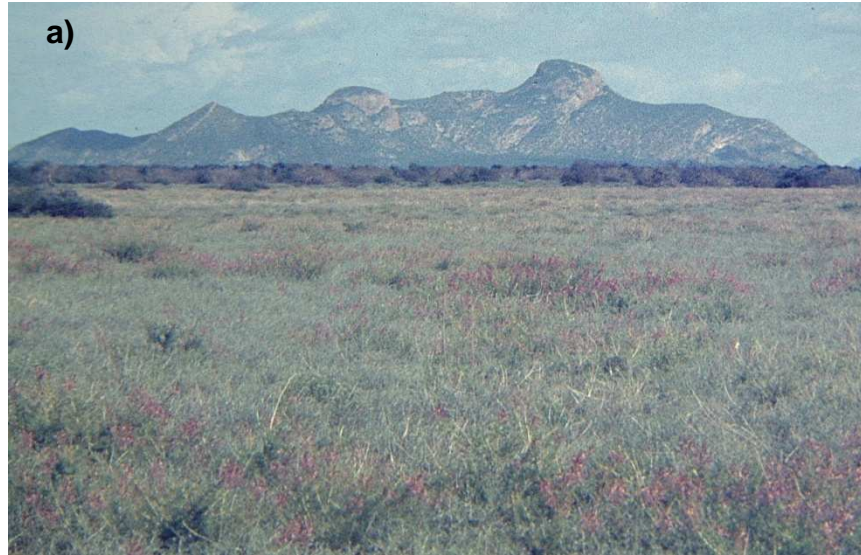


The major biomes of Africa







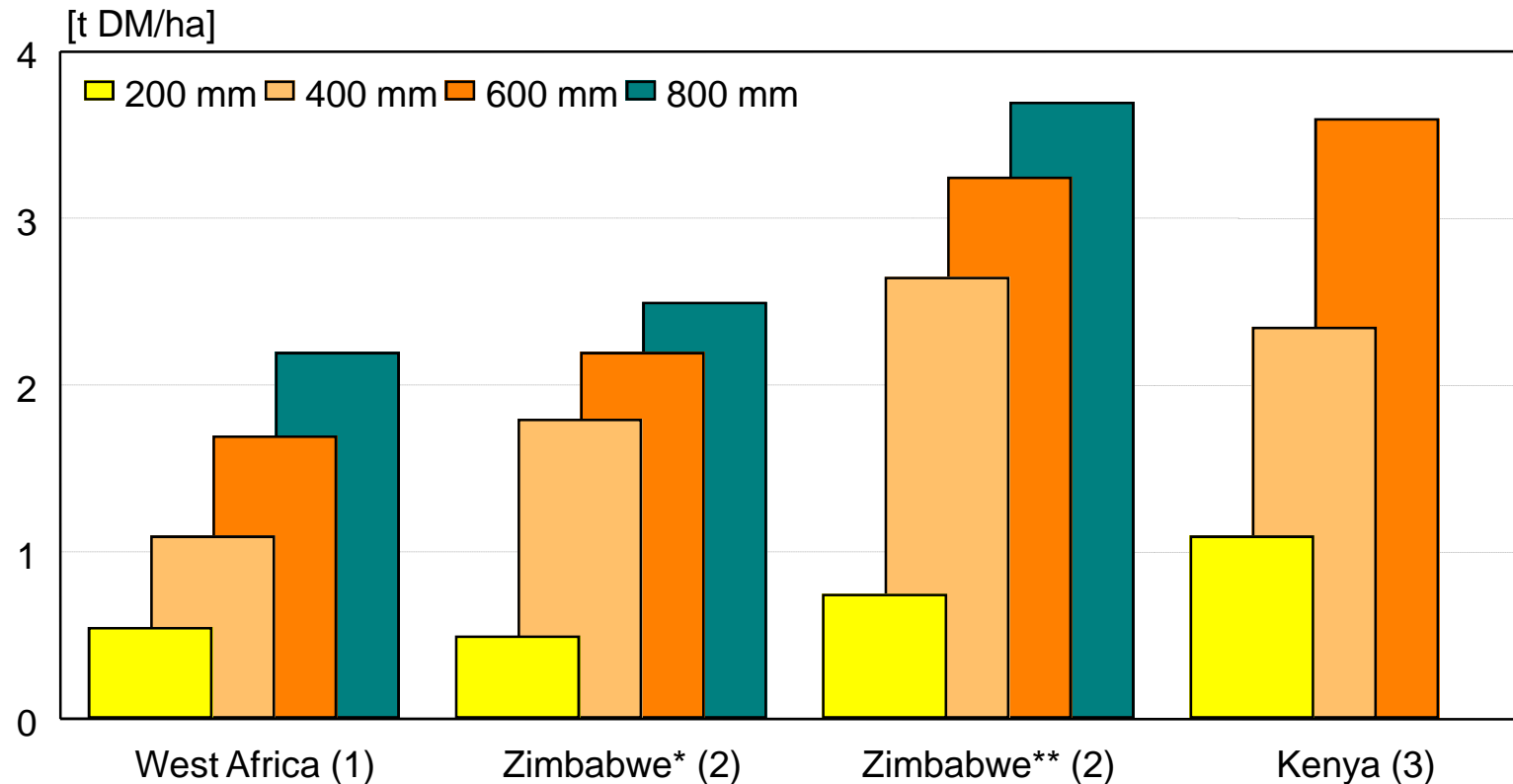


Seasonal forage availability on a semi-arid dwarf shrub / annual grass land in Northern Kenya

- a) At the end of the rainy season; standing biomass ca 3000 kg/ha
- b) Six weeks after the rainy season; standing biomass ca 1800 kg/ha
- c) Ten weeks after the rainy season and after two weeks of grazing by nomadic herds; standing biomass ca 500 kg/ha



Estimated biomass production (t DM/ha) in relation to annual rainfall



(1) Le Houerou & Hoste, 1977

(2) Dye & Spear, 1982

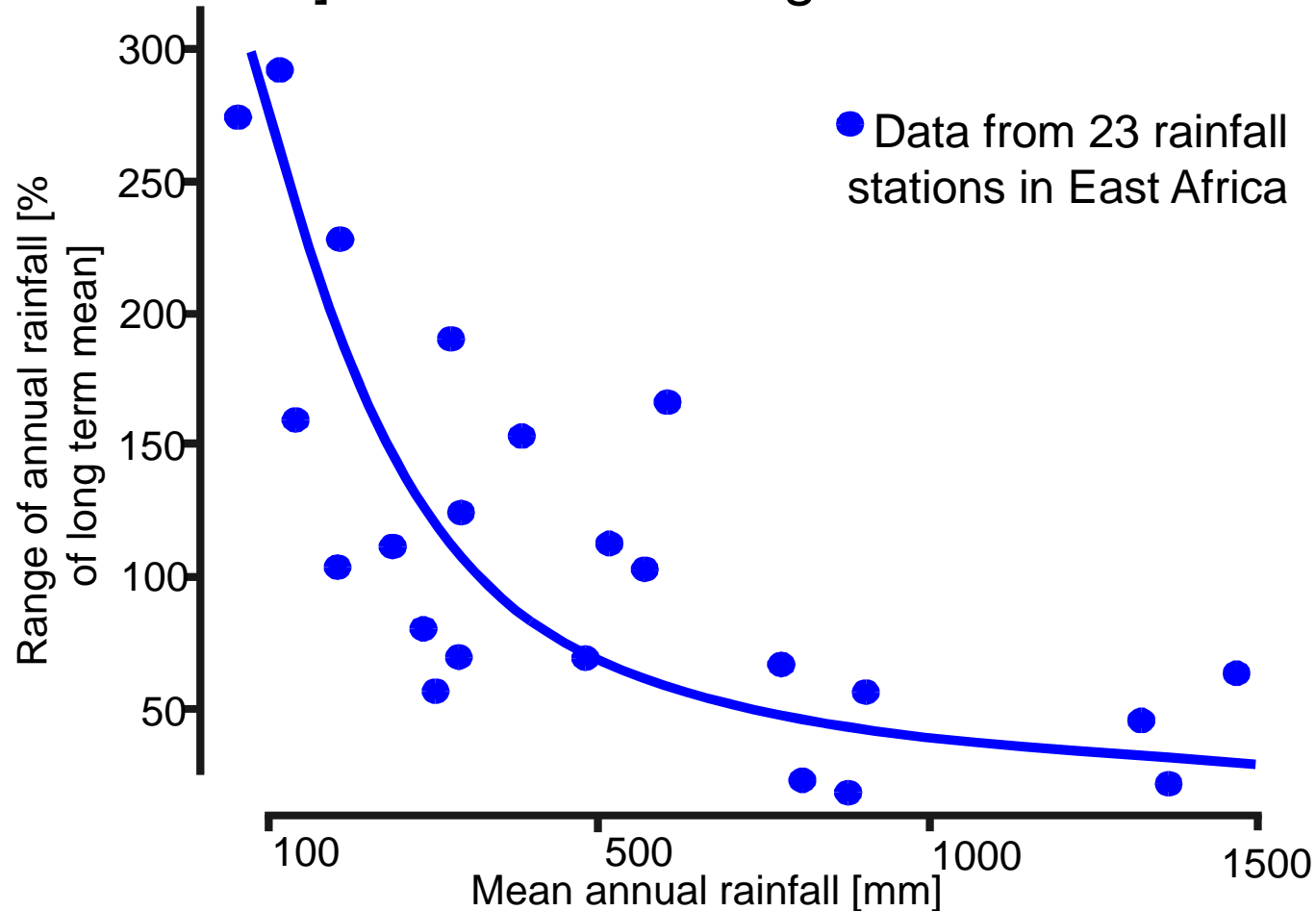
(3) de Leeuw & Nyambaka, 1989

* 100 mm water storage capacity

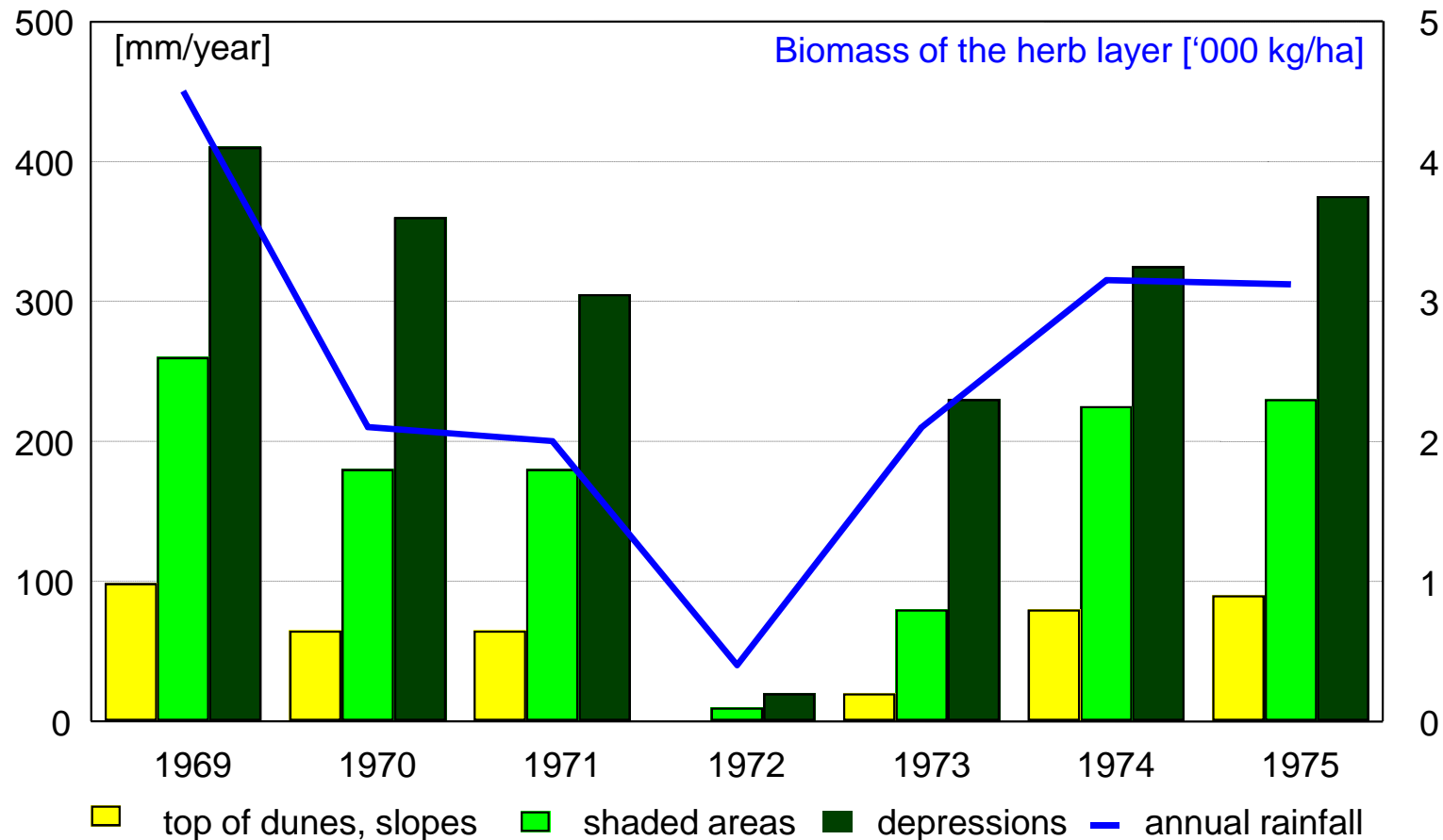
** 200 mm water storage capacity



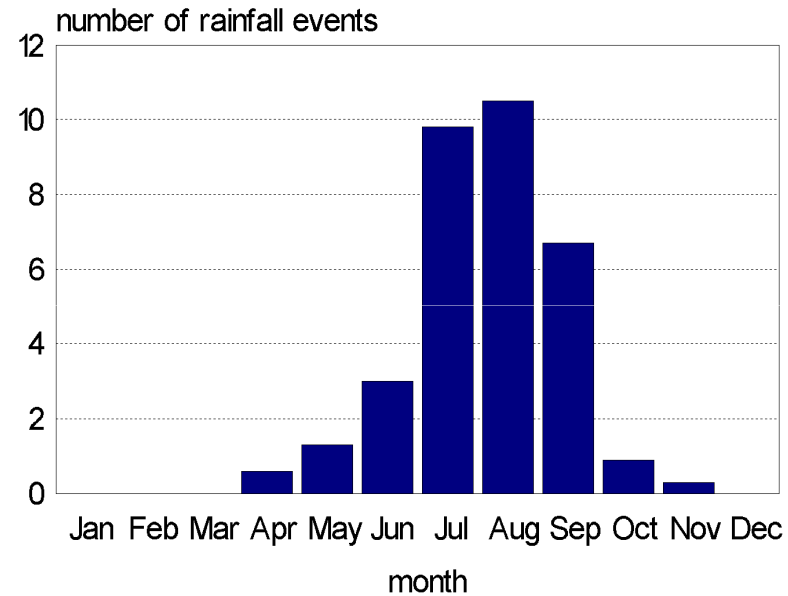
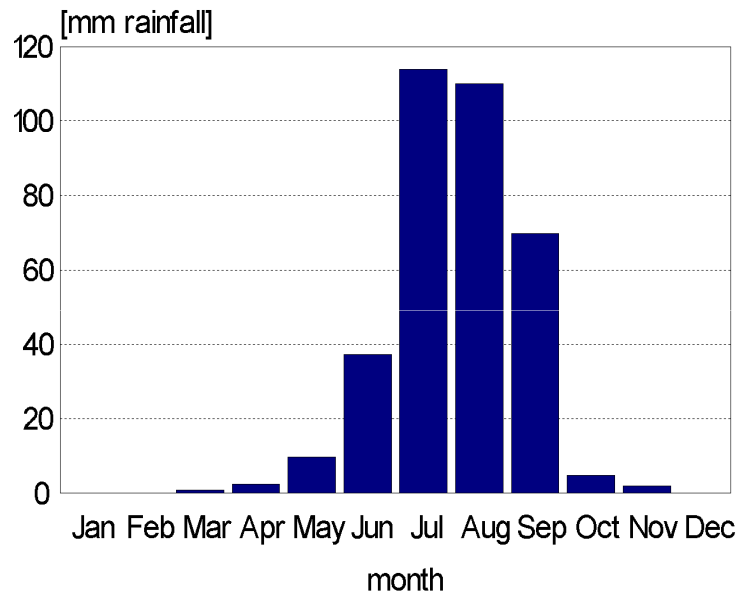
Observed range of annual rainfall [% of long term annual mean] in relation to long term annual means



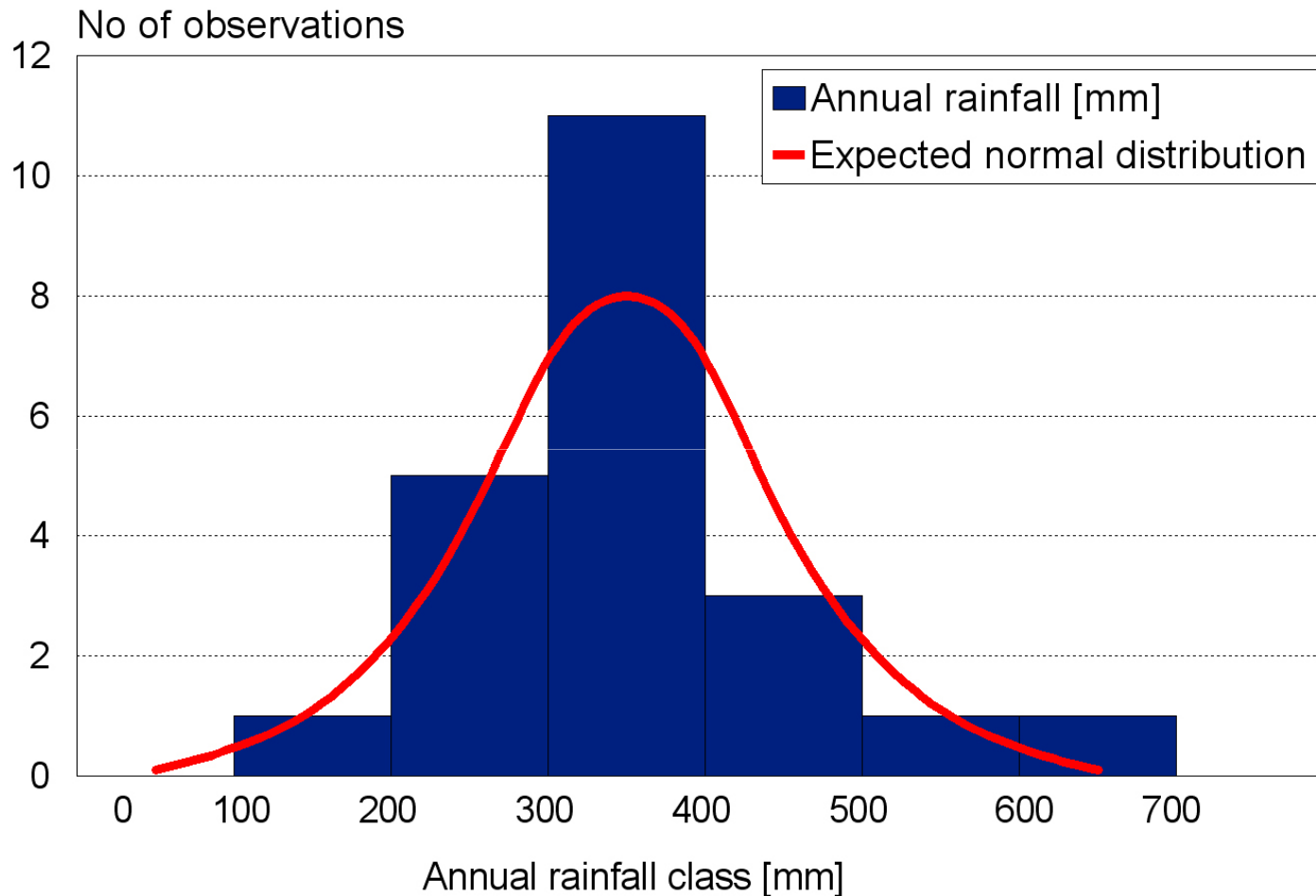
Biomass production in the herb layer related to total annual rainfall and topographic position (Niono, Mali)



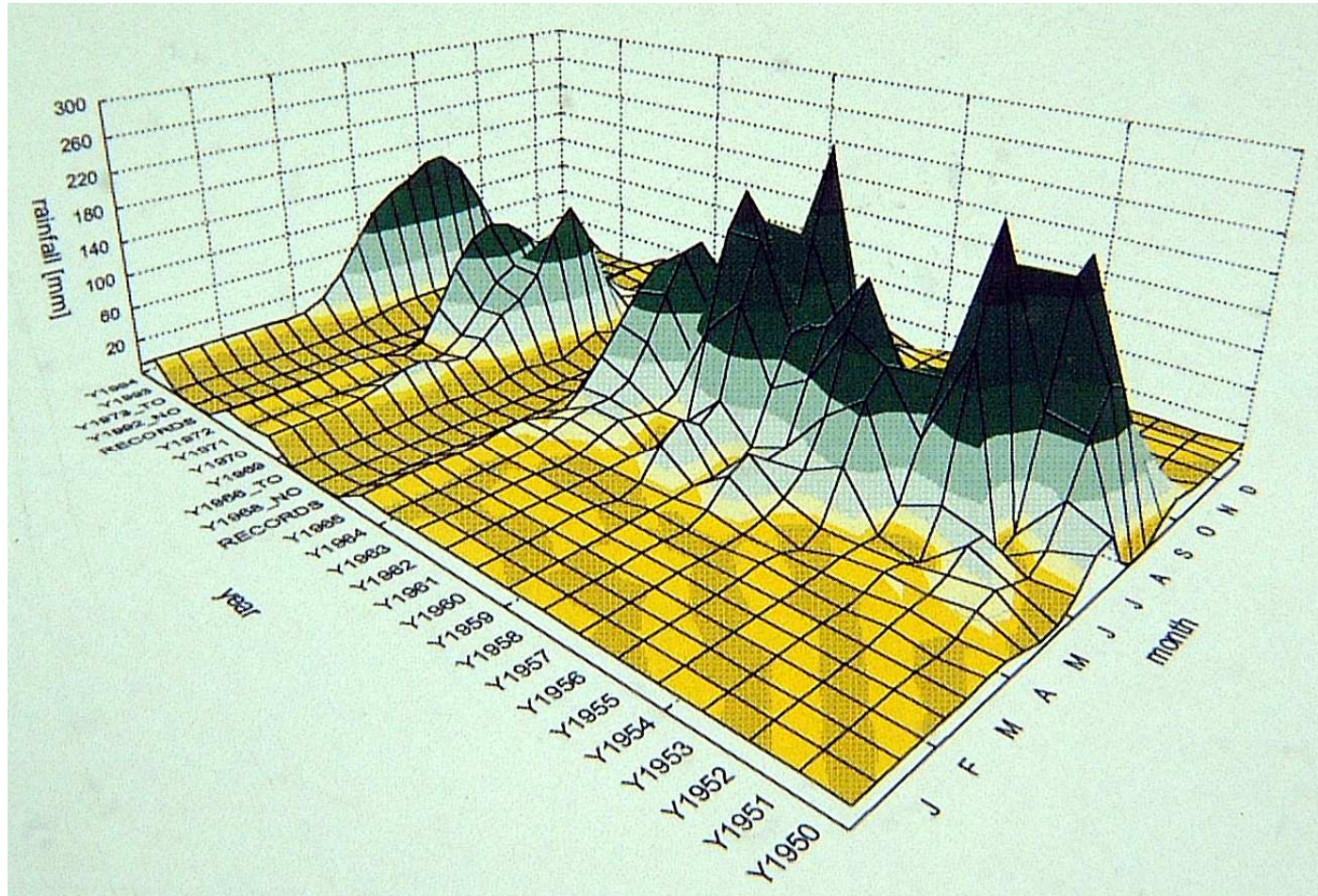
Mean monthly rainfall and mean monthly number of rainfall events during 22 years at the Tessenei (Eritrea) recording station



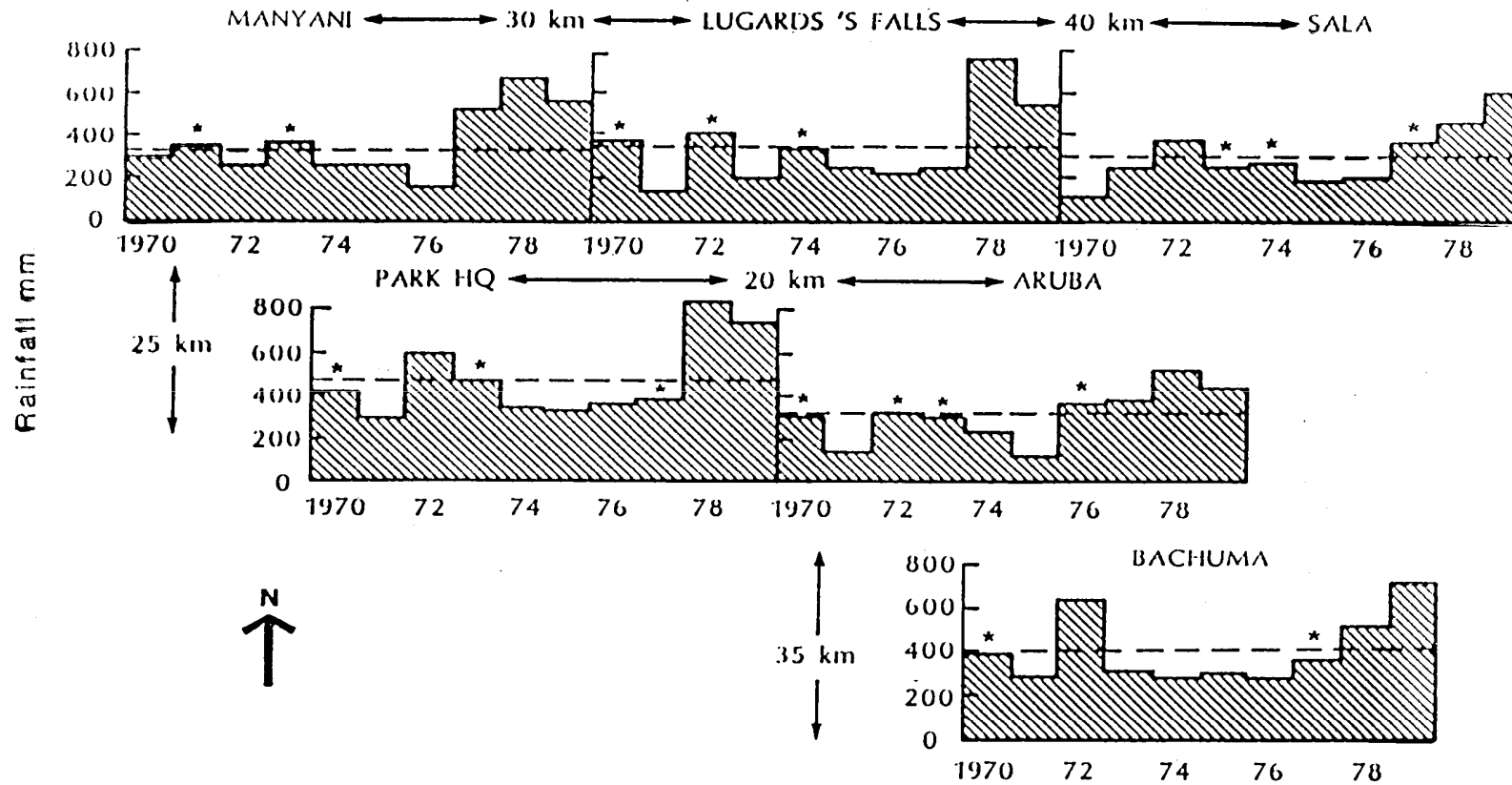
Distribution of total annual rainfall in classes of 100 mm at the Tessenei (Eritrea) station in 22 years



Distribution of monthly rainfall at the Tessenei (Eritrea) station during 22 years



Spatial variation of rainfall in an East African savannah ecosystem



Source: Deshmukh, 1984







too little

F2 back crosses of zebu to Holstein Friesian, genetic potential for 4500 kg milk, specialised dairy farm, improved pastures and maize silage, after a failed rainy season, marginal highlands in Kenya



too bad

Small East African Zebu, sub-humid tropical grassland at late dry season, beginning drought condition



too late

Small East African Zebu, semi-arid annual grassland two days after the first rain of the new season



too much

Small East African Zebu, recent flooding in semi-arid Western Kenya, also affecting 12 more countries of the African Sahel Belt

Normal summer pasture on riparian grasslands
along the river Elbe in Germany



Summer flooding on riparian grasslands along the river Elbe in Germany



Cracking soils on riparian grasslands after a dry spell in summer along the river Elbe in Germany



Normal winter pasture with standing hay on riparian grasslands along the river Elbe in Germany

