

Chile Wildland Fires

Augmenting Wildfire Risk Assessment Efforts with Satellite-based Measurements of Soil Moisture and Vegetation Health in Central and South-Central Chile



Since 2010, some parts of Chile have experienced a megadrought with unprecedented wildfires and an increasing threat to forest resources and the communities living at the wildland-urban interface. This project leveraged NASA Earth observations to provide insights on extreme wildfires and better inform future wildfire management efforts.

Objectives

- Utilize satellite-based measurements of soil moisture, evapotranspiration and vegetation greenness
- **Identify** affected burnt areas and delineate the extents of extreme wildfires in recent years
- Analyze ground conditions and terrestrial anomalies for the days and months preceding wildfires



- **Understand** the relationship and spatiotemporal patterns between wildfires and their potential drivers
- Validate our new risk assessment model against previous red-flagged forecast and burnt extents

Study Area & Period

- This study investigated the Chile wildfires of 2017 and 2023, which were some of the most destructive on record.
- When vegetation gets dry, the 7 regions of Central and South-Central Chile (CSCC) become particularly prone to wildfires.
- February 2023 wildfire propagated quickly, igniting 75% of the total burnt area in less than a week (February 1-6, 2023). **O'Higgins**

Methodology





In addition, we found that the areas burned during the 2023 fire were more likely to have exhibited extremely low soil moisture in the 10 days prior to the fire than in the control areas (44% against 26% of data below 0.08 m³/m³).



Conclusions

Measurements of soil moisture and vegetation health from space provided us a better insight into the ground conditions ahead of extreme wildfire events. We observed lower surface soil moisture values in the fire-prone areas prior.



Valparaíso

Santiago

Maule

Ñuble

Bio-Bío

Araucanía

Overall, understanding these variables can help assess future wildfire risks and allocate resources to monitor, prevent, and suppress wildland fires.

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Project Partners

- Corporación Nacional Forestal (CONAF)
- Embassy of Chile, Agricultural Office

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