

Identifying climate stressors – A matter of scale

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From Annex 4 …

"These components seek to provide a range of benefits, including: increasing understanding of the needs of individual poor families at the level of timber stands or agroforestry farm plots (CRP6.1), generating ecologically sustainable forestry options for communities (CRP6.2), balancing the interests of multiple sectors of society with differing claims on multifunctional landscapes (CRP6.3; e.g., "learning landscapes"), **identifying prospects for mitigating and adapting to climate change through forests and trees (CRP6.4)** and creating a geographic context in which, for instance, to address the effects of globalized trade and investment on society and the environment (CRP6.5) "

Climate is constantly changing

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- ✓ Adaptation strategies are often based on climate predictions for the end of the 21st century, a period that is difficult to incorporate in the agenda of policy makers.
- ✓ Most of the climate variability is on inter-annual timescale. In some regions decadal variability is important, whereas trends explain the least of the observed variability.

Establish good practices by evaluating past, current and future climate considering all temporal scales of climate variability (i.e., trends, decadal and inter-annual).

The SLs

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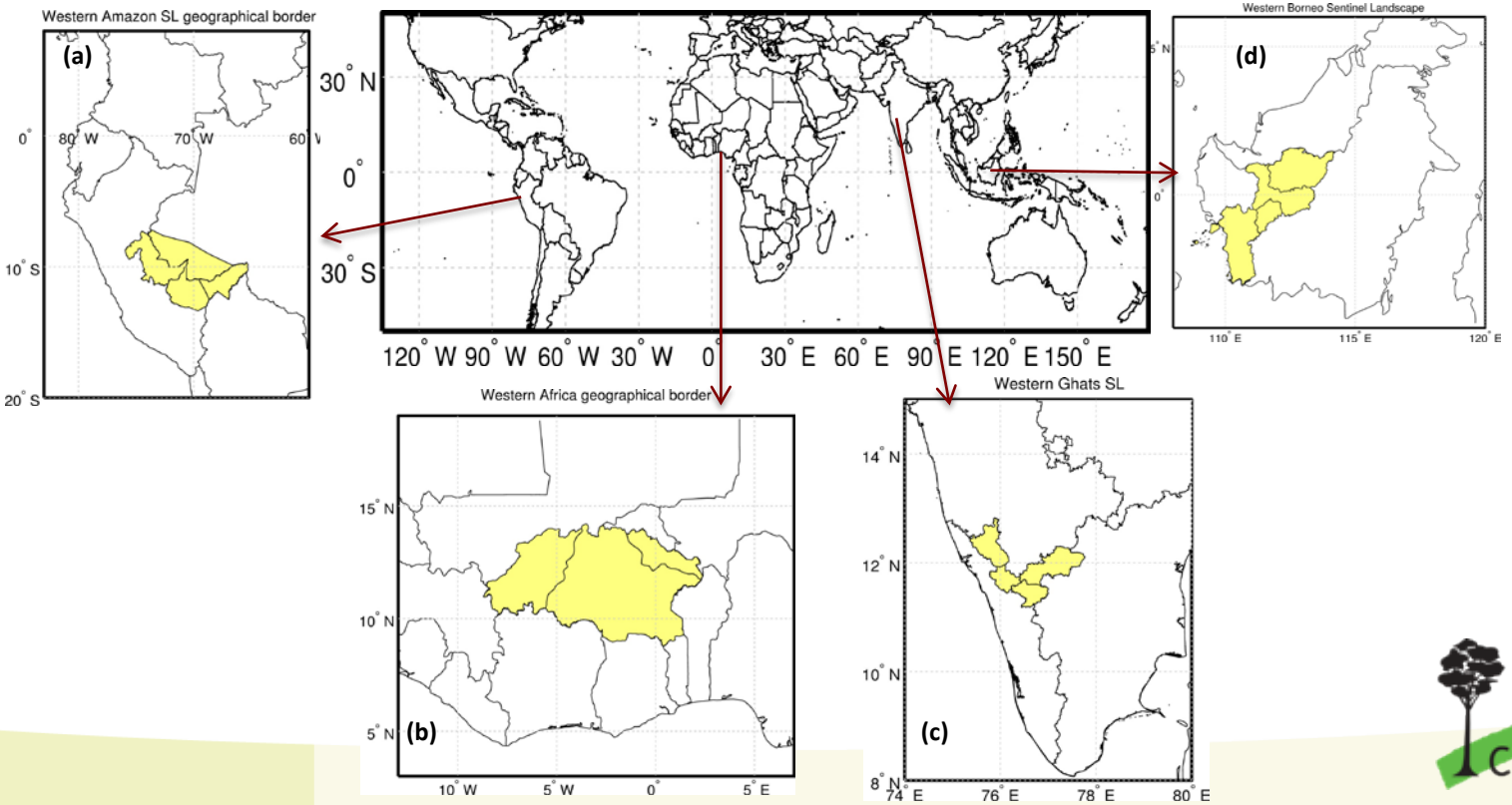
- ✓ Rain gauge only global gridded precipitation data (GPCC) at 0.5 degrees resolution and monthly time step. Period- 1930-2010.
- ✓ Timeseries of seasonal, domain averaged precipitation anomalies are partitioned into trends, decadal and inter-annual timescales.



Timeseries partitioning

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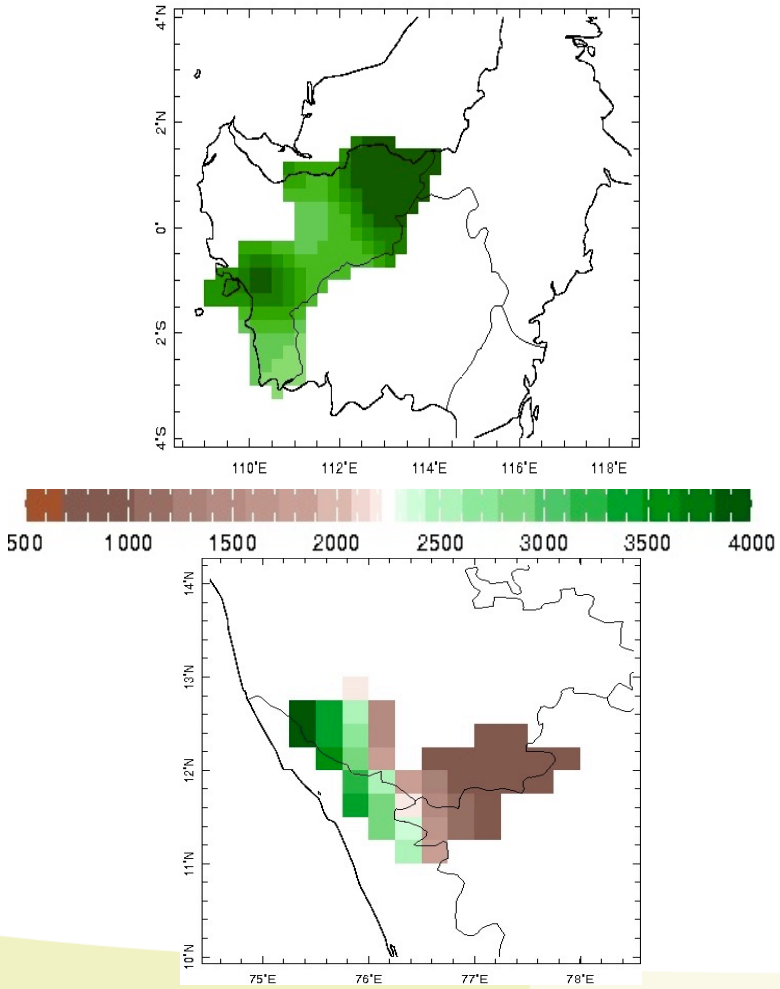
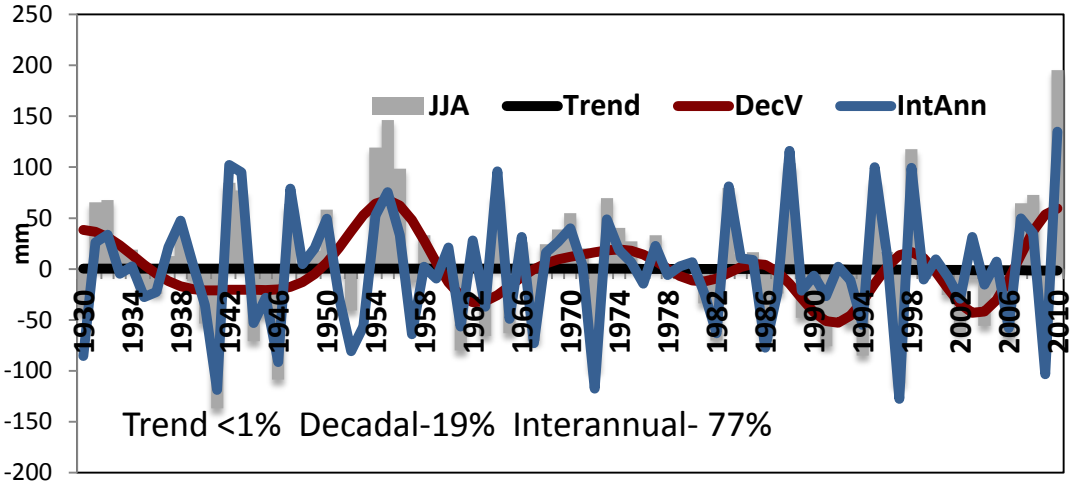
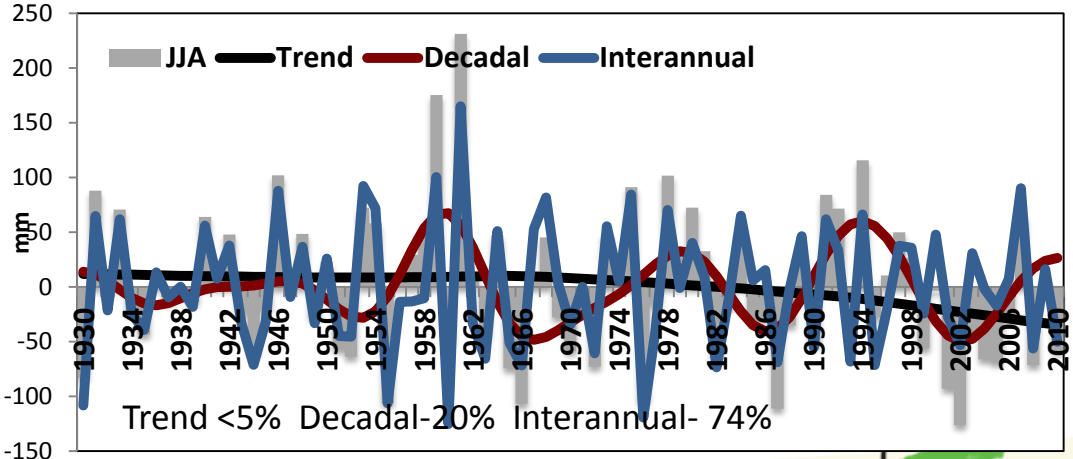
Annual Precipitation



June-July-August domain precipitation





CIFOR

Western Amazon (WA)

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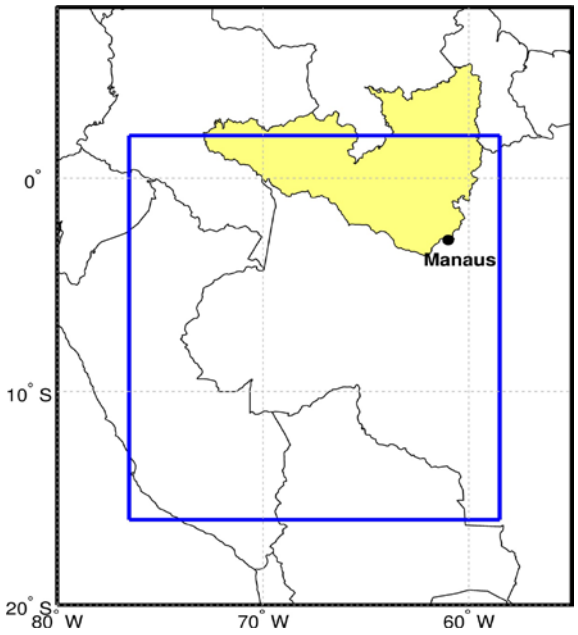
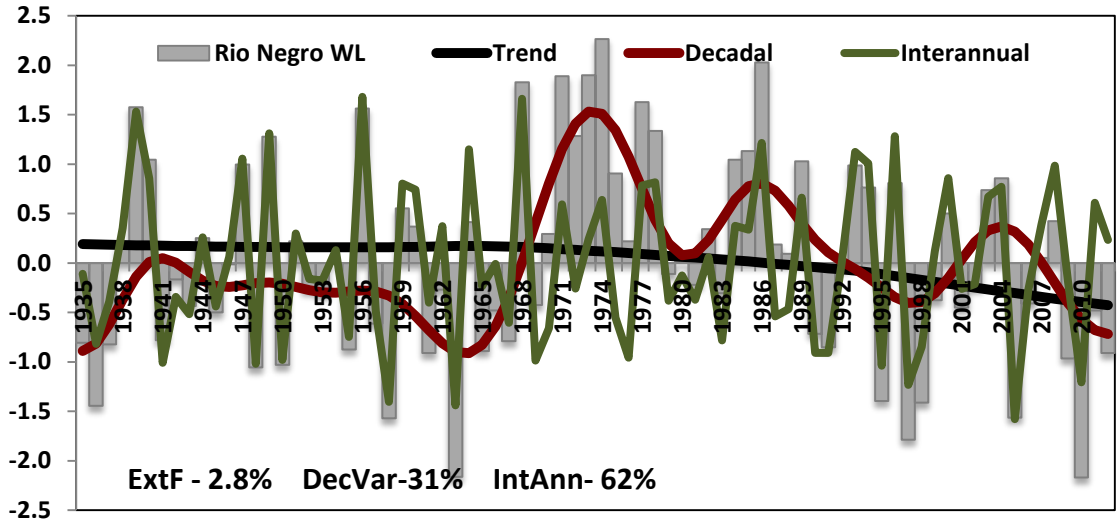
- ✓ The 2 severe droughts of 2005 and 2010 in WA raised the question of possible climate change signal in the seemingly more frequent events.
- ✓ Dry season- July-September





Large-scale ocean forcings

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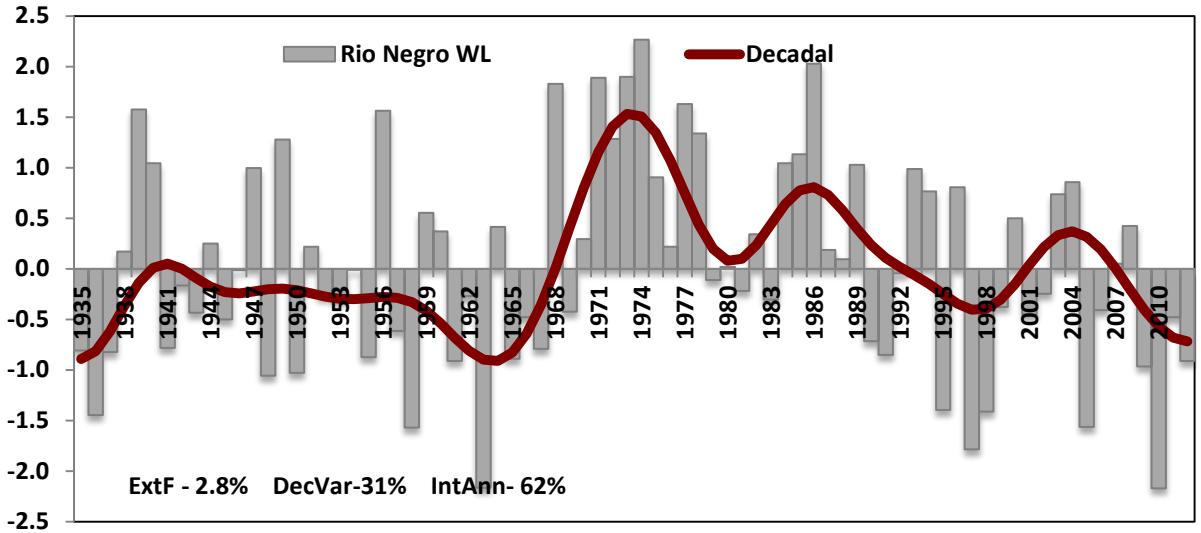

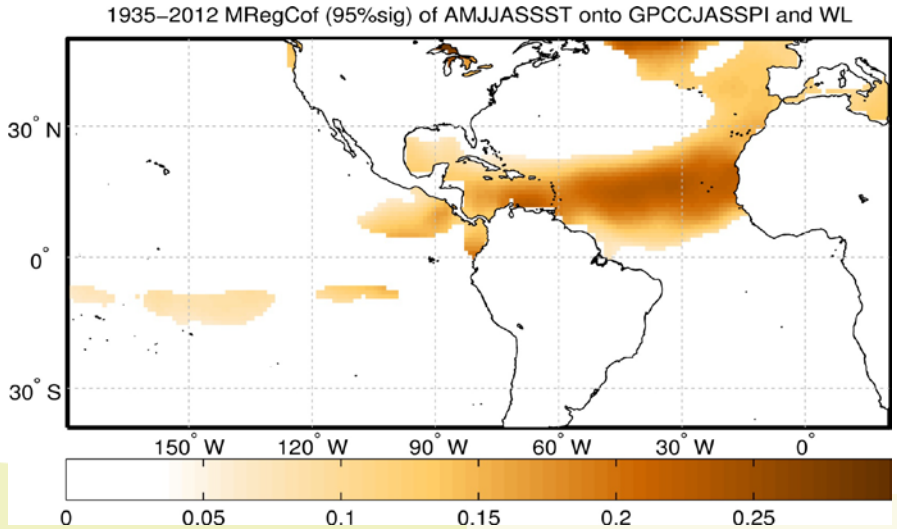

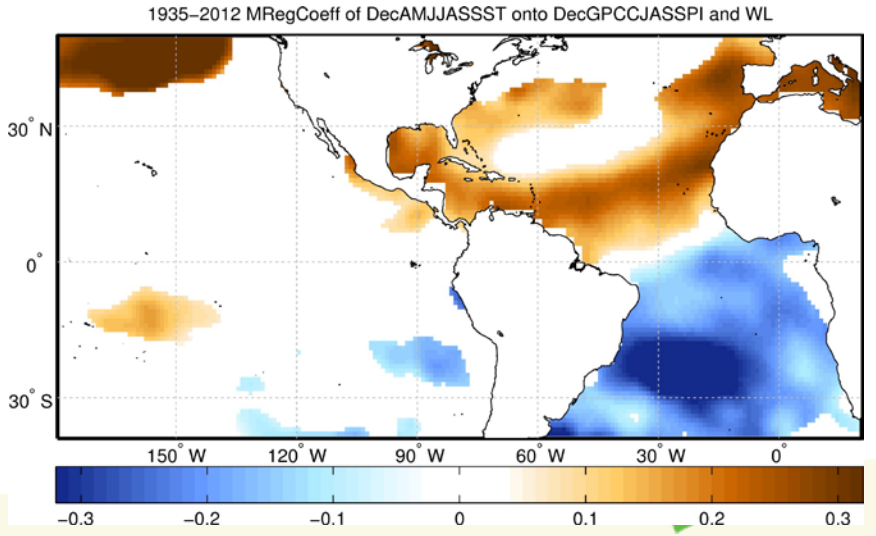

Predictability

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- ✓Timeseries partitioning is a statistical method and establishing a physical mechanism increases our confidence in the found modes.
- ✓Ocean processes are the “base” for climate prediction and are more skillfully simulated than precipitation in Global Climate Models (GCMs).
- ✓Using sea surface temperature (SST) prediction from models may increase our ability to predict precipitation-related variables.

Frequency of droughts

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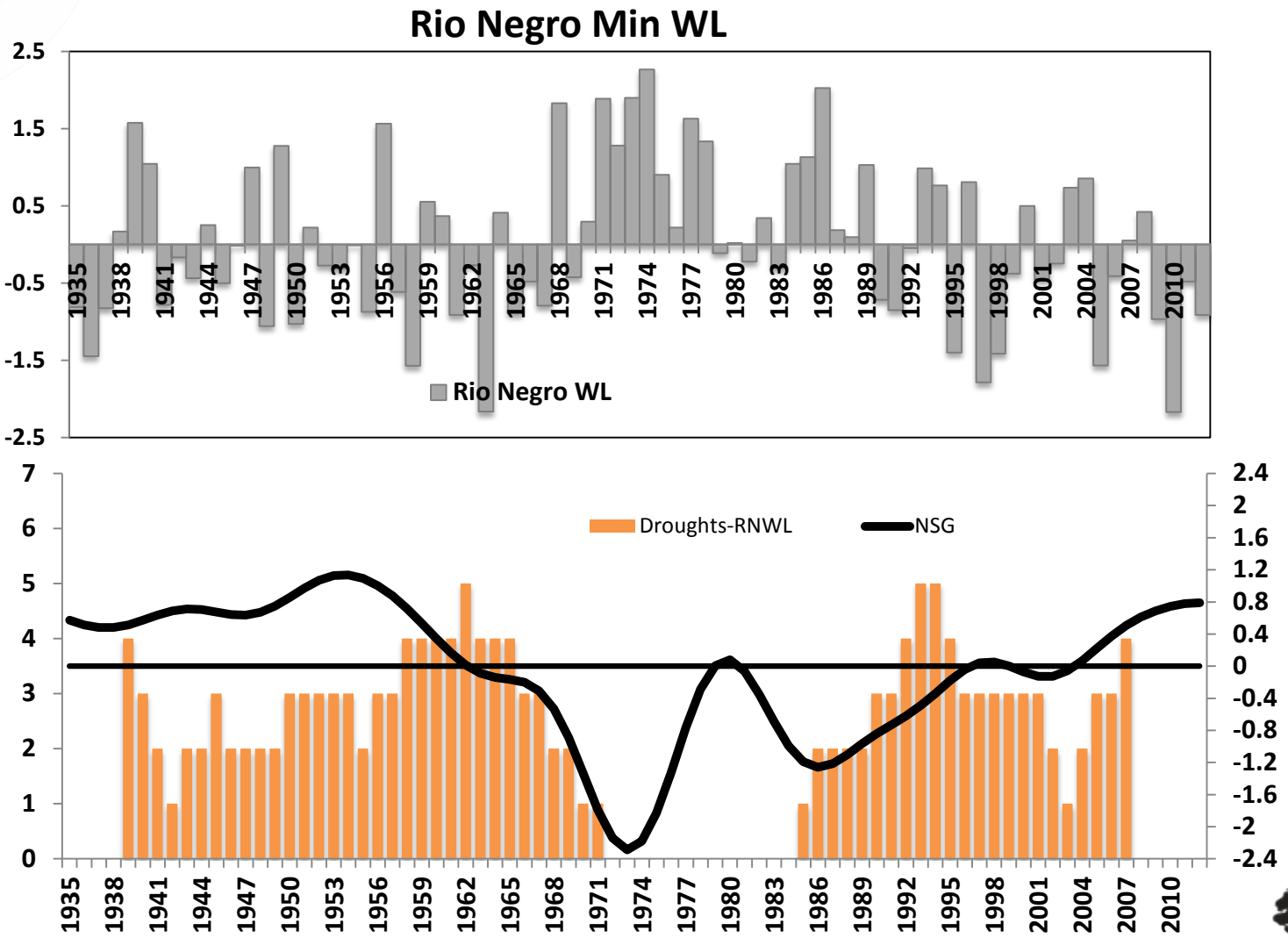

Probability Distribution of Extremes

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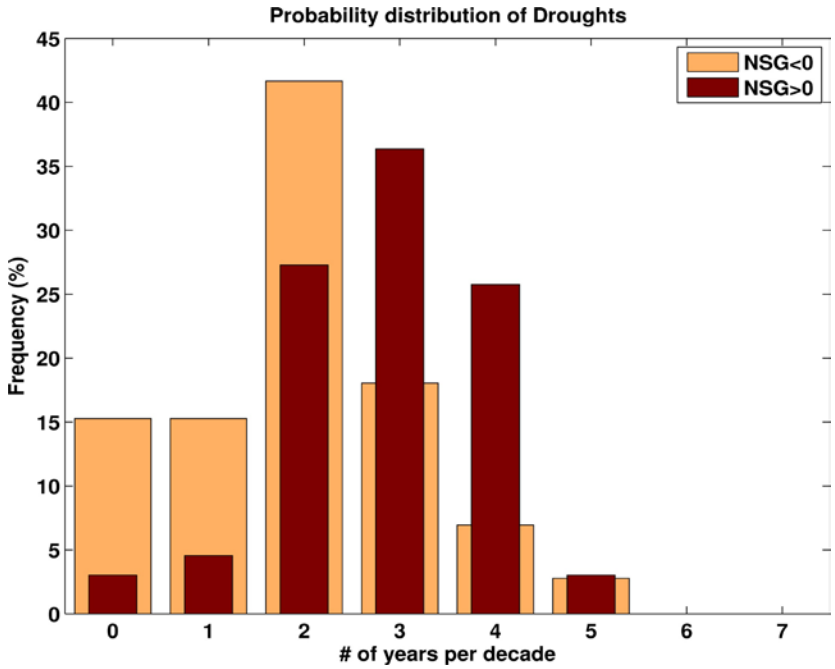

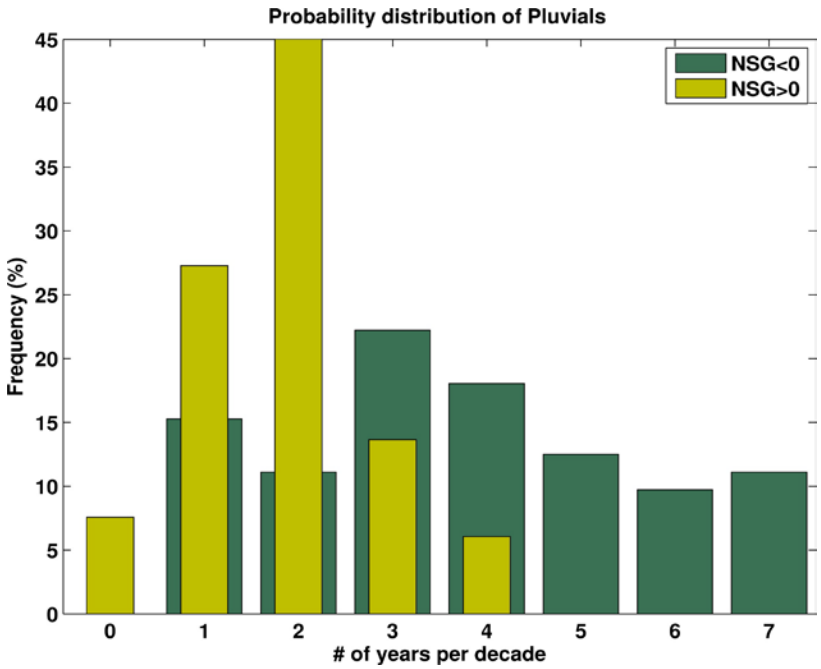

- ✓ Drought probability distribution during opposite phases of the NSG are significantly different.

Drought Frequency JJA

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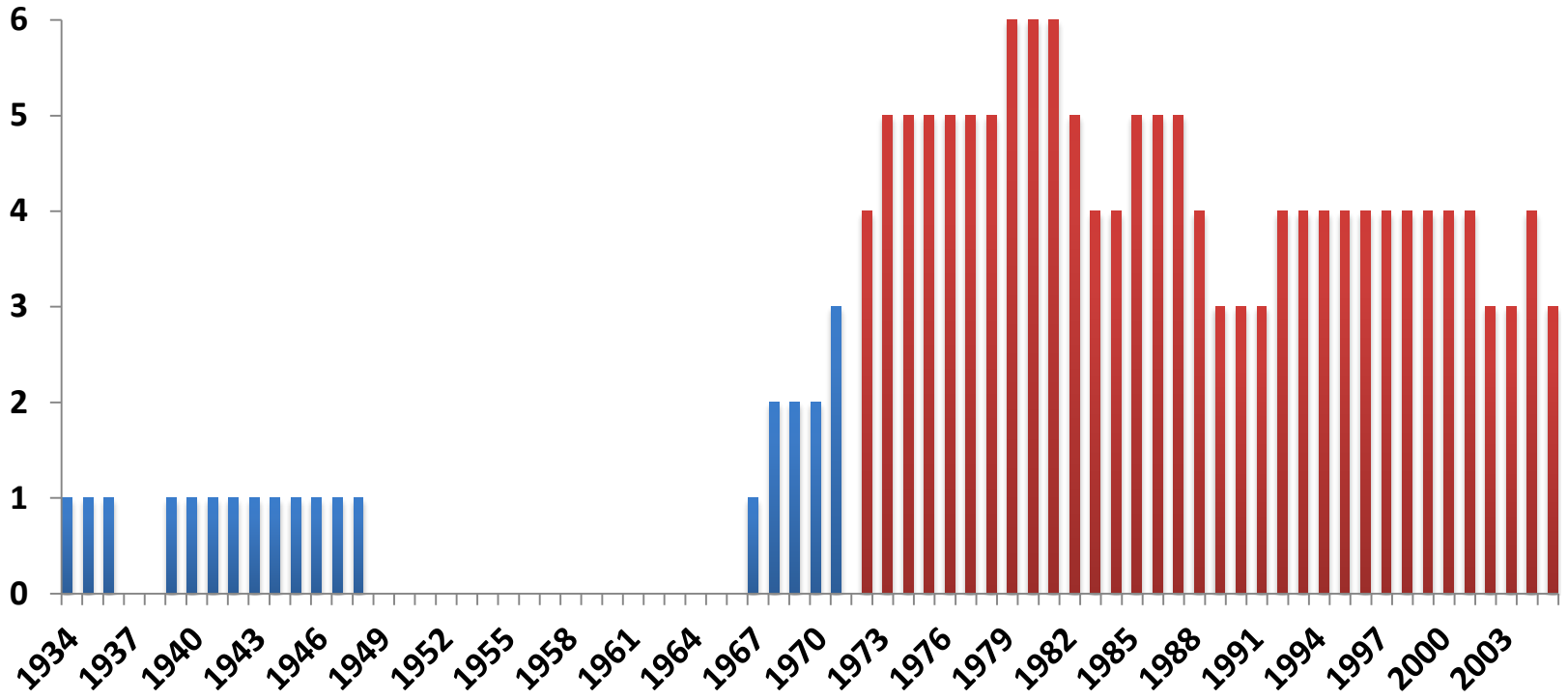
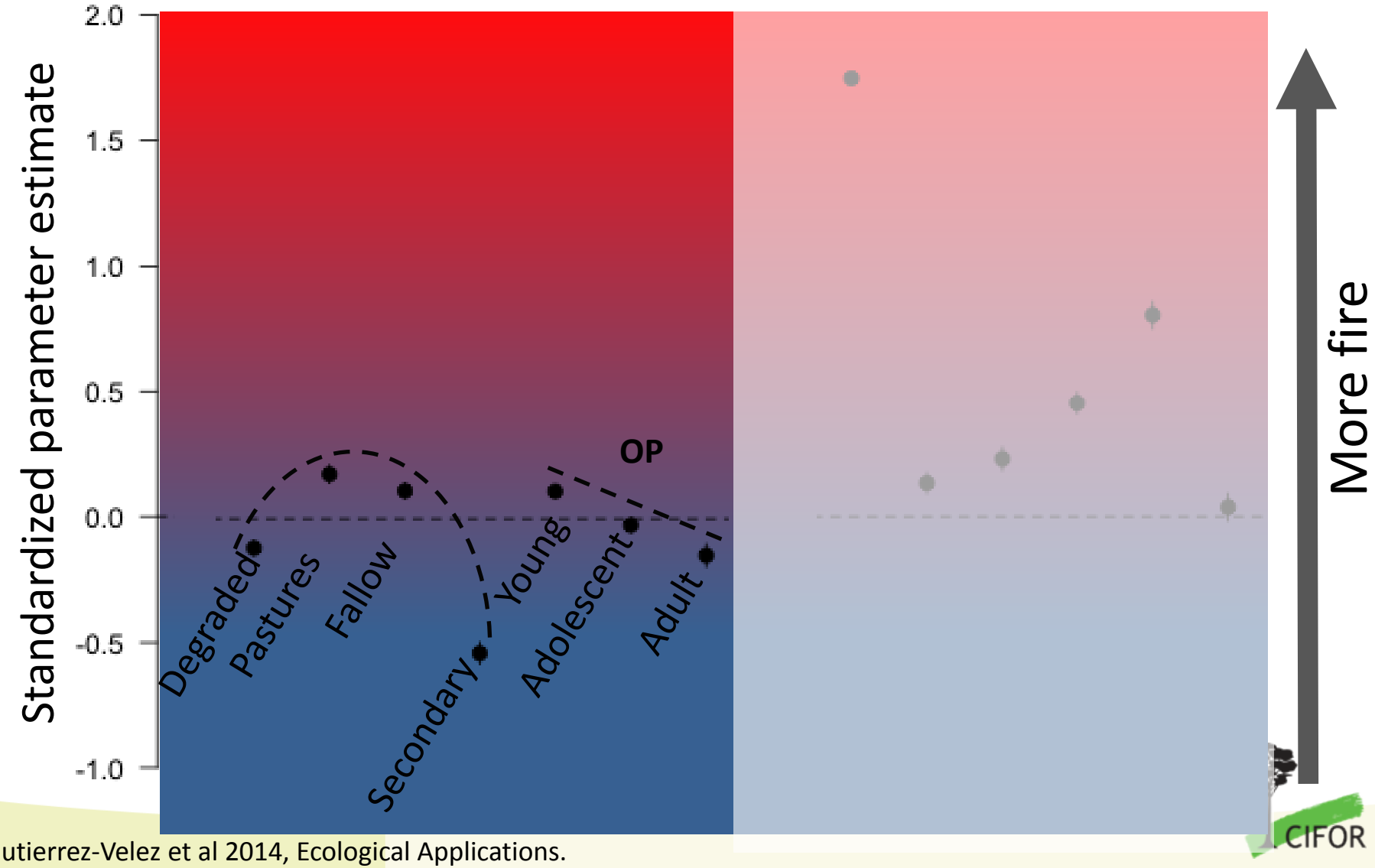
Number of years of droughts per decade in the WAfrica SL



Climate analysis is essential for better management of natural resources



Gutierrez-Velez et al 2014, Ecological Applications.

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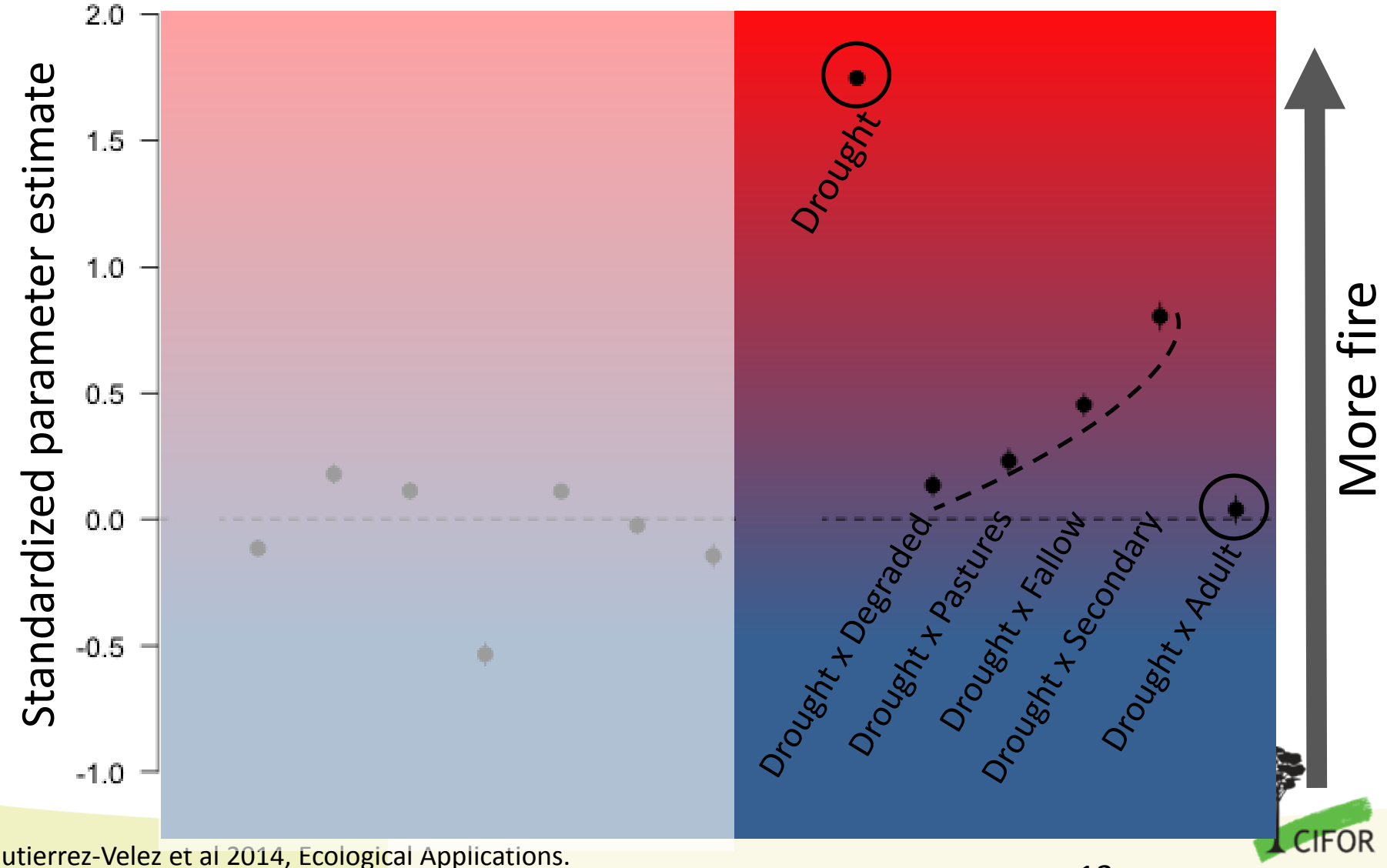

Gutierrez-Velez et al 2014, Ecological Applications.

The bottom line



To understand vulnerability and adaptive capacity to climate stressors, we must understand

- ✓ How adapted people are to the current climate at various timescales.
- ✓ How climate is expected to progress in the near-term.