

Katie Smith

Postdoctoral Associate

Field of Study

Atmospheric Sciences**What impact do you want your research to have?**

I am working with the Dynamics and Chemistry of the Summer Stratosphere project to monitor the chemical composition of outflow from large convective storms over North America. The project as a whole is looking to see if any of the compounds transported rapidly upwards impact stratospheric chemistry and the ozone layer. The instrument I work with, the Whole Air Sampler, was installed onto an ER-2 which flew over North America this summer targeting overshooting material at altitudes of 50-60 kft. We plan on contributing the chemical concentration of trace gases in the air samples we grab. These will include CFCs, HCFCs, HFCs, and the shorter-lived halogenated species (lifetime of less than 6 months), such as dichloromethane and bromoform. These measurements will help to estimate the stratospheric chlorine and bromine budgets.

What inspired you to pursue your area of research?

I really enjoy studying atmospheric chemistry and learning about how all the compounds react and interact in our atmosphere. This project, investigating the chemical composition of the stratosphere, sounded so exciting! It's my first aircraft campaign, too, so it was fun to see how the samples were collected using the ER2.

What is most exciting about your research?

It's really fun seeing how all the different teams interact to predict the storms and produce a flight plan. Then the plane goes up, and I communicate with the AWAS instrument to take samples when the real-time data shows that we are in a plume of outflow from that storm. I'm currently in the process of analyzing the Whole Air Samples to find out what's in the air that we collected 60 kft up!

What makes your research unique?

It's the large array of compounds we can observe. Using Gas Chromatography with Mass Spectrometry, Electron Capture Detection, and Flame Ionisation Detection, if the compounds are present we'll measure them, even if they are only present in part per trillion amounts. Also, there are a limited amount of Whole Air Samples taken in the stratosphere over North America, so these samples can update and contribute to that database.

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