

# New Communication Method for Wildland Fire Risk Assessment using Pyrowarn



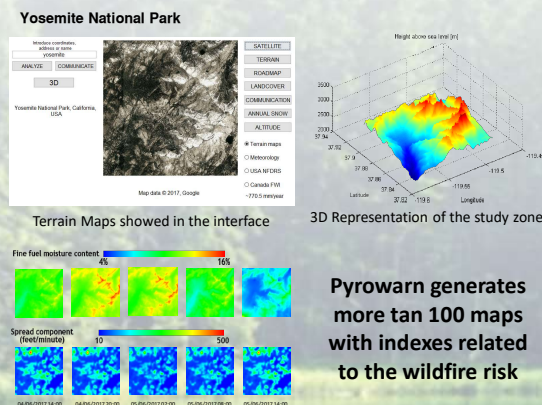
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## Background

- Wildland fires pose an increasing risk to the preservation of the environment and the biodiversity. However, the forecasting technics of this extreme events is far from being accurate enough. In addition, regional, micro and nanoscale physical and meteorological factors have a great influence in the process, which implies great computation requirements along with a high degree of uncertainty. For this reasons, obtaining a global methodology for the forecasting of this environmental phenomena has revealed a challenging task.
- The Pyrosat project aims to create an universal tool for forecasting wildfires by combining today's scientific knowledge with the use of a **large amount of information** and the implementation of **machine learning** for the improvement of the methodology's accuracy.

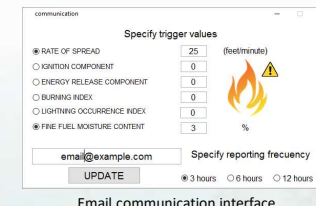
## What is Pyrowarn?

- Pyrowarn is an extension of the software package Pyrosat which is focused on reporting parameters related to the wildfire risk. Pyrowarn produces the current values and predictions of the Canadian Fire Weather Indexes and the USA National Fire Danger Rating System Indexes for any point of the globe. The computation of the forecasts and indexes are based on the use of different remote meteorological stations and numerous land cover and environmental maps provided by different institutions. The comparison of information from different sources allows the system to recreate the physical and atmospheric conditions of the study zone.



## What can Pyrowarn report?

- Pyrowarn can automatically communicate with the user via email or social media when the current risk indexes or its forecast exceeds the established trigger values. Thanks to this, Pyrowarn can be used as a tool for both prevention and evaluation of an ongoing wildfire's risk level.



communication

Specify trigger values

☒ RATE OF SPREAD 25 (feet/minute)

☐ IGNITION COMPONENT 0

☐ ENERGY RELEASE COMPONENT 0

☐ BURNING INDEX 0

☐ LIGHTNING OCCURRENCE INDEX 0

☒ FINE FUEL MOISTURE CONTENT 3 %

email@example.com Specify reporting frequency

UPDATE ☒ 3 hours ☐ 6 hours ☐ 12 hours

Email communication interface

## Validation and methodology

- Although the assessment of the whole methodology is not currently completed, most of the relevant parameters have already been validated. Such is the case of the fuel moisture content of all the different sizes, which play a major role in the forecasting and risk rating of wildfires (Indeed it is one of the 7 wildland environmental factors continually monitored for safety reasons). Images show the experimental results for the 1000 hour timelag fuel moisture content. Comparing both images, it can be observed that Pyrosat's machine learning algorithm produces a significant improvement in the accuracy of the methodology.

