

Transport key in meeting clean air standards

By Sarah Witman, ACAST Communications Specialist
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The House Science Subcommittee on Environment looks forward to hearing the U.S. Environmental Protection Agency (EPA)'s proposal for a new ozone standard later this year and, in preparation, held a congressional hearing Wednesday with testimonies from five expert witnesses. The hearing, titled "Background Check: Achievability of new ozone standards," offered up opinions from House representatives as well as the most current research from air quality scientists on an issue that is as divisive as it is complex.

The EPA is required by the longstanding Clean Air Act to review pollutant standards every five years. While no formal proposal has yet been made, the agency has discussed lowering the National Ambient Air Quality Standard on ozone from the existing 75 ppb standard — put in place in 2008 — to no more than 70 ppb.

Ozone is a respiratory hazard and pollutant that is formed in the atmosphere when sunlight reacts with chemicals in the air. It is perhaps best-known for being the main component of smog.

The five witnesses that testified at the hearing were industry experts relied upon by the House Subcommittee to shed accurate and relevant light on the issue of national ozone regulation. They consisted of Executive Director for the Utah Department of Environmental Quality Amanda Smith, Cooperative Institute for Research in the Environmental Sciences Senior Research Associate Samuel Oltmans, Bracewell & Giuliani Partner Jeffrey Holmstead, and Director of Research at the National Center for Environmental Assessment and U.S. EPA John Vandenberg, as well as University of Maryland Department of Atmospheric and Oceanic Science Professor Russell Dickerson, who is supported in part by NASA Air Quality Applied Sciences Team (ACAST).

Dickerson, who has more than 30 years of experience in air quality research, was asked to testify at the hearing because he is considered to be an expert on ozone pollution. He spoke on his knowledge of ozone pollution and its applications to policy, the environment, and human health.

"The NAAQS for ozone should be set to no more than 60-70 ppb, as recommended by the U.S. EPA in 2006 based on compelling scientific evidence," he said. "This standard is achievable with existing technology and necessary to protect welfare and human health."

To support this conclusion, he cited reductions in emissions of other pollutants that have been highly successful, "even more effective than had been predicted by models," he said.

He continued that while past efforts have focused mainly on reducing emissions from power plants and automobiles, other major sources like industrial boilers and off-road vehicles are still uncontrolled or under-controlled.

"Laboratory and field studies show clear, consistent evidence of a causal relationship between short-term ozone exposure and harmful respiratory health effects such as cough, wheeze and shortness of breath," he said.

"Evidence is compelling that ozone in concentrations above 60-70 ppb causes substantial morbidity and mortality — that is, sickness and death," he said, adding that harmful effects have even been seen in concentrations as low as 40 ppb.

“In addition, ozone is a phytotoxin, harmful to plants, both wild and agricultural. Valuable crops and produce are damaged by even modest concentrations of ozone, and the economic losses from this damage are substantial,” he said. “Reducing ozone protects America’s farms and forests.”

Dickerson presented his and colleagues’ findings to members of the House that background ozone from natural processes — especially the unusual, uncontrollable “exceptional events” identified by the EPA — is minimal compared to manmade ozone during smog events in heavily populated areas.

He further referred House Members and State Air Managers to projects from ACAST, a NASA-funded research team launched in 2011 to support air quality management needs. ACAST work includes analysis of NASA satellites’ observations of forest fires and stratospheric intrusions, both of which can be considered “exceptional events” and excluded in the tally of violations kept by the EPA.

“To protect the natural environment, farms and forests, but most of all human health, an ozone standard of no more than 60-70 ppb is urgently needed,” he finished.

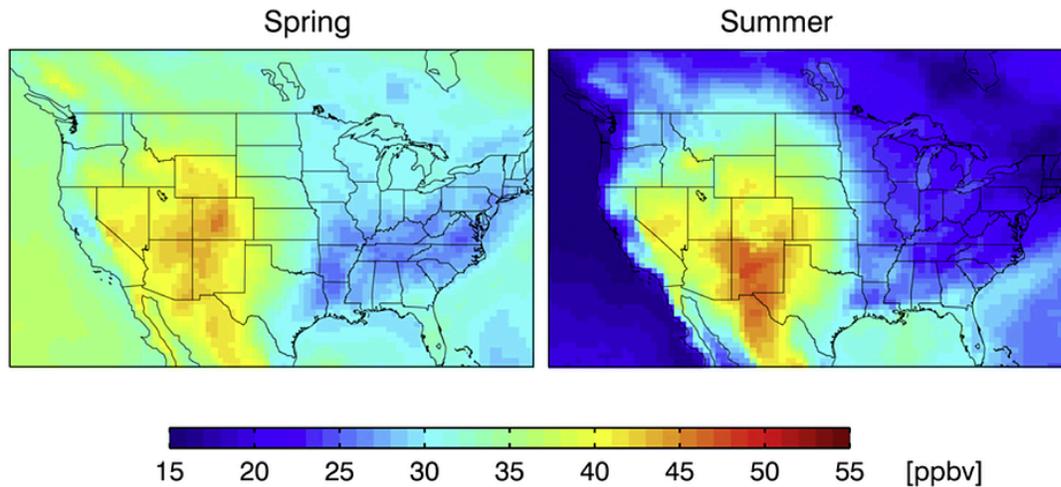
When discussions broke out at the hearing, opponents to the proposed change said lowering the national standard on ozone below 75 ppb would be unfair, and even impossible, because rural areas, especially non-coastal, high-altitude western states, have higher ozone due to air pollution transport from far upwind urban areas and naturally-occurring sources of ozone, both of which are uncontrollable. It was also mentioned that while the EPA offers waivers for areas affected by these circumstances, they are difficult to obtain.

Furthermore, there were complaints that such an effort would be costly for the government and possibly unnecessary since ozone levels have been down over the past 30 years.

Voices in favor of lowering the standard to between 70 ppb and 60 ppb said they worried about the medical ramifications, since Dickerson had testified that maintaining the current standard would pose a severe health risk to residents of the areas most affected by ozone, such as in coastal cities.

The American Lung Association, one of several medical and environmental organizations to file legal action against the EPA in 2008 regarding the ozone standard, recommends a standard of 60 ppb, a point that was brought up in the hearing. The association’s stance is based on studies that show a potential to prevent thousands of deaths, heart attacks and asthma attacks each year.

Whatever the EPA ultimately proposes, it seems clear that — in order to ensure that all states are able to comply with standards, while remaining sensitive to the interest of human health — any new standard will need to account for state-by-state and regional variations in the formation of ozone. With expertise on a wide range of issues related to U.S. ozone, ACAST offers a valuable resource to provide policy-relevant science on this issue.



This image was used by NASA ACAST researcher Russ Dickerson in a presentation before the House Science Subcommittee on Environment last week. Dickerson was asked to testify as an expert witness in this congressional hearing to prepare policymakers for the U.S. EPA's upcoming review of the National Ambient Air Quality Standards on ozone. The Clean Air Act requires the EPA to review these standards every five years. The national standard for ozone was set at 75 ppb in 2008.

The image comes from this 2011 article in the Journal of Geophysical Research. It shows the seasonal averages for North American background (PRB) surface ozone concentration for spring and summer 2006.