

A century of rainfall variability and recent change in the African Great Lakes region

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OUTLINE

Part 1. Rainfall in eastern Africa

Rainfall variability since 1998

Century-long rainfall variability

Seasonal rainfall during four regimes

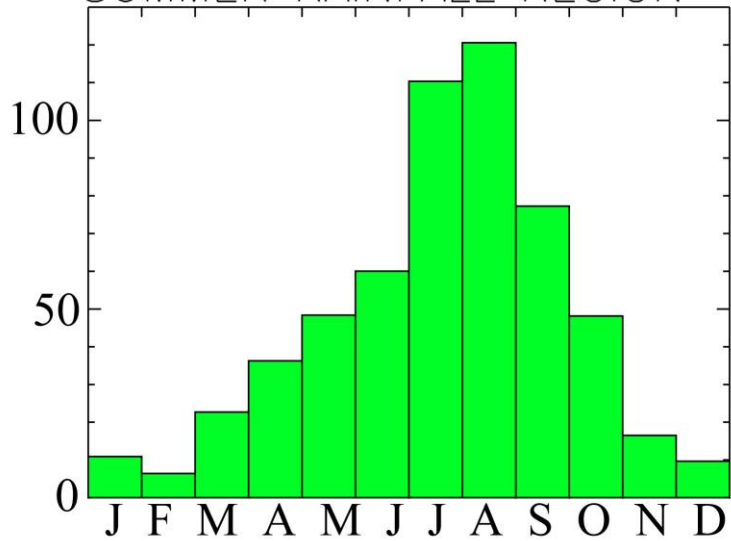
Part 2. Rainfall over lakes and their catchments

Variability in catchments 1940 to 2015

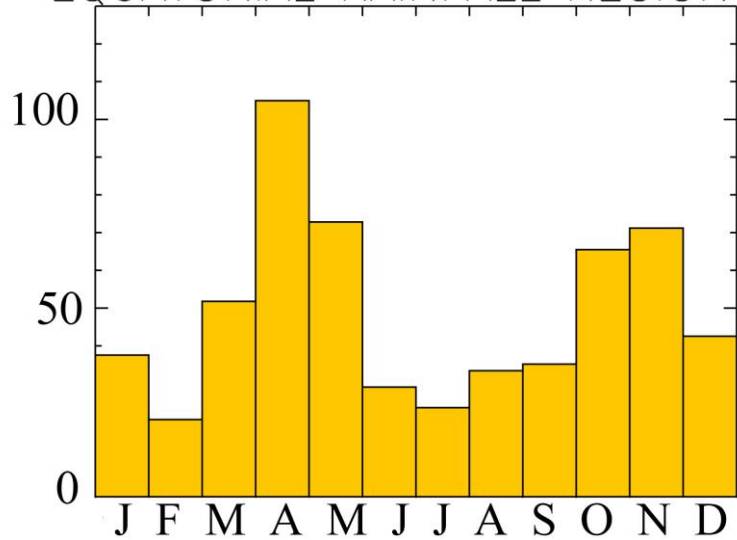
Lake effect rainfall (from TRMM satellite)

PART 1. VARIABILITY OF RAINFALL IN EASTERN AFRICA

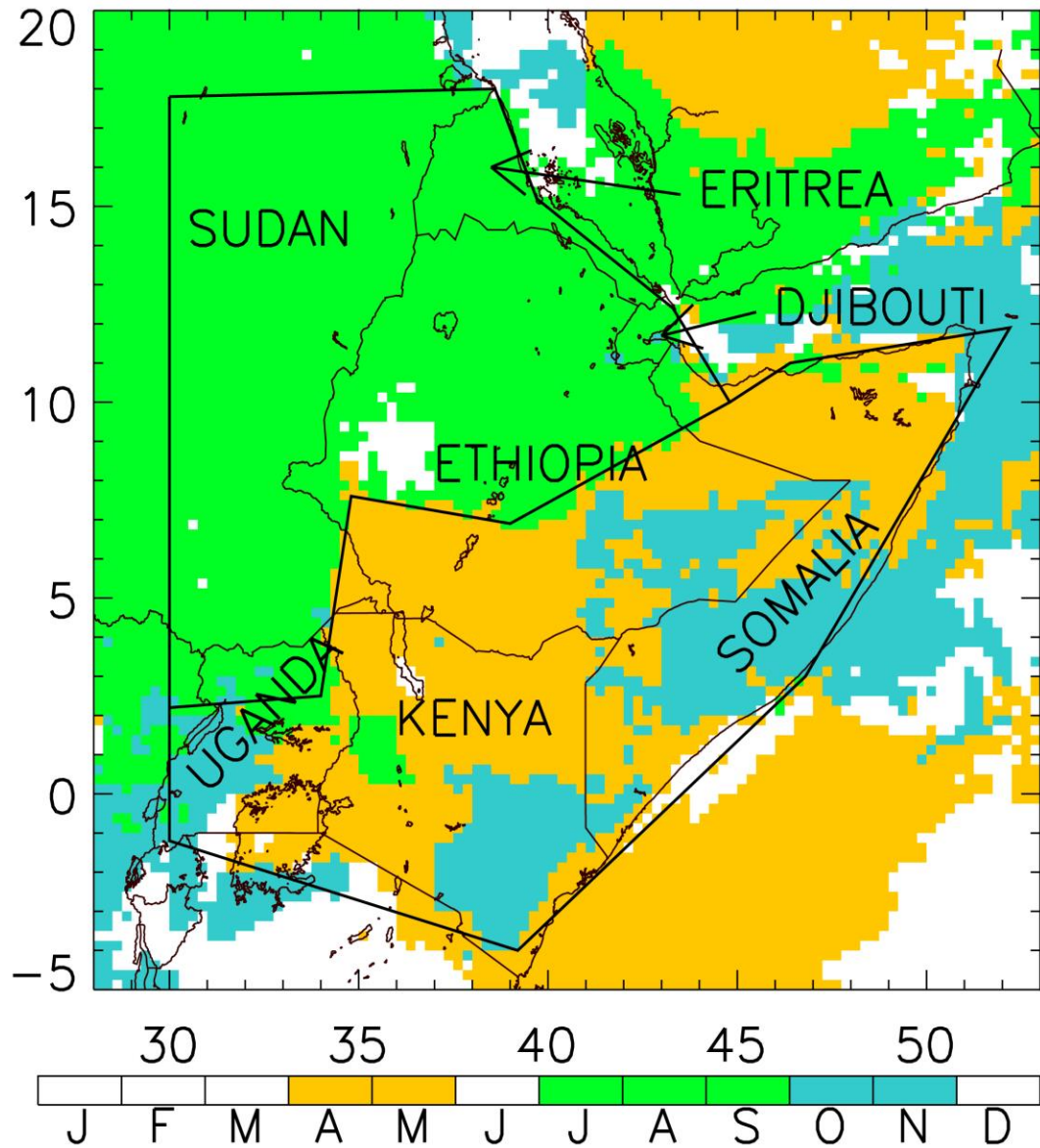
SUMMER RAINFALL REGION



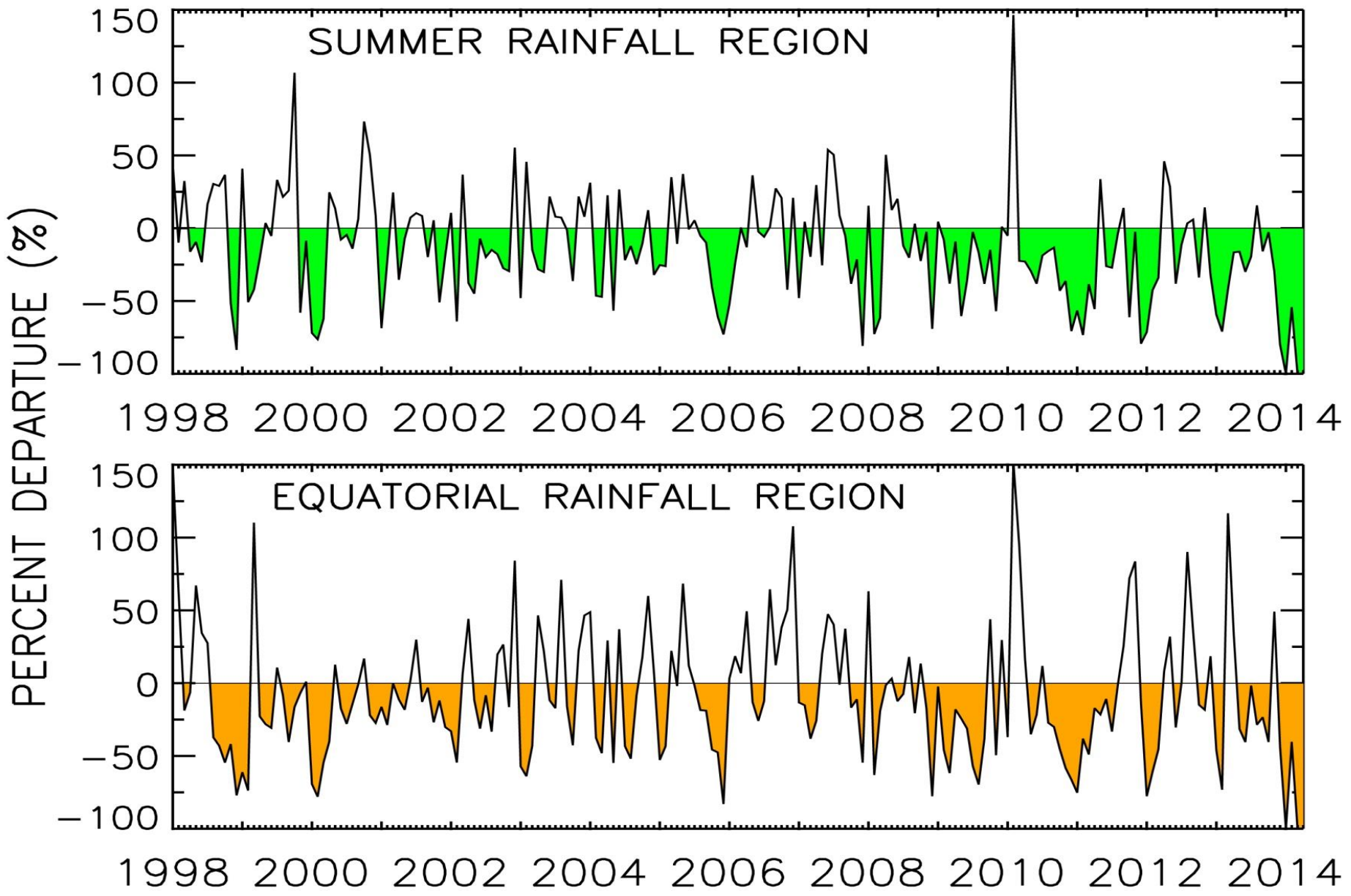
EQUATORIAL RAINFALL REGION



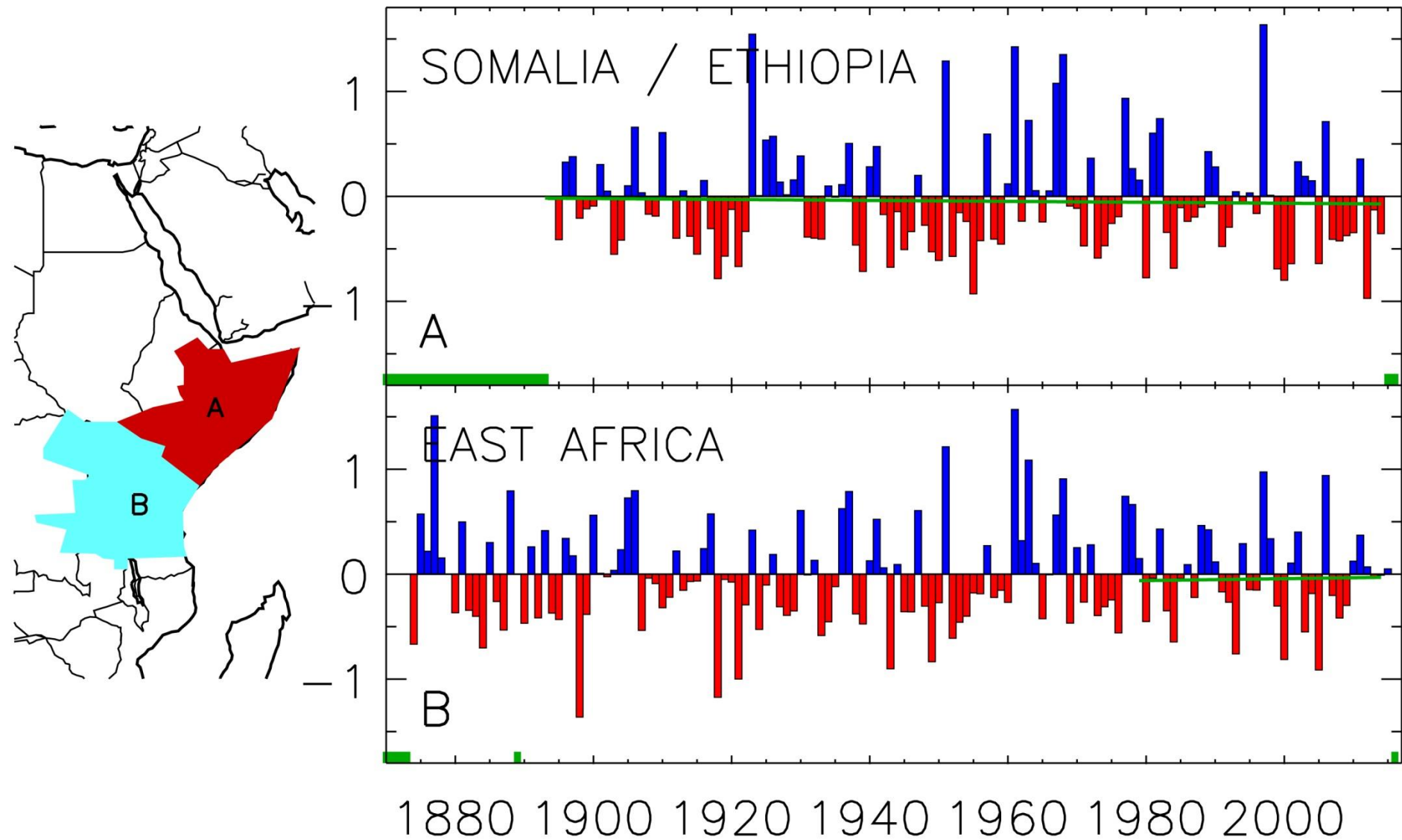
Region boundaries and Month of maximum rainfall.



RAINFALL 1998 to 2014 EXPRESSED AS A % DEPARTURE FROM MEAN



ANNUAL RAINFALL IN EQUATORIAL REGION EXPRESSED AS REGIONALLY-AVERAGED STANDARD DEVIATION FROM MEAN

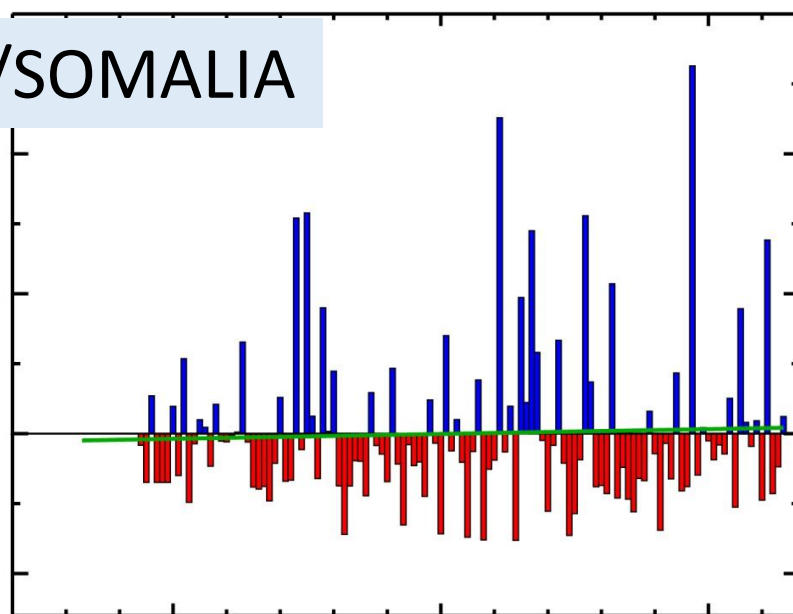
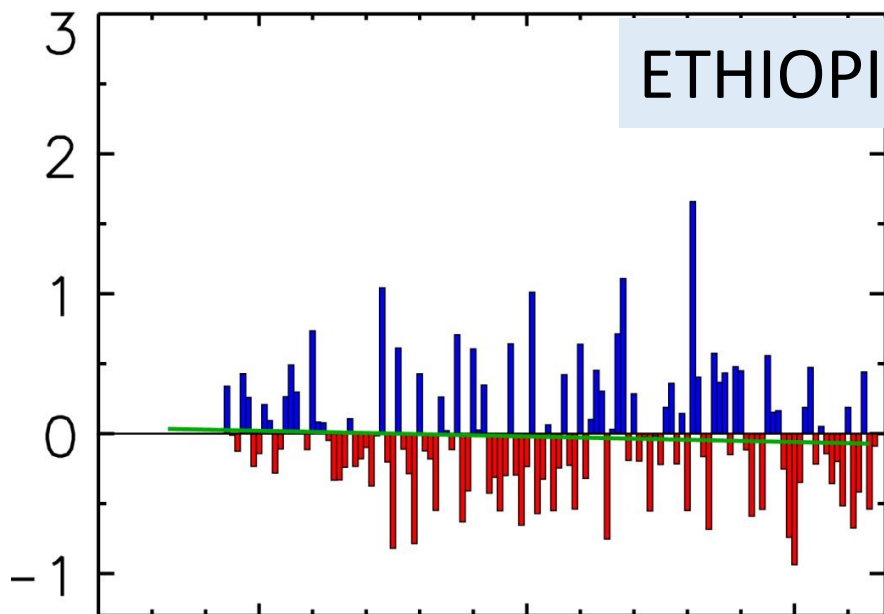


SEASONS TELL A DIFFERENT STORY

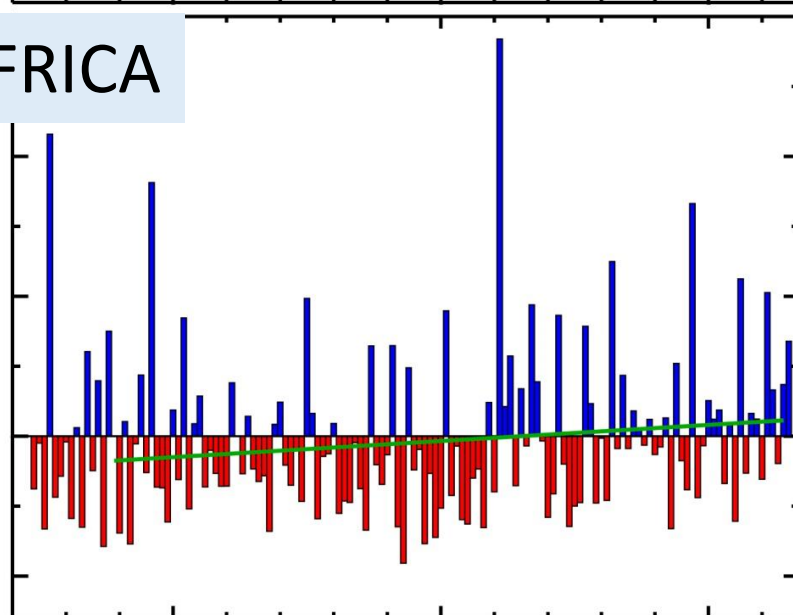
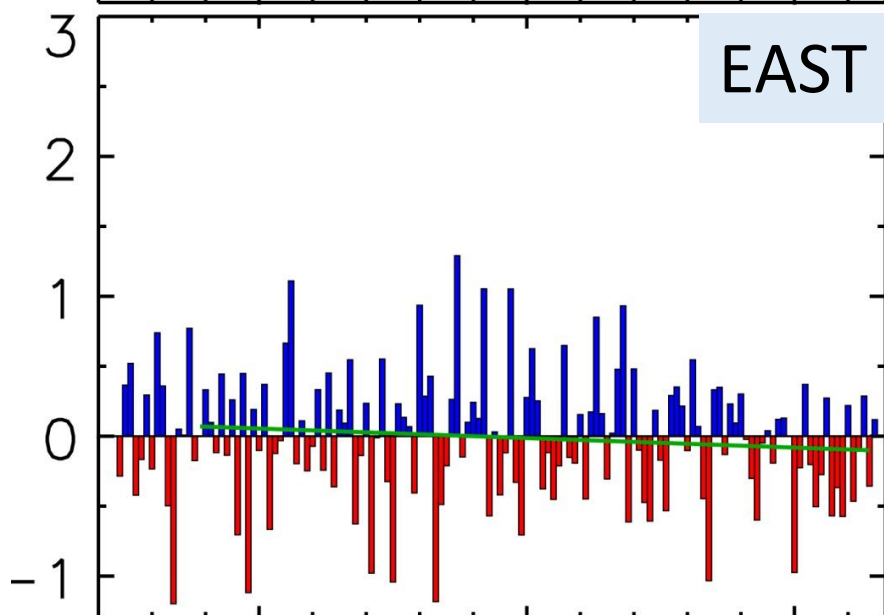
MAR-APR-MAY

OCT-NOV

ETHIOPIA/SOMALIA

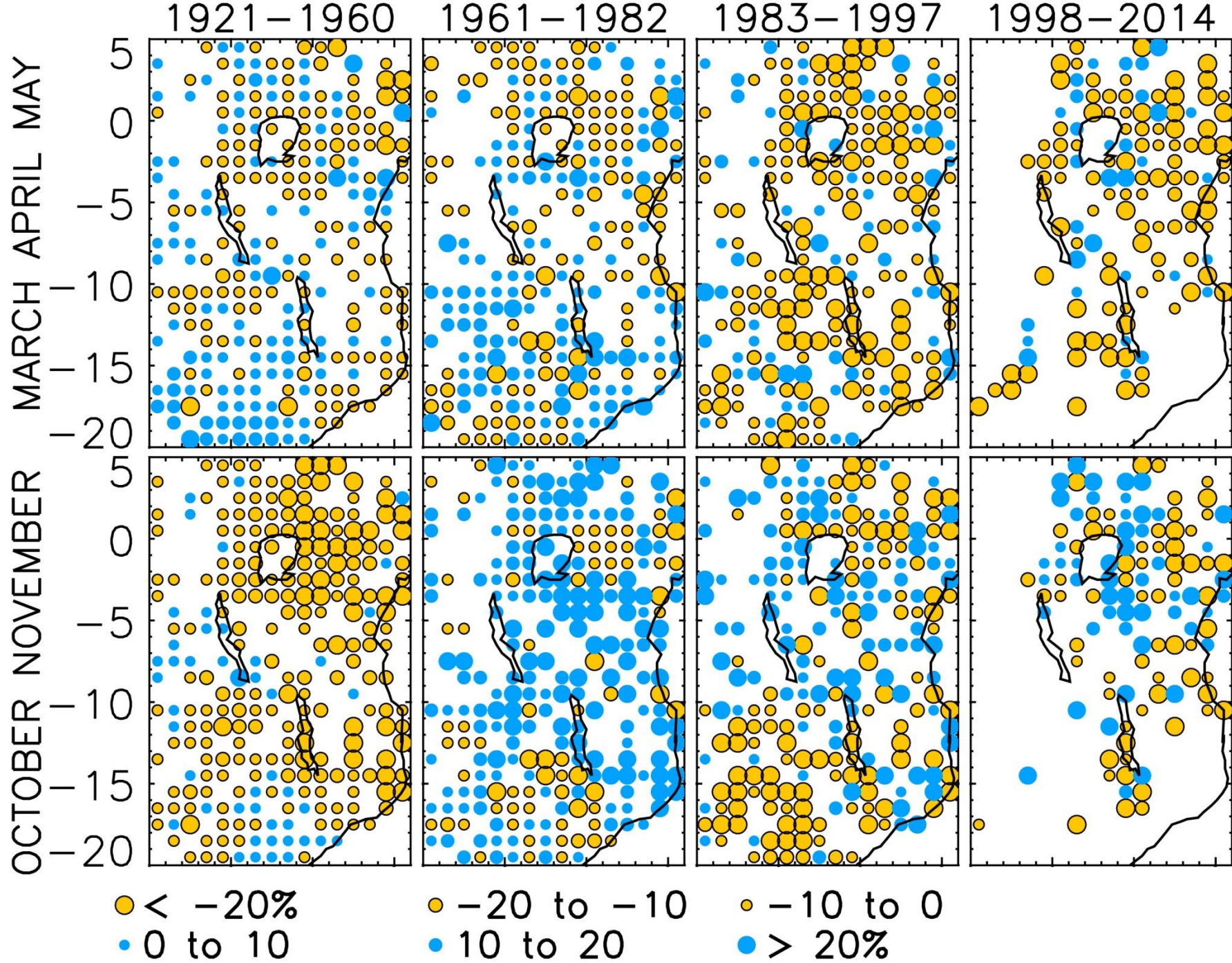


EAST AFRICA



1900 1950 2000

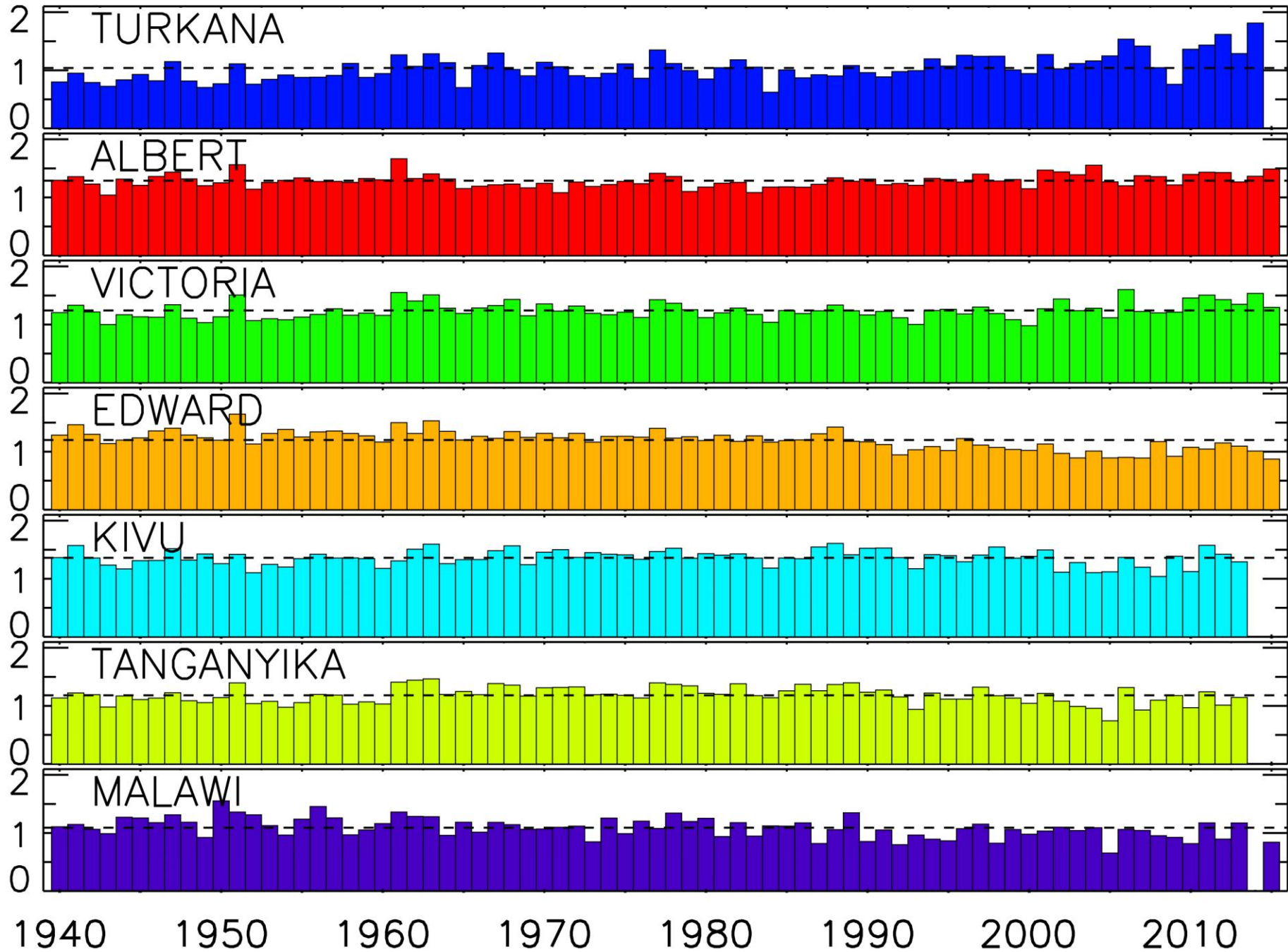
1900 1950 2000



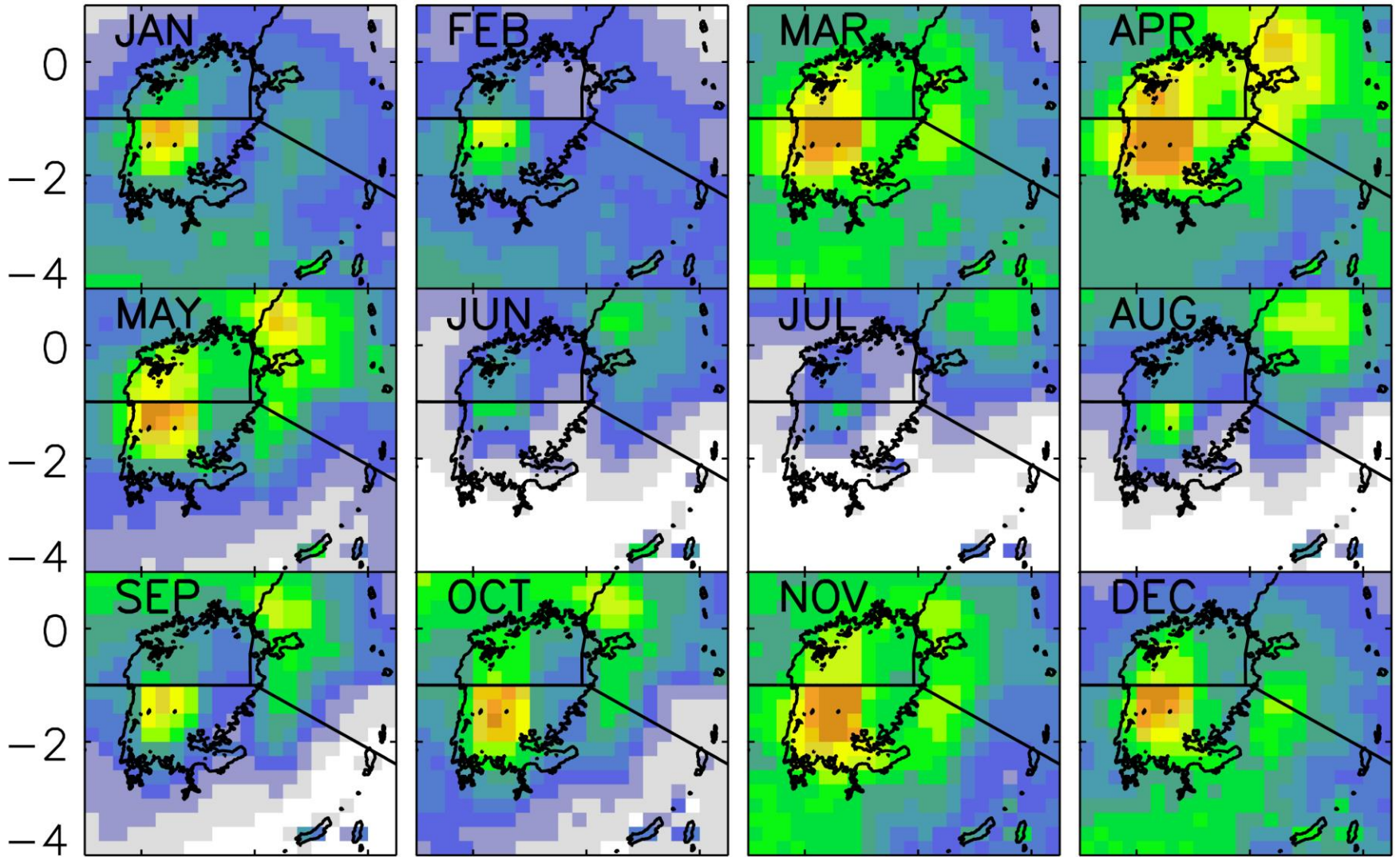
PART 2. RAINFALL OVER THE LAKES AND RAINFALL OVER THEIR CATCHMENTS

RAIN IN CATCHMENT

METERS OF RAINFALL PER YEAR

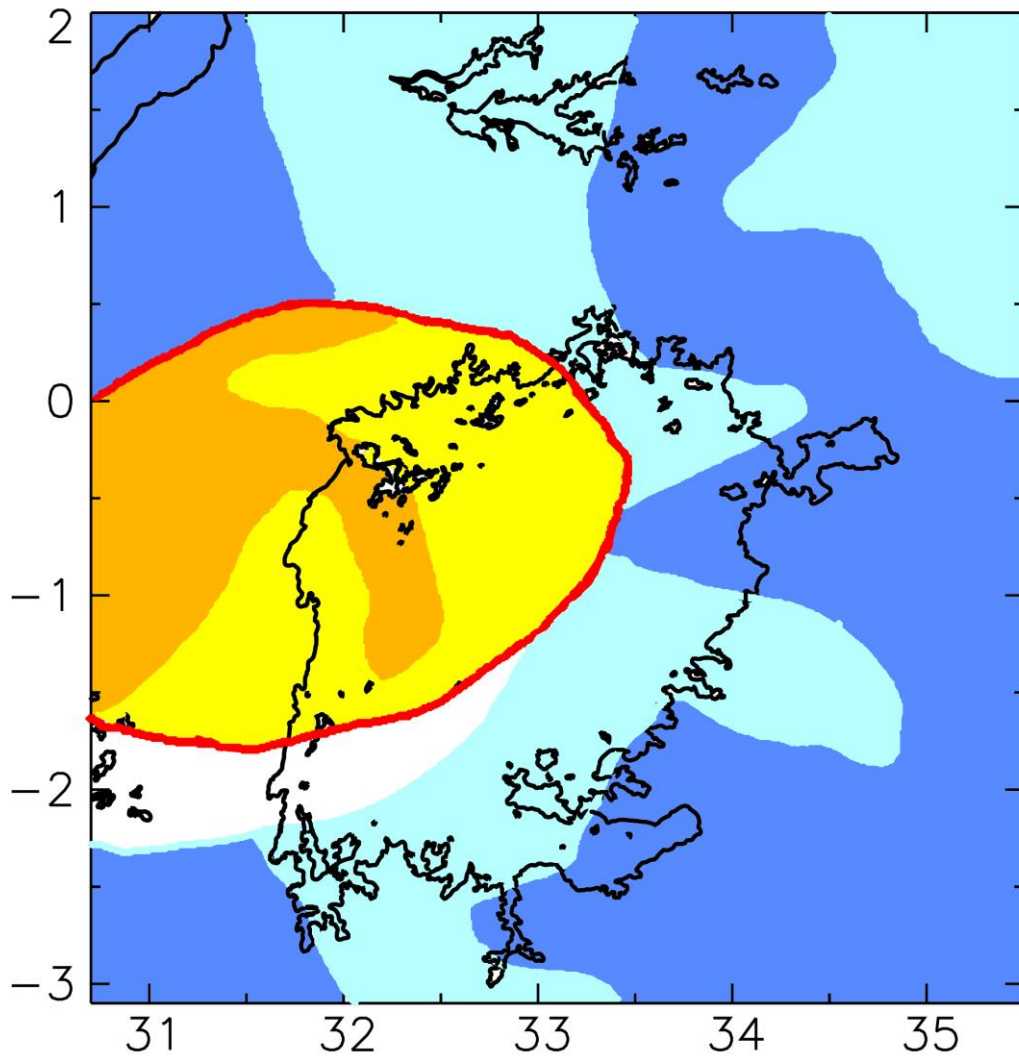


TRMM RAIN LAKE VICTORIA



32 34 36 32 34 36 32 34 36 32 34 36 32 34 36





**Contrasts in diurnal cycle
affect patterns of
insolation
lake temperature
lake evaporation
possibly surface
circulation over lake**

**NOCTURNAL
RAINS**

**AFTERNOON
RAINS**

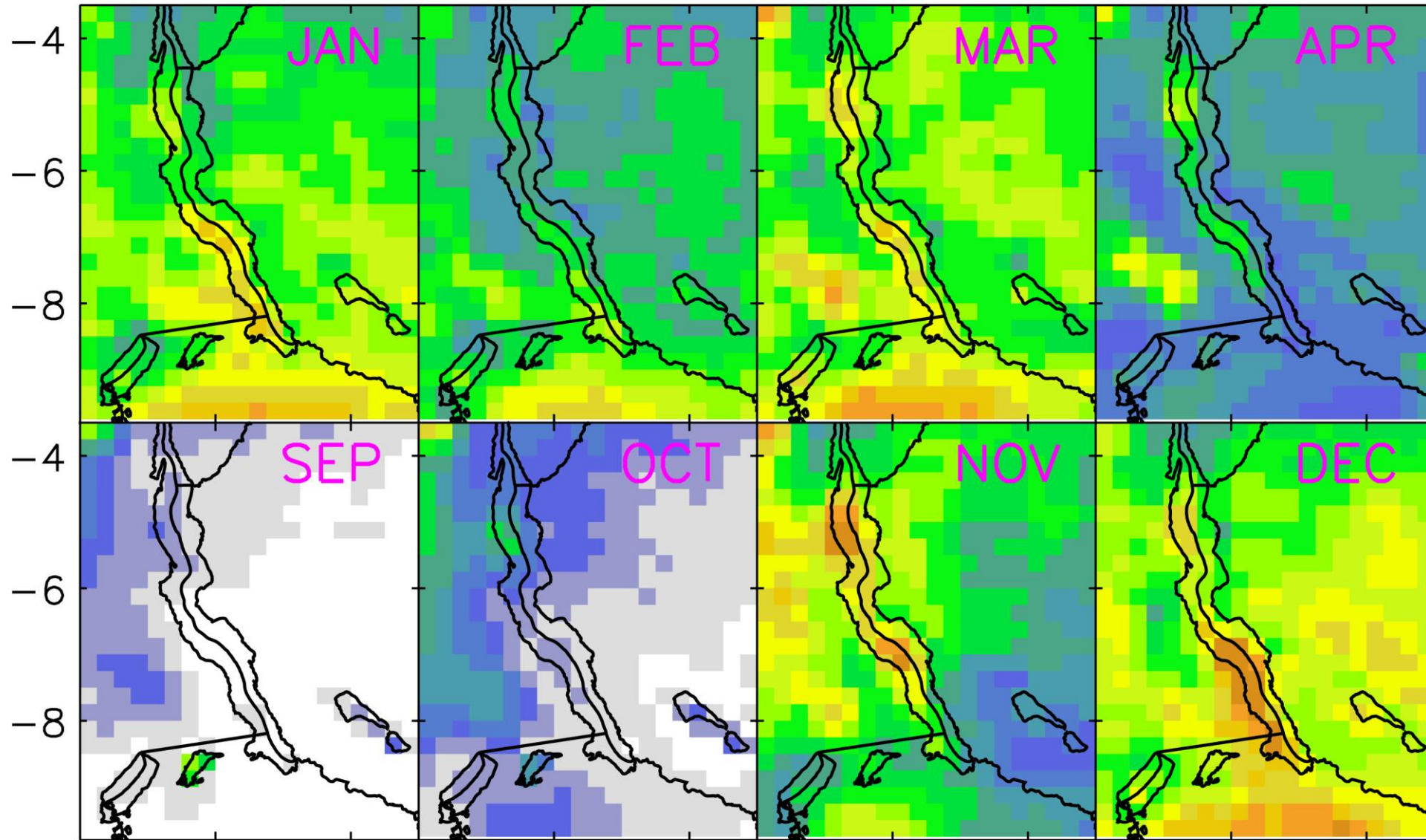
2 AM

4 AM

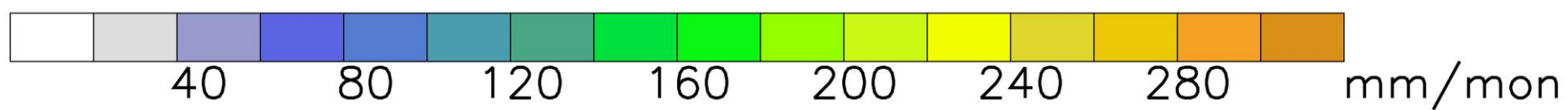
2 PM

4 PM

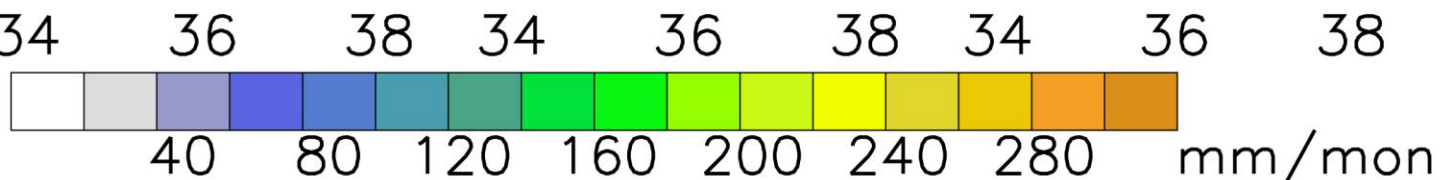
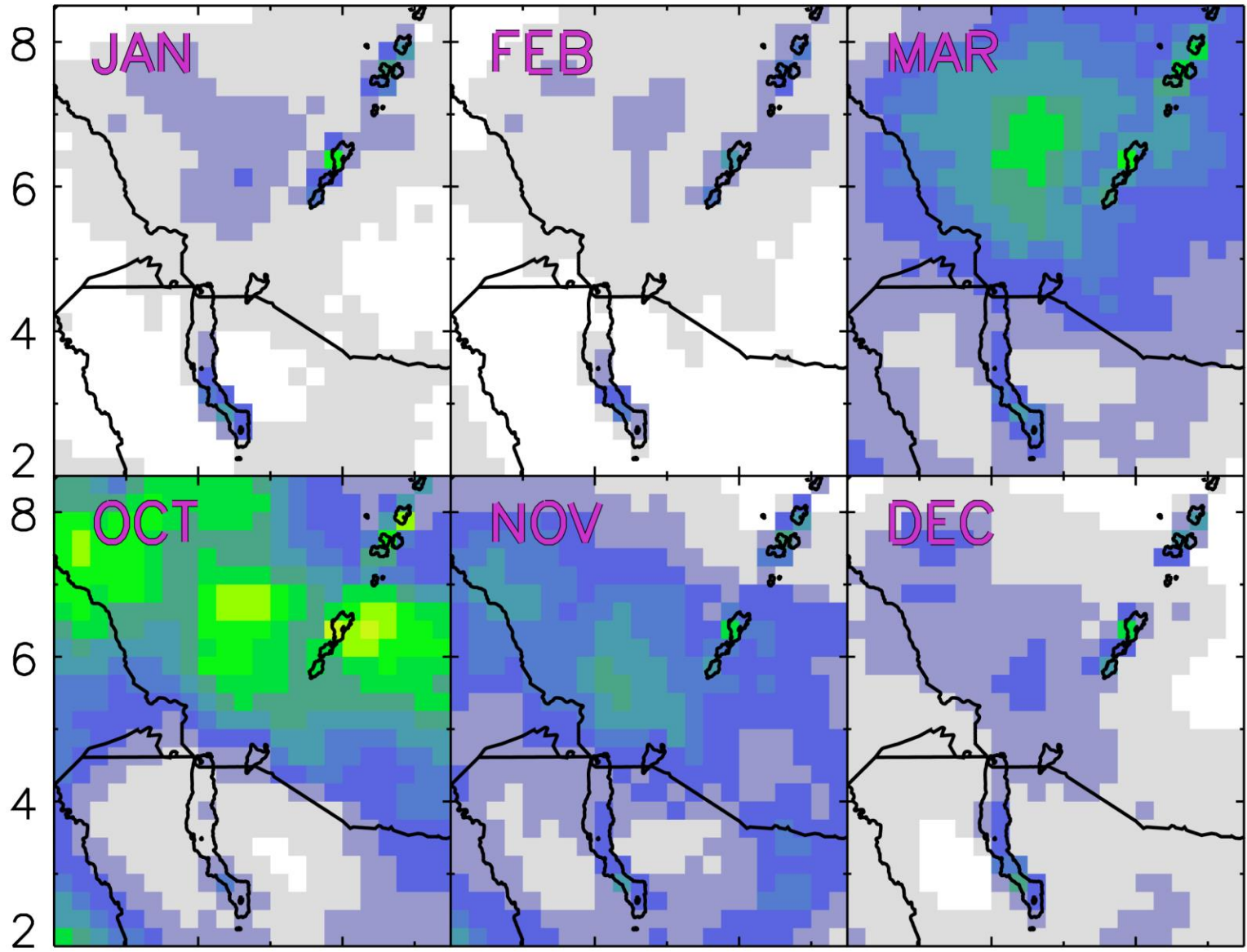
TRMM RAIN LAKE TANGANYIKA



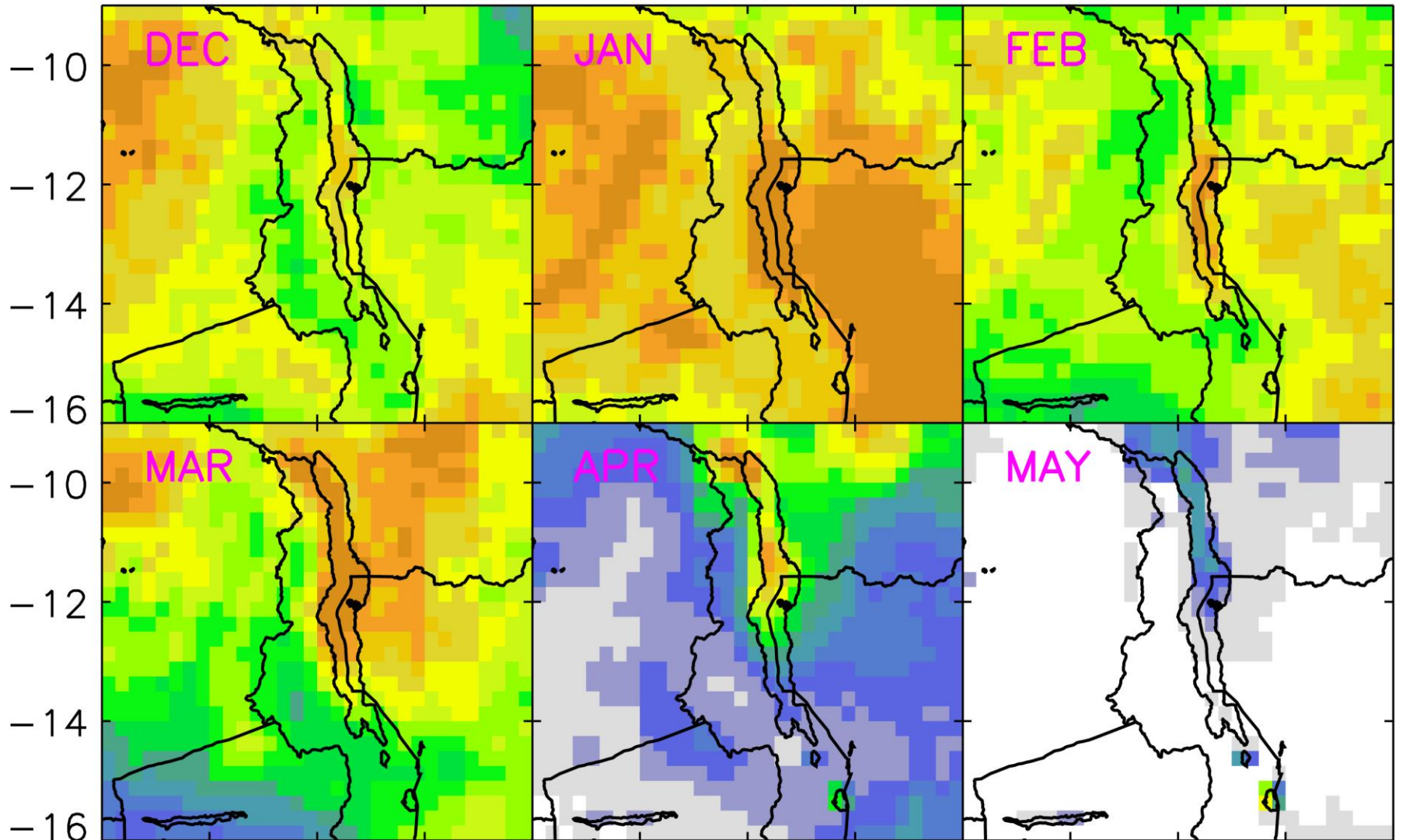
28 30 32 28 30 32 28 30 32 28 30 32



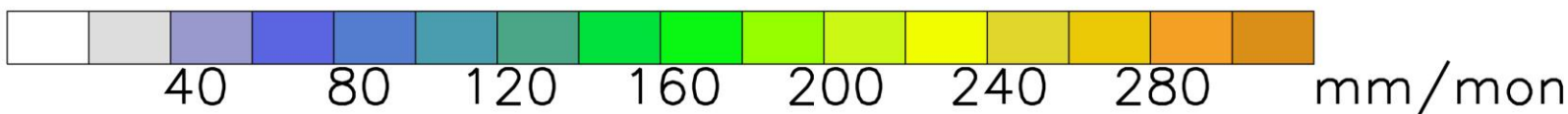
TRMM RAIN LAKE TURKANA



TRMM RAIN LAKE MALAWI



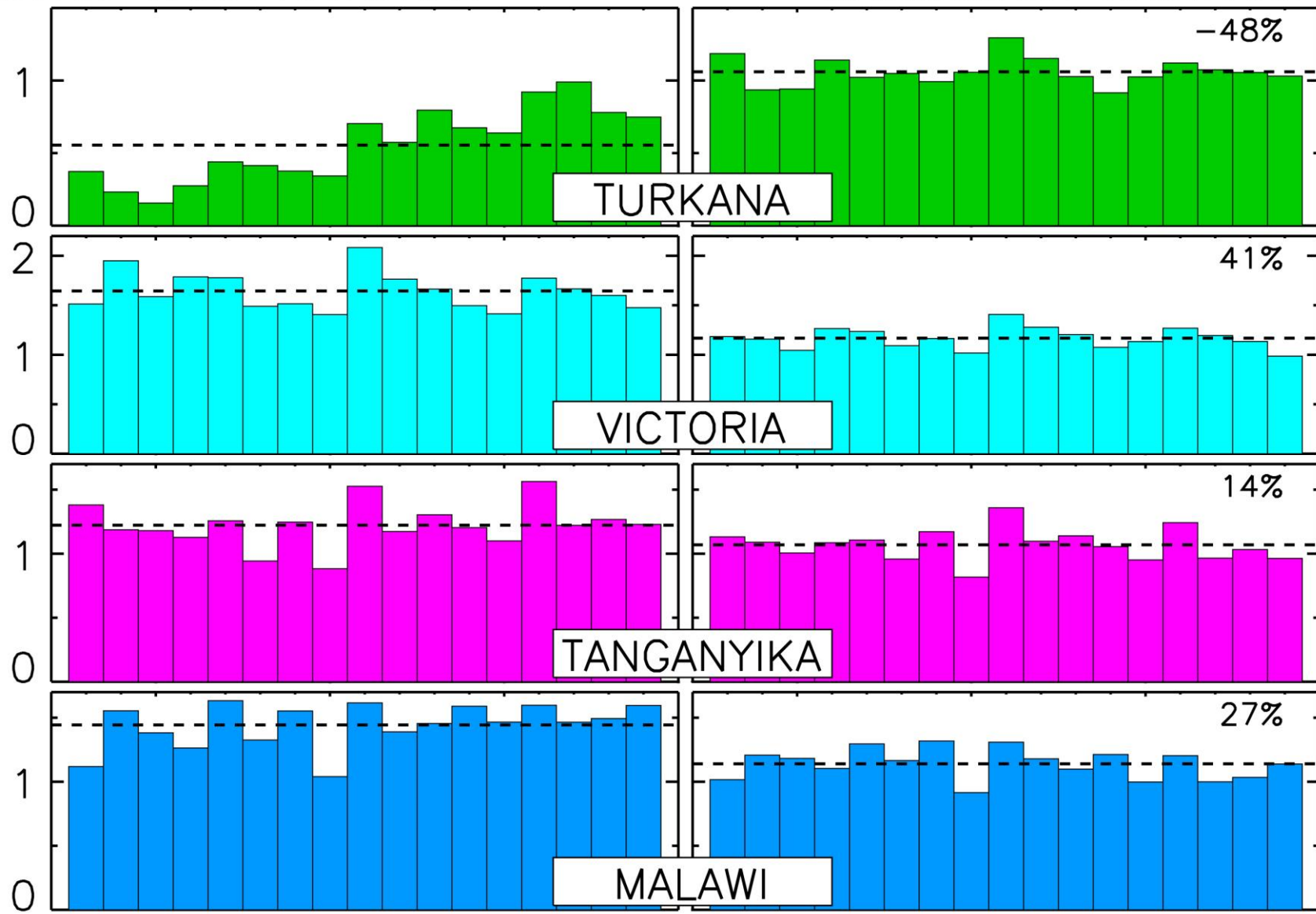
30 32 34 36 38 32 34 36 38 32 34 36 38



OVER-LAKE RAINFALL from TRMM

CATCHMENT RAINFALL

METERS OF RAINFALL PER YEAR



2000

2005

2010

2015

2000

2005

2010

2015

SUMMARY AND CONCLUSIONS

- **RAINFALL IS CHANGING OVER THE GREAT LAKES REGION**
- **SHORT RAINS HAVE GOTTEN STRONGER, LONG RAINS WEAKER**
- **RAINFALL REGIMES OVER THE LARGEST LAKES**
 - **DIFFERENT FROM THOSE OVER CATHMENTS AND**
 - **MIGHT RESPOND DIFFERENTLY TO CLIMATE CHANGE**

FURTHER RESEARCH IS NEEDED TO

DETERMINE

WHAT CONTROLS THE LAKE-EFFECT RAINS

IMPACT OF LAKES' RAINFALL REGIMES ON LAKES' HEALTH

APPLY FUTURE CLIMATE PROJECTIONS TO THE LAKES

THANK YOU!



