

## History of Smoke Modeling and Monitoring in Region 8

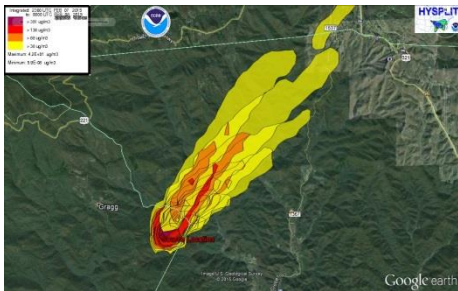
Bill Jackson, who started working for the US Forest Service in Region 8, more than 20 years ago, remembers how the process began. “I was new to the Region, and Hurricane Andrew had struck the Francis Marion National Forest. There was funding to work on restoring the severe damage and my Staff Officer wanted me to develop a project to address possible air quality impacts, so I suggested we look at how air pollutants might impact the forest ecosystems”. As Bill tried to provide different suggestions to his boss about air quality, none were approved. Eventually, the Staff Officer said “What we really need help with is addressing smoke impacts from prescribed fires.”

This lead Bill to work with Forest Service Researchers to implement a tool that would help District staff increase the number of acres treated with prescribed fires. In a conversation with Lee Lavdas, retired Research Meteorologist with the Southern Research Station, Lee described “a

computer model, called VSMOKE, that predicts downwind smoke concentrations. No one was using it because it was hard to put the numbers into it, so I thought, I can develop a software interface for everyone to use” said Bill.

As Bill continued to use the smoke model, he was efficient at providing reliable results to the prescribe burners on the Districts. Bill started to teach others how to use the VSMOKE. “On the Francis Marion National Forest, the staff used the model on a daily basis and at the end of the prescribed fire season, the District Fire Management Officer called to thank me because the smoke modeling tool helped them burn 50% more acres than the previous year”, said Bill.

This marked the beginning of Air Specialists working closely with the people responsible to implement the prescribed fires in Region 8. Since then, many District staff has used VSMOKE for planning prescribed fires because Bill successfully implemented the use of a second, more advanced, atmospheric dispersion model, called PC HYSPLIT for use on the day before or the day a prescribed fire is planned. The PC HYSPLIT software tool assists Line Officer and other District staff, determine if the smoke concentrations will be unhealthy for people downwind of the fire.



**Map of smoke impacts from a forest prescribed fire. Red shows the most affected areas and light yellow the least impacted**

program, then, informs the District staff on the results and then then can adjust future prescribed fires if the air quality became unhealthy for people downwind of the burn.

Burning is very important for the ecosystem since many species need fire to survive. “In order to help the ecosystem while protecting public health, these tools help land managers make better decisions,” said Bill.

As the Air Resource Management team in Region 8 continue working together, training and assisting others in evaluating smoke impacts, they hope the use of smoke modeling and monitoring expands as awareness increases thus helping District fire staff and the Air Program in its efforts to contribute to protect the ecosystem and people’s health.



**Smoke monitor located in the forest**

Melanie Pitrolo joined the Air Program in 2008, and since then, her work has included providing smoke modeling assistance to anyone in the region. “District staff email or call us for help when they are going to implement a prescribed fire, and we perform the PC HYSPLIT analysis for their use. In addition, we also produce a brief report describing modeling results and the predicted air quality downwind of the prescribed fire.” In addition to the modeling, the Region 8 Air team also conducts ambient monitoring.

Dan Stratton assists the Districts by setting up ambient monitors that measure the amount of air pollution downwind of a prescribed fire. With the information gathered from the monitor, the air



**Photo of a burning forest from a prescribed fire**