All throughout human history, weather and the understanding of it, played a critical part in the development of modern society. So many aspects of human life and survival depend on weather conditions. Either if they are good or bad, being able to predict weather and climate accurately could be the difference between knowing when to bring an umbrella, what outfit to wear, or knowing how to dispatch oil tankers effectively to avoid the path of severe weather events on the open seas. Having an in depth knowledge of how weather works and how to predict it, will allow for global society and its economy to run more efficiently and would directly affect the vast majority of the planet population in a positive way.

The need for new observation tools such as Unmanned Aerial Systems are ever increasing because of the detrimental effects that climate change will impose on future generations and that the current and future plans for a planetary global observation system are vastly inadequate to collect the data necessary to observe and predict these climate events, in an attempt for the international community to solve the problem effectively. An example of a UAS is the Northrop Grumman Global Hawk. It is a long range unmanned aerial vehicle, it provides an assortment of high resolution and long range sensors, it can survey up to 40,000 square miles of terrain a day. It has a range of 14,000 miles, it can fly to any point on the earth in a single flight, it cruises between 50,000ft and 60,000ft, well above the ceiling of commercial aircraft making it a very safe option. It would be ideal to measure upwelling radiation; it has excellent worldwide communications and accurate GPS allowing it to be easily monitored by air traffic control. It has a payload weight of approximately a
1000 kg allowing it to be fitted with an assortment of sensors and deployable sonde. In all it can be a highly useful piece of equipment in the Atmospheric Sciences. My overall goal for this project was to learn how to operate safely a quadrocopter that someday will become fully automated and used in the Atmospheric Sciences. I want to figure out ways to fit it with various sensors, gps and a cpu, and to work out the coding that is going to operate these sensors safely and effectively and be able to collect a full assortment of data while conducting test flights.