



Fresh Air, Weather Fair

Air quality researchers note cleaner air last summer, but expect return to normal pollution levels this season.

by JANE M. SANDERS

Though air quality in Atlanta last summer was the best on record since 1989, the state's air pollution problems have not been solved. So researchers at the Georgia Institute of Technology are already busy this season collecting air quality data around the state, hoping to advise cities on pollution control strategies, and alert metro Atlantans daily of ozone levels that could be harmful to their health.

"Last year was one of those rare annual events that occurs when the weather cooperates and you hit the cycle just right," explains Michael Chang, a senior research scientist at the Georgia Institute of Technology's School of Earth and Atmospheric Sciences and director of the Center for Urban and Regional Ecology. "Though it was good to have cleaner air, unfortunately, it happened when we were conducting an air pollution study."

Chang leads the Fall Line Air Quality Study (FAQS), which is assessing urban and regional air pollution in the Georgia metropolitan areas of Augusta, Columbus and Macon. Researchers are identifying the sources of pollutants and pollutant precursors and will later recommend strategies for air quality improvement.

The four-year study, which began in the summer of 2000, involves a team of researchers from the Georgia Tech schools of Earth and Atmospheric Sciences and Civil and Environmental Engineering. The team is conducting field studies from both mobile

Left: Atmospheric scientists at Georgia Tech are studying the ozone levels in three Georgia cities – Augusta, Columbus and Macon. They use a mobile air quality monitoring unit to gather air quality measurements.

PHOTO BY STANLEY LEARY

and stationary monitoring sites during smog season from May 1 through Sept. 30, and then using the data to feed models that can predict the impact of various air quality control strategies.

"This summer is critical for us," Chang explains. "We need to decide on the factors that are contributing to air quality. But last year we didn't see the pollution episodes we needed to diagnose the causes. We are beginning to analyze a couple of pollution events from last year, but preliminary results suggest that last year was not an ideal year to study air pollution. There were no violations of the current federal air quality standard in Columbus, six in Macon and three in Augusta. In Atlanta, we had just 20 violations of the federal air quality standard compared to 46 in 2000."

The FAQS team believes air quality in Georgia cities will return to a more normal state this year. With all of their field sites ready to go, they expect to collect a lot of useful data. "We don't know if it will get really bad this year, but it's important to be out there," Chang says. "Sometimes you don't know when a bad air day is going to occur."

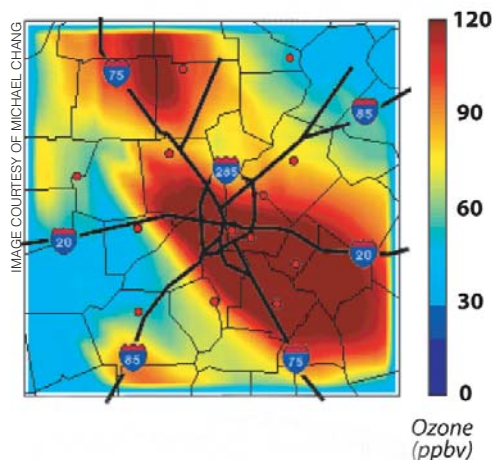
The challenge for FAQS researchers now will be the faster pace required to integrate field data with the complex computer models they will use to simulate air quality control strategies for Augusta, Columbus and Macon.

"There are different strategies for these different cities," Chang explains. "Augusta is very industrialized, but Columbus is service-oriented and half of Augusta's size. So the strategies and controls for a large metropolitan area like Atlanta may not be appropriate for these smaller cities. Modeling various strategies is much cheaper than doing a retrofit to address air quality and then waiting to see if it works."

Researchers plan to conclude the FAQS study by December 2003, probably about the time that the federal Environmental Protection Agency imposes a deadline for cities to comply with its stricter air quality standard. "We will get the best information we can by then to the people who need it before the regulatory agencies mandate them to come up with a solution. The cities want

Urban Airshed Model in Forecast Mode

METROPOLITAN ATLANTA PREDICTED PEAK 8-HOUR AVERAGE OZONE CONCENTRATIONS – AUGUST 17, 1999



This map shows the typical peak ozone concentration on a hot summer day in Atlanta.

local control in choosing their air quality management strategies."

FAQS is funded by an appropriation from the Georgia General Assembly and administered by the Georgia Department of Natural Resources' Environmental Protection Division (EPD). The total study cost is expected to be \$2.75 million.

Meanwhile, Chang's research team is entering its seventh year of participation in ozone forecasting for metro Atlanta. The project, funded for \$500,000 by the EPD for the past four years, provides both ozone forecasting tools and expertise to state officials.

"In the past several years, we've been able to improve both the accuracy and the length of our forecast," Chang says. "Now we want to know if we can stretch the forecast from 24 to 36 or 48 hours and remain within a level of accuracy that is necessary to maintain credibility. We've got an 80 to 85 percent accuracy rate now."

Six EPD forecasters and four Georgia Tech researchers, including Chang, make up a 10-member forecasting team that meets daily during smog season in an Internet chat room to forecast the



Lead researcher Michael Chang

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next day's peak ozone level. By the time they gather in the early afternoon, the team members have reviewed the results from computer model simulations that require an entire night of automated number crunching. They also consider several different weather forecasts and assess what is happening with ozone levels that day — a big factor for the ozone forecast for tomorrow.

It takes about 15 minutes for the team to reach a consensus on the forecast. When they cannot, the chief of EPD's Air Protection Branch makes the decision on whether to recommend a smog alert. If the team recommends a smog alert, Georgia's Clean Air Campaign publicizes it via the news media and changeable message signs on the highways. The goal is to get citizens and employers to

reduce emissions-causing activities, such as driving, mowing and filling gas tanks during the day.

Researchers at Georgia State University are examining whether the public responds to smog alerts. They have found a small, but growing, benefit from these messages, Chang says.

"Atlanta is now taking the lead in the nation in terms of quantifying how people respond to smog alerts," he adds. **RH**

■ For more information, you may contact Michael Chang, School of Earth and Atmospheric Sciences, Georgia Tech, Atlanta, GA 30332-0595. (Telephone: 404-385-0573) (E-mail: michael.chang@eas.gatech.edu). Or visit **www.cure.gatech.edu** for more information.

PHOTOS BY STANLEY LEARY



Above: Columbus is one of the Georgia cities included in the Fall Line Air Quality Study.

Right: A mobile air quality monitoring unit is used to gather air quality measurements.

Inset: Researchers monitor air quality measurements inside the mobile unit.