



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

Name(s) Ashley Welch; Max Zinkievich	Project Number 38796
Project Title On Developing a More Environmentally Viable Method of Atmospheric Data Collection	
Abstract Objectives/Goals This year we continue our endeavor to find a more sustainable way to collect atmospheric inversion data. The previous methods using a radiosonde and sounding system are very antiquated and costly. With this project we aimed to develop a less expensive and more sustainable method to collect the same data as a radiosonde. To eliminate the use of weather balloons and helium we are now launching our sensor suite with a drone, which can be brought to the desired height, and then brought back down so we can reuse the sensor suite and eliminate the litter. To avoid having to use a radiosonde we engineered a sensor suite. Methods/Materials We have made improvements on the sensor that we built last year, thus making it more sensitive to the data points that it is looking at and ensuring that it is a more durable piece of equipment with the addition of a 3D printed case. Updates to the software make it so that the sensor is able to store the data in a better file format, as well as incorporate the new and more high-sensitivity sensors. Results Overall, this year has been a year of refinement and fine-tuning, making sure that the launch of the sensor on the drone goes smoothly and we are able to collect high-quality data at a reliable rate. Conclusions/Discussion Through our trials we have found that the sensor suite and the drone are a reliable and sustainable method to collecting atmospheric inversion data. The sensor suite produces higher quality data as the radiosonde for this purpose, and it does not require the sounding system or antiquated computer software. The sensor suite is user-friendly, making it simpler for the team studying inversions and it can also easily be used in schools to educate the public about why the understanding the atmosphere is so important. The previous methods required a radio, and antenna setup that costs thousands of dollars. We were able to build the sensor suite for around two hundred dollars, which is the cost of one radiosonde. Our solution to this problem of wasteful atmospheric data collecting methods has been proven, through extensive testing, to be an accurate way to collect this data and also preserve our environment.	
Summary Statement We developed a sustainable method to collect data about atmospheric inversions.	
Help Received Grant from MBAPCD, Minor Assistance from members of the Air Quality Board	