

# Assessment of Changes in Post-Fire Vegetation Resilience over Mediterranean Region



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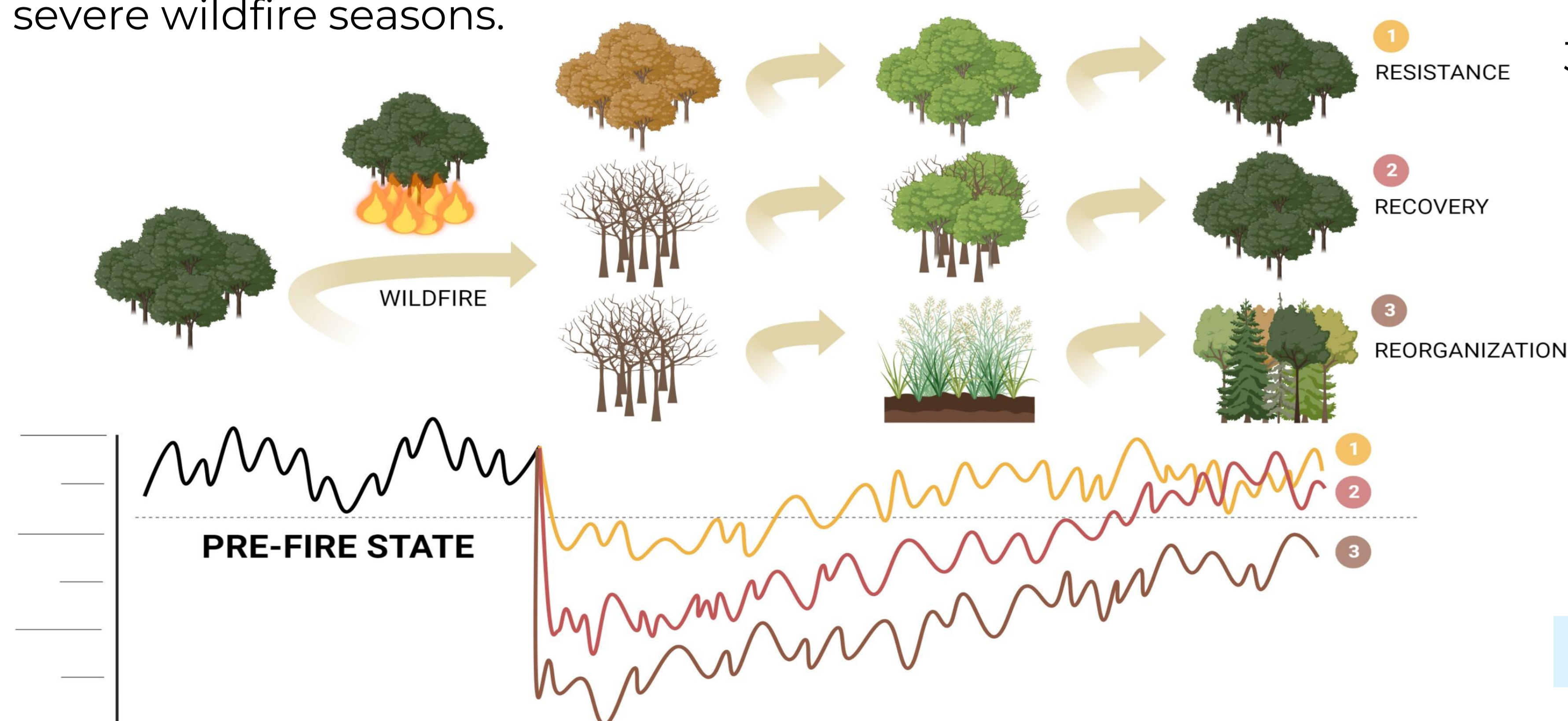


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## MOTIVATION

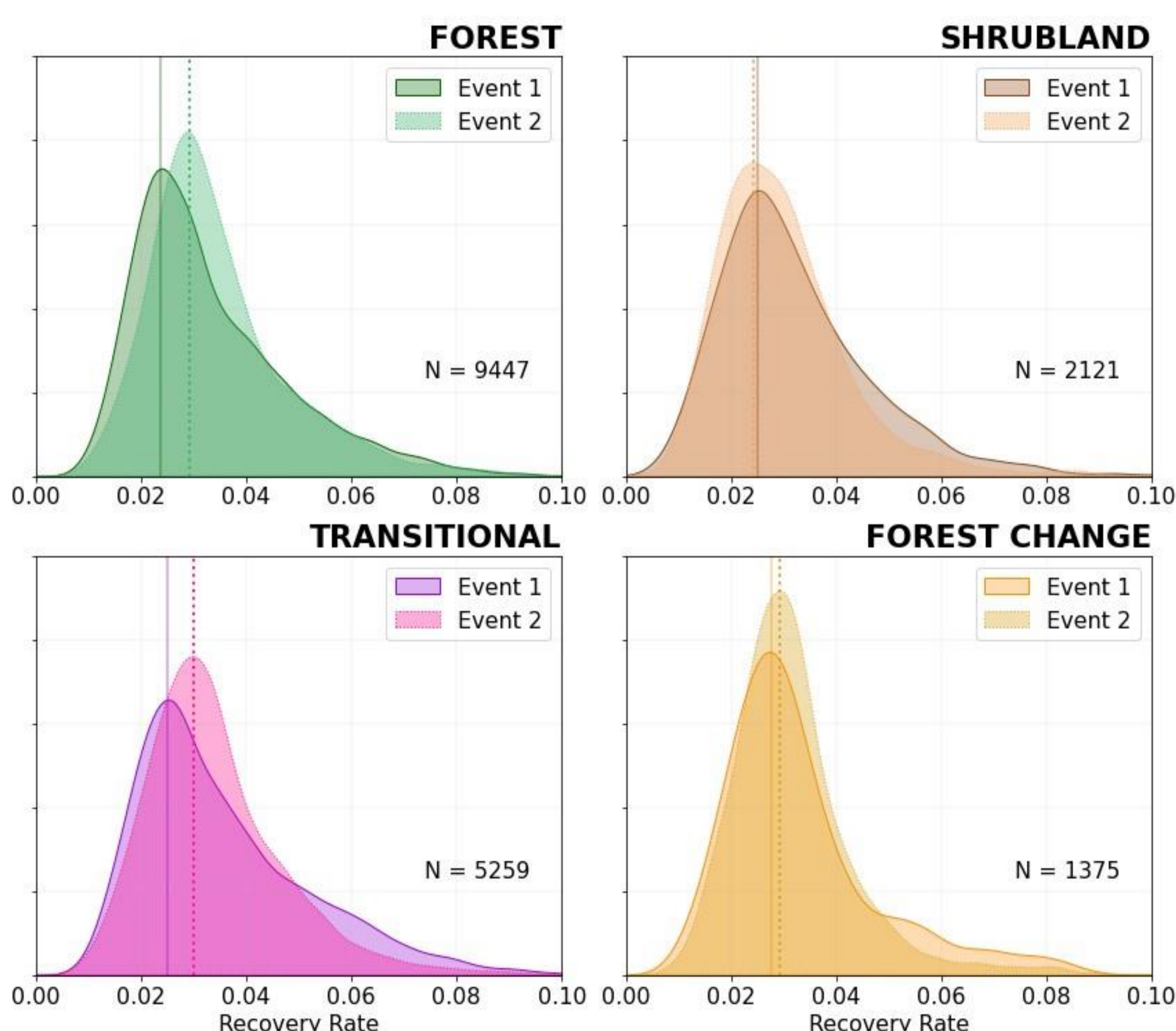
The ability of a vegetation community to recover or adapt following a disturbance – **ecological resilience** – has been potentially affected by increasing frequency and severity of extreme events.

Mediterranean region has been recently affected by extreme hot and dry summers (e.g., 2003, 2017, 2021, 2022 and 2023) which promoted severe wildfire seasons.



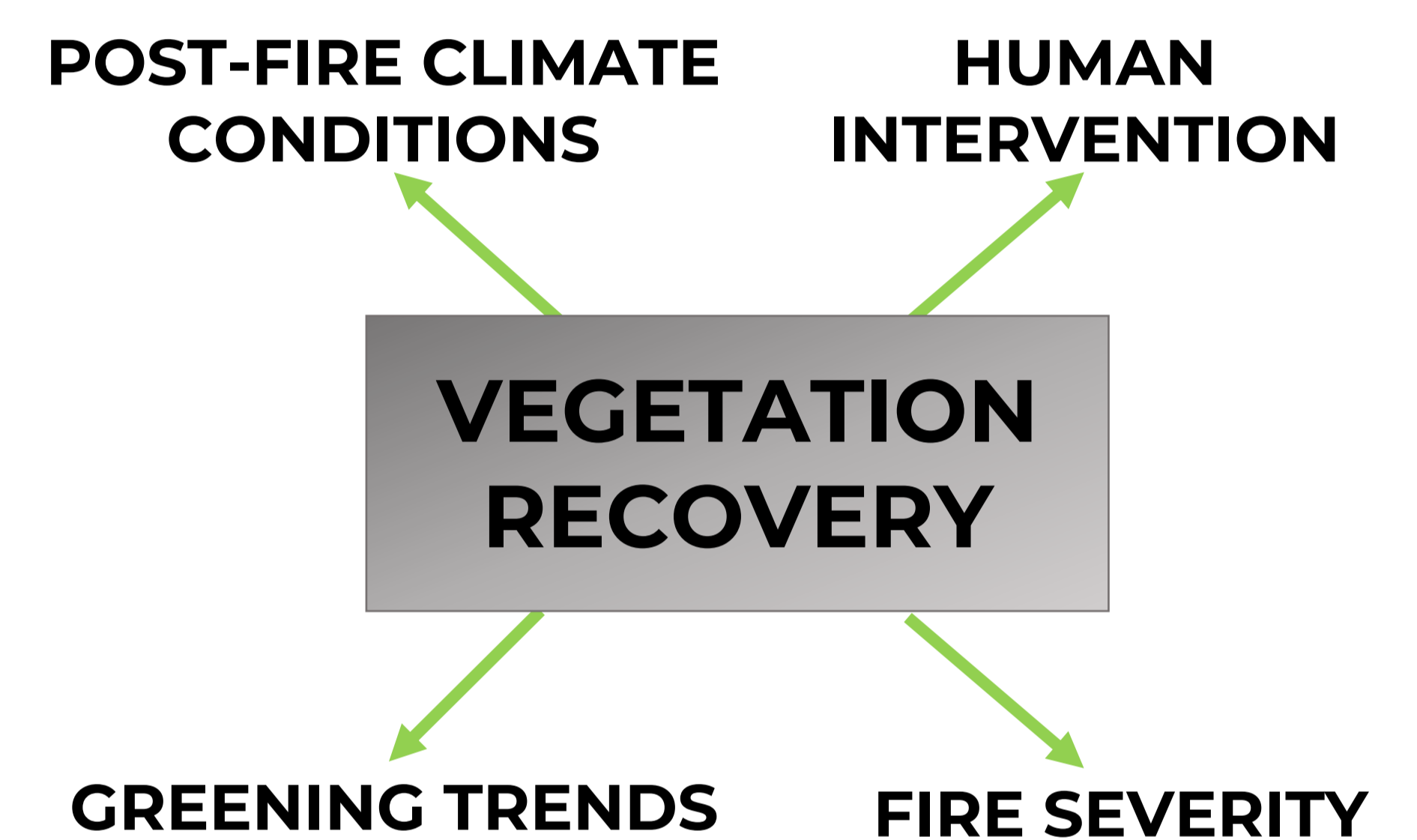
## RESULTS

- Recovery faster after the 2<sup>nd</sup> event, excepting for **Shrublands**.
- **Forests** and **Transitional** have similar recovery rates in both events.
- Right tails of PDFs (faster recovery) show more density in 1<sup>st</sup> event.



## MAIN GOALS

1. Perform a post-fire vegetation recovery model over areas burned twice to assess the recovery time differences over the last 22 years.
2. Observe the recovery patterns among the different landcovers.
3. Study the main drivers of vegetation recovery.



## DATA

VARIABLE	PRODUCT	NATIVE RESOLUTION	TEMPORAL COVERAGE
Vegetation Activity	MOD13A1 v6.1	500m	2001-2022
Burned Areas	MCD64A1 v6.1	500m	2001-2022
Land Cover	ESACCI	300m	2001-2020

## MODEL CONSIDERATIONS

$$y = -ae^{-bt}$$

POST-FIRE MINIMUM      RECOVERY RATE

1. Model application over areas burned **twice** over the Mediterranean between 2001 and 2022.
2. Model application on the following landcovers: **FOREST | SHRUBLAND | TRANSITIONAL | FORESTS CHANGE**
3. Pre-processing of data based on removing cloud pixels, interpolation of missing values, smoothing the time-series using FFT filter and data detrend.

## TAKE HOME MESSAGES

- Post-fire vegetation is recovering **faster** in Mediterranean, especially forests and transitional
- **Post-fire climate conditions** may have a strong influence in recovery process.
- **Fire severity** can modulate the time length of vegetation recovery.

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