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: The Effects of Climate Change on Allergens and Human Health

Finalist's Name: Allan Luo Yu

School and City: Fairview High School, Boulder

Sponsor's Name: Ryan Langendorf

Category: Earth & Environmental Sciences

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Many studies show the effects of climate change increasing pollen production with robust evidence. Furthermore, pollen allergy is the most prevalent environmental allergy. In the few studies on climate change and human health, these studies tend to overlook internal links between climate change and human health. Thus, this study explores the relationship between the effects of climate change on the production of pollen, which in turn, affects human health. In this study, climate and pollen data were utilized in a new way: to make predictions into the future rather than to make climate reconstructions. To circumvent financial restraints, I used Google Trends search data to categorize Allergy/health data. Additionally, a Structural Equation Model (SEM) was employed novelly in ecology, away from the traditional social and behavioral fields, to create a network of variables from climate, pollen count, and allergy categories, and used to research the causal network between the variables. The results generally showed increases in pollen production as temperature increased, and showed a decrease in pollen production as precipitation increased. This aligned with current studies and beliefs. Contrarily, sometimes, for pollen taxa, my modeled showed less allergy searches, which is inconsistent with current studies as well as common sense. Unfortunately, my model showed poor model fit, likely resulting from the use of unrobust data. While some findings were significant, findings should be interpreted with skepticism because of model fit. Altogether, this study highlights the need for future research with better data.

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.**