



# ClimaMeter


## Putting Weather Extreme Events in a Climate Perspective


**Davide Faranda & The ClimaMeter team**



- Laboratoire des Sciences du Climat et de l'Environnement, IPSL, Gif-sur-Yvette, FR
- Laboratoire de Météorologie Dynamique, Paris, FR
- London Mathematical Laboratory, London, UK

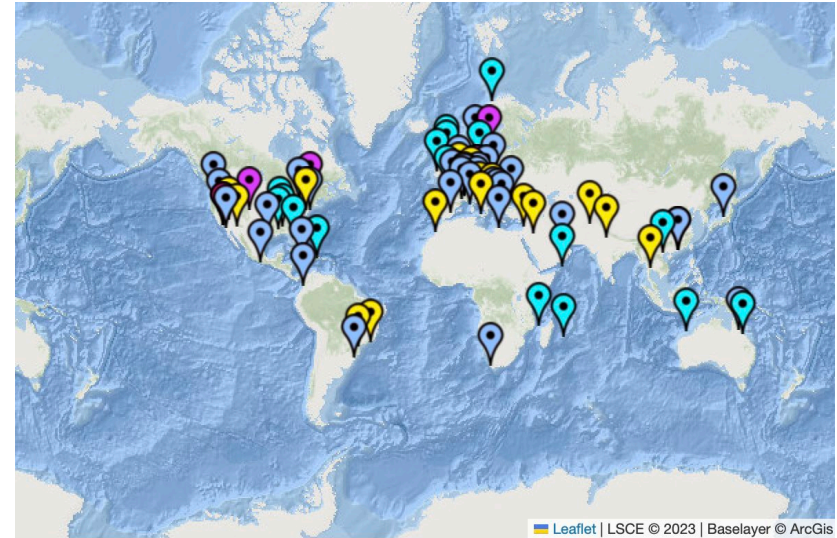
# CLIMAMETER

 **ClimaMeter** is an observation-based rapid attribution framework for putting weather extremes in a climate perspective, developed by IPSL-CNRS

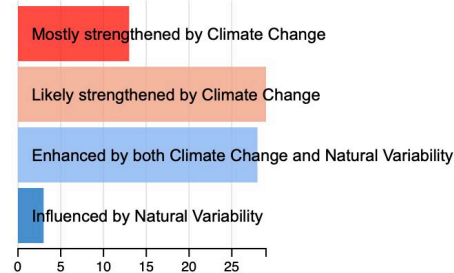
 **ClimaMeter** is a consortium of scientists coming from several institutions all over the world.

 **Report ready about 48 hours after the event. All reports available on Zenodo**

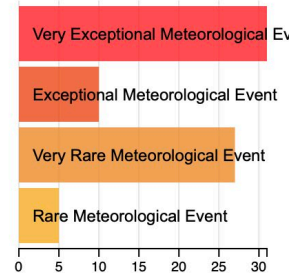
 **We have analyzed 70 events in 15-months**, with over 2000 international press articles



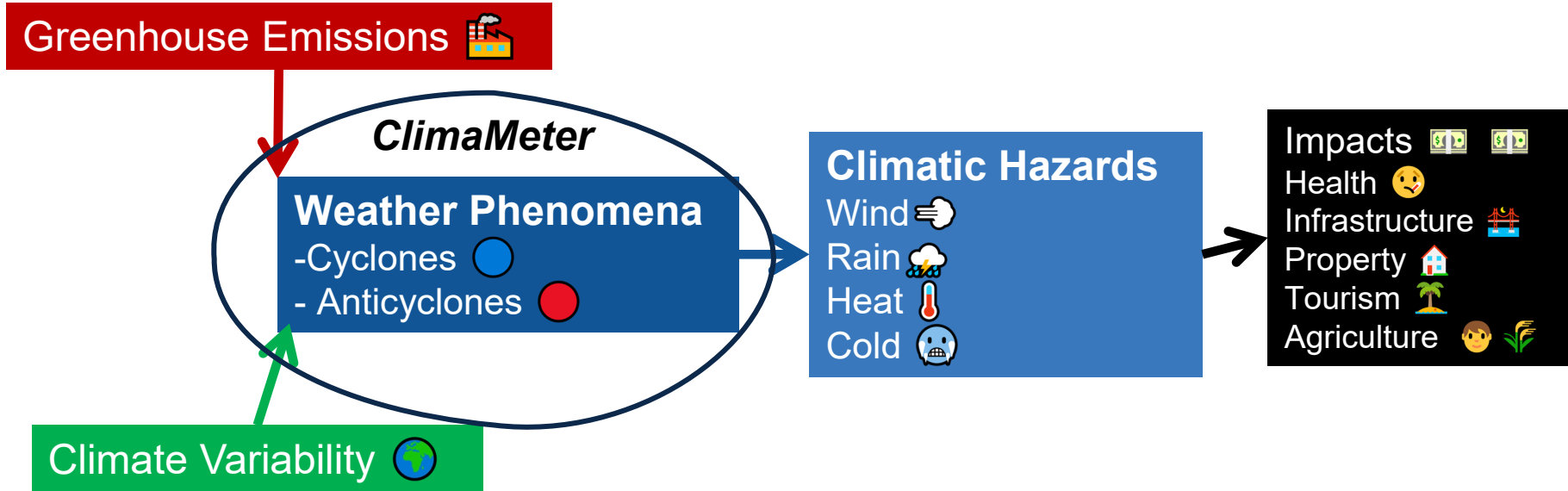
**Sources of Detected Changes**



**Event Rarity**



# CLIMAMETER ATTRIBUTION PATHWAY



## CLIMAMETER: FAST, OPEN, AND CONSISTENT EVENT ATTRIBUTION

- **Approach & Motivation:** Uses atmospheric circulation analogs to assess event changes in a warming climate, ensuring rapid, observationally grounded attribution.
- **Difference from Other Methods:** ClimaMeter relies on historical reanalysis data, making it independent of climate simulations and their biases.
- **Strengths:** Provides fast, physically interpretable attribution with minimal computational demand, leveraging direct observational constraints.
- **Best Suited For:** Events dominated by atmospheric circulation, such as cyclones, heatwaves, cold spells, and heavy precipitation extremes.
- **Limitations:** Lacks full process-based modeling, and depends on reanalysis data quality.

# CLIMAMETER THROUGH AN EXAMPLE - LA FIRES

13-Jan-2025CNRS-IPSL (ERA5+GFS Data)

## ClimaMeter for Los Angeles wildfires 07-Jan-2025 to 08-Jan-2025



LSCE-IPSL  
www.ipsl.fr



Influenced by  
Natural Variability

Strengthened by  
Climate Change



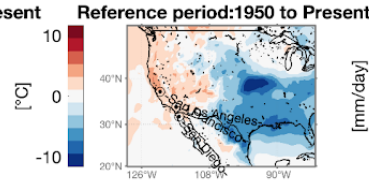
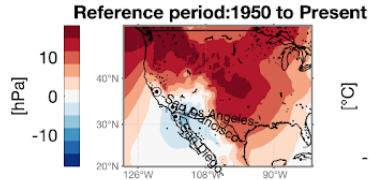
Rare  
Meteorological Event

Very Exceptional  
Meteorological Event

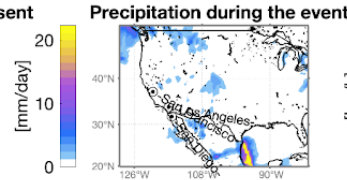


www.climameter.org  
© davide.faranda@cea.fr

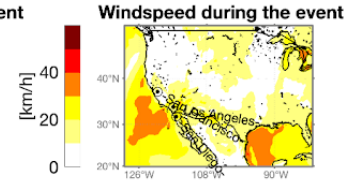
### Surface Pressure Anomalies Temperature Anomalies



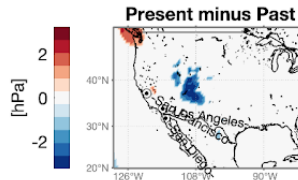
### Precipitation Data



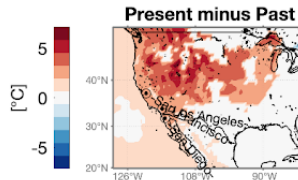
### Windspeed Data



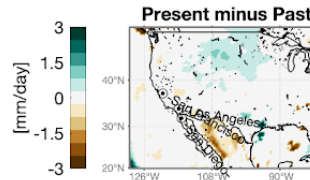
### Surface Pressure Changes



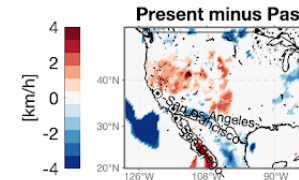
### Temperature Changes



### Precipitation Changes



### Windspeed Changes



 **THANKS FOR YOUR ATTENTION!**

-Faranda, D et al (2022). A climate-change attribution retrospective of some impactful weather extremes of 2021. *Weather and Climate Dynamics*, 3(4), 1311-1340.

-Faranda, D et al (2024) : ClimaMeter: Contextualising Extreme Weather in a Changing Climate, *Weather and Climate Dynamics*, 2024



[www.climameter.org](http://www.climameter.org)



climameter



climameter@lsce.ipsl.fr

EDIPI has received funding from the European Union's Horizon 2020 research and innovation programme under Marie Skłodowska-Curie grant No. 95639

Xaida has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003469.