Meet Ryan A. Gesser, Certified Consulting Meteorologist
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How did you first get interested in weather?

I remember being five years old when a tornado blew the back doors off our house and flooded the first floor with torrential rain. I have always had an eye to the sky since that moment. As an elementary school student well before the internet and 24-hour weather on TV, I created my own graphics to track hurricanes with magic markers on paper. Eventually I graduated to more systematic projects like building my own barometer and studying the effects of acid rain on residential landscapes for school science fairs. I am proud to say I work in the field in which I have always been most interested.

How did you find your first job, and what was it like?

I found my first job as an air quality consultant by luck. At the time I didn't even know such jobs existed.

I studied Applied Math as an undergraduate at the University of Virginia expecting to go to graduate school in atmospheric sciences, which I did at Georgia Tech. I initially expected to get a Ph.D. and enter the research and academic community, but quickly realized a professional career in the private sector was more appealing. Naturally, I expected to pursue a forecasting job (maybe even on TV) but in hindsight I had no idea about all of the different career options that generally fall under the category of "applied meteorology."

In the last quarter before completing my first master's degree, I registered for elective classes in air pollution meteorology and environmental law to fill out my schedule, and discovered my ultimate vocation. The environmental law course provided the context I always wondered about: how the technical aspects of atmospheric physics, chemistry, dynamics, and environmental impacts were used to shape legislative, regulatory, and policy aspects of the real world, and vice versa. The air pollution meteorology course was my introduction to a true applied meteorology discipline where science, engineering, economics, and public policy meet.

Nonetheless, without the benefit of a mature internet, I had little awareness of professional opportunities in this field, other than working in the public sector for U.S. EPA or state government. I attended Georgia Tech's annual career fair that quarter and struggled to find any job opportunities other than in research or programming. I stumbled upon the booth for a private sector environmental consulting company and got the attention of their representative. They weren't advertising for atmospheric science majors, but I learned they specialized in environmental engineering that utilized the aspects of applied, air quality meteorology in which I was quickly becoming very interested.

I ultimately got the job as an entry level air quality consultant, where I worked for more than nine years. Moving up through the ranks I had various responsibilities, initially focused on technical tasks such as preparing air quality emissions inventories, regulatory reviews, and modeling analyses to support permit applications and environmental reports. As I gained experience, I took on additional

responsibilities for project management, client development, and staff management, as well as more challenging and innovative technical projects. My clients represented a very broad range of industrial companies and utilities. Seeing firsthand how "stuff" gets made was one of my favorite parts of the job. I worked with clients that make insulation, tires, lumber, plywood, potato chips, fighter jets, paper, gasoline, and generate electricity and transport natural gas.

Consulting is a challenging, fast-paced career that exposes an individual to a lot of opportunities in a very short time. In my experience, entry level consultants get a lot of knowledge and responsibility very quickly. Consulting is an ideal career for individuals who want to make science and engineering their vocation but are also interested in business, law, public policy, and working with many other people. I always described the job by saying, "some days I'm a weatherman, some days I'm an engineer, some days I'm a lawyer, and some days I'm a lobbyist."

How would you describe your current job and how is it different from a forecasting job and other jobs you've had?

My current job with Georgia-Pacific is essentially identical to my first job except that I work for a private company that is one of the world's leading manufacturers of tissue, pulp, paper, packaging, building products, and related chemicals. My "clients" are GP's five business units and nearly 300 manufacturing operations in the U.S. and abroad. Otherwise, my role is very much the same. I work on a team of internal consultants that supports our manufacturing operations' commitment to environmental compliance and operational excellence by preparing air emissions inventories, regulatory analyses, modeling analyses, and risk assessments. Of course, assessing the implications of climate change legislation and regulation in our market economy is an increasing part of the job.

With one exception, my job has never had a "forecasting" role in the traditional sense. However, I routinely work with meteorological data and computer models in an analogous way that a forecaster uses observations to initialize and run a forecast model. Air quality computer modeling is a primary tool used by environmental scientists, engineers, and policy analysts to quantify impacts, assess risks, and devise control strategies. There are many different air quality models that might be used on different scales ranging from a single source of emissions to an entire region of the country with emissions from utilities, industries, transportation, and natural sources. All of these models are driven by meteorological conditions that are processed using actual observations. At a minimum, these models have to be carefully developed and thoroughly evaluated to ensure the meteorological conditions are appropriately simulated. The emissions sources are added to the model that simulates the physics, dynamics, and chemistry to calculate air quality impacts such as ambient concentrations, deposition, and visibility change. The model results can be further analyzed with regard to chemical data, demographics, and control technologies to infer risks and costs or benefits to various control strategies. The results of these analyses are used to make decisions about permits for new source growth and regulations to improve health and welfare. I have grown my career by developing expertise in this entire process.

Is forecasting the weather part of your job anymore?

No, forecasting never was a part of my job except for one contract at a military facility I worked for in a reserve role as a consultant. My role was to serve part-time as a hazards meteorologist that was

primarily responsible for managing a network of meteorological towers that collected local data used to assess hazards associated with management of a chemical weapons stockpile. Daily forecasting was part of the job to support the military base in planning operations to minimize environmental impacts. Because of the nature of the operations and location of the base, forecasting severe weather and issuing warnings were essential to the job. The office was fully equipped with dedicated radar, satellite, and lightning detection equipment and it was my responsibility to issue local warnings and terminate operations if necessary. Perhaps the most memorable event was waking up to the sound of distant thunder at about 2am and then racing to the base in time to monitor the situation and activate the tornado sirens at about 3am. Although I worked in this position only about 10 days per year, it was an excellent opportunity to practice pure forecasting and showed me a job opportunity I would not have otherwise known about.

What would you say to those interested in working in the private sector?

The private sector provides innumerable opportunities and an individual's potential is limited only by one's imagination, flexibility, and persistence in learning about what career options are available. When exploring career opportunities, the greatest challenge may be resisting the temptation to consider only pure meteorology and forecasting positions. Because society is increasingly aware of and interested in environmental impacts as related to public policy and economic prosperity, individuals who can cultivate their interest and acumen in applied meteorology truly have boundless opportunities.

Individuals interested in private sector work should also hone their skills beyond technical proficiency. Effective written and verbal communication skills are essential because there are no work assignments that are not communicated as a deliverable in one way or another; the best technical work has no value if it is not presented accurately and efficiently to its target audience. Likewise, all work is conducted under the constraints of budgets and other financial considerations, if not directly integrating costs and benefits as part of a technical analysis. Successful individuals in the private sector have at least a fundamental understanding of financial management and analysis.

As an individual grows in his or her career, continuing education and professional development becomes imperative to refine skills and increase the breadth one's of expertise. For me, this meant going back to Georgia Tech to pursue a second master's degree in environmental engineering while continuing to work as a consultant. Professional certifications, such the AMS's Certified Consulting Meteorologist designation, demonstrate technical proficiency and a commitment to professional excellence. Recognition of these attributes further distinguishes an individual and increases opportunities for career growth. In general, the more well-rounded an individual is, the more opportunities that individual will have in the practice of private sector meteorology.