This project is about heat islands, the effects of heat and cold on the land, and how they affect humans. It is important because people should know what is making things so hot and so cold so we can change that for the better.

The project is a NetLogo model of a heat island with people roaming the area and planting trees. The sun is moving overhead, which makes the trees have shadows. The shadows prevent heat within them. Every square is gradually heated by the sun, and when the tree’s shadows fall over the square, the heat goes away. The heat also goes away when the people step over the tile.

The problem is, that when the heat grows and grows, it gets so hot that we humans are dying off1, and our reproduction isn’t fast enough to keep numbers high. The reason it’s getting so hot is because we humans are burning off too many fossil fuels, making the CO2 levels rise in the air and destroying the ozone layer. If we don’t fix this sooner or later, we might all be gone in the next 5 million years2. That sounds like a long time, but we humans have only been around for about 300,0003 of the 4.5 BILLION years the universe has been around.

The way this project will help solve this worldwide mess is that it will be simulated in a way where we can control all different kinds of variables and see which ones make the most heat occur, alongside carbon dioxide4. This is so that we can try to fix the real-life variables and help to heal our planet.

To make the project, first, the NetLogo models library was very helpful. The urban tab had a lot of projects close to this one, and the closest one was the Urban Suite - Pollution preset which helped. All that was done was some tweaking and BOOM, the pollution was gone, say hello to urban heat islands5.

Next, the code had to be changed. There were trees and people, but the heat needed to be everywhere, not just in certain areas. So the code was changed from having little spots of head to having the heat spread everywhere in the world. Except, of course, the spots with the trees. And where the humans stepped. The trees had shadows, which would block heat from being in the spaces behind the trees- depending on where the sun is, of course. The sun moves clockwise around the screen, making the heat show up. The shadows behind the trees are based on where the sun isn’t in the sky, like normal shadows.

We hope that since we have created this project, we can use it in the future to get some pretty cool results. Based on the population, tree density, and temperature of an area, we can figure out how to make the land cooler or warmer.

Finally, since the coder was not very experienced with NetLogo, ChatGPT6 was asked for some help fixing the code errors. This year’s theme was AI, so we used some of that to help with the project.

1: This information was found by searching on the World Health Organization.

2: This information was found by asking Google Gemini.

3: This information was found by looking on Wikipedia.

4: This information was found by wandering onto Climate.gov.

5: This information was found by inspecting the U.S. Environmental Protection Agency.

6: I got some help with code from ChatGPT.

I got very small snippets of code from GitHub to help run the “shadows”.