

## **Cumulative Honors Portfolio Reflection**

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In meteorology, we always talk about our “weather moment” - the juncture when we found a lifelong curiosity for the atmosphere and the amazing weather that happens inside it. My “moment” was Hurricane Florence, which hit my piedmont North Carolina hometown when I was in seventh grade. While my friends were just happy that we got to go home early, I was asking any teacher who would listen a list of *whys*. *Why* was the hurricane taking this path? *Why* were impacts occurring in our town, a four-hour drive from the nearest coast? *Why* could we not have predicted this event sooner? Of course, the answer was *we don't know*, and I found myself in a world of questions that I wanted to answer.

While I considered a variety of majors throughout middle school and early high school, I found myself returning to meteorology time and time again. My mom would always laugh and joke that I hated to be wrong, so why would I become a weather person? I would always respond that I definitely did not want to be on TV, but I wanted to study this amazing field of our Earth. I also cultivated an interest in engineering throughout high school, so in my junior year, I attended an engineering camp at NC State. Aerospace engineering involves the development of satellites, and upon researching weather satellites in preparation for camp, I was thrilled. That week, I fell in love with the problem-solving mindset that engineers use, and I was thrilled to marry meteorology and aerospace engineering as my career path.

When I returned to NCSU a year later, I was no longer a high schooler, but a freshman in aerospace engineering with the intent to double major in meteorology. This is when I became a member of the Women in Science and Engineering living and learning village. Living in this village was the first of my honors college high-impact experiences, and I know that this experience significantly altered my path through college. I was able to quickly make friends and connections that I still cherish to this day, and I had access to mentorship opportunities with women who helped me through every part of my first 3 semesters at NC State. In every aspect- from learning to share a dorm to learning about 3D integrals - I was a part of this community.

Part of what this community helped me through was realizing two weeks into my first semester that I did not want to be an aerospace engineer. While attending club meetings and speaking with upperclassmen in the engineering department, I concluded that while I was intrigued by engineering, it was not something I wanted to spend the rest of my life doing. Looking at avionics and printed circuit boards was not what I imagined developing weather satellites was going to be. Upon this realization, I was devastated. This plan that I had spent high school carefully crafting seemed to be falling apart in front of my eyes, and I did not entirely know where I was going to go next.

I walked into the freshman atmospheric science advisor's office with ideas of where I wanted to be, but not how to get there. She was absolutely invaluable in helping me piece together a path to my goals. When I mentioned that I enjoyed coding and was considering a minor in computer programming, my advisor assured me that if coding was something I enjoyed, getting a formal education in it would be incredibly beneficial in the field of meteorology. So began my journey as a meteorology major and computer programming minor. As I mention in

my high-impact experience reflection for this cross-college educational path, I entered a position where I pair the curiosity of a scientist with the problem-solving skills of an engineer. This cross-disciplinary path has opened my eyes to a unique understanding of the problems engineers and scientists face, and has put me in a position to continue growing my skills and knowledge moving forward.

While I knew early on that I wanted to change my major, it was not an instantaneous switch. I finished out my first semester of engineering classes, including E102: Engineering in the 21st Century. I took this course for honors credit, and as part of this requirement, I wrote an essay on the intersection of science and engineering in the context of meteorology. My professor was attempting to introduce engineers to the interdisciplinarity of their field, but for me, this essay was a reflection of my future hopes. Reading this essay 2 ½ years later is nostalgic. I was writing this as someone who was still unsure of themselves and their undergraduate path. Now, as I read as a nearly graduate in a field that combines science and engineering, I am overwhelmingly proud of the path I have and continue to forge.

After that first semester of engineering projects, I jumped right into meteorology and computer programming courses, as well as some interesting interdisciplinary fields. The first computer science course required as part of the minor is CSC 116, colloquially referred to as “Java”. I took this course as a summer course, and it was truly a make-or-break experience. This was the first time I would be expected to learn a language and create a program from scratch. If I did not like this course, I was not going to complete the computer programming minor. If I did, it would set up my path for the next 3 years of my education. Thankfully, it was a “make” moment. The two most significant things I gleaned from this course are that programming is challenging and fun, and communication is important and multi-directional. I loved learning to program, problem-solve, and build something from a blank text file. As a collaborative final project, my teammates and I engineered a simple program that allows the user to play the dice game Yahtzee. While the coding was challenging, I would argue that working collaboratively in coding was my main takeaway. I learned how difficult it can be to accommodate different schedules, workflows, and communication styles. This project compelled me to take the lead, making sure that the work was fairly divided and everyone was learning from the experience. The programming was fun, sure, but I am forever grateful for this course’s lessons on collaboration and leadership.

That same summer, I took ENG 333 - Communication for Science and Research. This was also a class that solidified my love for science and taught me about the inherent interdisciplinarity of science. Especially in meteorology, where risk communication is a huge part of a forecaster’s job, scientific communication skills are immensely valuable. This course was taught by an English professor, but I could tell that she possessed the same passion for science that all the STEM majors in the course shared. Part of this course was creating a “micro-review” - essentially, a scaled-down version of a literature review. I chose carbon dioxide remote sensing by satellites, driven by my interest in the field of remote sensing. This project taught me about journal publication, exploring scientific literature, and the importance of

simplicity in communication. I learned that science is much more than field work and research projects: it's communicating what you find, tailoring that to your audience, and ensuring your contributions to the field are understood.

Another assignment in this course would return a few months later, during my fall semester. My atmospheric dynamics professor and academic advisor approached me about attending the Naval Academy Science and Engineering Conference held at the US Naval Academy in Annapolis, MD. The theme was *Beyond the Forecast: Exploring Extreme Weather in a Changing Climate*, and I was immediately interested in attending this conference which sat firmly at the intersection of engineering and science.

During the conference, I attended sessions with speakers from the US Navy, NASA, and the US Department of Commerce. This was also where I did my first poster presentation. In ENG 333, we also completed a poster to present our findings from our micro-review and practice graphical scientific communication. I chose to present this at the conference, as the subject matter was on the engineering of satellites and their use in meteorology, and to practice presentations. At first, when presenting I was nervous, but I got into the groove of giving a spiel on my work, then interacting with my presentees to see what they wanted to learn more about. When looking at this poster now, I cringe a bit. I have continued developing my design skills since this poster was created, and I want to go back and fix some things that I now know are not best practice. However, I also smile. This was the first poster I ever did, and cringing means that I have grown since this experience. This opportunity offered me invaluable practice in presenting, networking, and attending conferences, and I am forever grateful for my academic advisor's help in attending.

This is not the only poster I presented during my second fall semester. I also took a graduate-level course in remote sensing for atmospheric processes. In groups of 3, we were tasked with creating a poster to propose a radar setup for a randomly selected city. We then presented this poster to a variety of subject experts, from professors to TV meteorologists. This was the first time I was tasked with making major decisions and justifying them during my presentation, and my teammates were in a similar boat. In fact, that was the professors' intent: taking us from learning to the application of the knowledge we had accrued. This project was the first time I realized how much meteorological data exists and how vital the skills to process and interpret it are. I distinctly remember checking out a solid-state drive from the library in order to store past radar data on it and research the climatology of our area as a team. My communication skills were useful as I worked with my teammates to discuss, make decisions, and design our poster. All of our presentation skills were tested when presentation day rolled around, and we were all nervous. Then, we all worked together and knocked our presentation out of the park. I was proud of my team. We justified our design decisions, made a good-looking poster, and communicated with these meteorologists as colleagues.

The next summer, it was time to get some hands-on experience through an internship. After applying to a variety of internships and research opportunities, I chose to become an intern

for NSF Unidata, a branch of the University Corporation for Atmospheric Research. I was able to take on independent projects, combine my coding skills and atmospheric knowledge, and learn about the research branch of the atmospheric science field. This was another high-impact experience, and spending the summer in Boulder, CO, doing work that I was passionate about, solidified my desire to do research and development in the future.

During this internship, I employed my software development skills to create a continuous-development/continuous-integration pipeline to test the performance of the open-source software package MetPy. While I enjoyed being a software engineer for the summer, I learned that I do not anticipate doing this as a career. It was just one step too far removed from meteorology for me - I wanted to work with a bit more weather data and models. However, again, I would not trade this experience for any other. As a result, I have more tools in software development and research applications for my career, and I learned about my affinity for independent projects. I am proud of the work that I did during my time at Unidata.

Earlier this semester, I dusted off the poster I created during my internship to prepare to present at the American Meteorological Society's 2026 annual meeting. I participated in both the student conference poster session and the Python conference. Presenting at the AMS conference is a milestone for many students in meteorology: AMS is the biggest conference for meteorologists, and you can meet everyone from potential graduate school advisors to CEOs of successful weather companies. Despite all this, I was not as nervous jumping into this presentation. I have accumulated a lot of practice with presentations and scientific communication in the last 3 years of my education, and I am confident in the work I did during the summer. When comparing how I felt at NASEC, my first conference, only a few months after becoming a meteorology major, to now, as a near graduate looking at a masters and PhD in the field, I am proud of the growth I have shown. I am more confident in myself, my work, and my knowledge, and am continuing to learn new skills every day.

While I focused in my undergraduate on meteorology and computer programming, being a part of the honors program also allowed me to emphasize interdisciplinary learning throughout my time at NCSU. It is easy to dive fully into science and engineering without considering the humanities, but studying these disciplines is important to being a well-rounded student, scientist, and person.

One such course was HON 300, an honors seminar entitled "Race, Membership, and Eugenics". This course focused on the development and impact of these concepts. During this course, I participated in a collaborative project concentrating on Historically Black Colleges and Universities (HBCUs) and interviewing HBCU students about a contemporary topic. My group chose to focus on DEI policies and their impact on these students at a time when these policies were under scrutiny. I was a bit uncomfortable with the idea at first, as I am not practiced in having conversations on race. However, the point of this project was to be uncomfortable and grow as a result, and grow I did. This project opened my eyes to the importance of HBCUs to the Black community and challenged some pre-existing biases I harbored, as well as equipping me

with new skills and perspectives to engage in dialogue on racial topics eloquently and respectfully, and added a dimension to my education that I could not have gotten from my meteorology courses.

Another interdisciplinary endeavor I undertook was DSA 202, a course within the Data Science and AI Academy at NCSU. This course focused on the visualization of data and highlighted accessibility, simplicity, and honesty in visual communication. These tenets were assessed during a final project where we created a poster with teammates using the software that we had learned during the semester. I will admit that this course humbled me; I had visualized meteorology data previously and assumed I would know most of the content. I was wrong; we used software for a variety of data, including social science data, and I found myself in new waters during every course meeting. However, my team and I used these newfound skills to visualize coffee production and quality. This project again emphasized communication within disciplines, but also taught me about the importance of simplicity in designing visuals and made me think about accessibility more within my projects.

I am nearly unrecognizable from the wide-eyed freshman who moved into this campus nearly three years ago, in the best way possible. My experiences in my courses, social life, extracurricular activities, and professional development have shaped me into the person that I am proud of. From switching majors to taking honors seminars to sprinting for Route 41, everything I've done has made me into a person with a passion for science and engineering and their intersection, a respect for the role of liberal arts in my career and life, and a sense that I am going down a path to have an impact on the world.

The honors college has played a key role in my time at NCSU. They have supported me intellectually, socially, and financially throughout all my endeavors. The HON seminars and honors forums that would not have been available to me otherwise were some of my favorite courses, providing knowledge and perspective outside of my STEM bubble and broadening my horizons throughout my undergraduate studies. One of my favorite hobbies now is rock climbing, and that is not something I would have tried if it were not for an honors forum offering. Through the honors program, I have made friends and memories that I cherish deeply. If a student wants to step outside of their comfort zone, become a more well-rounded person, and explore the vast perspectives of this world, then I would recommend the NCSU Honors Program.