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Internship Report

Throughout the ten weeks of my internship, I devoted my time to a project titled Evaluation of Operational Z-S Relationships in Marquette, Michigan. This was a research project primarily of my own labor, though with close guidance from mentor Dr. Ali Tokay. The goal of the research was to bolster the accuracy of NASA's Global Precipitation Measurement (GPM) mission ground validation network over the United States. The instrumentation used for this study were a National Weather Service dual-polarization radar, Pluvio weighing gauges for ground validation, and two surface weather stations used for wind correction. Ultimately it was concluded that several existing operational snow estimation relationships provided better estimation than others and event-derived relationships. The specifics of the internship are described below.

My first two weeks of the internship consisted of getting reacquainted with the programming language Python through the first task of converting my mentor's code written in Fortran77 to my own Python script. This initially took a lot of web research on both of the languages, eventually culminating in the first script used for radar data processing. After cutting my teeth on the first assignment, I went ahead and developed a code to construct a database necessary to begin my hard research. This required creating scripts that would process radar data into estimated snow accumulation totals as well as computing the measured snow totals from ground-based instrumentation. A few weeks in, I began developing plots of both estimated snow accumulation data and ground based instrumentation time series used for quality control.

Mid way through the internship, my time was spent creating various plots of estimated snow accumulation data and weighing gauge data used to support the conclusive scatter plots that were eventually created. The last three weeks of my internship consisted of creating and refining presentation materials for both group presentations and abstract submissions. In the eleventh hour of one of my presentations, a critical code error was discovered and the previous conclusions were thrown out. My mentor and I scrambled to derive new conclusions, and eventually did so before the presentation. Though that experience was quite nerve wracking, I feel it gave me the full research experience. The final days of the internship were spent double checking previous findings, further developing the new conclusions, and preparing an abstract for submission to the American Meteorological Society.

All in all, I am very grateful for this experience as it exposed me to the intricacies of real scientific research. I think I have acquired a taste for it, and I hope to further my research career in graduate school.