

## Event Summary Note

### El Niño, Extreme Weather, and the Climate Crisis in Latin America

Over the last few months, severe weather has occurred across the Americas. In the Northern Hemisphere, places like California are facing non-stop heavy rainfall, while in the Southern Hemisphere, regions are enduring persistent heat waves and destructive wildfires. The recent fire in Valparaiso, Chile, resulted in tragic loss of life and many people still unaccounted for. This fire was started intentionally but spread rapidly because of the dry weather and strong winds. What's causing these events, and what are the long-term risks associated with what we're witnessing?

Doctor Chris Funk, who leads the Climate Hazards Center at UCSB, explains that as the atmosphere warms, it can hold more moisture, intensifying droughts and leading to more powerful precipitation events. Essentially, climate change worsens extreme weather phenomena. Additionally, he suggests that El Niño and La Niña, often underestimated climate phenomena, present significant opportunities for prediction and proactive measures.

During this recent occurrence of El Niño, spanning from July to January, South America experienced deficient rainfall, leading to unusually high temperatures across the continent. Bolivia, in particular, reached record-breaking heat levels. This season is shaping to be the driest on record, with NASA's GISS data indicating record temperatures. The repercussions of this climate scenario are already evident in various areas. For instance, crop failures and severe drought have hit the Amazon basin hard, significantly impacting economies, especially in countries like Brazil. Despite being one of the hottest El Niño episodes recorded, it should have been foreseeable. As a global community, we must enhance our monitoring and early warning systems to better prepare for future occurrences.

Leila Carvalho, a Geography Professor at UCSB, outlines the typical weather patterns observed during El Niño and La Niña in Central and South America. Usually, El Niño brings dry and hot summers to the north and wet winters to the south, while La Niña results in wet winters in the south and increased rainfall in the north. However, during last year's El Niño, there were significant deviations from these patterns, marked by unusually high temperatures and precipitation anomalies. This created conditions conducive to the devastating fires seen in Chile, fueled by rapid vegetation growth exacerbated by a long-term drought and record temperatures. Additionally, steep terrain and increased development in wildland-urban interfaces with combustible materials contributed to the severity of the fires.

Mallory Harris, a PhD candidate at Stanford University, discussed the impact of such extreme weather events and climate change on public health, mainly focusing on the dengue burden across South America. She explains the efficiency of dengue vectors, such as *Ae. aegypti* and *Ae. albopictus* is highly sensitive to changes in temperature. As temperatures rise across the continent, there is a corresponding increase in dengue burden, with most countries in South America experiencing elevated rates of dengue transmission. Models have been developed to quantify the contribution of human-induced climate change to this burden, suggesting that reducing emissions could mitigate the spread of dengue in many affected countries. Mallory also highlights the impact of cyclones on dengue transmission, using Cyclone Yaku's effects on coastal regions of Peru and Ecuador as an example. Such weather events create new breeding grounds for dengue vectors, destroy infrastructure, increase exposure to vectors, and often disrupt vector prevention efforts due to emergencies.