**Testimony of James W. Boylan, Ph.D.**

**Chief, Air Protection Branch**

**Georgia Environmental Protection Division**

**U.S. House Committee on Energy & Commerce**

**Subcommittee on Environment**

**June 11, 2025**

Good morning Chairman Griffith, Ranking Member Tonko, and members of the Subcommittee. My name is Jim Boylan and I am honored to testify before you today as the Chief of the Air Protection Branch at the Georgia Environmental Protection Division (EPD). The mission of Georgia EPD is to protect and restore Georgia's environment. We take the lead in ensuring clean air, water, and land. With our partners, we pursue a sustainable environment that provides a foundation for a vibrant economy and healthy communities.

Today, I am here to discuss the National Ambient Air Quality Standards (NAAQS) and its impact on state regulatory agencies and the regulated community. The establishment of the NAAQS along with technological advances from American industry has resulted in significant improvements in air quality. In Georgia, total emissions of air pollutants covered by the NAAQS dropped by 68% from 1990 to 2022, while at the same time gross domestic product increased by 437%, vehicle miles traveled increased by 66%, population increased by 69%, and energy consumption increased by 29%. This shows that economic growth and clean air are compatible.

The NAAQS program was developed by EPA and then handed over to States to implement requiring a lot of cooperation. My remarks will focus on two components of the NAAQS: first, I will discuss the setting of the NAAQS, then I will discuss the implementation of the NAAQS.

## Setting of the NAAQS

The NAAQS setting process involves the development and review of multiple documents, including the Integrated Science Assessment (ISA) which includes relevant research studies, the Risk and Exposure Assessment (REA) which involves the technical analysis and modeling to evaluate the health impacts of various NAAQS, and the Policy Assessment (PA) which provides policy options and recommendations for the EPA Administrator to consider when setting the NAAQS. The time to develop and review each document can be substantial since some of these documents can be over a thousand pages long, with drafts going out for public comment and being subject to review by independent scientific advisors. Currently, the NAAQS review process covering the primary (health based) and secondary (welfare based) standard is required to be repeated for ozone, particulate matter, sulfur dioxide, nitrogen dioxide, carbon dioxide, and lead every 5 years. There simply is not enough time to squeeze in all this work within a 5-year cycle. As far as I am aware, EPA has only completed a NAAQS review within the statutory 5-year cycle **one time** since the establishment of the program in the Clean Air Act in 1970. Extending the timelines for NAAQS reviews from 5 to 10 years would give EPA the time needed to develop new standards without being rushed to complete the review. In addition, this change would bring about more stability and certainty for state air pollution control agencies and industry. The process to bring an area from nonattainment back into attainment is typically 5 or more years, depending on the amount of emissions that needs to be reduced. Many times, states are on the verge of showing attainment with the current NAAQS and a new, lower NAAQS is promulgated that starts the whole process over. Also, staff resources are stretched extremely thin across states. As NAAQS standards are lowered it requires more resources from states to implement those standards since the more obvious and less-costly emission controls have already

been implemented. As a result, the focus has moved from large industrial sources to smaller point and non-point sources. Extending the NAAQS review cycle from 5 to 10 years would allow more effective allocation of limited federal and state resources.

Protecting public health is the core responsibility of agencies like Georgia EPD and we will always prioritize that. However, there is likely room for some balance in the NAAQS review process. The proximity of new standards to background levels (levels in the absence of human-made emissions) can put many states in a situation where the new standard is not achievable for many impacted areas for reasons that are beyond a state's control, such as wildfires, international transport, and Saharan dust events. Therefore, the EPA Administrator should be allowed to consider likely attainability of the standard as proposed NAAQS levels approach background concentrations.

The Clean Air Act requires the EPA Administrator to appoint an independent scientific review committee composed of seven members, including at least one member of the National Academy of Sciences, one physician, and one person representing state air pollution control agencies to complete a review of the national primary and secondary ambient air quality standards and provide recommendations to the Administrator. For the past four decades, this "independent scientific review committee" role has been fulfilled by the Clean Air Scientific Advisory Committee (CASAC). The CASAC serves a critical role in the NAAQS setting process by providing independent expert feedback on various aspects of the NAAQS.

I had the pleasure to serve on the CASAC from 2017-2023 and was only one of two people selected to serve on the CASAC under both the Trump and Biden Administrations. I have seen first-hand the imbalance that is caused by stacking the CASAC with mostly academic researchers (see Attachment 1). While academic researchers have a good understanding of the

underlying science, they do not always have a practical understanding of how science is translated into the NAAQS to determine if a standard is adequate to protect public health and welfare. This requires extensive knowledge on how ambient monitoring data is transformed into design values and subsequently used to show whether a location meets or violates the standards. It requires a deep understanding of how pollution levels change over time and across different areas, and the resulting impact on exposure and risk. State air regulatory agencies possess specialized expertise, and the practical knowledge and skills needed for environmental management, such as ambient monitoring, data and statistical analysis, dispersion modeling, photochemical modeling, emissions inventory development, toxicology, and/ or risk assessment. CASAC members who understand the importance of EPA's Risk and Exposure Assessment (see Attachment 2), how design values are calculated, and what they represent will help provide more informed advice to EPA. For this reason, the CASAC should include at least three representatives from air pollution control agencies who are well versed in NAAQS implementation to balance the CASAC. Including more CASAC members with hands-on experience implementing the NAAQS at the state level would provide a real-world perspective on the difficulties of implementing and developing future NAAQS.

**Implementation of the NAAQS**

I'd now like to turn to the implementation of the NAAQS. Currently, new NAAQS standards go into effect once the rule becomes final; however, it may take the EPA months or even years to release implementation guidance. Implementation guidance needs to be issued concurrently with the issuance of any new NAAQS, so that states have an immediate understanding of the requirements and are able to come into attainment quickly.

Once a new NAAQS is promulgated, states are required to submit attainment/nonattainment designation recommendations to EPA one year after promulgation, and EPA is required to finalize designations two years after promulgation. As part of the designation process, states can submit exceptional event demonstrations to EPA for approval. Exceptional events are unusual or naturally occurring events that can affect air quality but are not reasonably controllable (e.g., volcanic activity, wildfires, dust events). When EPA concurs with an exceptional event, that data can be excluded from the comparison to the NAAQS. When enough days are flagged as exceptional events, an area can be designated as attainment rather than nonattainment. Prescribed fires help prevent even more significant air quality concerns by preventing catastrophic wildfires. The state of Georgia issues prescribed burn permits for approximately 1.5 million acres per year. This requires the Georgia Forestry Commission to invest substantial resources to ensure prescribed burning is done under conditions that minimize the impact of smoke and other air emissions on nearby communities. The application of prescribed fires in Georgia has been extremely successful as show by the historically low number of wildfires across the state. Even when wildfires inevitably occur, they are quickly contained with minimal impact to human health and property damage. However, the current provisions for exceptional events do not explicitly recognize prescribed fires as exceptional events. While EPA has tried to address this through guidance, it really needs to be addressed through legislation. As part of Georgia EPD's designation recommendations for the 2024 PM NAAQS, Georgia EPD submitted 129 exceptional event demonstrations for days in 2021, 2022, and 2023 in six different Metropolitan Statistical Areas. Of those 129 exceptional events, 89 were associated with prescribed fires. Section 319(b) of the Clean Air Act should include prescribed fires and other

actions to mitigate wildfire risk as eligible events for excluding air monitoring data for regulatory determinations.

There are multiple permitting challenges associated with implementing extremely low NAAQS in both attainment and nonattainment areas. For manufacturing or other projects that want to be built in an area meeting the NAAQS, they must comply with stringent prevention of significant deterioration (PSD) program requirements. These PSD requirements apply upon the effective date of the new NAAQS. For the most recently tightened PM NAAQS, the effective date was May 6, 2024. There is no grandfathering of PSD projects that were submitted before the effective date so any project permitting process that was already underway and not yet finalized, regardless of the resources invested, will need to update their PSD permitting based on the newly tightened standards. This is an inefficient and costly provision of the program for both industry and states. An even bigger issue is the lack of headroom (difference between the standard and the background levels), making it very difficult to approve permits especially when more than one new source of emissions or facility is modeled based on their cumulative impact.

For areas found to be in violation of the NAAQS, they will be required to implement the most restrictive New Source Review (NSR) permitting process not only for new but also for existing sources. Existing sources will be required to install Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT). New sources will be required to install Lowest Achievable Emissions Rate (LAER) controls and purchase expensive emission offsets for the precursor pollutants. In many nonattainment areas, industrial sources have dramatically reduced their emissions, yet are still subject to the enhanced controls that come with nonattainment. This will add resource burdens on states as a significant number

of states will be required, for the first time, to implement nonattainment permitting programs and emissions offset programs.

For many years, I was the Georgia EPD liaison to the Georgia Department of Economic Development and met with many companies looking to locate in Georgia. I quickly learned that companies in Georgia and other states avoided nonattainment areas and attainment areas with little headroom for PSD modeling. In 2012, the annual $PM_{2.5}$ standard was dropped from 15 micrograms per cubic meter to 12 micrograms per cubic meter. Typically, a new PSD project will need 1.0 to 3.0 micrograms per cubic meter of headroom. However, the headroom was less than 0.5 micrograms per cubic meter in a number of locations, which makes it nearly impossible to pass PSD modeling for $PM_{2.5}$ when trying to build new manufacturing facilities in those locations. For example, we had no new large permitting projects in the four nonattainment areas until those areas were redesignated back to attainment. Also, the number of PSD applications were significantly reduced in the attainment areas due to the lack of headroom between the background values and the standard.

In 2024, the annual $PM_{2.5}$ standard was dropped from 12 micrograms per cubic meter to 9 micrograms per cubic meter. Again, many locations in Georgia are currently over the standard or lack enough headroom for new projects. This is especially a concern with the large number of economic development projects looking to locate in Georgia. Specifically, data centers are one of the fastest growing industries in the state. These data centers need large amounts of energy to operate. In May, a data center developer announced plans to build one of Georgia's largest data centers, a 20-building campus costing $16 billion that will require more power than one of Plant

Vogtle's nuclear reactors (1.2-gigawatt)[1]. Power generation to support all the new data centers will pose multiple permitting challenges under the current NAAQS process.

In closing, I would like to emphasize that Georgia EPD takes its responsibility of ensuring clean air in our state very seriously. In fact, the air in Georgia is the cleanest it has ever been since we started monitoring air quality decades ago. The Clean Air Act has provided great benefits in Georgia and across the country. There may be ways to modernize the NAAQS process that could help states implement the new standard in a way that continues to protect air quality without restricting economic opportunities. Again, I would like to thank Chairman Griffith for the invitation to appear before the subcommittee this morning, and I look forward to your questions.

[1] https://www.ajc.com/news/business/t5-data-centers-plans-campus-spanning-20-buildings-in-georgia/P7OWRM6AQJCFTAFM5NHRNZPWMA/

Perspective:

# The Need for a Balanced CASAC in the NAAQS Review Process

by James W. Boylan

As a member of CASAC that reviewed the 2020 particulate matter and ozone standards and the recent reconsiderations, the author provides his perspective about the importance of a balanced CASAC in the NAAQS review process.

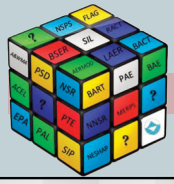
**Section 109(d)(1) of the U.S. Clean Air Act (CAA)** requires the U.S. Environmental Protection Agency (EPA) Administrator to every five years "…complete a thorough review of the criteria published under Section 108 and the national ambient air quality standards…and shall make such revisions in such criteria and standards and promulgate such new standards as may be appropriate…." Section 109(d)(2)(A) requires the EPA Administrator to "appoint an independent scientific review committee composed of seven members, including at least one member of the National Academy of Sciences, one physician, and one person representing state air pollution control agencies." Section 109(d)(2)(B) provides that this committee "shall complete a review of the criteria… and the national primary and secondary ambient air quality standards…and shall recommend to the Administrator any new…standards and revisions of existing criteria and standards as may be appropriate…." For the past four decades, this "independent scientific review committee" role has been fulfilled by the Clean Air Scientific Advisory Committee (CASAC).

It is critically important to keep a balanced set of perspectives on the chartered CASAC and the panel members. The charge to the CASAC is to review the science, review the risk and exposure assessment, and review EPA's policy recommendations. While university researchers will typically be most capable of reviewing the science, it is equally important to include members with expertise in risk and exposure assessments and policy assessments. The CAA requires at least one person representing state air pollution control agencies on the CASAC because it is crucial to have someone who has hands-on experience and practical knowledge in the implementation of the National Ambient Air Quality Standards (NAAQS). This allows for a real-world implementation perspective rather than a purely academic research perspective.

The topics for discussion in the CASAC deliberations are complex and there is usually not a clear right or wrong answer since the CAA does not require the standard to be set at zero risk. Rather, multiple lines of evidence and associated uncertainties must be evaluated and weighed to come to a determination of what is an acceptable risk when determining if the current standards are adequate or need to be lowered. Based on the 2020 particulate matter (PM) and ozone reviews and the recent PM and ozone reconsideration reviews, it is clear from the large variation in recommendations between reviews that the previous and recent CASAC both lacked a proper balance of scientific perspectives. Since the chartered CASAC and panel members are selected by the EPA Administrator, a political appointee, the "majority" and "minority" opinions can be directly determined by those selections.

## Unbalanced CASAC

In the 2020 PM review, the chartered CASAC was appointed by a Republican EPA Administrator and consisted of one independent consultant, four state/local air pollution control agency representatives, one research professor, and a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representative from the U.S. Army Corps of Engineers. The U.S. Army Corps of Engineers representative resigned during the deliberations, leaving only six CASAC members to complete the review. In the 2019 CASAC recommendations,[1] five CASAC members supported retaining the current annual $PM_{2.5}$ NAAQS, while only one member supported lowering it; and all six CASAC members unanimously supported retaining the current daily $PM_{2.5}$ NAAQS.

In the most recent PM reconsideration review, the chartered CASAC was appointed by a Democratic EPA Administrator and consisted of one state air pollution control agency representative and six research professors. In the 2022 CASAC recommendations,[2] all seven CASAC members unanimously supported lowering the current annual $PM_{2.5}$ NAAQS (however, they could not agree on the range); six CASAC members supported lowering the current daily $PM_{2.5}$ NAAQS, while only one member supported retaining it. The "Introduction" to the 2021 PM Policy Assessment (PA)[3] states: "Much of the information in this draft PA is drawn directly from information included in the 2019 ISA [Integrated Science Assessment] and the 2020 PA", indicating that the science and policy assessment did not change significantly between these two reviews. However, the "majority" and "minority" opinions drastically changed simply based on who was appointed to the CASAC.

In the 2020 ozone review, the chartered CASAC was appointed by a Republican EPA Administrator and consisted of one independent consultant, four state/local air pollution control agency representatives, and two research professors. In the 2020 CASAC recommendations,[4] six CASAC members supported retaining the current primary ozone NAAQS, while only one member supported lowering it; and all seven CASAC members unanimously supported retaining the current secondary ozone NAAQS. In the most recent ozone reconsideration review, the chartered CASAC was appointed by a Democratic EPA Administrator and consisted of one state air pollution control agency representative and six research professors. In the 2023 CASAC recommendations,[5] six CASAC members supported lowering the current primary ozone NAAQS, while only one member supported retaining it; and six CASAC members supported lowering the current secondary ozone NAAQS, while only one member supported retaining it. The "Introduction" to the 2023 Ozone Policy Assessment[6] states: "this document draws heavily on information presented in the 2020 PA," indicating that the science and policy assessment did not change significantly between these two reviews. However, the "majority" and "minority" opinions drastically changed simply based on who was appointed to the CASAC.

In all these reviews, the CASAC members consisted of highly creditable nationally recognized scientists, but the CASAC was clearly unbalanced in perspectives. While academic researchers have a good understanding of the underlying science, they do not always have a good understanding of how science is translated into the NAAQS to determine if a standard is adequate or not. This requires extensive knowledge on how design values are calculated and used to show attainment, a deep understanding of the resulting temporal and spatial concentration distributions, and the resulting impact on exposure and risk. However, many CASAC members don't understand how design values are calculated or what they represent. In fact, during the 2023 ozone deliberations, one chartered CASAC member asked EPA "What is a design value"? For this reason, the CASAC should include a balance of people representing state air pollution control agencies and academic researchers.

## Minority Opinions

Since the CAA requires seven uniquely qualified members on the CASAC, each member's recommendation (consisting of 14.3% of the total) is critically important to the EPA Administrator. Therefore, the recommendation of the minority should not be dismissed, especially when the minority recommendations are sound and directly supported by evidence presented in the Integrated Science Assessment and Policy Assessment documents. However, that is exactly what happened during the recent ozone review. The chair of the CASAC decided that the minority opinion was not worthy of being included in the letter to the Administrator or the main response to charge questions. Instead, the minority opinion was relegated to an obscure appendix at the back of the document. This new policy was contrary to the precedent that was set during the 2020 ozone review, the 2020 PM review, and the 2022 PM reconsideration, which allowed both minority and majority opinions in the main documents. As a result, the recommendations by the one person representing state air pollution control agencies (a specific perspective required by the CAA to be included in the recommendations to the EPA Administrator) were buried in an obscure appendix so that the majority opinion consisting of academic researchers would appear to be undisputed.

## Outcome of EPA's PM and Ozone Reconsiderations

During the CASAC's 2022 PM policy assessment review,[2] the CASAC majority recommended that the annual $PM_{2.5}$ NAAQS be lowered to 8–10 micrograms per cubic meter ($\mu g/m^3$), while the CASAC minority recommended that the annual $PM_{2.5}$ NAAQS be lowered to 10–11 $\mu g/m^3$. Also, the CASAC majority recommended that the daily $PM_{2.5}$ NAAQS be lowered to 25–30 $\mu g/m^3$, while the CASAC minority recommended that the daily $PM_{2.5}$ NAAQS be retained at 35 $\mu g/m^3$. In the recently published 2024 PM NAAQS final rule,[7] EPA agreed with the CASAC majority that the annual $PM_{2.5}$ NAAQS should be lowered to 9.0 $\mu g/m^3$. However, EPA agreed with the CASAC minority that

the daily $PM_{2.5}$ NAAQS should be retained at 35 µg/m$^3$.

During the CASAC's 2023 ozone policy assessment review,[5] the CASAC majority recommended that the primary ozone NAAQS be lowered to 55–60 part per billion (ppb), while the CASAC minority recommended that the primary ozone NAAQS be retained at 70 ppb since the risk and exposure assessment presented in the Policy Assessment6 did not support lowering the primary standard. Also, the CASAC majority recommended that the secondary ozone NAAQS be lowered to a W126 index value of 7–9 parts per million-hours (ppm-hrs), while the CASAC minority recommended that the secondary ozone NAAQS be retained at 70 ppb since there was no evidence presented in the Policy Assessment[6] to support lowering the secondary standard.

On August 18, 2023, Administrator Regan wrote a response letter[8] to the CASAC Chair, which stated, "In particular, I have taken note of the CASAC advice that the draft policy assessment is missing important analyses and information and that the draft policy assessment '… does not provide sufficient information to adequately consider alternative form and level combinations.'" Administrator Regan's letter concludes by stating, "…I have decided that the best path forward is to initiate a new statutory review of the ozone NAAQS and the underlying air quality criteria and to wrap the EPA's reconsideration process of the 2020 ozone NAAQS decision into that review." In essence, the recent ozone reconsideration was dropped because there was not enough evidence to support lowering the ozone NAAQS. This was consistent with the CASAC minority recommendation.

## Conclusion

A CASAC that lacks a proper balance of scientific perspectives can result in science being driven by politics. EPA should make a conscious decision to appoint CASAC members and panel members with a balance of perspectives from a variety of backgrounds. This includes adding more people representing state air pollution control agencies. In fact, the U.S. House of Representatives recently proposed a bill,[9] titled "Air Quality Standards Implementation Act of 2024," which would amend Section 109(d)(2)(A) of the CAA by striking "one person representing state air pollution control agencies" and inserting "three persons representing state air pollution control agencies". While it is admirable to try to achieve unanimous consensus, it is even more important to include a fair balance of scientific viewpoints so that the Administrator can make an unbiased and informed decision on the adequacy of the standards. In addition, the CASAC's new policy for removing dissenting opinions from the letter to the EPA Administrator and placing them in an obscure appendix is wholly inappropriate and only adds to the imbalance that already exists. The first action taken by the next CASAC chair should be to reverse this prejudicial policy. **em**

**James W. Boylan, Ph.D.,** is Chief of the Air Protection Branch at the Georgia Department of Natural Resources Environmental Protection Division. He has been implementing U.S. Clean Air Act requirements for more than 30 years and is a national expert in regulatory air quality modeling and NAAQS risk assessments. He was appointed to the chartered Clean Air Scientific Advisory Committee (CASAC) in 2017 and reappointed in 2020. He was actively involved in the 2020 review of the particulate matter and ozone standards, as well as the recent particulate matter and ozone reconsiderations. Email: **james.boylan@dnr.ga.gov**.

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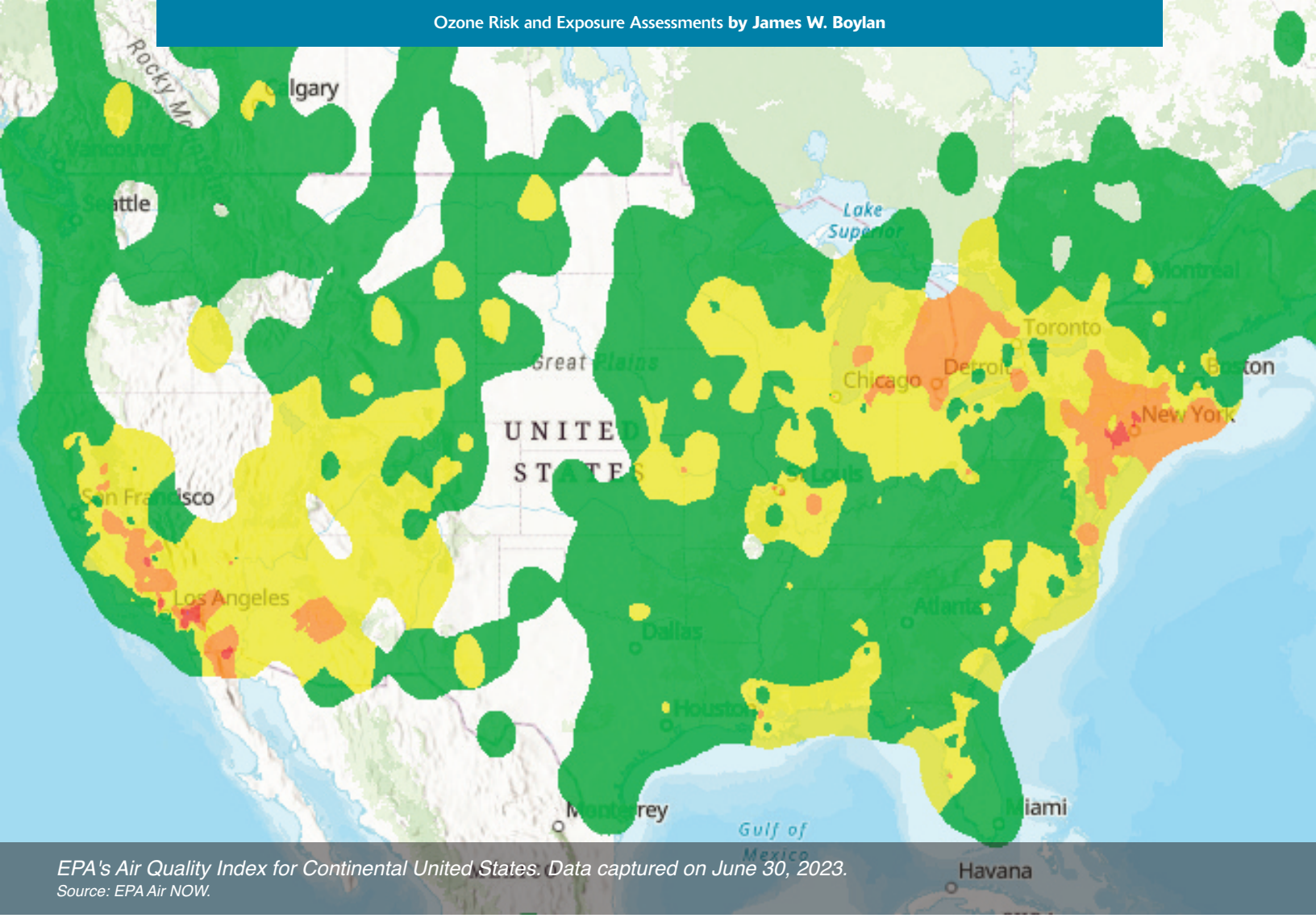


*EPA's Air Quality Index for Continental United States. Data captured on June 30, 2023.*
*Source: EPA Air NOW.*

# The Importance of Risk and Exposure Assessments in Setting the Ozone NAAQS

**by James W. Boylan**

As a member of CASAC that reviewed the 2020 ozone standard and the recent reconsideration, the author provides his perspective about the importance of developing a formal risk and exposure assessment for the committee's review of the ozone NAAQS.

**Section 109(b)(1) of the U.S. Clean Air Act** defines primary National Ambient Air Quality Standards (NAAQS) as ones that "the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health." NAAQS are not required to be set at a zero-risk level or background levels. Therefore, the U.S. Environmental Protection Agency (EPA) Administrator must set the standard at a level that provides protection at an acceptable risk level. Determining an acceptable risk is a policy decision that is subjective (i.e., what is an acceptable risk to one person may not be an acceptable risk to another person). To determine whether the current or alternative standards provide protection at an acceptable risk level, the risk associated with the current and alternative standards must be determined considering the indicator, averaging time, level, and form of the standard. The best way to estimate risk is to conduct a risk and exposure assessment (REA).

Every NAAQS has four elements: indicator, averaging time, level, and form. For the primary ozone standard, the current indicator is ozone, the current averaging time is 8 hours, the current level is 0.070 ppm, and the current form is the annual fourth-highest daily maximum 8-hr concentration, averaged over three years. The ozone design value (DV) for an area is the highest site-specific annual fourth-highest daily maximum 8-hr concentration, averaged over three years, from the monitors located in the Core Based Statistical Area (CBSA). Design values are updated annually as new data becomes available. A violation of the NAAQS occurs when the DV for an area is greater than the standard.

The results of the scientific evidence (e.g., epidemiologic studies and human exposure studies) that provide the foundation for the NAAQS can't be used directly to set the standards because this evidence has not been evaluated in the proper context of the standard to determine the actual exposure and risk associated with the current and alternative standards. All elements of the standard (indicator, averaging time, level, and form), the way attainment with the standard is determined (i.e., highest site-specific design value in the CBSA), temporal and spatial distributions of people and ambient air ozone concentrations throughout an area, the variation of ambient air-related ozone concentrations within various microenvironments in which people conduct their daily activities (indoor, outdoor, and in-vehicle), and the effects of activities involving different levels of exertion on breathing rate (or ventilation rate) for the exposed individuals should be considered when determining the appropriate level for the standard.

The most common way to do this analysis is to perform a REA to determine the spatial and temporal concentration distributions that individuals are exposed to in a study area and the resulting risk at the current and alternative standards. A REA estimates health effects based on modeled or monitored air quality changes, population distributions, concentration-response (C-R) functions (from epidemiologic studies or human exposure studies), and other factors that impact expose and risk. Typically, REA results are presented as the number of adverse health effects (e.g., number of additional asthma attacks), number of hospital visits, number of morbidities, and/or number of mortalities.

## Setting Standards

It is important to note that setting standards based on the highest site-specific design value in an area can result in spatial and temporal concentration distributions across the area that are well below the level of the standard. For example, 2018–2020 ozone data from the Atlanta–Sandy Springs–Alpharetta CBSA (Atlanta CBSA) in Georgia was examined to look at the distribution of ozone measurements in the Atlanta CBSA. The 2018–2020 ozone data was examined because that three-year period resulted in a design value of exactly 70 ppb for the Atlanta CBSA. The Atlanta CBSA has nine monitors that measure ozone during Georgia's ozone season (March 1–October 31).

Figure 1 contains the 2018–2020 ozone site-specific design values for each of the nine monitors in the Atlanta CBSA (Athens is outside the Atlanta CBSA), along with interpolated design values using an inverse distance weighted method. The 8-hr daily maximum ozone concentration for each monitor and each day was compiled into a single data set


**In Next Month's Issue…**

**CMAQ 25th Anniversary**

June 2023 marked the 25th anniversary of the U.S. Environmental Protection Agency's (EPA) Community Multiscale Air Quality (CMAQ). CMAQ is EPA's premier modeling system for studying air pollution from global to local scales, and it has thousands of users across six continents for air quality management, forecasting, and research. The January issue looks back on elements of CMAQ's storied history from various perspectives and offers thoughts on the new directions that drive continued development.

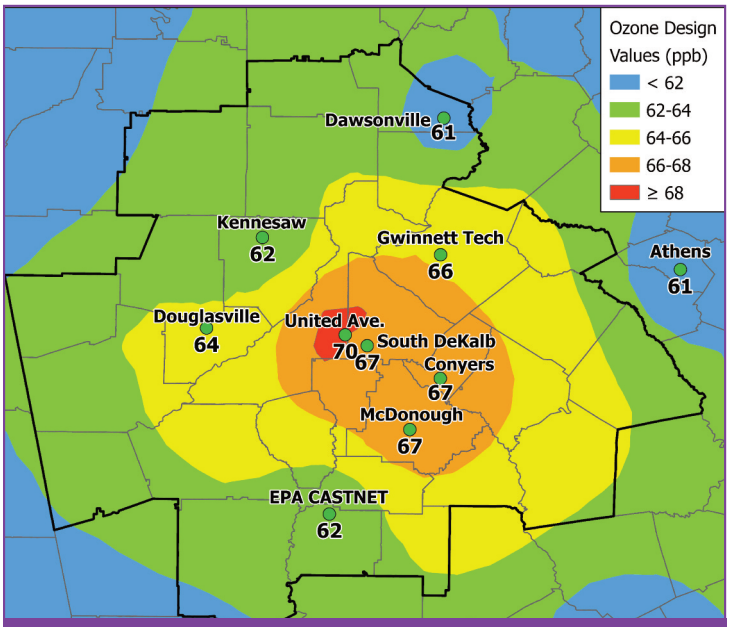


**Figure 1.** 2018–2020 ozone site-specific design values (ppb) in the Atlanta CBSA (outlined in the thick black solid line), along with interpolated design values using an inverse distance weighted method.

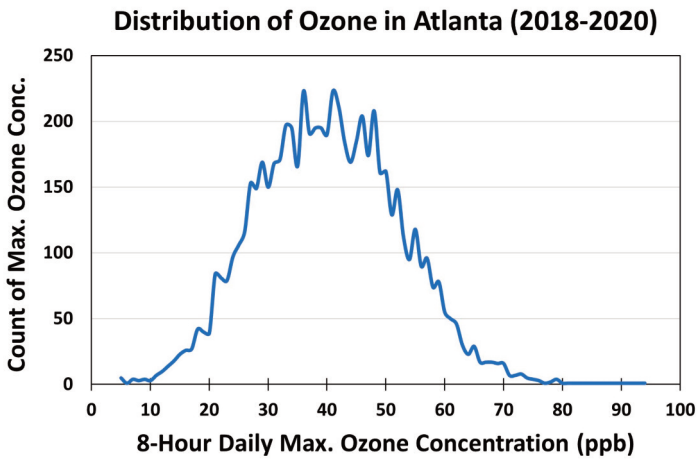


**Figure 2.** Distribution of 2018–2020 8-hr daily maximum ozone concentrations for the nine monitors in the Atlanta CBSA.

consisting of 6,615 (9 monitors x 245 days/year x 3 years) 8-hr daily maximum ozone concentrations. The resulting distribution of ozone was graphed in Figure 2 by counting the number of values at each 8-hour daily maximum ozone concentration.

Based on this data:

- 99.3% of the 8-hr daily maximum ozone concentrations were at or below 70 ppb;
- 98.0% of the 8-hr daily maximum ozone concentrations were at or below 65 ppb;
- 95.3% of the 8-hr daily maximum ozone concentrations were at or below 60 ppb; and
- 89.3% of the 8-hr daily maximum ozone concentrations were at or below 55 ppb.

The overall average 8-hr daily maximum ozone concentration was 40.3 ppb. This demonstrates that the current standard of 70 ppb will provide protection at concentrations well below the level of the standard.

## Risk and Exposure Assessments

In EPA's most recent ozone policy assessment,[1] the REA was based on human exposure studies of 6.6-hr exposures with quasi-continuous exercise with concentrations ranging from 60 to 80 ppb. At a standard of 70 ppb, the REA estimates that: (a) more than 99.9% of children with asthma are protected from a single exposure during moderate to heavy exercise at/above 80 ppb and 100% are protected from multiple exposures; (b) more than 99% of children with asthma are protected from a single such exposure at/above 70 ppb and more than 99.9% are protected from experiencing multiple exposures; and (c) more than 95% of children with asthma are protected from experiencing multiple such exposures at/above 60 ppb. EPA staff concluded that the available evidence does not call into question the adequacy of protection provided by the existing standard and the current primary ozone standard should be retained without revision.

Unfortunately, a risk and exposure assessment using concentration–response (C–R) functions from epidemiological studies was not conducted by EPA; therefore, the policy assessment is limited in its ability to use epidemiological studies to provide insights regarding health outcomes that might be expected under air quality conditions that meet the current and alternative standards. It should be noted that a REA based on epidemiological studies was included in the 2014 ozone policy assessment.[2] In the associated REA,[3] alternative ozone standards tended to reduce concentration levels at the upper ends of the ambient distributions and increase concentration levels at the lower ends of the ambient distributions. Seasonal means of daily concentrations show minimal changes upon air quality adjustment, reflecting the seasonal balance between daily decreases and increases in ambient concentrations. The resulting compression in distributions of ambient ozone concentrations is evident in all of the urban case study areas that were evaluated. In fact, there were some locations where lower ozone standards resulted in an increase in the number of ozone related hospital admissions and deaths. Therefore, it is not appropriate to skip the REA and simply assume that lower ozone standards will result in significant health benefits.

## CASAC Letter

In CASAC's letter to EPA Administrator Regan regarding the 2023 draft ozone policy assessment,[4] the majority of the committee recommended lowering the level of the ozone standard to 55–60 ppb. However, this recommendation was not supported by a REA. The one dissenting CASAC member wrote,[4] "Recommending a standard without the support of a REA is inappropriate and should be viewed with extreme skepticism."

On August 18, 2023, Administrator Regan wrote a response letter[5] to the CASAC Chair, which stated:

"In particular, I have taken note of the CASAC advice that the draft policy assessment is missing important analyses and information and that the draft policy assessment '… does not provide sufficient information to adequately consider alternative form and level combinations.' CASAC also advised '…that the EPA incorporate the information available from the epidemiological studies in the risk assessment.'"

This statement clearly demonstrates the importance of risk and exposure assessments in setting the ozone NAAQS. Administrator Regan's letter concludes by stating, "…I have decided that the best path forward is to initiate a new statutory review of the ozone NAAQS and the underlying air quality criteria and to wrap the EPA's reconsideration process of the 2020 ozone NAAQS decision into that review." The next ozone review should include REAs based on both the epidemiological studies and the human exposure studies. Since epidemiological studies and human exposure studies both have different strengths and weaknesses, this would allow the EPA staff and CASAC to make policy recommendations to the EPA Administrator based on all the available evidence. em

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4. U.S. Environmental Protection Agency Clean Air Scientific Advisory Committee. *CASAC Review of the EPA's Policy Assessment (PA) for the Reconsideration of the Ozone National Ambient Air Quality Standards (External Review Draft Version 2);* EPA-CASAC-23-002; June 9, 2023.
5. U.S. Environmental Protection Agency Administrator Response to "CASAC Review of the EPA's Policy Assessment (PA) for the Reconsideration of the Ozone National Ambient Air Quality Standards (External Review Draft Version 2)". Letter from Michael S. Regan to Elizabeth A. Sheppard, Ph.D., August 18, 2023.

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