



# Albedo Effect in the Clay High School Parking Lot

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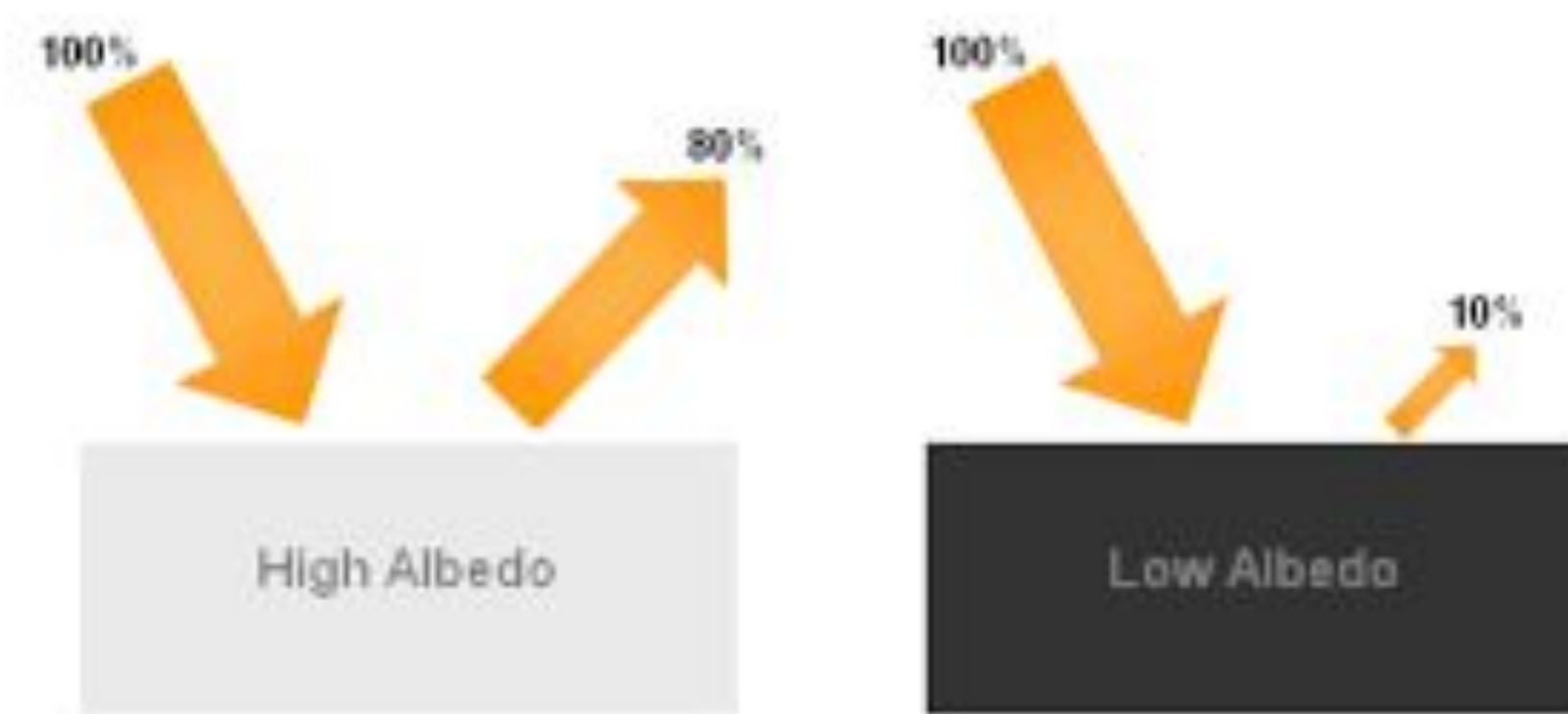


## Abstract

- Our research question was "Does the albedo effect pertain to black and white painted parking lots?"
- Every school day in the months of October and December we took the temperature of a spot painted white, and a spot painted black. We measured the temperature with an infrared thermometer which gave us our results in Celsius. We then took our results and compared them to find our final results.
- Our conclusion is that the Albedo effect does apply to painted parking spots.

## Research Question

Does the albedo effect pertain to black and white painted parking lots?



## Introduction

For our research we tracked the temperature of a black parking lot versus white painted parking lot, testing the albedo effect. The albedo effect describes how reflective a surface is to sunlight, with high albedo reflecting more energy and staying cooler, and low albedo absorbing more and heating up. We chose to do this study because we were curious of how the temperatures vary between the black and white areas. Also the temperature of parking lots can cause issues in certain areas, so we wanted to see if white painted parking areas can make a significant difference in temperature. Some of the issues that this can effect are urban heat island, pavement longevity, and vehicle/pedestrian comfort.



## Research Methods

### Planning Investigations

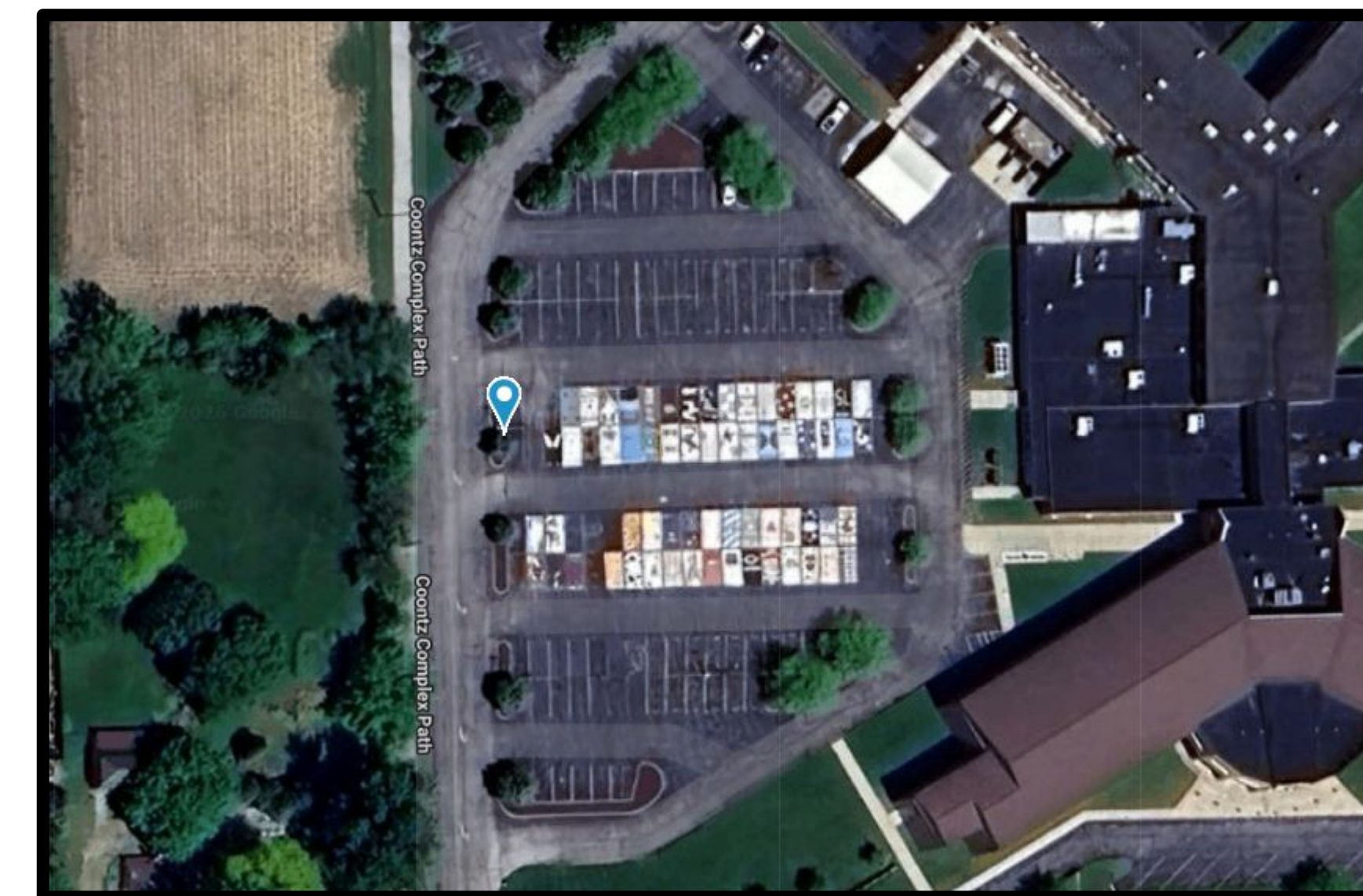
Describes the planning process

- Tools: Your eyes, GPS unit, Infrared Thermometer, Meter Stick
- We took the data during my stride period which is around 9:30-9:40. The data was collected every school day of October and December.

### Carrying Out Investigations

Describes what happened

- For both the black and white areas of the parking lot I took 10 temperature samples, and averaged each of them.
- To take the surface temperature you holds the infrared thermometer 3 feet above the ground.



## GLOBE Badges

**I am a researcher:**

We are researchers because we are taking a question and evaluating data to find a conclusion.

**I am a Problem solver:**

We are problem solvers because we had to figure out ways to get the data even when one of us was absent.

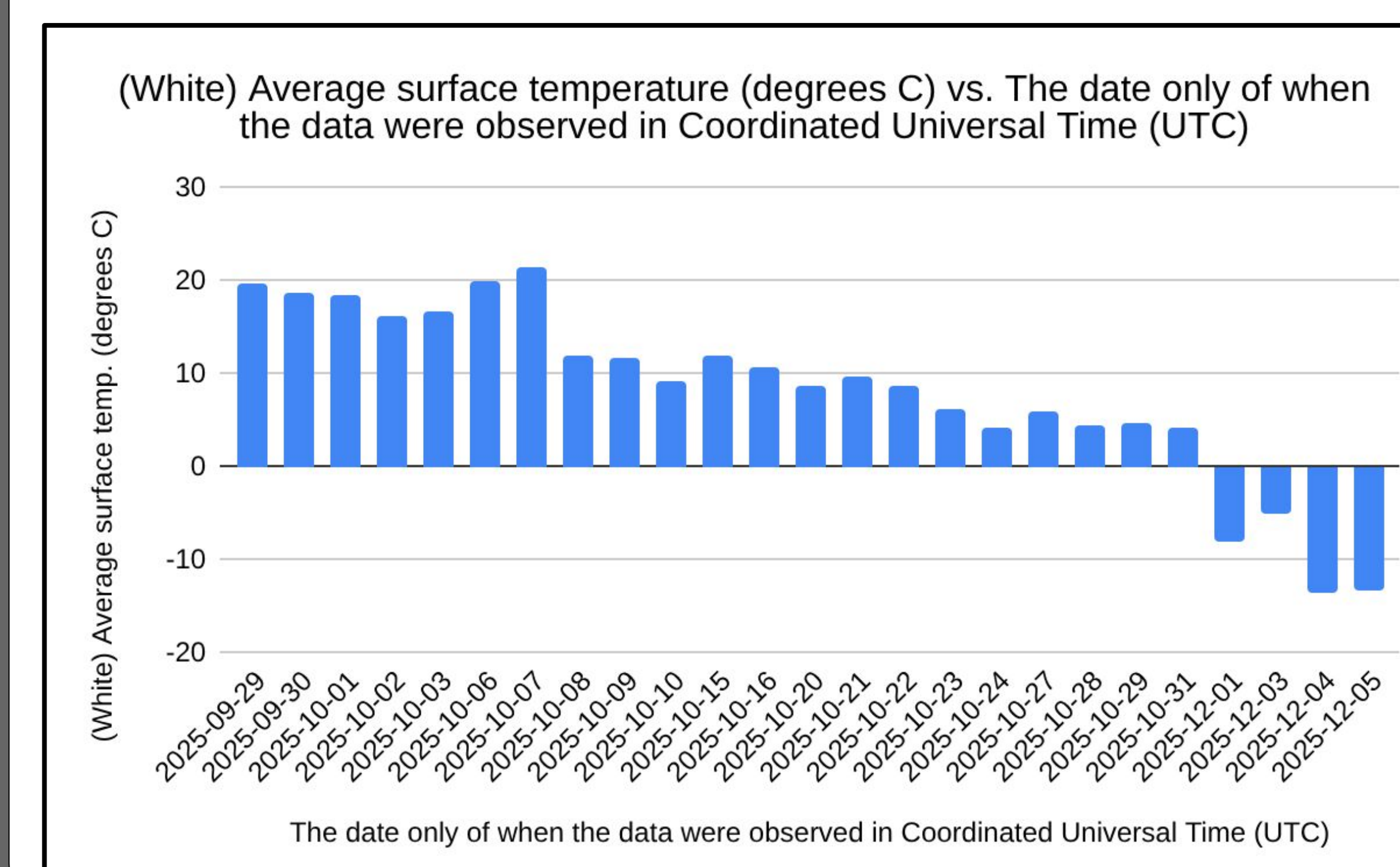
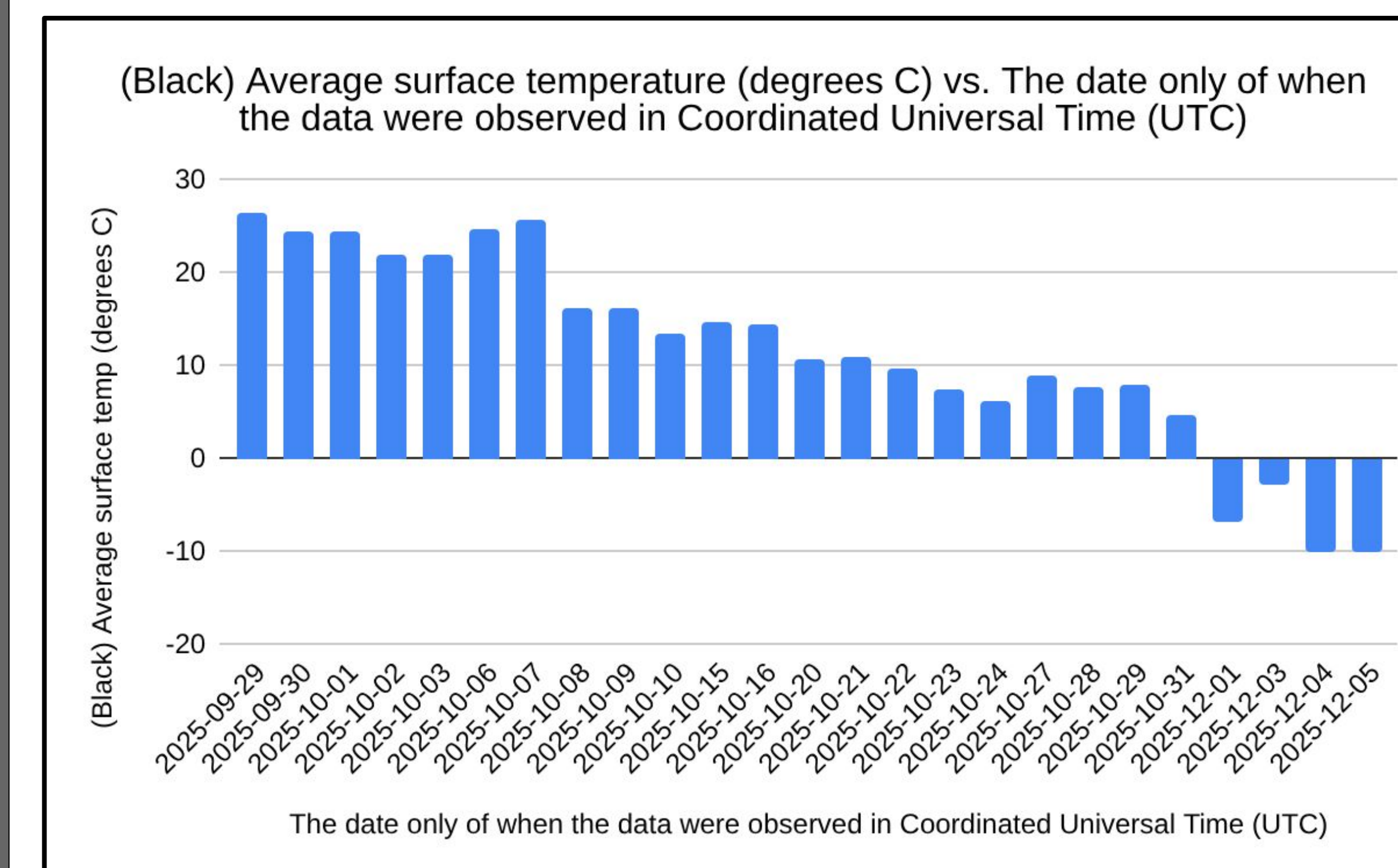
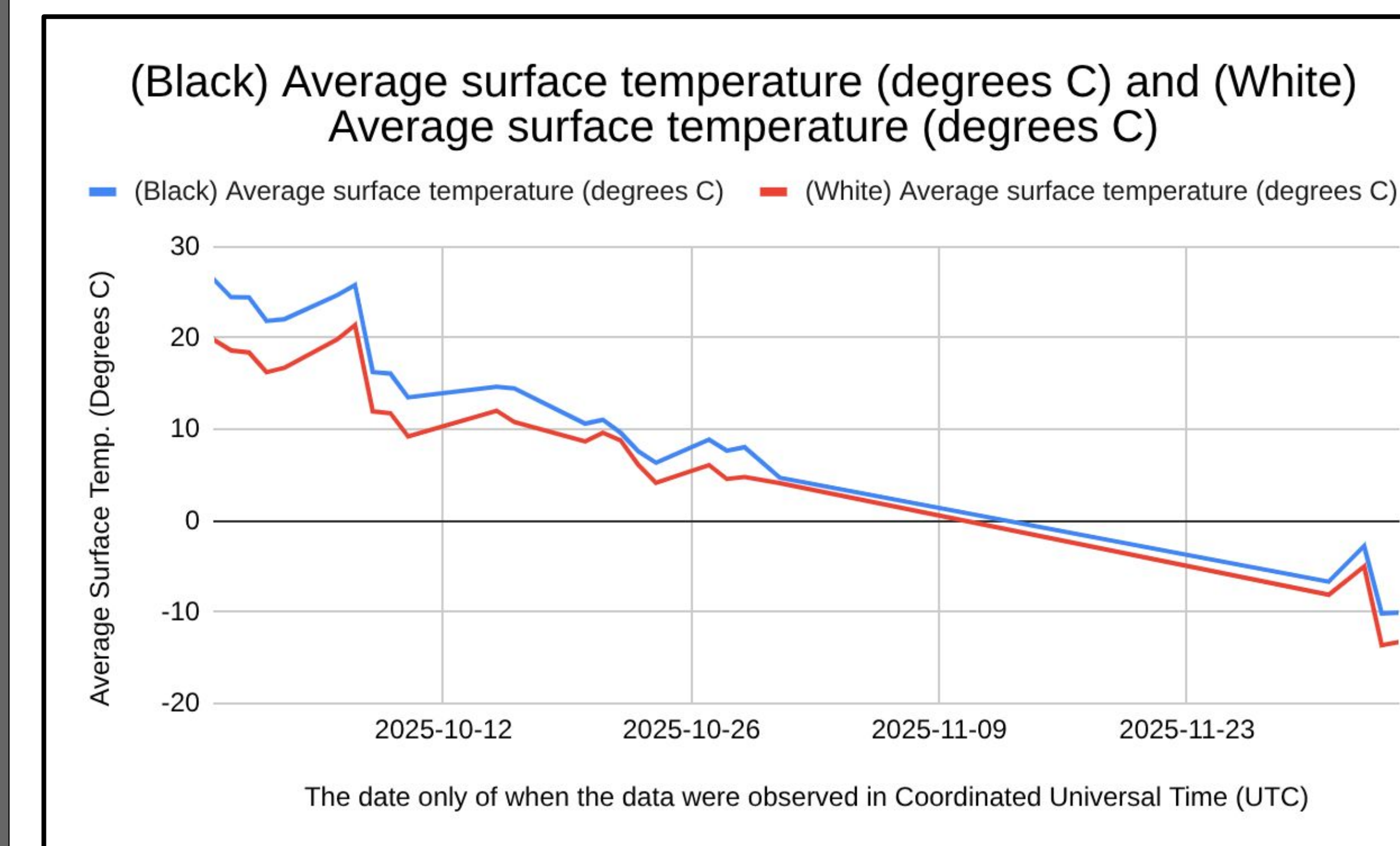
**I am a Data scientist:**

We are data scientists because gathering data and finding results was necessary to complete our research

## Results

### Analyzing Data

- With this data we can prove that the Albedo effect does pertain to parking lots and that it can cause a difference in temperature to paint parking lots white.
- The first table shows how the black and white parking spaces differ compared to each other and the bottom two show this individual tables of black and white spaces.



## Discussion

### Interpreting Data

- These results show that the albedo effect does apply to the Clay High School parking lot and that painting parking lots white can help cause problems like the urban heat islands and vehicle/pedestrian comfort.
- This works because the albedo effect states that Light-coloured surfaces immediately return a large part of the solar energy back to the atmosphere (high albedo). Dark surfaces absorb the energy from the sun and convert it to heat (low albedo)
- This is important because it helps with urban heat island which is when a city becomes significantly warmer than its surrounding rural areas, caused by dark surfaces (like pavement and roofs) absorbing and re-emitting heat
- Differences with moisture in concrete could affect the final temperature

## Conclusions

### Drawing Conclusions & Next Steps

- The Albedo effect does apply to parking lots.
- Our data proves this by showing lower temperatures on white parking spots compared to black parking spots.
- We could paint parking lots white to help lower temperatures.
- Our teacher Mr. Carstensen helped us out a lot with teaching us how to take Globe data.

## Bibliography

### References

- [Globe.Gov](http://Globe.Gov)
- [data.giss.nasa.gov](http://data.giss.nasa.gov)
- [gcos.wmo.int](http://gcos.wmo.int)