Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Seasonal Precipitation Swings and Their Impacts on Wildfires in Colorado

Finalist's Name: Nora Simmons

School and City: Broomfield High School, Broomfield CO

Sponsor's Name: Andrew Hoell

Category: Earth & Environmental Sciences   Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Precipitation between May and September has been steadily decreasing and is strongly correlated with increased wildfires, which are theorized to be worsened by strong hydroclimatic swings between dry and wet spells. While research has been done on the impacts of overall dryness and early springs on worsening wildfires, the impacts of seasonal swings are not formally understood within Colorado. By comparing seasonal precipitation and wildfire area burned, I sought to reveal the strength of the relationship between seasonal precipitation swings and wildfires in Colorado.

In this study, I compared datasets of mean monthly precipitation and wildfire area burned separately in each of the five Colorado climate divisions. Precipitation swings were found by subtracting the spring precipitation (the summed mean monthly precipitation from March, April, and May) from the summer precipitation (June, July, and August), with an especially negative swing value indicating a dry summer preceded by a wet spring. The wildfire season for a given year was summed from July through December. Graphical analysis of wildfire area, seasonal precipitation, and precipitation swings revealed that there is little to no direct correlation between swings and increased wildfire area burned. Rather, we identified a relationship between low precipitation in both spring and summer and wildfire area burned. Furthermore, there appears to be a link between years with high occurrences of wildfires and low atmospheric pressure consistent with La Nina events.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature: Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**