

Patterns and Drivers of African Tropical Climate

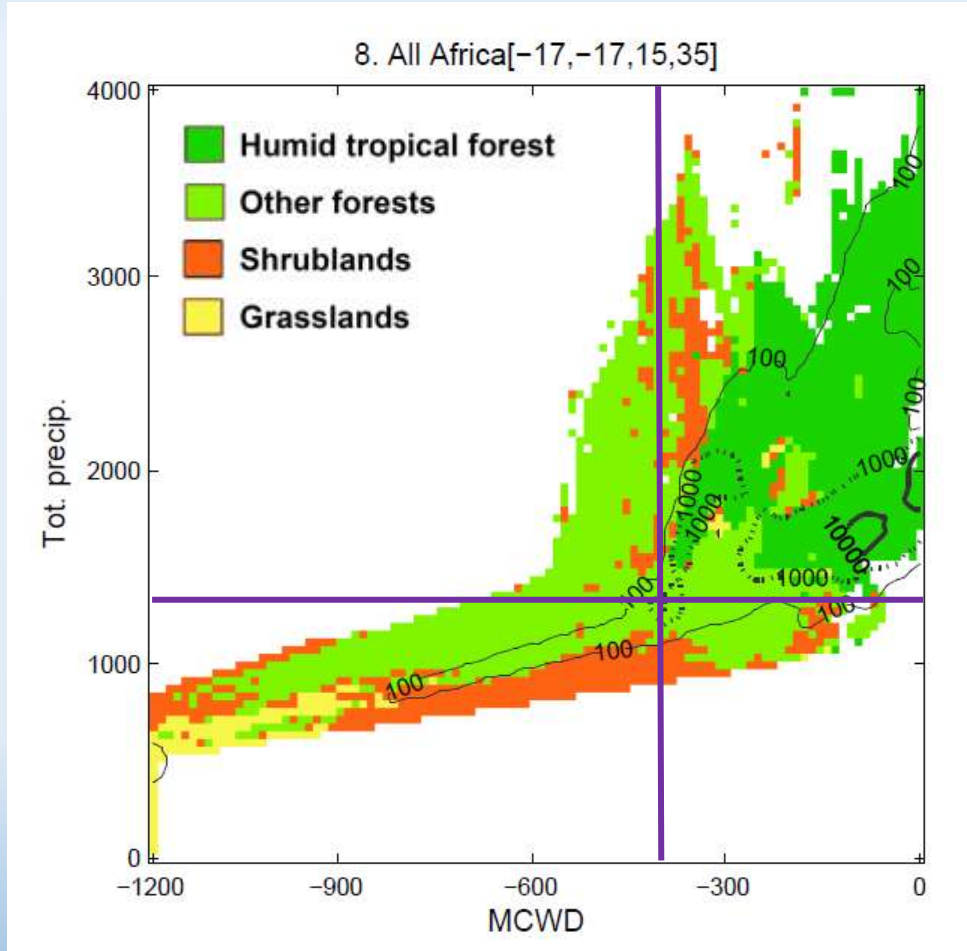
Mark New



Part 1: Climate Niche



Precipitation and Humid African Forests



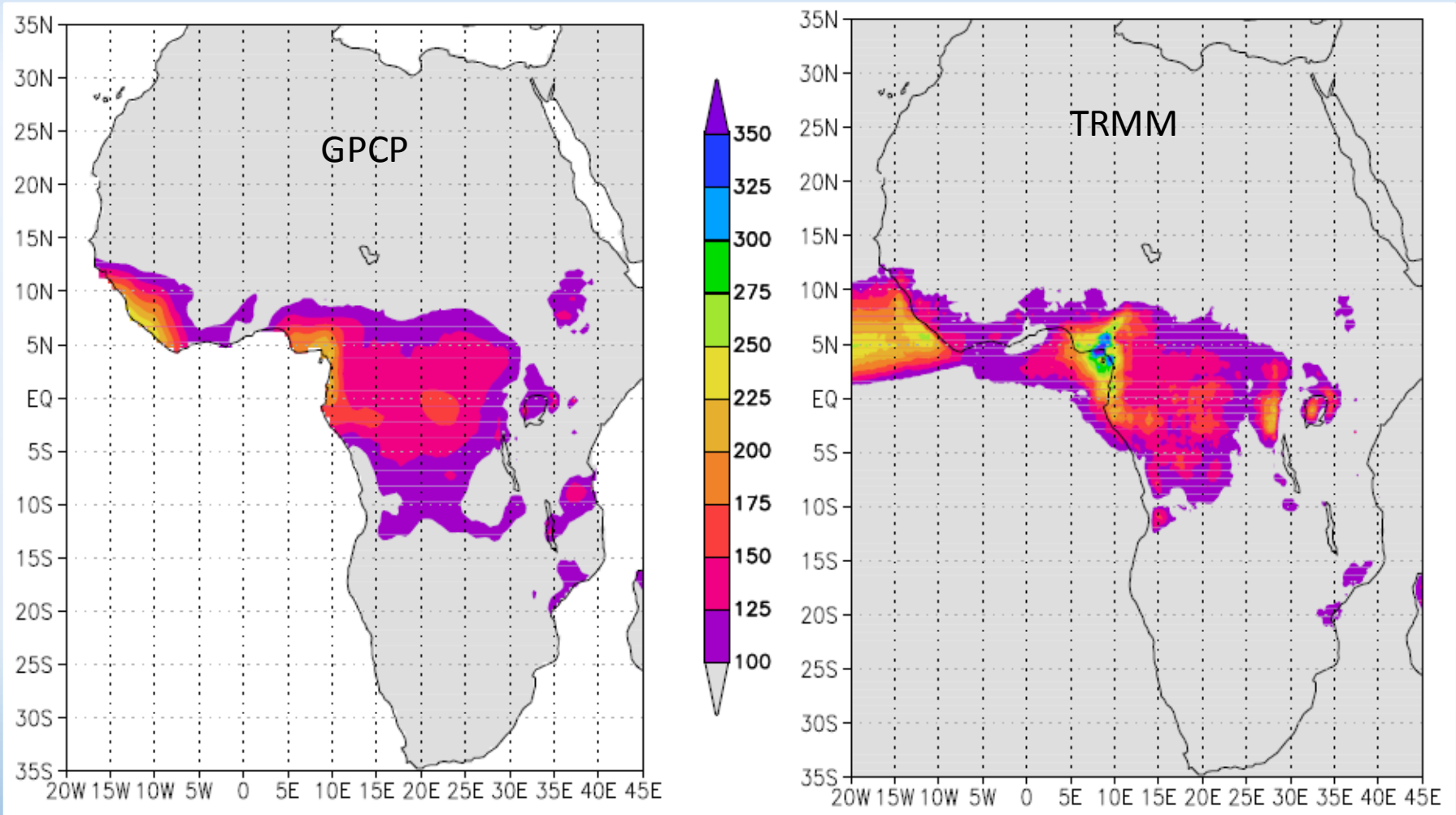
- MAP > 1300 mm
- MCWD > -410 mm

Precipitation and Humid African Forests

Domain	MAP >	MCWD >
Western W Africa	1200	-300
Eastern W Africa	1500	-230
Northern Congo	1300	-240
Western Congo	1300	-410
Eastern Congo	1470	-260
Greater Congo	1300	-390



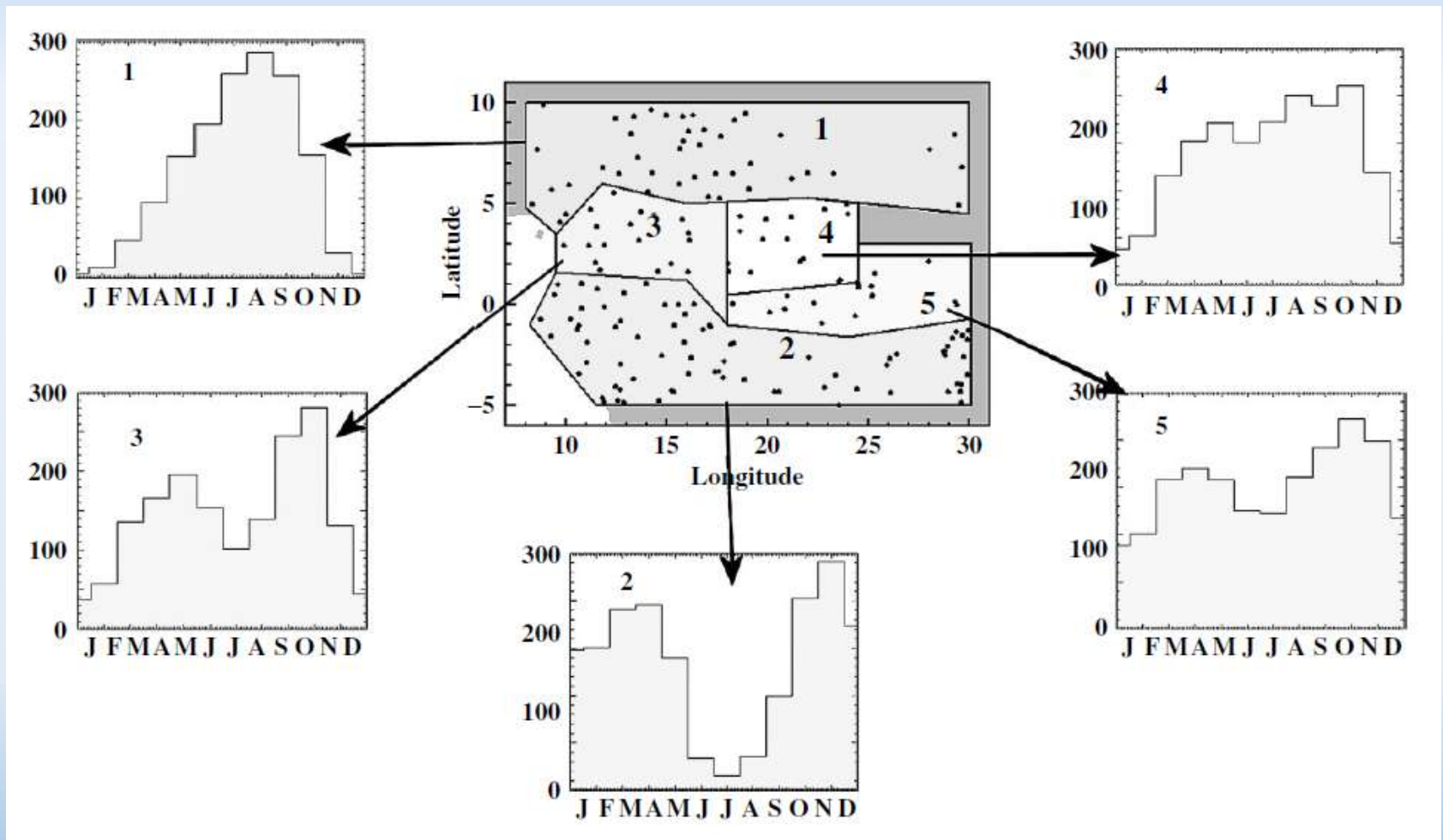
HTF Niche – Mean Annual Precip



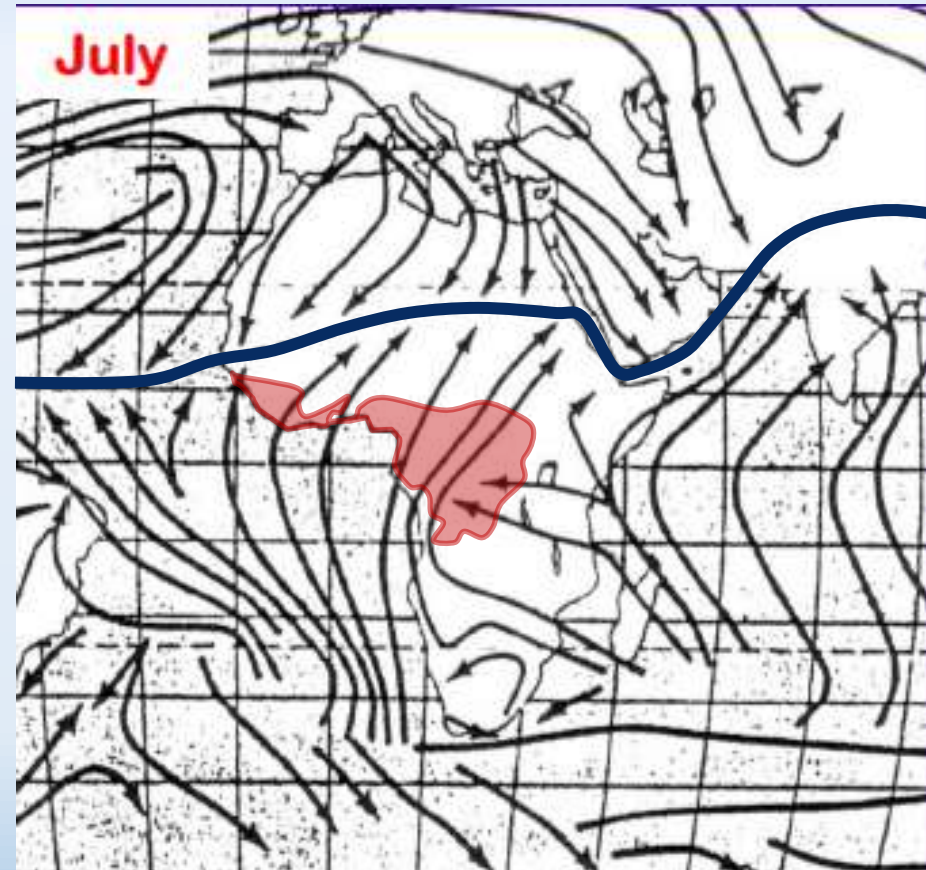
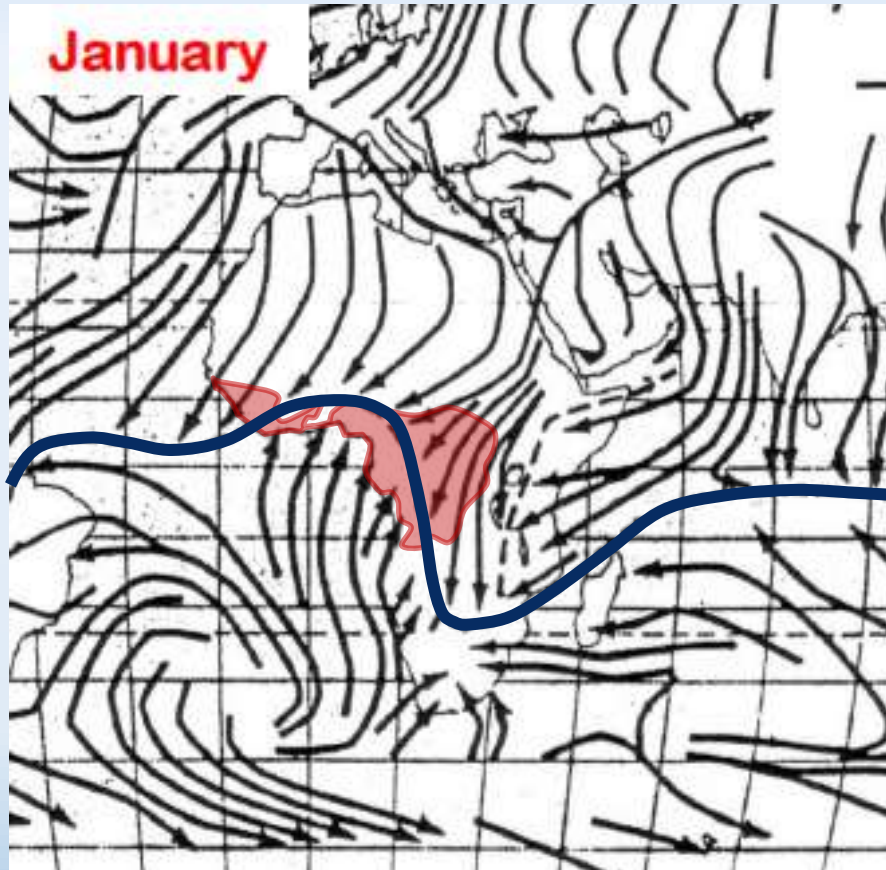
Part 2: Climatology & Meteorology



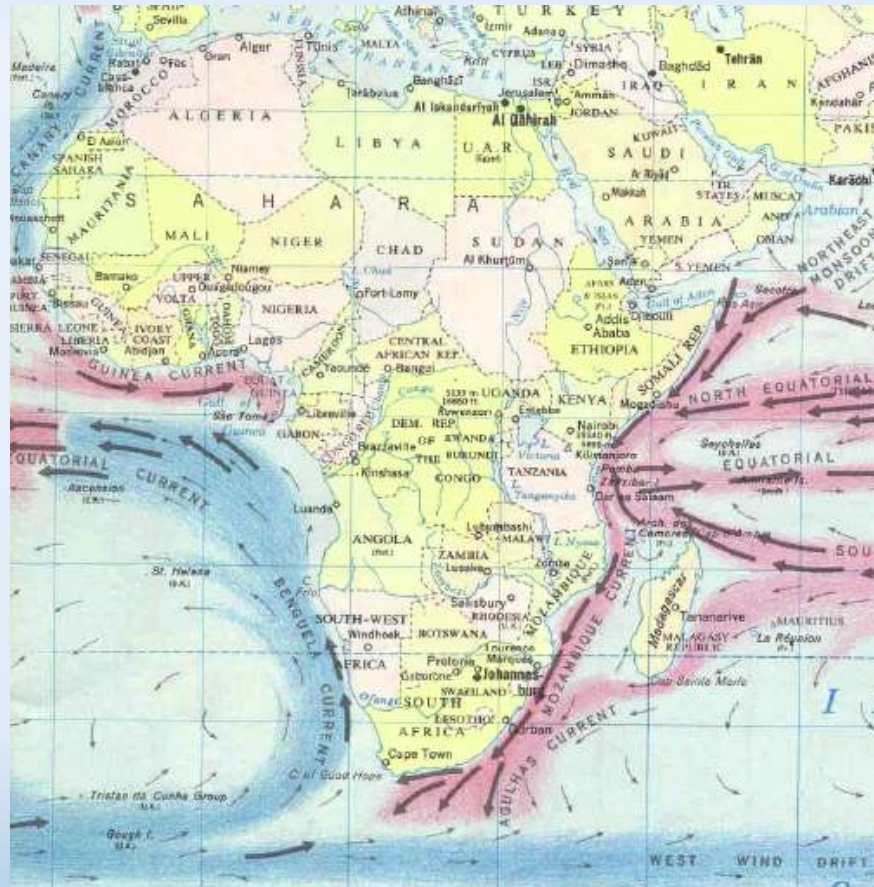
Seasonal Rainfall Patterns



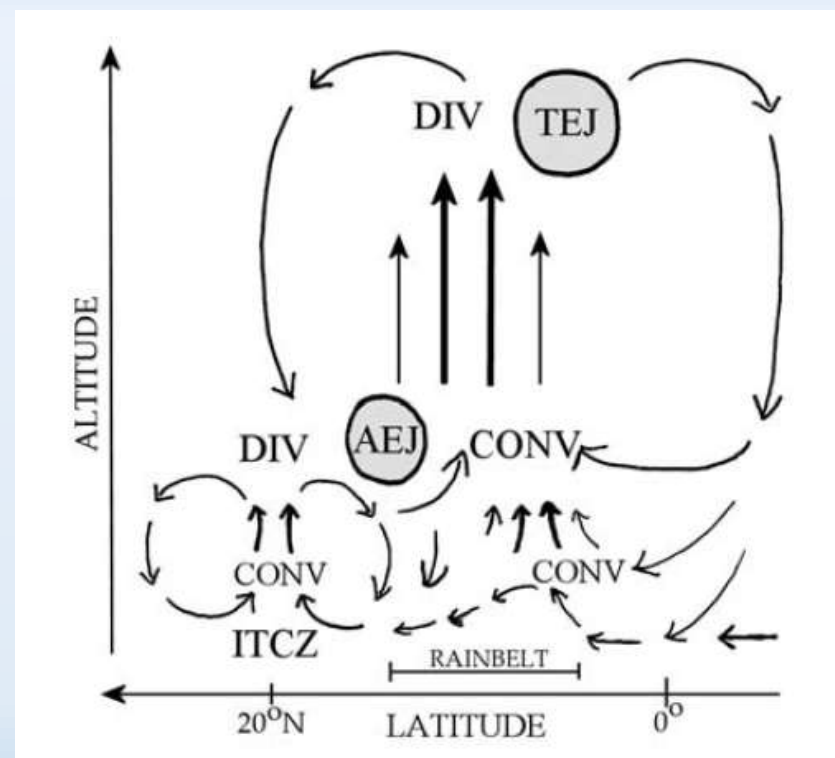
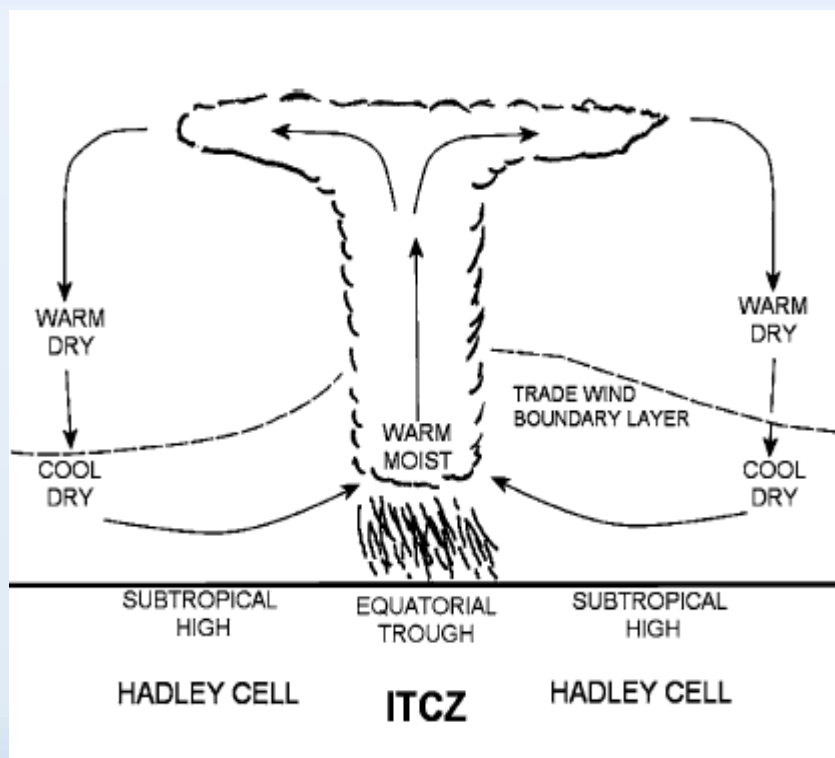
Surface Climatology



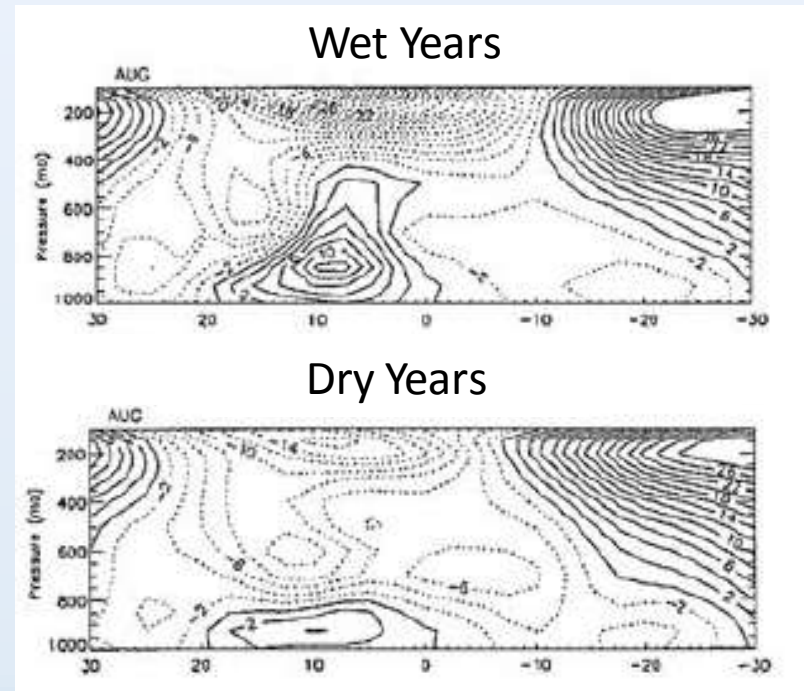
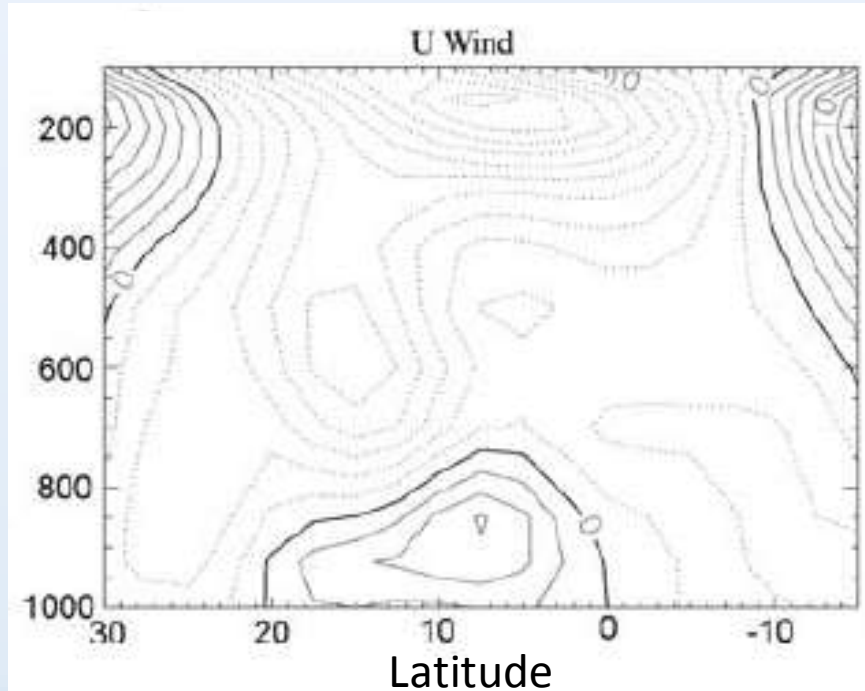
Equatorial Cold Tongue



ITCZ and Tropical Rain Belt



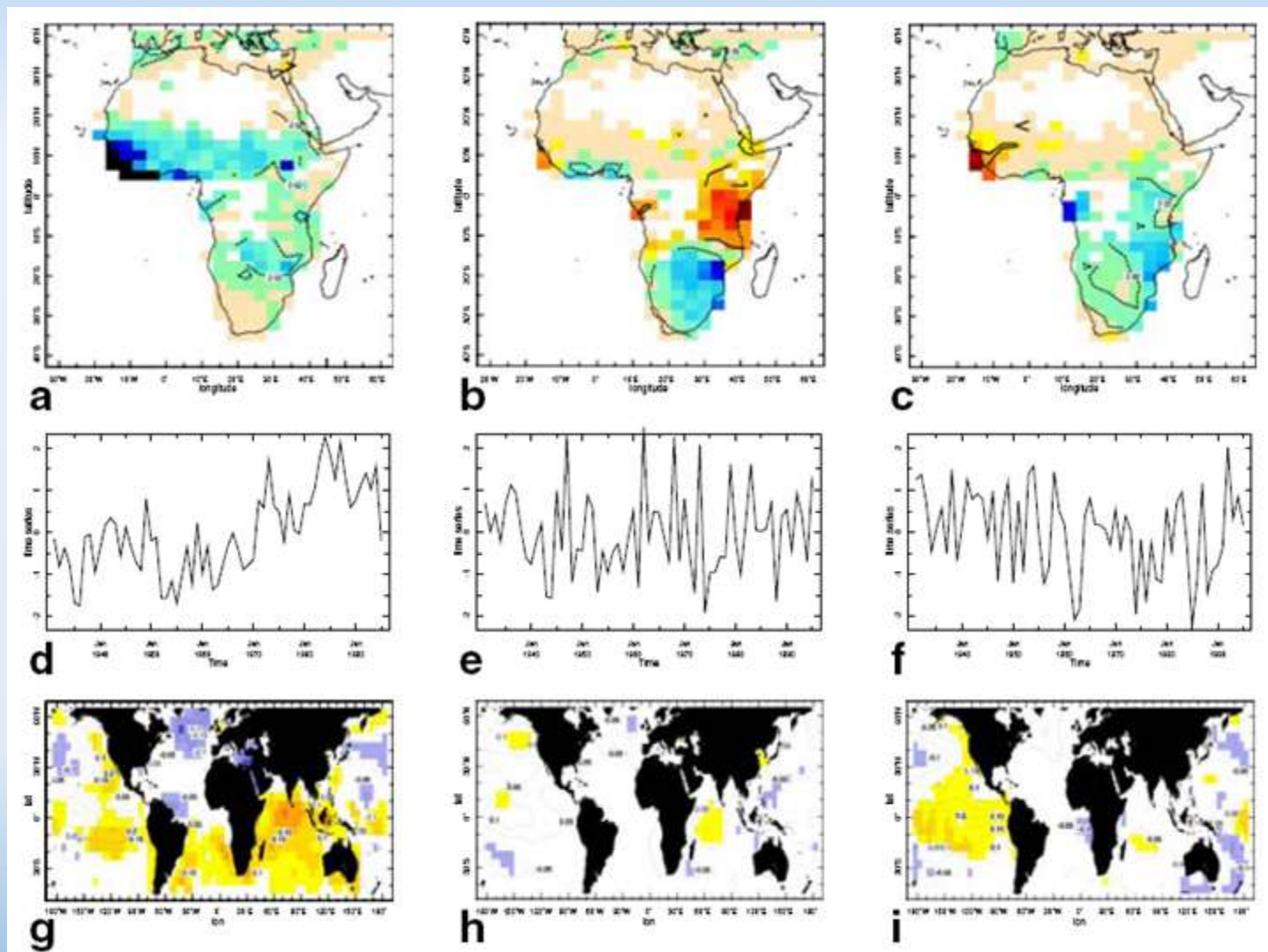
African Westerly Jet



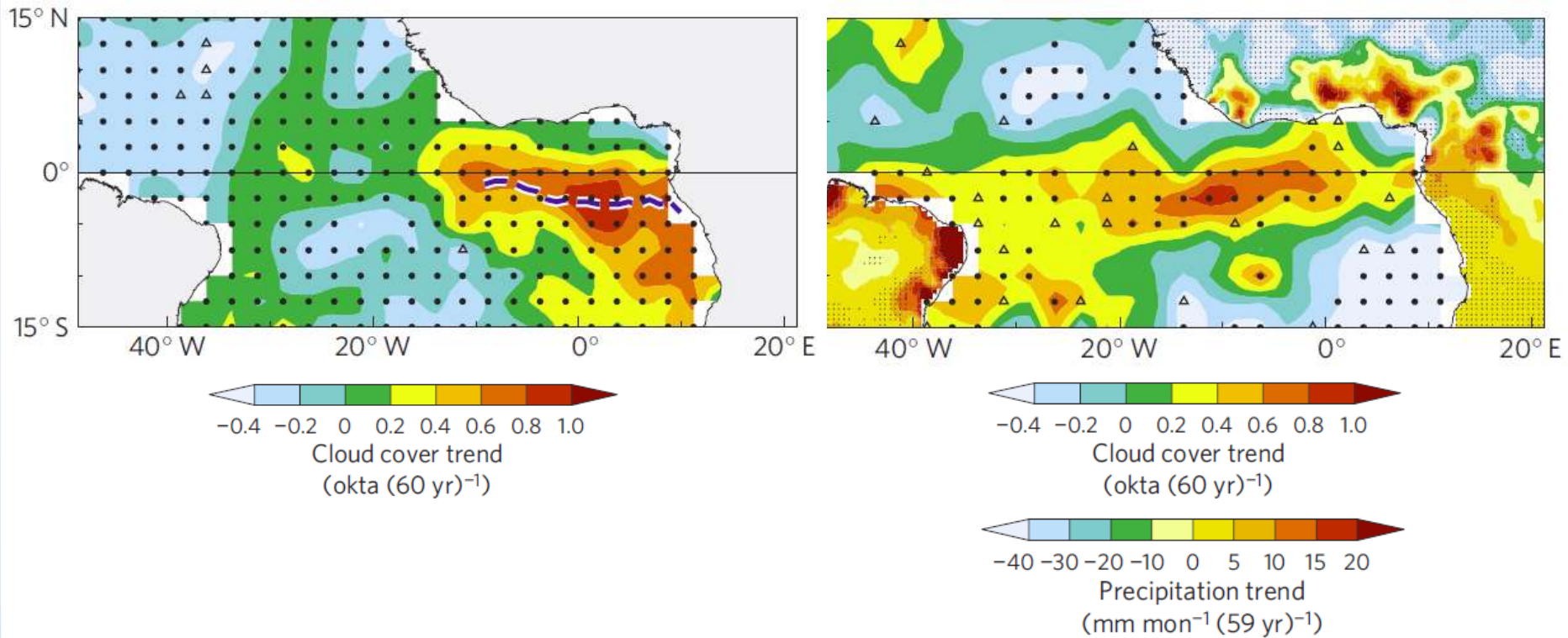
Part Three: Variability and Trends



Main Modes of Rainfall Variability

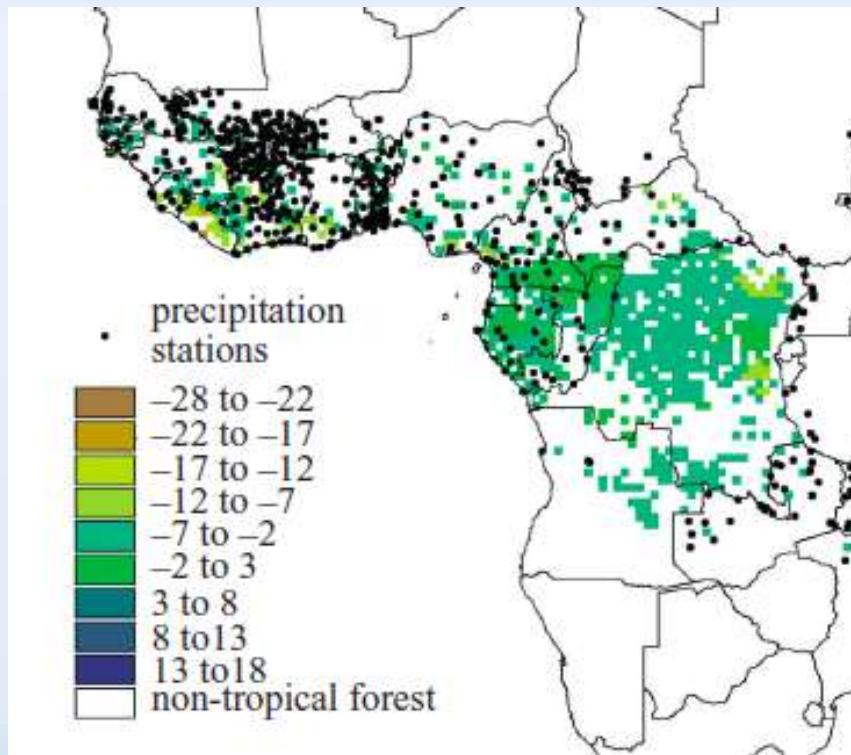


Atlantic Cold Tongue, Cloud & Rainfall

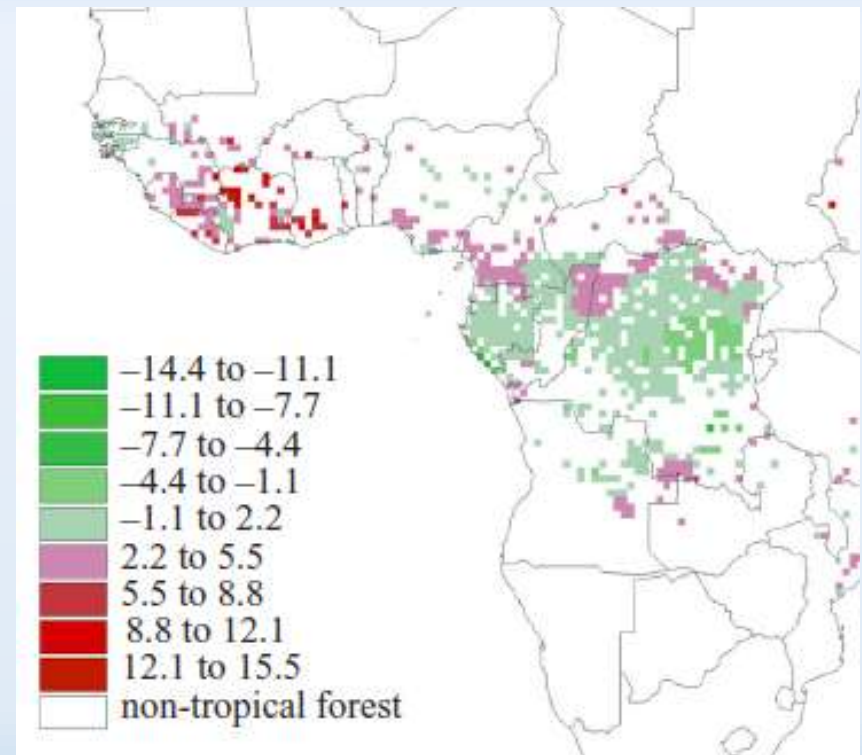


Late 20th Century Trends

Mean Precipitation



Dry Season Intensity



Discussion

- Tropical forests are climatically constrained, mainly by rainfall
 - Mean annual rainfall
 - Dry season length / intensity
 - Drought frequency?
- Climatology and meteorology of region under-researched
 - West Africa
 - Equatorial Central Africa



Discussion

- Moisture transport occurs through low-level (monsoon) winds, controlled by
 - Saharan heat low
 - Atlantic SSTs
 - Atlantic cross-equator pressure gradient
- Location and intensity of tropical rain belt controlled by
 - Atmospheric dynamics (directly)
 - Local and remote forcing (indirectly)
 - Land surface feedbacks (possibly)

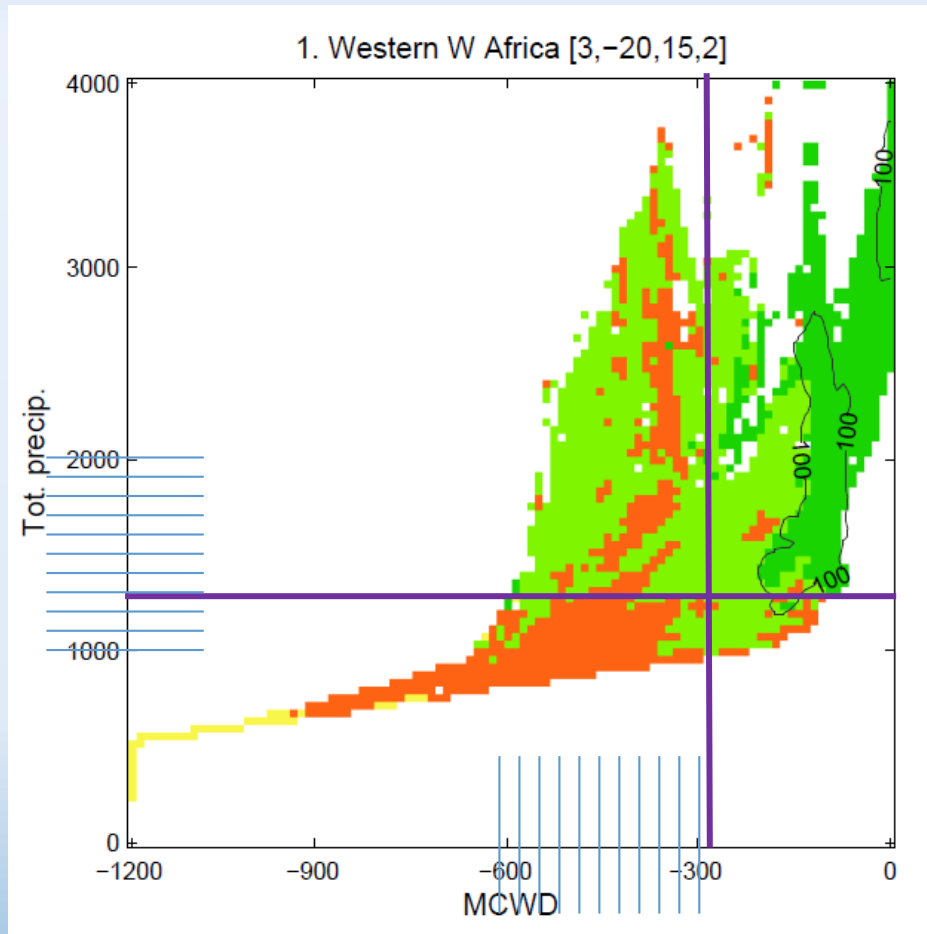


Discussion

- A big challenge for climate models?

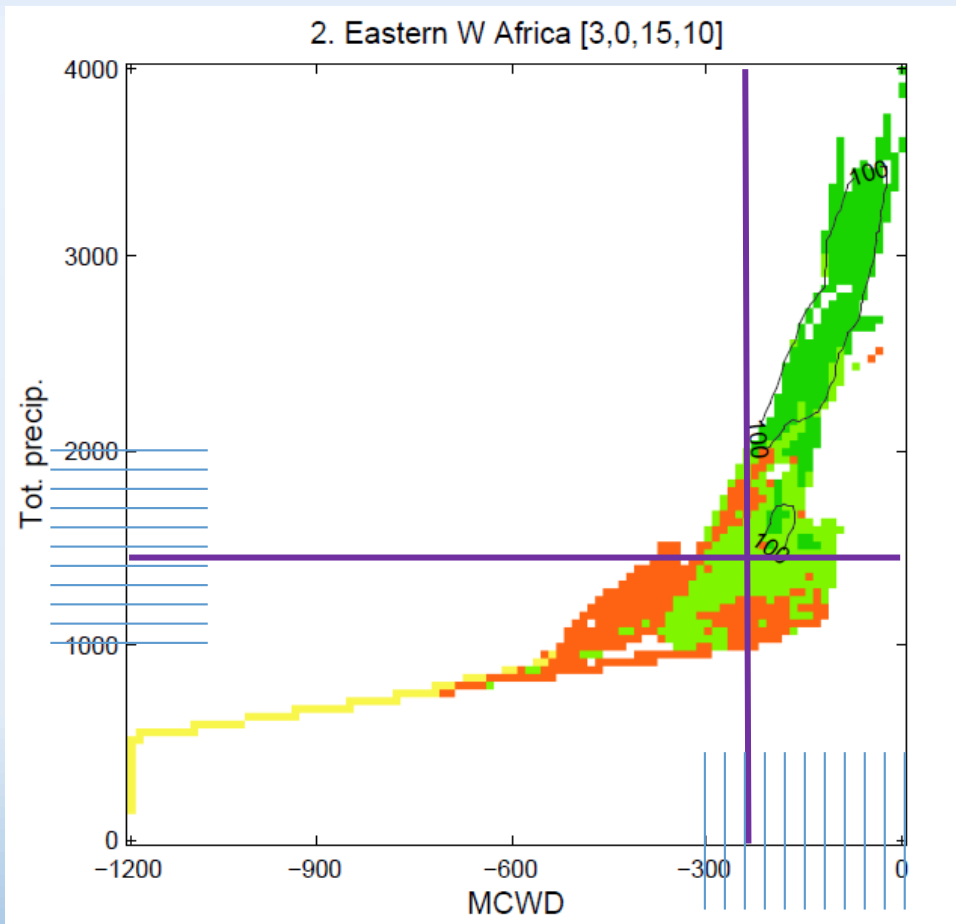


Precipitation and African Forests



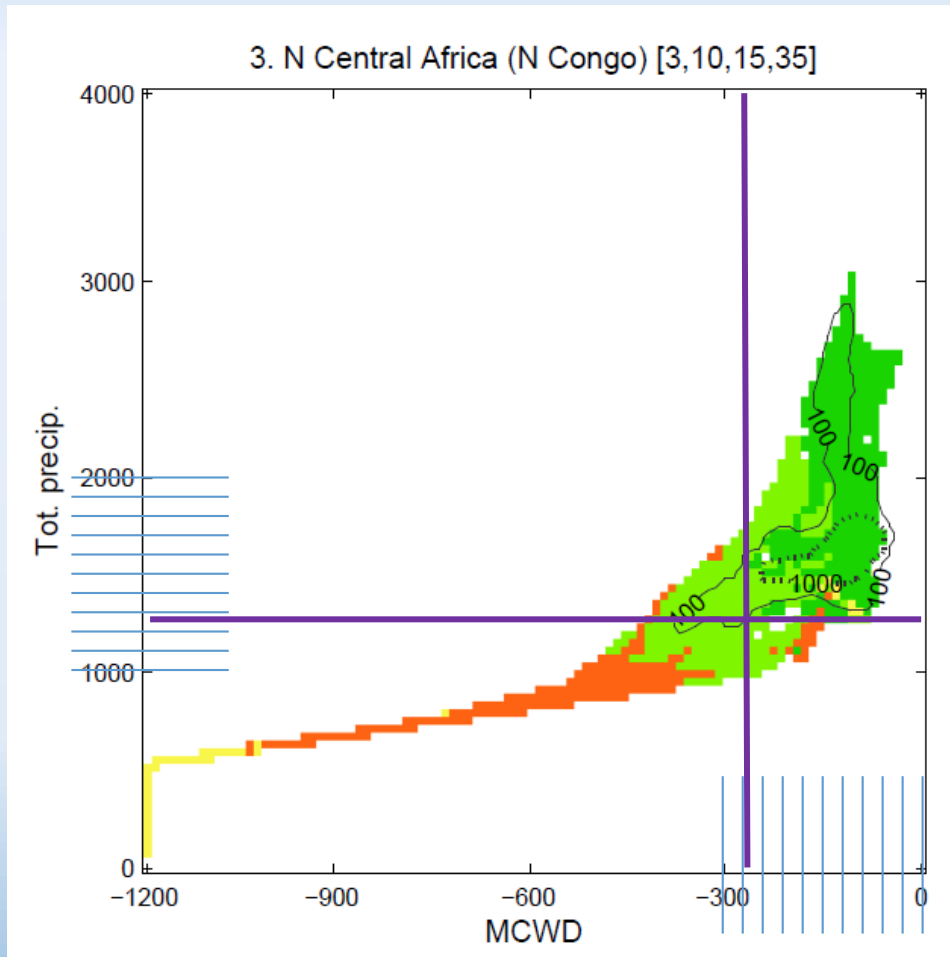
- MAP > 1300 mm
- MCWD > -300 mm

Precipitation and African Forests



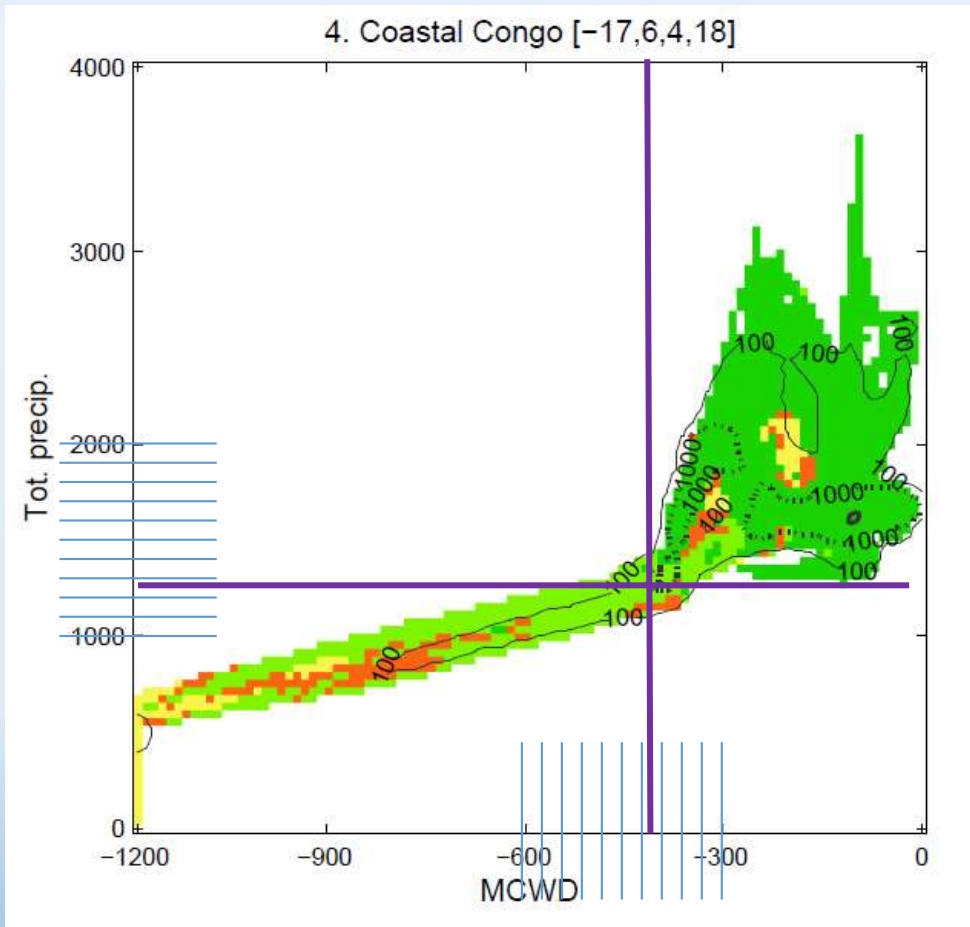
- MAP > 1500 mm
- MCWD > -240 mm

Precipitation and African Forests



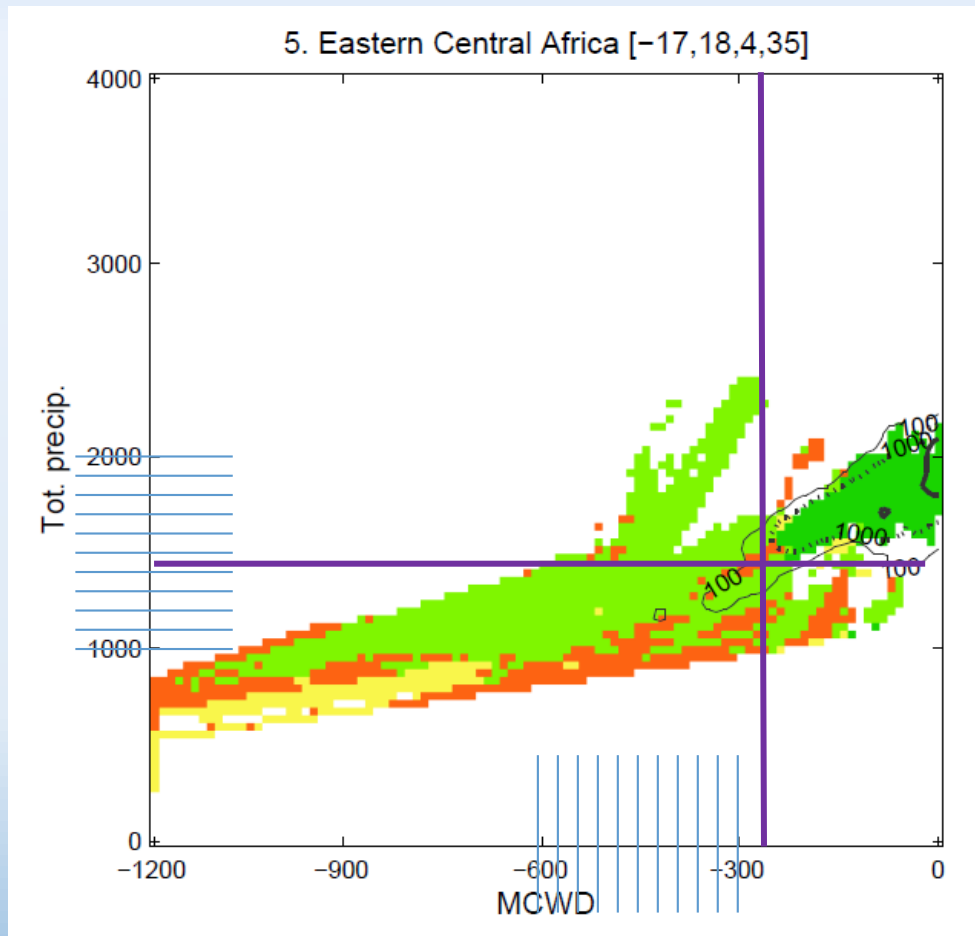
- MAP > 1300 mm
- MCWD > -270 mm

Precipitation and African Forests



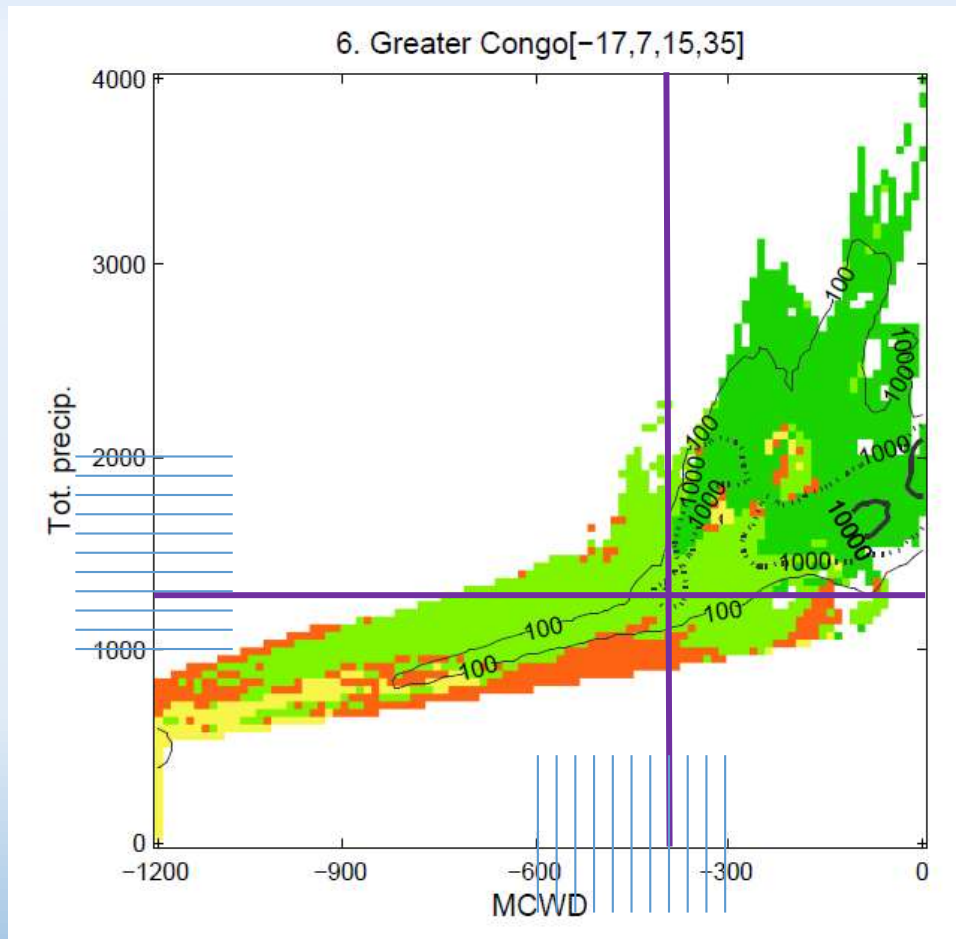
- MAP > 1300 mm
- MCWD > -400 mm

Precipitation and African Forests



- MAP > 1470 mm
- MCWD > -260 mm

Precipitation and African Forests



- MAP > 1300 mm
- MCWD > -400 mm