

United States Court of Appeals
FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued November 6, 2019

Decided July 10, 2020

No. 18-1203

CLEAN WISCONSIN,
PETITIONER

v.

ENVIRONMENTAL PROTECTION AGENCY AND ANDREW
WHEELER, ADMINISTRATOR, UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY,
RESPONDENTS

BCCA APPEAL GROUP, ET AL.,
INTERVENORS

Consolidated with 18-1205, 18-1206, 18-1208, 18-1212,
18-1214

On Petitions for Review of a Final Agency Action
of the United States Environmental Protection Agency

Daniel I. Rottenberg, Assistant Attorney General, Office of the Attorney General for the State of Illinois, *Maxine I. Lipeles*, *David R. Baake*, *Robert Ukeiley*, *Howard A. Learner*, and *Ann Brewster Weeks* argued the causes for petitioners. With them on the final joint briefs were *Kwame Raoul*, Attorney General, Office of the Attorney General for the State

of Illinois, *Jane Elinor Notz*, Solicitor General, *Benna Ruth Solomon*, *Stephen J. Kane*, *Susan Hedman*, *Elena K. Saxonhouse*, *Joshua A. Berman*, *Scott Strand*, *Ann Jaworski*, and *Jonathan Evans*.

Letitia James, Attorney General, Office of the Attorney General for the State of New York, *Barbara D. Underwood*, Solicitor General, *Steven C. Wu*, Deputy Solicitor General, *Michael J. Myers*, Special Counsel for Air Pollution and Climate Change Litigation, *Brian Lusignan*, Assistant Attorney General, *Kathleen Jennings*, Attorney General, Office of the Attorney General for the State of Delaware, *Brian E. Frosh*, Attorney General, Office of the Attorney General for the State of Maryland, *Keith Ellison*, Attorney General, Office of the Attorney General for the State of Minnesota, *Ellen F. Rosenblum*, Attorney General, Office of the Attorney General for the State of Oregon, *Thomas J. Donovan, Jr.*, Attorney General, Office of the Attorney General for the State of Vermont, *William Tong*, Attorney General, Office of the Attorney General for the State of Connecticut, *Aaron M. Frey*, Attorney General, Office of the Attorney General for the State of Maine, *Maura Healy*, Attorney General, Office of the Attorney General for the Commonwealth of Massachusetts, *Gurbir S. Grewal*, Attorney General, Office of the Attorney General for the State of New Jersey, *Peter F. Neronha*, Attorney General, Office of the Attorney General for the State of Rhode Island, *Karl A. Racine*, Attorney General, Office of the Attorney General for the District of Columbia, and *Robert W. Ferguson*, Attorney General, Office of the Attorney General for the State of Washington, were on the brief for *amici curiae* the States of New York, et al. in support of petitioners.

Sue Chen and *Tsuki Hoshijima*, Attorneys, U.S. Department of Justice, argued the causes for respondent. With

them on the brief was *Jeffrey Bossert Clark*, Assistant Attorney General.

Neil D. Gordon, Assistant Attorney General, Office of the Attorney General for the State of Michigan, argued the cause for intervenor-respondent State of Michigan. With him on the brief were *Dana Nessel*, Attorney General, and *Fadwa A. Hammoud*, Solicitor General.

Aaron M. Streett argued the cause for intervenors Greater El Paso Chamber of Commerce, et al. in support of respondents. With him on the brief was *Matthew L. Kuryla*.

Gabe Johnson-Karp, Assistant Attorney General, Office of the Attorney General for the State of Wisconsin, argued the cause for intervenor State of Wisconsin in support of respondents. With him on the brief was *Joshua L. Kaul*, Attorney General.

Ken Paxton, Attorney General, Office of the Attorney General for the State of Texas, *Kyle D. Hawkins*, Solicitor General, *Bill Davis*, Deputy Solicitor General, and *Linda B. Secord*, Assistant Attorney General, were on the brief for respondent-intervenors the State of Texas, et al.

John R. Jacus, *Shannon W. Stevenson*, *Catherine E. Stetson*, and *Jennifer L. Biever* were on the brief for *amici curiae* American Petroleum Institute, et al. in support of respondents.

Before: TATEL, GRIFFITH, and PILLARD, *Circuit Judges*.

Opinion for the court filed PER CURIAM.

In these consolidated petitions, several environmental organizations, municipal governments, and the State of Illinois challenge area designations promulgated by the Environmental Protection Agency (EPA) for the National Ambient Air Quality Standards (NAAQS) applicable to ground-level ozone, i.e., smog. Insisting that EPA failed to meet its basic obligation of reasoned decisionmaking for many of the designations, petitioners ask us to vacate those designations and send EPA back to the drawing board. In response, EPA disputes certain petitioners' standing, requests a voluntary remand of some designations, and defends other designations on their merits. For the following reasons, we find that at least one petitioner has standing to challenge each of the designations at issue, grant several of the petitions, deny one petition, and grant EPA's motion to remand the rest.

I.

We have previously summarized the governing regulatory framework, and we draw on those decisions in providing an overview of the statutory provisions and the agency proceedings relevant to this case. *See Miss. Comm'n on Env'tl. Quality v. EPA*, 790 F.3d 138 (D.C. Cir. 2015) (per curiam) (reviewing area designations for the 2008 ozone NAAQS); *Catawba Cty. v. EPA*, 571 F.3d 20 (D.C. Cir. 2009) (per curiam) (same for 1997 particulate matter NAAQS).

"Congress enacted the Clean Air Act (the Act), 42 U.S.C. §§ 7401 et seq., 'to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population.'" *Miss. Comm'n*, 790 F.3d at 144 (quoting 42 U.S.C. § 7401(b)(1)).

Under the Act, EPA must establish and periodically revise NAAQS for pollutants that “may reasonably be anticipated to endanger public health or welfare.” 42 U.S.C. § 7408(a)(1)(A). A NAAQS establishes the maximum permissible ambient—i.e., outdoor—air concentration for these so-called “criteria” pollutants. A network of air monitoring stations, known as monitors, measure pollutant concentrations and record violations of the NAAQS.

After EPA promulgates a new or revised NAAQS, the agency must designate each “area” in the United States as “attainment,” “nonattainment,” or “unclassifiable.” *See id.* § 7407(d)(1)(A)(i)–(iii). Generally, areas that meet the relevant NAAQS are designated as attainment; areas that exceed the NAAQS as nonattainment; and areas that “permit no determination given existing data” as unclassifiable. *Id.* Under the Act, however, even an area whose ambient air concentration complies with the relevant NAAQS must be designated as nonattainment if it “contributes” to a NAAQS violation in a “nearby area.” *Id.* § 7407(d)(1)(A)(i). “[C]ontributes,” “nearby,” and “area” are undefined in the Act.

EPA works collaboratively with states and tribes to determine the NAAQS attainment status for all areas within a respective state’s borders. No later than one year after the agency promulgates a new or revised NAAQS, each state must recommend “initial designations” to EPA. *Id.* § 7407(d)(1)(A). A state’s initial designations must suggest both the appropriate geographic boundaries for each “area” and whether EPA should classify the proposed areas as attainment, nonattainment, or unclassifiable. *See id.* § 7407(d)(1)(A)–(B).

Once EPA receives a state’s initial designations, it may either promulgate them as submitted or modify them as it “deems necessary.” *Id.* § 7407(d)(1)(B)(ii). EPA may change a

state's recommended designation, alter a state's proposed geographic area, or both. *See id.* Although EPA "has no obligation to give any quantum of deference to a designation that it 'deems necessary' to change," *Catawba*, 571 F.3d at 40, it must notify the state of any intended change and provide the state with at least 120 days "to demonstrate why any proposed modification is inappropriate," 42 U.S.C. § 7407(d)(1)(B)(ii). "These notifications are commonly known as the 120-day letters." Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards, 82 Fed. Reg. 54,232, 54,233 (Nov. 16, 2017) ("2015 Designations Rule"). Under the Act, EPA must promulgate designations "as expeditiously as practicable, but in no case later than 2 years from" the date it revises a NAAQS. 42 U.S.C. § 7407(d)(1)(B)(i). If EPA "has insufficient information to promulgate the designations," it may extend the deadline "for up to one year," but no further. *Id.*

An area's designation is important because it determines the stringency of applicable emission controls. Although EPA has ultimate authority to determine each area's attainment status, states have "primary responsibility" for ensuring that the geographic areas within their borders either maintain attainment status or progress towards it. *Id.* § 7407(a). Accordingly, once EPA finalizes its designations, states must submit to EPA "implementation plan[s]" specifying how the NAAQS "will be achieved and maintained." *Id.* In attainment or unclassifiable areas, a state need only implement "emission limitations and such other measures as may be necessary . . . to prevent significant deterioration of air quality." *Id.* § 7471. For nonattainment areas, by contrast, the Act imposes more stringent requirements, including, for example, requiring states to establish permitting programs for pollution sources, *see id.* § 7502(c)(5), and to demonstrate in their plans that they intend to implement "all reasonably available control measures" and

“reasonably available control technology” to bring the area into attainment, *id.* § 7502(c)(1). The Act also imposes deadlines, or “attainment dates,” on offending areas, which set the time period in which an area must reach attainment status. *See id.* § 7502(a)(2)(A).

This case involves the NAAQS for ozone, “a colorless gas that occurs both in the Earth’s upper atmosphere and at ground level.” *Murray Energy Corp. v. EPA*, 936 F.3d 597, 605 (D.C. Cir. 2019). Although “ozone is an essential presence in the atmosphere’s stratospheric layer, it becomes harmful at ground level and can cause lung dysfunction, coughing, wheezing, shortness of breath, nausea, respiratory infection, and in some cases, permanent scarring of the lung tissue.” *Miss. Comm’n*, 790 F.3d at 147 (internal quotation marks omitted). “It also has a broad array of effects on trees, vegetation, and crops and can indirectly affect other ecosystem components such as soil, water, and wildlife.” *Id.* (internal quotation marks omitted). Because ozone forms at ground level when “precursor” emissions—nitrogen oxides (NO_x) and volatile organic compounds (VOCs)—react with sunlight, compliance with the ozone NAAQS largely depends on reducing emissions from ozone-precursor producers like power plants, motor vehicles, and combustion engines. *Id.*; *see also* 2015 Designations Rule, 82 Fed. Reg. at 54,233. “Complicating this task is that ozone and ozone precursors travel easily through the atmosphere, which can result in NAAQS violations hundreds of miles away from the source of the ozone precursors.” *Miss. Comm’n*, 790 F.3d at 147.

In 2015, EPA strengthened the ozone NAAQS, reducing the maximum allowable “design value”—an average daily eight-hour level of ozone, *see* 40 C.F.R. § 50, App. U—from 0.075 parts per million (ppm) to 0.070 ppm, triggering states’ responsibility to submit initial area designations, *see* 2015

Designations Rule, 82 Fed. Reg. at 54,233. To assist states in this process, EPA issued guidance identifying the key factors it intended to evaluate in making final nonattainment area boundaries, emphasizing that “[b]ecause ozone and its precursor emissions are pervasive and readily transported, the EPA believes it is important to examine ozone-contributing emissions across a relatively broad geographic area associated with a monitored violation.” Memorandum from Janet G. McCabe, Acting Assistant Adm’r, to Reg’l Adm’rs, Area Designations for the 2015 Ozone National Ambient Air Quality Standards 5 (Feb. 25, 2016), Joint Appendix (J.A.) 511 (“Guidance Memo”). The agency explained that, “[c]onsistent with past designations for ozone NAAQS,” it planned to use a “weight-of-evidence” approach to designations, evaluating information relevant to five factors: (1) air-quality data, i.e., whether an area’s monitor reported a NAAQS violation; (2) emissions and emissions-related data, including NO_x and VOC levels, population, degree of urbanization, and traffic and commuting patterns; (3) meteorology, which involves calculating the effect of things like wind speed and direction, temperature, humidity, and pressure on air parcels in order to model the transport of ozone and ozone-causing emissions; (4) geography/topography, i.e., the effect of physical land features on the distribution of ozone; and (5) jurisdictional boundaries, which help determine whether a given nonattainment area will be able to effectively carry out air-quality planning and enforcement functions. *Id.* at 6, J.A. 512; *see also id.* Attach. 3, at 4-10, J.A. 522-28.

To evaluate these factors, EPA uses a variety of analytical tools and data. We describe just one here in general fashion, reserving additional elaboration on other tools for those portions of the opinion that require it.

Significantly for several of the petitions, when evaluating the effect of meteorology, EPA frequently relies on Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) data, which model the three-dimensional paths traveled by air parcels to a violating monitor. These paths, known as “back trajectories,” Guidance Memo 7, J.A. 525, are depicted on a standard map as single lines extending in two-dimensional space from a starting point. Each individual trajectory has only one starting height, so EPA plots trajectories of different starting heights—generally 100, 500, and 1,000 meters—from the same point, using different colors to distinguish the heights. According to EPA, HYSPLIT maps can “be easily misinterpreted as having finer accuracy than the underlying model and data” and “[o]ne should avoid concluding a region is not along a trajectory’s path” simply because that trajectory’s line “missed the region by a relatively small distance.” *Id.* at 8, J.A. 526.

By October 2016, all states had submitted their proposed designations to EPA. Rather than immediately review the designations, however, EPA attempted to extend the designations process by one year. *See* Extension of Deadline for Promulgating Designations for the 2015 Ozone National Ambient Air Quality Standards, 82 Fed. Reg. 29,246, 29,247 (June 28, 2017). After various parties sued, EPA withdrew the extension but published designations for only those areas that states recommended be designated as attainment or unclassifiable. *See* 2015 Designations Rule, 82 Fed. Reg. at 54,232. Another lawsuit followed, and this time a district court ordered EPA to promulgate final designations for all areas of the country, except for eight counties in the San Antonio area, by April 30, 2018. *See In re Ozone Designation Litig.*, 286 F. Supp. 3d 1082, 1091 (N.D. Cal. 2018).

In response, EPA sent 120-day letters to states and tribes announcing its intended designations, and, although not required by the Act, provided a thirty-day public comment period. *See* EPA Responses to Certain State Designation Recommendations for the 2015 Ozone National Ambient Air Quality Standards: Notice of Availability and Public Comment Period, 83 Fed. Reg. 651, 652 (Jan. 5, 2018). In accordance with the district-court order, EPA finalized the remaining designations—including all those disputed here—in April 2018. *See* Additional Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards, 83 Fed. Reg. 25,776 (June 4, 2018) (“Final Designations Rule”). In deciding whether to alter the states’ proposed nonattainment boundaries, EPA applied the Guidance Memo’s multi-factor, weight-of-the-evidence test, explaining its findings for each factor in technical support documents (TSDs).

After EPA promulgated the final designations, several public health and environmental groups (“Environmental Petitioners”), plus Illinois and three municipalities (“Government Petitioners”), sought review in this court, challenging a subset of the attainment designations. We consolidated the petitions and granted the requests of several other states and industry groups to intervene on EPA’s behalf, and now “review petitioners’ challenges under section 307(d)(9) of the Clean Air Act.” *Catawba*, 571 F.3d at 29.

II.

Before proceeding to the merits, we must confirm our jurisdiction. The Clean Air Act authorizes judicial review of final EPA actions, *see* 42 U.S.C. § 7607(b)(1), but EPA contests petitioners’ Article III standing. First, EPA argues that the Environmental Petitioners lack standing because the challenged attainment designations cause no harm to members who reside in areas that merely “contribut[e]” to NAAQS

violations. EPA Br. 15. Second, EPA claims that Government Petitioners may not sue a federal agency as *parens patriae*, invoking the rule articulated in *Massachusetts v. Mellon*, 262 U.S. 447 (1923). We reject both arguments.

A. Environmental Petitioners

Environmental Petitioners assert associational standing to bring this suit on behalf of their members. EPA argues that certain Environmental Petitioners lack associational standing because none of their members “have standing to sue in their own right.” *Fund Democracy, LLC v. SEC*, 278 F.3d 21, 25 (D.C. Cir. 2002). For each challenged designation, an Environmental Petitioner must identify one member who suffers from a “concrete and particularized” injury-in-fact caused by the challenged agency conduct and redressable by a favorable judicial decision. *Nat. Res. Def. Council v. EPA*, 755 F.3d 1010, 1016 (D.C. Cir. 2014) (quoting *Ark Initiative v. Tidwell*, 749 F.3d 1071, 1075 (D.C. Cir. 2014)). As with a plaintiff at the summary-judgment stage in district court, a petitioner challenging final agency action must “support each element of its claim to standing ‘by affidavit or other evidence.’” *Sierra Club v. EPA*, 292 F.3d 895, 899 (D.C. Cir. 2002) (quoting *Lujan v. Defs. of Wildlife*, 504 U.S. 555, 561 (1992)).

Supreme Court precedent and our own case law identify several environmental harms that constitute cognizable injuries. First, “environmental plaintiffs adequately allege injury in fact when they aver that they use the affected area and are persons ‘for whom the aesthetic and recreational values of the area will be lessened’ by the challenged activity.” *Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC), Inc.*, 528 U.S. 167, 183 (2000) (quoting *Sierra Club v. Morton*, 405 U.S. 727, 735 (1972)); see also *Nat. Res. Def. Council v. EPA*, 489 F.3d 1364, 1371 (D.C. Cir. 2007). Adverse health effects likewise

constitute Article III injuries, even if a petitioner merely asserts realistic health concerns instead of providing medical evidence. *See Nat. Res. Def. Council*, 755 F.3d at 1016-17 (finding standing based on declarations of members “who are concerned about the [challenged EPA action’s] effects on their health and, in some cases, spend less time outdoors on that account”); *see also Sierra Club v. EPA*, 926 F.3d 844, 848-49 (D.C. Cir. 2019) (similar). Finally, in the Clean Air Act context, “[t]he health and economic costs of increased . . . pollution for individuals in nonattainment areas constitute injuries in fact that are fairly traceable to the EPA’s challenged rule.” *WildEarth Guardians v. EPA*, 830 F.3d 529, 535 (D.C. Cir. 2016).

EPA contends that Environmental Petitioners have not identified members injured by the attainment designations of McHenry, Monroe, Lake, Porter, Door, Kenosha, and El Paso counties. This argument is correct only as to Monroe County, for which no Environmental Petitioner has supplied a member affidavit. (We address Government Petitioners’ standing to challenge the Monroe County designation in Part II.B, *infra*.) For the remaining designations, Environmental Petitioners have submitted declarations that establish concrete injuries-in-fact caused by EPA’s failure to regulate that are redressable by this Court.

Association members who reside in McHenry, Door, Kenosha, and El Paso counties provided affidavits asserting concrete health and recreational injuries caused by ozone pollution from sources within their home counties. *See Schindler Decl.* ¶¶ 4-6, 10-13; *Leline Decl.* ¶¶ 5-7, 13-14; *Perloff Decl.* ¶¶ 5-7, 15-16; *Powers Decl.* ¶¶ 5-9, 14-16; *Antaramian Decl.* ¶¶ 5-7, 14-16; *De Aztlan Decl.* ¶¶ 2-4. For example, Clean Wisconsin member Willard Leline, Jr. declares that EPA’s designation of much of Door County as attainment exposes him to unhealthy ozone concentrations during his

preferred forms of outdoor recreation, including “golfing, hiking, boating, tending horses, doing yardwork, grilling, running, [and] working outdoors as a Segway tour guide.” Leline Decl. ¶¶ 6, 13-14. Association members from Cook County declare similar injuries caused by pollution contributed by Lake and Porter counties. See Horine Decl. ¶¶ 2, 6-10; Lipton Decl. ¶¶ 3-8.

These concrete injuries are “fairly traceable to the EPA’s challenged rule” and redressable by an order setting aside that decision as arbitrary and capricious. *WildEarth Guardians*, 830 F.3d at 535; see also *Sierra Club v. EPA*, 699 F.3d 530, 533 (D.C. Cir. 2012). Put simply, an attainment designation amounts to a relaxation of regulatory requirements. State regulations in an attainment area need only “prevent significant deterioration of air quality.” 42 U.S.C. § 7471. Conversely, a nonattainment area must be brought into NAAQS compliance prior to a statutory deadline, *id.* § 7502(a)(2)(A), using “all reasonably available control measures,” *id.* § 7502(c)(1). By preserving the status quo rather than demanding stricter pollution controls, EPA’s designations increase the likelihood that Environmental Petitioners’ members will experience ozone-related injuries.

Faced with these attestations of harm, EPA proposes a new categorical rule for standing in area-designation suits. EPA argues that petitioners “cannot establish standing by relying on members [who reside] in areas that comply with the ozone standards,” including “allegedly contributing areas.” EPA Br. 14-15. This new rule would deny standing to Environmental Petitioners whose members live in areas that, in their view, contribute to “nearby” ozone violations. See 42 U.S.C. § 7407(d)(1)(A)(i).

EPA's argument requires that we disregard the real-world injuries described in petitioners' declarations and focus instead on a formal distinction between "contributing" and "violating" areas. But that distinction is a product of the challenged agency action, and by relying on it, EPA implicitly assumes that its area designations reflect scientific reality. At this stage, however, we must assume that *petitioners* are correct that EPA should have designated the contested areas as nonattainment zones. *See City of Waukesha v. EPA*, 320 F.3d 228, 235 (D.C. Cir. 2003). It does not matter whether EPA should have done so because these areas contain violations or because they contribute to "nearby" violations—more ozone is more ozone, and there is no "threshold concentration below which" ground-level ozone is "known to be harmless." *Am. Trucking Ass'n, Inc. v. EPA*, 283 F.3d 355, 360 (D.C. Cir. 2002) (citing National Ambient Air Quality Standards for Ozone, 62 Fed. Reg. 38,856, 38,863 (July 18, 1997)). Either way, petitioners attest that EPA's decision to forgo stricter controls on emitters in these areas will expose them to higher ozone levels.

B. Government Petitioners

Illinois and the City of Chicago challenge the designations of Monroe, McHenry, Kenosha, Lake, and Porter counties. Illinois and Chicago are the only petitioners that filed an affidavit alleging injuries caused by emissions from Monroe County. The City of Sunland Park, New Mexico challenges the designation of El Paso County, but because we have already concluded that *Familias Unidas del Chamizal* has standing to challenge the El Paso designation, *see* Part II.A, *supra*, we need not consider Sunland Park's independent assertion of direct harm. *See Massachusetts v. EPA*, 549 U.S. 497, 518 (2007) (explaining that only one petitioner must demonstrate standing).

EPA argues that Government Petitioners such as Illinois and Chicago may not bring a *parens patriae* suit against an arm of the federal government. EPA Br. 15-17. In *Massachusetts v. Mellon*, the Supreme Court held that “a state, as *parens patriae*, may [not] institute judicial proceedings to protect citizens of the United States from the operation of the statutes thereof.” 262 U.S. at 485. Petitioners disclaim *parens patriae* status and assert standing based on “direct” injuries. Reply Br. 7-10. Alternatively, they claim that various Clean Air Act provisions supplant the *Mellon* rule.

Mellon established that states lack “standing as *parens patriae* to bring an action against the Federal Government.” *Alfred L. Snapp & Son, Inc. v. P.R. ex rel. Barez*, 458 U.S. 592, 610 n.16 (1982). In other words, state governments cannot sue the federal government on behalf of their injured state citizens. The same rule presumably applies to municipal governments. *City of Olmsted Falls, Ohio v. FAA*, 292 F.3d 261, 268 (D.C. Cir. 2002). However, *Mellon* does not apply when a state sues in its capacity as a state rather than a representative of its citizens. *See West Virginia v. EPA*, 362 F.3d 861, 868 (D.C. Cir. 2004). A government that demonstrates direct harm to its economic, environmental, or administrative interests as a result of federal action may have standing to sue the federal government. In *Massachusetts v. EPA*, for instance, the Supreme Court found standing based on the Commonwealth’s assertion of “a particularized injury in its capacity as a landowner.” 549 U.S. at 522; *see also Nat’l Ass’n of Clean Air Agencies v. EPA*, 489 F.3d 1221, 1228 (D.C. Cir. 2007); *City of Olmsted Falls*, 292 F.3d at 268 (finding standing where, on a “generous reading of the petitioner’s materials,” the City “alleged harm to its own economic interests based on the environmental impacts of the approved [agency] project”).

Illinois and Chicago submitted their first standing declaration with petitioners' opening brief. The declaration conveys expert testimony from Dr. Stephen Zemba, who described "[t]he purpose of [his] declaration" as "provid[ing] information to the Court relating to the following question: whether *residents* of the State of Illinois and City of Chicago will suffer injuries as a result of" EPA's designations. First Zemba Decl. ¶ 4 (emphasis added). Although the declaration notes that ozone "damages vegetation," *id.* ¶ 7, it does not contain direct evidence of harm to the City or State in their governmental capacities. Instead, it sounds in the language of *parens patriae*.

EPA noted this omission. EPA Br. 15-16. Illinois and Chicago responded by alleging a direct injury in their reply brief: property damage to government parks. Reply Br. 7-9. They support this claim with another declaration from Dr. Zemba. Through that declaration, Illinois and Chicago refocus their injury-in-fact claim on "harm [to] trees and other vegetation on state and city owned-and-operated lands," including "Illinois State Parks and Chicago Park District parks." Second Zemba Decl. ¶ 5, Reply Br. Attach. B. Dr. Zemba declares that emissions from the challenged areas traveled over state parks in northeast Illinois, *id.* ¶ 7, and city parks in Chicago, *id.* ¶ 8, and degraded government-owned flora.

On its own terms, this declaration demonstrates an Article III injury. As in *Massachusetts v. EPA*, Illinois and Chicago have alleged "particularized injur[ies] in [their] capacit[ies] as . . . landowner[s]," 549 U.S. at 522, so *Mellon* poses no barrier to suit. EPA, however, urges us not to consider any standing declaration submitted in the first instance with petitioners' reply brief. EPA Br. 17 n.10.

Our decision in *Sierra Club v. EPA* instructs “a petitioner whose standing is not self[-]evident” to “establish its standing by the submission of its arguments and any affidavits or other evidence appurtenant thereto at the first appropriate point in the review proceeding”—typically its opening brief. 292 F.3d at 900. But *Sierra Club* is not “a ‘gotcha’ trap,” *Am. Library Ass’n v. FCC*, 401 F.3d 489, 493 (D.C. Cir. 2005), and we retain “discretion to look beyond the opening brief and consider material submitted later if the petitioner reasonably believed its standing was self-evident,” *Del. Dep’t of Nat. Res. & Env’tl. Control v. EPA*, 785 F.3d 1, 8 (D.C. Cir. 2015) (alteration omitted) (internal quotation marks omitted).

Illinois and Chicago claim they reasonably believed their standing was self-evident. Reply Br. 8. They point to our observation in *Mississippi Commission* that ozone “has a broad array of effects on trees, vegetation, and crops,” 790 F.3d at 147, as well as statements in the administrative record by EPA and commenters reciting ozone’s harmful effects on forests, crops, and “park ecosystems around the country,” Comments of National Parks Conservation Association 1-2, J.A. 721-22; see also Guidance Memo 1, J.A. 507. Although we reiterate that litigants risk forfeiture by submitting standing declarations on reply, these petitioners could reasonably believe “that the initial filings before the court had sufficiently demonstrated standing,” *Ctr. for Sustainable Econ. v. Jewell*, 779 F.3d 588, 599 (D.C. Cir. 2015), and that the administrative record contained ample evidence supporting standing, *Am. Library Ass’n*, 401 F.3d at 494.

At oral argument, EPA raised for the first time a second objection to petitioners’ standing, namely that Monroe County emissions originate too far away from northeastern Illinois to harm the parks identified in petitioners’ second declaration. Oral Arg. Tr. 7:5-10. However, EPA has been aware since

January 25, 2019, that petitioners' standing theory relied on ozone that was carried from Monroe County to northeastern Illinois. See First Zemba Decl. ¶¶ 22-23. Dr. Zemba's initial expert declaration—submitted alongside petitioners' opening brief—made that clear. *Id.* His second declaration relied on the same ozone-transport theory and simply identified a second injury: one to government-owned vegetation rather than Chicago-area residents. See Second Zemba Decl. ¶¶ 4-8.

EPA has never directed us to evidence in the administrative record refuting petitioners' factual claims. Nor has it submitted a rebuttal affidavit. Thus, applying *Sierra Club's* summary-judgment analogy, 292 F.3d at 899, EPA has not generated a factual dispute regarding injury-in-fact, causation, or redressability. See *Massachusetts v. EPA*, 415 F.3d 50, 66 (D.C. Cir. 2005) (Tatel, J., dissenting) (“[I]f EPA wants to challenge the facts petitioners have set forth in their affidavits, it has an obligation to respond to the petitioners [with affidavits or record evidence].”), *rev'd on other grounds*, 549 U.S. 497. And even if summary judgment is an imperfect comparison, we are ill-equipped to conduct a rigorous *sua sponte* inquiry into the scientific soundness of an un rebutted expert declaration. See *id.* at 55 (majority opinion) (declining to “refer the standing issues to a special master for a factual determination” or “remand to EPA for a factual determination of causation and redressability”).

We therefore accept Dr. Zemba's affidavits for purposes of establishing Government Petitioners' standing to challenge the Monroe County designation. On their own uncontested terms, these expert declarations—relying in part on evidence from the administrative record—show that emissions from sources in Monroe County increase ozone concentrations in northeast Illinois. First Zemba Decl. ¶¶ 22-23. These heightened concentrations in turn damage vegetation in state-

and city-owned parks. Second Zemba Decl. ¶¶ 4-8. This injury is sufficiently concrete and particularized, *see Massachusetts*, 549 U.S. at 522, and the unrebutted declarations demonstrate a “substantial probability” that air quality in northeastern Illinois would be improved if EPA subjected Monroe County emitters to stricter regulation, *Sierra Club*, 292 F.3d at 899. Finally, EPA’s eleventh-hour assertion that Monroe County is simply too far away to affect the relevant area is belied by its statement that “[o]zone and ozone precursors can be transported to an area from sources in nearby areas or from sources located hundreds of miles away.” Final Designations Rule, 83 Fed. Reg. at 25,777.

Alternatively, Government Petitioners argue that the Clean Air Act displaces the *Mellon* bar and permits *parens patriae* suits. Reply Br. 10-12. We have held that “the *Mellon* bar speaks to prudential, not Article III, standing,” and that Congress may therefore enact a statute “authoriz[ing] a State to sue the federal government in its *parens patriae* capacity.” *Gov’t of Manitoba v. Bernhardt*, 923 F.3d 173, 180 (D.C. Cir. 2019). Because we conclude that Government Petitioners have adequately demonstrated standing based on direct injuries rather than *parens patriae* status, we leave this question for another day.

III.

Having established that at least one petitioner has standing to challenge each designation, we turn to the merits. In reviewing EPA’s area designations, we apply “the same standard we use in reviewing a challenge brought under the Administrative Procedure Act,” *Miss. Comm’n*, 790 F.3d at 150, “which requires the court to set aside EPA’s final actions when they are in excess of the agency’s statutory authority or otherwise arbitrary and capricious,” *Catawba*, 571 F.3d at 29 (citing 42 U.S.C. § 7607(d)(9)). “[W]e must give an extreme

degree of deference to the EPA's evaluation of scientific data within its technical expertise," *Maryland v. EPA*, 958 F.3d 1185, 1196 (D.C. Cir. 2020) (per curiam) (internal quotation marks omitted), and will "uphold its action if the record shows that the EPA considered all relevant factors and articulated a rational connection between the facts found and the choice made," *Miss. Comm'n*, 790 F.3d at 150 (internal quotation marks omitted). "That requirement is satisfied when the agency's explanation is clear enough that its path may reasonably be discerned." *Encino Motorcars, LLC v. Navarro*, 136 S. Ct. 2117, 2125 (2016) (internal quotation marks omitted). We "may not," however, "accept . . . counsel's post hoc rationalizations" for EPA's decisions; rather, the designations "must be upheld, if at all, on the basis articulated by the agency itself." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 50 (1983).

In framing their challenges to the final designations, petitioners rely on comparisons to EPA's intended designations, which do not bind EPA. Quite the opposite. The Act prescribes an iterative process in which EPA may revise its intended designations in response to states' comments. *See* 42 U.S.C. § 7407(d)(1)(B)(ii) (requiring EPA to allow states 120 days "to demonstrate why any proposed modification[s]" to the states' recommendations are "inappropriate"). Nonetheless, we have held that where EPA "rhetorical[ly] revis[es] . . . its characterization" of data between intended and final designations, that may be evidence of arbitrariness. *Catawba*, 571 F.3d at 51. As we recently explained, the relevant inquiry asks not simply whether EPA changed position, but whether the agency satisfied "its obligation 'to enable' a reviewing court to conclude that the agency's action 'was the product of reasoned decisionmaking.'" *Physicians for Soc. Responsibility v. Wheeler*, 956 F.3d 634, 646 (D.C. Cir. 2020) (quoting *State Farm*, 463 U.S. at 52).

A. Jefferson County

We first consider petitioners' challenge to EPA's attainment designation for Jefferson County, Missouri, located in the St. Louis, Missouri-Illinois metropolitan area. EPA initially announced that it would designate Jefferson as nonattainment based on its contributions to area violations, citing 2014-2016 data showing five violating monitors in the St. Louis area. Although Jefferson itself lacks a monitor, EPA concluded that the violating monitors' back trajectories "highlight[] the potential impacts to the violating monitors from the counties to the south" of St. Louis, including Jefferson. St. Louis, MO-IL Nonattainment Area, Intended Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 24, J.A. 715. The agency also emphasized that Jefferson has "among the highest NO_x and VOC emissions" and "among the highest [vehicle miles traveled]" for the area. *Id.* at 23-24, J.A. 714-15.

Despite this, EPA ultimately designated Jefferson as attainment, explaining that between Jefferson's initial and final designations, the number of violating St. Louis-area monitors dropped from five to one. *See* St. Louis, MO-IL Nonattainment Area, Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 8-9, J.A. 1167-68 ("St. Louis Final TSD"). Petitioners contend that Jefferson's attainment designation is arbitrary and capricious because (1) EPA designated similarly-situated Boles Township, located in nearby Franklin County, as nonattainment; and (2) EPA failed to address data supporting its earlier conclusion that Jefferson contributes to St. Louis-area violations. We agree on both points.

We have explained that EPA engages in "arbitrarily disparate treatment . . . if it treat[s] genuinely similar counties dissimilarly." *Miss. Comm'n*, 790 F.3d at 169 (emphasis

omitted) (internal quotation marks omitted). That is precisely what EPA did here. Both Jefferson and Boles Township contain stationary sources that emit approximately 6,000 tons of NO_x annually, and Jefferson fares worse than Franklin County on almost every other metric discussed in the final TSD: Jefferson has twice the population, is growing more than twice as fast, has more vehicle miles travelled, and has more residents that commute to St. Charles County, where the still-violating West Alton monitor is located. *See* St. Louis Final TSD 10, 11, 13, 15, J.A. 1169, 1170, 1172, 1174; Memo from Denise Scott, U.S. EPA, Office of Air Quality Planning and Standards, Air Quality Policy Division, to EPA Docket No. EPA-HQ-OAR-2017-0548, EPA Datasets Used for 2015 Ozone NAAQS Designations, J.A. 1367-68. For Franklin, moreover, EPA addressed the back-trajectory data for all seventeen of the West Alton monitor's exceedance days, but for Jefferson, the agency addressed only the back-trajectory data for the monitor's three highest exceedance days and took into account only 100-meter trajectories, while ignoring data from other exceedance days and trajectory heights. *See* St. Louis Final TSD 22-23, J.A. 1181-82.

Making matters worse, EPA treated Jefferson's data inconsistently between the intended and final designations. *See Catawba*, 571 F.3d at 52 (finding that EPA acted arbitrarily and capriciously where the agency's "rhetorical revision of its characterization" of data "[was] not justified by any change in the underlying data"). As explained above, EPA's initial TSD emphasized Jefferson's emissions and vehicle miles travelled as reasons for the agency's finding that Jefferson contributes to St. Louis-area violations. It also observed, citing HYSPLIT back-trajectory modeling, that ozone transport to the St. Louis area is predominately from the south, where Jefferson is located. EPA presented the same data in support of Jefferson's final designation but said nothing about its significance,

leaving us to conclude that EPA believed this unchanged data supports Jefferson's attainment designation—a belief that makes no sense given the agency's earlier emphasis on this very same data as evidence of contribution.

It is true, as EPA points out, that when the agency announced Jefferson's intended designation, five St. Louis-area monitors were violating the ozone NAAQS—West Alton, Maryland Heights, Orchard Farm, Clara Barton School, and Water Plant—whereas by the time of Jefferson's final designation, only the West Alton monitor continued to show violations. This, however, does nothing to bolster EPA's conclusion, implicit in Jefferson's attainment designation, that the county no longer contributes to West Alton's violations. Put differently, we cannot see how the four *other* air-quality monitors' compliance relates to the question of whether Jefferson contributes to the *West Alton* monitor's violations, and EPA does not tell us.

In any event, EPA points to nothing in the record that justifies its differing treatment of Boles Township and Jefferson County. Instead, it argues in its brief that Jefferson's largest point sources are forty-eight and fifty-one miles from the West Alton monitor, whereas Boles's major source is just thirty-nine miles away. *See* EPA Br. 24. The agency, however, nowhere specified these distances in the final TSD, and “we cannot accept . . . counsel's *post hoc* rationalizations for agency action.” *Nat'l Ass'n of Clean Water Agencies v. EPA*, 734 F.3d 1115, 1138 (D.C. Cir. 2013) (internal quotation marks omitted). To be sure, the point sources' locations are indicated on a map in the final TSD. *See* St. Louis Final TSD at 11 fig.3, J.A. 1170. Even were this sufficient to specify the distances, however, EPA nowhere explains why nine- to twelve-mile differences between the point sources' distances to the monitor justify the two areas' differential treatment.

In sum, EPA has, without explanation, treated similarly-situated areas—Jefferson and Boles—differently and drawn conflicting conclusions from the same data. “Such inconsistent treatment is the hallmark of arbitrary agency action,” and requires further explanation from EPA. *Catawba*, 571 F.3d at 51.

B. Monroe County

Petitioners next challenge EPA’s attainment designation of Monroe County, Illinois, which, like Jefferson, is located in the St. Louis metropolitan area. Also as with Jefferson, EPA initially announced its intent to designate Monroe as nonattainment based on its contributions to St. Louis-area violations. Although Monroe itself lacks a monitor, EPA concluded that it contributed to violations in nearby counties based on back-trajectory data from nearby violating monitors and data regarding Monroe’s emissions and vehicle miles travelled. Illinois concurred in EPA’s intended nonattainment designation.

Five days before EPA was due to promulgate Monroe’s final designation, however, an EPA employee emailed Illinois EPA director Alec Messina, seeking “5 min[ute]s . . . for a quick call about ozone” and explaining that then-EPA director Scott Pruitt had asked him to “reach out.” Email from Clint Woods, Deputy Assistant Adm’r, Office of Air and Radiation, U.S. EPA to Alex Messina, Dir., Ill. Env’tl. Prot. Agency (Apr. 25, 2018), J.A. 1452. The next day, Messina sent a one-page letter to Pruitt, stating, in relevant part:

I appreciate the recent opportunity for discussion of impending air quality designations for ozone as part of the 120-day consultation process. Indeed, Illinois EPA would be comfortable in an approach to such

designations that ensures national and regional consistency by considering the 2014 emissions data that evidences the county-by-county contributions of nitrogen oxides and volatile organic material. As such, it would seem appropriate to consider a designation of attainment for . . . Monroe.

Email from Alex Messina, Dir., Ill. Env'tl. Prot. Agency, to Scott Pruitt, Adm'r, U.S. EPA (Apr. 26, 2018), J.A. 1371 (“Messina Letter”). A few days later, EPA designated Monroe as attainment. In the final TSD, EPA cited the Messina Letter three times, noting that Monroe’s designation was “consistent with Illinois’ communication” in the letter. St. Louis Final TSD 25, J.A. 1184; *see also id.* at 1 n.1, 2 n.3, J.A. 1160, 1161.

Petitioners argue that EPA (1) “inadequately explained” Monroe’s attainment designation; (2) “employed an illogical process in switching [the] designation at the last minute based principally on the Messina Letter”; and (3) violated the Act’s requirement that the agency provide Illinois with 120 days’ notice before modifying its recommended designation. Petitioners’ Br. 94. We need address only the first argument because it alone demonstrates that Monroe’s designation must be remanded to EPA for further explanation.

As petitioners point out, the final TSD repeatedly cites the Messina Letter, which in turn cites the 2014-2016 monitoring data—the very data that EPA previously found supported a *nonattainment* designation. This incongruity, about which EPA says nothing in the final TSD, renders EPA’s explanation suspect. Like with Jefferson County, moreover, nothing in the final TSD disavows EPA’s initial reason for designating Monroe as nonattainment—namely, the county’s location to the south of the violating monitors, which, together with back-

trajectory data, supported EPA's finding that Monroe contributes to St. Louis-area violations. To the contrary, the West Alton monitor continued to violate the NAAQS between 2015 and 2017 and EPA itself noted that "HYSPLIT trajectories show the potential for air masses to traverse . . . Monroe." St. Louis Final TSD 26, J.A. 1185.

It is true, as EPA points out, that the final TSD notes that air trajectories that traverse Monroe on their way to the West Alton monitor subsequently pass through other, higher-emitting counties before reaching the monitor and, accordingly, that Monroe is "less likely to contribute to [West Alton's] violations. *Id.* This statement, however, leaves open the possibility that Monroe contributes to West Alton's violations—albeit, perhaps, at lower rates or less often than do neighboring counties. *Cf. Sierra Club v. EPA*, 884 F.3d 1185, 1196 (D.C. Cir. 2018) ("[D]escribing [emissions] as 'low,' even 'extremely low,' . . . implies that [they] have not been entirely eliminated."). In other words, we have no way of telling whether EPA means that, compared to neighboring counties, Monroe has a lower probability of contributing on any given day, contributes less ozone to West Alton's violations, or does not contribute at all. This is a problem because, as EPA itself explains, the agency "*must* designate as nonattainment any area that monitors a violation of the NAAQS and *any nearby areas that contribute to the violation.*" St. Louis Final TSD 6, J.A. 1165 (emphasis added).

"The outcome the EPA ultimately reached [for Monroe] may be reasonable; however, [n]ot only must an agency's decreed result be within the scope of its lawful authority, but the process by which it reaches that result must be logical and rational." *U.S. Sugar Corp. v. EPA*, 830 F.3d 579, 652 (D.C. Cir. 2016) (internal quotation marks omitted). By failing to "provide[] an explanation" for designating Monroe as

attainment “that is not premised on inconsistencies in the record,” *id.*, EPA fell short of that requirement here.

C. Ottawa County

Petitioners next challenge EPA’s attainment designation of Ottawa County, Michigan. They focus on EPA’s failure to conduct a five-factor analysis of Ottawa County’s potential contributions to NAAQS violations in two adjacent counties. Petitioners’ Br. 85-90. They contend further that any reasonable analysis would have identified ozone contributions and resulted in a nonattainment designation.

Ottawa County sits on the eastern shore of Lake Michigan between two nonattainment counties: Muskegon to the north and Allegan to the south. Although Ottawa County contains no violating monitors, the violating monitor in neighboring Allegan County is quite literally next door. *See* Mich. Dep’t of Env’tl. Quality, Recommended Area Designations in Michigan for the Ozone National Ambient Air Quality Standard 3-5 (Sept. 30, 2016), J.A. 293-95 (“Michigan Recommended TSD”); Michigan: Detroit, Muskegon County, Allegan County, and Berrien County Nonattainment Areas, Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 23 fig.7, J.A. 1130 (“Michigan Final TSD”); Oral Arg. Tr. 23:15-18 (“[T]he city of Holland where the Allegan monitor is located . . . [is] partially in Allegan and partially in Ottawa, in fact, I believe the violating monitor is actually across the street from Ottawa County.”). Michigan recommended an attainment designation for Ottawa County but nonattainment designations for Muskegon and Allegan, both of which contained violating monitors. Michigan Recommended TSD 6-9, 42-43, J.A. 296-99, 332-33. The State attributed these violations to emissions from across Lake Michigan. *See id.* at 14-15, J.A. 304-05. EPA adopted Michigan’s approach in its intended designation, *see*

Michigan: Allegan County, Berrien County, Muskegon County and Detroit Nonattainment Areas, Intended Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 20-22, J.A. 576-78, but did not include a five-factor analysis of Ottawa County.

Petitioner Sierra Club submitted comments challenging EPA's intended attainment designation of Ottawa County, arguing that because the county was clearly "nearby" the violating areas of Muskegon and Allegan counties, EPA was required to evaluate its contribution potential. Comments of Sierra Club on EPA's Intended Ozone Nonattainment Areas for Michigan 1 n.2 (Feb. 5, 2018), J.A. 757; *see also* 42 U.S.C. § 7407(d)(1)(A)(i) (requiring nonattainment designations for areas that "contribute[] to ambient air quality in a nearby area that does not meet" the NAAQS). Sierra Club also identified Ottawa County's J.H. Campbell Generating Complex as a significant source of ozone precursors based on a 2011 study showing that emissions from the plant "exceeded 1 percent of the 2015 primary ozone [NAAQS] on forty-three distinct days . . . at monitors in Muskegon, Allegan and/or Berrien Counties." *Id.* at 4, J.A. 760.

EPA made no relevant changes in its final TSD and did not add an Ottawa County contribution analysis. Michigan Final TSD 20-41, J.A. 1127-48. In response to Sierra Club's comment, EPA stated that (1) according to air-transport modeling, violations in western Michigan were caused primarily by Chicago-area emissions; (2) the Club's 2011 study was outdated because the J.H. Campbell plant had installed new pollution controls since then; and (3) the Club offered no evidence connecting the plant's emissions to "days when the relevant monitors . . . exceed[ed] the 2015 ozone NAAQS." EPA, Responses to Significant Comments on the State and Tribal Designation Recommendations for the 2015

Ozone National Ambient Air Quality Standards (NAAQS) 20 (Apr. 2018), J.A. 1206 (“EPA, Response to Comments”).

Petitioners characterize EPA’s treatment of Ottawa County as arbitrary and capricious. They point out that EPA declined to conduct the holistic contribution analysis prescribed by the Guidance Memo and contend that any such analysis would confirm that Ottawa contributes to violations in neighboring counties. EPA defends its decision not to conduct a five-factor analysis of Ottawa County and contests petitioners’ evidence of ozone contributions.

The Clean Air Act requires EPA to designate an area as nonattainment if it “contributes to ambient air quality in a *nearby* area that does not meet” the ozone NAAQS. 42 U.S.C. § 7407(d)(1)(A)(i) (emphasis added). By implication, EPA need not evaluate the contribution potential of an area without a “nearby” violation. Here, EPA announced its intention to “examine ozone-contributing emissions across a relatively broad geographic area” and to consider data “associated with the counties in the Combined Statistical Area (CSA) or, where appropriate, the Core Based Statistical Area (CBSA) in which the violating monitor(s) are located.” Guidance Memo 5, J.A. 511.

As a general matter, we see nothing wrong with EPA’s chosen approach. Because “nearby,” as used in this portion of the Act, is an ambiguous term, “*Chevron* requires that we defer to the agency’s reasonable interpretation.” *Pa. Dep’t of Env’tl. Prot. v. EPA*, 429 F.3d 1125, 1130 (D.C. Cir. 2005) (citing *Chevron U.S.A. Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 843 (1984)). And in *Mississippi Commission*, we upheld an interpretation of “nearby” akin to that in EPA’s Guidance Memo. 790 F.3d at 152. In that case, petitioner Delaware “proposed a nonattainment area that would stretch across 16

upwind states and . . . as far west as Missouri.” *Id.* at 151. Connecticut volunteered a similar transcontinental nonattainment zone. *Id.* The states argued that any area “near enough to contribute to nonattainment” was sufficiently “nearby” for Clean Air Act purposes. *Id.* (internal quotation marks omitted). We declined to adopt that interpretation and deferred to EPA’s “definitional presumption,” *id.* at 153, that a “nearby” area comprises only those “counties within the same metropolitan area as the violating county,” *id.* at 152. EPA’s approach comported with dictionary definitions of “nearby,” past agency practice, and the Act’s tendency to refer to metropolitan areas as significant geographic units. *Id.*

Elsewhere in *Mississippi Commission* we clarified that the colloquial term “metropolitan area” may describe either a Combined Statistical Area (CSA) or a Core Based Statistical Area (CBSA). *Id.* at 147 n.3. Each CBSA is composed of one Metropolitan or Micropolitan Statistical Area. Guidance Memo 5, J.A. 511. Each CSA “is formed by two or more adjacent CBSAs if there is sufficient employment interchange between them.” *Miss. Comm’n*, 790 F.3d at 147 n.3 (internal quotation marks omitted); *see also* Guidance Memo 6, J.A. 512.

According to the Office of Management and Budget’s 2013 list, which EPA used for its 2015 designations, *see* Guidance Memo 5 n.8, J.A. 511, Ottawa County is in the same CSA as Muskegon and Allegan counties, *see* Office of Mgmt. & Budget, Exec. Office of the President, OMB Bull. No. 13-01, *Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance on the Uses of the Delineations of These Areas* 33, 101 (2013). But because Muskegon and Allegan counties are both stand-alone CBSAs, Ottawa County does not share a CBSA with either violating monitor. *See id.* at 41, 72. As a result, the choice between analyzing the Muskegon and

Allegan violations on a CSA or CBSA level meant the difference between considering or ignoring Ottawa County. EPA took the latter route.

Petitioners protest that Ottawa “is directly adjacent to, and in the same metropolitan area as, a county with a violating monitor.” Reply Br. 40. The second assertion inaccurately conflates “metropolitan area” with CSA; as explained, Ottawa’s Metropolitan Statistical Area does not contain a violation. But petitioners understandably balk at the notion that Ottawa County, sandwiched between two violating monitors, is not “nearby” for contribution purposes. Petitioners’ Br. 84 n.10.

EPA responds with two explanations. First, it reasons that a CBSA-based approach makes good sense when a lakeshore county is primarily affected by cross-lake, out-of-state sources. According to EPA’s support document, “the meteorological data strongly indicates that the violating monitors in” Muskegon and Allegan counties “are predominantly affected by the transport of emissions over Lake Michigan.” Michigan Final TSD 31, J.A. 1138; *see also id.* at 20, 29, 39, J.A. 1127, 1136, 1146 (showing that exceedance-day air masses originated almost exclusively in the areas around Milwaukee and Chicago). Second, EPA points out that its treatment of Muskegon and Allegan counties is consistent with past agency practice. EPA Br. 44; *see also* Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards, Early Action Compact Areas with Deferred Effective Dates, 69 Fed. Reg. 23,858, 23,910 (Apr. 30, 2004) (listing Muskegon and Allegan separately rather than as part of a multi-county CSA).

These justifications strike us as plausible, but they arrive too late. “[T]he soundness of an agency’s decision must rest on

the reasoning contained therein, and not on any post hoc justifications offered by counsel.” *Oglala Sioux Tribe v. NRC*, 896 F.3d 520, 536 n.11 (D.C. Cir. 2018) (citing *SEC v. Chenery Corp.*, 318 U.S. 80, 87-88 (1943)). EPA failed to offer either explanation in its final rule or support documents. In fact, EPA never explained its decision to evaluate the Muskegon and Allegan violations on the CBSA level and therefore to disregard Ottawa County’s emissions. Meanwhile, petitioner Sierra Club marshalled significant evidence of Ottawa County’s contribution potential in its public comment, including the 2011 study showing that emissions from Ottawa’s J.H. Campbell facility contributed ozone in excess of 0.7 parts per billion (ppb) at the Muskegon and Allegan monitors. See Comments of Sierra Club 4, J.A. 760. Petitioners also emphasized Ottawa County’s large population and high levels of precursor emissions, categories in which Ottawa surpasses its northern and southern neighbors. See Michigan Recommended TSD at 42, J.A. 332; Comments of Sierra Club 2, J.A. 758; Michigan Final TSD 27 fig.10, 36 fig.16, J.A. 1134, 1143. This evidence is “relevant to our assessment of the reasonableness” of EPA’s unexplained failure to consider Ottawa County’s contribution potential. *Miss. Comm’n*, 790 F.3d at 153.

On this record, we agree with Petitioners that EPA’s unexplained decision to disregard Ottawa County was arbitrary and capricious. We do not question EPA’s general discretion to choose between CSA- and CBSA-level contribution analyses. Nor do we require EPA to provide an explanation in every case. No challenger could fault EPA for failing to explain why a county located hundreds of miles from any violating monitor is not a “nearby area.” But Ottawa is not such a county. It sits directly between two violating monitors—one of which lies extremely close to the county line. And the record evidence renders plausible petitioners’ assertion that Ottawa County

contributes to these ozone exceedances. On remand, EPA should either analyze Ottawa County's contribution potential or explain why that analysis is unnecessary.

D. Weld County

Petitioners challenge EPA's decision to designate the northern portion of Weld County, Colorado, a large county located north of Denver, as attainment. Petitioners advance two theories. First, they argue that, in analyzing northern Weld's contribution to Denver area exceedances, EPA improperly read a "significant contribution" requirement into the Clean Air Act's instructions to designate as nonattainment areas that "contribute[] to" exceedances. 42 U.S.C. § 7407(d)(1)(A)(i); see Petitioners' Br. 109-13. Second, petitioners argue that EPA arbitrarily drew a nonattainment boundary based on flawed analysis of topographical features and emissions data. We need not resolve the first argument because we accept the second. (That is not to suggest that EPA on remand could require a "significant contribution," but it is not apparent that EPA in fact did so, nor that petitioners have shown that the flaws in the challenged Weld County designation flow from an erroneous use of a "significant contribution" standard.) We must, in any event, remand to EPA for further consideration because we conclude that, on the record before it, EPA's nonattainment decision was inadequately supported and reasoned.

EPA analyzed Weld County as a potential contributor to the ozone exceedances recorded in the Denver nonattainment area. EPA proposed, then finalized, a nonattainment area that excluded the northern part of Weld County, bordered to the north by Wyoming. EPA explained that it excluded northern Weld because "emissions from the northern portions of Weld County were approximately 25% of NO_x and 18% of VOC total emissions in Weld County" in 2011 (the year for which Colorado provided data), and because the Denver Basin's

“unique meteorological conditions and topographical features . . . indicate that emissions in Northern Weld . . . are not likely to contribute to violating monitors.” Colorado: Denver Metro/North Front Range Nonattainment Area, Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 36, J.A. 1080 (“Denver Final TSD”). Neither explanation satisfies.

Given that Weld County sources generate exceptionally high amounts of VOCs and NO_x—mostly from oil and gas operations—the fact that northern Weld contributed only a quarter of those emissions does not support EPA’s decision not to consider them. In 2011, Weld County produced approximately six times as many VOCs and substantially more NO_x than the next-highest county included in the Denver nonattainment area; compared to the lowest-emitting county, Weld produced about sixty times as many VOCs and twenty times more NO_x. Colo. Dep’t of Pub. Health & Env’t, Technical Support Document for Recommended 8-Hour Ozone Designations 13 tbl.1-2 (Sept. 15, 2016), J.A. 103. And, even if the northern part of Weld County were viewed separately, the volume of its emissions alone in 2011 approached or exceeded those of several entire counties in the nonattainment area that year. *See id.* at 12-13, J.A. 102-03. EPA could not rationally rule out contribution from northern Weld by downplaying the area’s proportionate contribution to the county’s overall, excessive emissions.

Nor does EPA coherently explain its conclusion that local topography and meteorology prevent northern Weld from contributing to Denver exceedances. EPA contends that a topographical feature called the Cheyenne Ridge “restrict[s] contributions from sources on the upper reaches of and beyond the feature[,], including” northern Weld County, from reaching monitors further south in the Denver Basin. Denver Final TSD

33, J.A. 1077; *see also id.* at 27, J.A. 1071. EPA similarly asserts that the Cheyenne Ridge “roughly coincide[s] with” the boundary of the nonattainment area bisecting Weld County. *Id.* at 33, J.A. 1077.

But, in Colorado’s initial submission, cited by EPA in the final TSD, the state accurately located the Cheyenne Ridge farther north, “along Colorado’s border with Wyoming.” *Id.* at 27, J.A. 1071. EPA’s initial TSD nonetheless mistakenly located northern Weld outside the Denver Basin, requiring it to clarify in its final TSD that northern Weld “include[s] the elevated terrain which forms the norther[n] boundary of the Denver Basin,” namely, “the southern aspect [of] Cheyenne Ridge.” *Id.* at 36, J.A. 1080. Moreover, maps included in the final TSD reflect no topographical basis at all for northern Weld’s exclusion; they show no distinctly elevated terrain walling off northern Weld from the rest of the Denver basin, *see id.* at 34 fig.15, J.A. 1078, and show northern Weld only at an elevation comparable to that of Denver itself, where violating monitors are located, *see id.* at 37 fig.16, J.A. 1081. In light of EPA’s conflicting characterizations of the topographical and meteorological data, its central reliance on one—apparently mistaken—interpretation of those data to justify the Weld County nonattainment boundary is arbitrary and capricious.

E. Lake County

Petitioners also challenge Lake County, Indiana’s attainment designation. EPA initially planned to designate all of Lake as nonattainment based on its contributions to Chicago-area violations, but ultimately confined the nonattainment designation to the county’s northern portion. Petitioners contend that Lake’s designation is unreasonable because EPA failed to identify any “material change” justifying its change of position, Reply Br. 13, and treated Lake

dissimilarly from similarly-situated neighboring Kane County, which has lower emissions but was designated as nonattainment in its entirety. We disagree.

Lake's designation is consistent with the Guidance Memo and reasonably explained in the final TSD. As EPA explained in the Guidance Memo, "[w]hile the EPA generally believes it is appropriate to include the entire violating or contributing county in an ozone nonattainment area, . . . in some cases, an assessment of relevant information may support inclusion of only part of a county." Guidance Memo 7, J.A. 513. Here, northern Lake not only contains all of the county's point sources, but also accounts for 88% of the county's population, 98% of its NO_x point-source emissions, and 99% of its VOC emissions. See Chicago, IL-IN-WI Nonattainment Area Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 25, J.A. 1293. The differing designations thus reflect the differences in the two areas' data and, accordingly, a "rational connection between the facts found and the choice made." *Encino Motorcars*, 136 S. Ct. at 2125 (internal quotation marks omitted); see also *Catawba*, 571 F.3d at 42 (finding "no fault" in EPA's decision to designate as nonattainment a township with an emitting source rather than the entire county).

Petitioners' two arguments to the contrary are unpersuasive. First, our court has never said that EPA automatically acts unreasonably when it alters a nonattainment boundary with no "material change" in data. Reply Br. 13. To the contrary, we have emphasized that "EPA's burden to justify [a] change in policy . . . [does] not require[] [it] to refute the factual underpinnings of its prior policy with new factual data." *U.S. Sugar Corp.*, 830 F.3d at 626. Rather, "[EPA] only need[s] to provide a reasoned explanation for discounting the importance of the facts that it had previously relied upon,"

id.—a requirement EPA satisfied here by explaining that Lake’s final nonattainment area encompasses the vast majority of the county’s emitting sources. Second, the agency’s differing treatment of Lake and Kane was perfectly appropriate given that Kane’s point sources are scattered across the county, whereas Lake’s sources, as noted above, are clustered in its northern half.

F. Sheboygan and Door Counties

Petitioners challenge as arbitrary and capricious EPA’s decision to designate nine Wisconsin counties located along or near the Lake Michigan shoreline as either in partial or full attainment. EPA does not defend its designations for seven of those counties: Milwaukee, Ozaukee, Waukesha, Washington, Racine, Manitowoc, and Kenosha. *See* EPA Br. 59 & nn.29-30. As discussed below, we treat EPA’s decision not to defend those designations as a concession that they are arbitrary and capricious. As for the two Wisconsin designations EPA defends, Sheboygan and Door, our review persuades us that those designations, too, are arbitrary and capricious.

1. Sheboygan County

According to Wisconsin’s certified 2014-2016 data, a monitoring site located on Sheboygan County’s Lake Michigan shorefront exceeded the 2015 NAAQS by nine ppb. *See* Wis. Dep’t of Nat. Res., 2015 Ozone National Ambient Air Quality Standards Area Designations: Technical Support Document 7 tbl.2.1 (Apr. 2017), J.A. 422 (“Wisconsin Recommended TSD”). A second monitor in Sheboygan County, located 3.2 miles inland, reported air quality in attainment with the NAAQS. *See id.* EPA initially proposed a 3.2-mile-wide nonattainment boundary along the shoreline of Sheboygan County, observing that Sheboygan’s emissions were “relatively low” but “not trivial,” and concluding that violating

design values extended no further inland than the attaining monitor. Wisconsin: Milwaukee Area, Sheboygan County Area, Manitowoc County Area, Door County Area, Intended Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 43, J.A. 652 (“Wisconsin Intended TSD”). EPA therefore drew the boundary of the nonattainment area to encompass sources accounting for a substantial percentage of the county’s emissions, and to “conservatively capture the likely spatial extent of the violating area.” *Id.*

In comments on the proposed designation, Wisconsin objected that EPA had not sufficiently credited the state’s technical analyses. Wisconsin attributed all violations within the counties EPA initially designated as nonattainment to pollution from other counties or states, including ozone transported to Wisconsin over Lake Michigan via “lake breeze” meteorology. Letter from Gail Hood, Director, Air Mgmt. Program, Wis. Dep’t of Nat. Res., to Robert Kaplan, Acting Reg’l Adm’r, EPA - Region 5, at 2 (Apr. 20, 2017), J.A. 405-06; *see also* Wisconsin Recommended TSD 10-14, J.A. 425-29.

EPA’s final designation reduced the Sheboygan nonattainment area to extend only 2.3 rather than 3.2 miles inland from the lakeshore. Wisconsin: Northern Milwaukee/Ozaukee Shoreline Area, Sheboygan County Area, Manitowoc County Area, Door County Area, Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document 41, J.A. 1334 (“Wisconsin Final TSD”). Reversing its initial assessment of data and analyses submitted by Wisconsin, EPA concluded that it lacked “sufficient evidence” of any contribution from Sheboygan-area emissions. *Id.* EPA’s final designation also adopted Wisconsin’s tightly confined estimate of the violating

area, rather than EPA's prior, "conservative[]" estimate. Wisconsin Intended TSD 43, J.A. 652.

Petitioners contend that EPA has not adequately justified its final nonattainment boundary in Sheboygan County. Petitioners point out that the TSD supporting EPA's final designations relied on multiple analyses submitted by Wisconsin that, in response to comments and in the final TSD, EPA had said it could not fully assess or had determined to be seriously flawed. For example, EPA observed that Wisconsin's source-apportionment modeling—which extrapolated the origins of emissions contributing to ozone at Sheboygan's violating monitor—attributed only twelve percent of the detected ozone to sources within Wisconsin. *See* Wisconsin Final TSD 40, J.A. 1333. However, as EPA itself acknowledged, Wisconsin "did not provide any details on the source apportionment modeling" or any information "on specific methods used to calculate design value contributions from the source apportionment modeling outputs," which would be necessary to meaningfully assess the modeling analysis. *Id.* at 40 n.32, J.A. 1333; *see also id.* at 25 n.23, J.A. 1318. Without further explanation, therefore, EPA could not reasonably rely on Wisconsin's source-apportionment modeling.

EPA also cited Wisconsin's modeling of a hypothetical ten-percent reduction in emissions from stationary and nonroad sources "across a 10-county area that includes Sheboygan County," which purported to show that such emission reductions would produce no "meaningful reduction in ozone design values" at the Sheboygan County monitor. *Id.* at 40, J.A. 1333. But, as far as EPA was able to analyze the model, it was critically flawed: The "base case" omitted certain sources accounting for between twenty-five and forty percent of emissions in the studied area. *Id.* at 40 n.33, J.A. 1333. In

addition, in response to comments encouraging EPA to rely on Wisconsin's ten-percent reduction scenario, which EPA had not mentioned in its proposed designations, EPA cautioned that a partial-emissions cut scenario was not particularly informative. EPA specifically noted that, "[d]ue to the nonlinear nature of ozone chemistry," the impact of specific emissions changes "cannot be used to infer the overall impact that results from total emissions." EPA, Response to Comments 27, J.A. 1213.

Further, without explanation, EPA excluded from its final contribution analysis HYSPLIT trajectories of air parcels shown to arrive at the Sheboygan violating monitor at heights of 500 and 1,000 meters. Looking to trajectories only at the 100-meter level, which pass predominantly over Lake Michigan, rather than the 500- and 1,000-meter trajectories, which pass predominantly over Sheboygan County, EPA concluded that "air parcels traveled almost exclusively" over the lake to reach the monitor. Wisconsin Final TSD 38 & fig.6, J.A. 1331. In its proposed designations, however, EPA had analyzed trajectories at all three heights, and in response to comments EPA affirmed that trajectories originating at all three heights "are relevant in assessing transport of air parcels for potential contribution." EPA, Response to Comments 28, J.A. 1214. EPA has not explained its failure to account for admittedly pertinent data in its final designation for Sheboygan.

In defending its decision to this court, EPA disclaims reliance on the selective HYSPLIT consideration, or the ten-percent emissions-cut photochemical sensitivity modeling or source-apportionment modeling. *See* EPA Br. 35-36; Oral Arg. Tr. 55:14-25. EPA instead asserts that its shift between the proposed and final designations turned on two other analyses submitted by Wisconsin: (1) an "inland penetration analysis,"

which showed a correspondence between inland penetration of a lake breeze and ozone levels recorded at the lakeshore and inland Sheboygan monitors; and (2) photochemical modeling of an emissions “zero-out” scenario, which predicted that elimination of all man-made emissions in Sheboygan County would result in no improvement in design values at the violating monitor. EPA Br. 30-34. EPA argues that, on closer inspection, those analyses persuaded it that lake breeze was the sole culprit for ozone violations in Sheboygan County.

“EPA ‘retains a duty to examine key assumptions as part of its affirmative burden of promulgating and explaining a non-arbitrary, noncapricious rule.’” *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998) (quoting *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 534 (D.C. Cir. 1983)). With respect to both the inland-penetration analysis and the zero-out modeling, EPA’s explanation falls short, rendering the Sheboygan designation decision arbitrary and capricious.

First, even as EPA now says the inland-penetration analysis suggests that ozone travels across Lake Michigan to Sheboygan monitors, the agency did not account for additional contribution from local emissions. Wisconsin’s own data show that local Wisconsin pollution “contribut[es] to the Sheboygan County violating monitor.” Wisconsin Final TSD 40, J.A. 1333. As EPA explained in response to comments questioning its initial nonattainment designation of portions of the Milwaukee area subject to lake breeze: “That an area experiences lake breeze meteorology is alone not mutually exclusive with a determination that an area may also contribute to its own ozone violations.” EPA, Response to Comments 31, J.A. 1217. Moreover, EPA seriously equivocated as to its understanding of the effects of the lake breeze, admitting that “many details of the various factors regarding how the local

lake breeze . . . influences ozone production and transport around Lake Michigan are episode-specific and not well-understood,” and that “[t]here are gaps in the peer-reviewed scientific literature on this topic.” Wisconsin Final TSD 11-12, J.A. 1304-05. EPA insists that it nevertheless understands the “basic concepts of lake breeze meteorology and its potential to influence ozone production and transport . . . well enough to place significant weight on the effects of lake area meteorology on the analysis of both the area determined to violate the ozone NAAQS and emissions contribution from nearby sources.” *Id.* at 12, J.A. 1305. But EPA has failed to explain how, even assuming the propriety of placing “significant weight” on lake breeze effects, that analysis could justify disregarding emissions originating inside Sheboygan County. *See Columbia Falls*, 139 F.3d at 923. After all, Sheboygan emissions need not be a “but-for cause of a violation,” *Miss. Comm’n*, 790 F.3d at 163, but may “contribute” even if they “simply exacerbate [the] problem rather than cause it,” *Catawba*, 571 F.3d at 39.

In court EPA contends that the zero-out modeling provides the missing link for its sole-causation conclusion—i.e., that elimination of emissions that originate in Sheboygan County would result in no improvement in measured ozone. *See* EPA Br. 36. But it is far from clear from the record that EPA fulfilled its responsibility to verify the zero-out modeling, let alone that the agency intended the modeling to bear critical weight in supporting the Sheboygan designation. EPA introduced the zero-out modeling only at the end of its analysis of Sheboygan County, in the last sentence of an addendum to its five-factor contribution analysis titled “Additional Information.” *See* Wisconsin Final TSD 39-40, J.A. 1332-33. EPA there noted that Wisconsin had “provided information suggesting emissions levels from sources in the immediate area are not highly correlated with high ozone values.” *Id.* at 40, J.A. 1333. EPA cautioned, however, that “[s]ome aspects of

[Wisconsin's] claims are difficult to fully evaluate because EPA does not have the details necessary to fully review the emissions reduction modeling analyses that these claims are based on." *Id.* EPA then briefly described the results of Wisconsin's ozone source-apportionment modeling, its hypothetical ten-percent emissions-reduction modeling, and "a 'zero-out Sheboygan run'" under Wisconsin's model. *Id.*

EPA's counsel now argues that the agency's qualification that it could not "fully review [Wisconsin's] emissions reduction modeling analyses" meant to temper only its reliance on the source-apportionment and ten-percent emissions-reduction modeling, and that EPA was, in contrast, confident in the model and the assumptions to which it was applied in the zero-out scenario. Oral Arg. Tr. 55:20-56:23 (citing J.A. 455-56). The record does not reflect grounds for EPA's differential crediting of those data; it contains no explanation why, for example, EPA relies on the zero-out analysis even as it disavows the ten-percent emissions-reduction data derived from the same model.

In sum, we cannot say that, on the record assembled by EPA, "the evidence supports the [attainment] designations EPA promulgated." *Catawba*, 571 F.3d at 52. We remand the designation to EPA to provide explanation how the evidence supports its attainment designation, or to make a different designation if it concludes on re-examination that the evidence so requires.

2. Door County

Door County's single monitor, perched at the tip of a roughly seventy-five-mile-long peninsula extending into Lake Michigan, reported design values exceeding the ozone NAAQS by two ppb. EPA proposed to designate as nonattainment the upper half of the Door County peninsula, where the violating

monitor and most of the sources producing Door County's "not trivial" but "relatively low" emissions are located. Wisconsin Intended TSD 72-73, J.A. 681-82. Arguing that exceedances at the monitor resulted from pollution in other counties and states, and that NAAQS exceedances were unlikely to occur anywhere in Door County except at the violating monitor, Wisconsin advocated instead for a 3.7-square-mile nonattainment area limited to the state park where the monitor is located. Ultimately, as with Sheboygan County, EPA concluded that it did not have "sufficient evidence that these other portions of Door County contribute to air quality at the violating monitor" and accepted Wisconsin's proposed drastic diminution of the nonattainment area. Wisconsin Final TSD 70, J.A. 1363.

Petitioners challenge Door County's constricted final nonattainment area, arguing that EPA did not adequately explain why it ignored local emissions it previously identified as contributing to Door County violations. Our review of the record confirms the inadequacy of the agency's explanation.

Without explaining its extrapolation from the Sheboygan lake-breeze analysis, EPA applied the conclusions of the Sheboygan study to Door County. It did so in the face of its own description of lake-breeze meteorology as "episode-specific" and its warning that the Sheboygan study was not generalizable. Wisconsin Intended TSD 43, J.A. 652; *see also* EPA, Response to Comments 31, J.A. 1217. In particular, EPA had noted that a reason it was able to justify a narrow nonattainment area in Sheboygan "is the existence of a second ozone monitor in Sheboygan [C]ounty which is attaining the standard coupled with [Wisconsin Department of Natural Resources'] lake breeze inland penetration distance analysis." EPA, Response to Comments 31, J.A. 1217. Door County had no second, inland monitor, nor had Wisconsin conducted any inland-penetration analysis there.

As it did for Sheboygan County, EPA cited Wisconsin's source-apportionment analysis and ten-percent emissions cut simulation, and looked exclusively to 100-meter HYSPLIT trajectories, most of which pass over Lake Michigan. See Wisconsin Final TSD 67 & fig.6, J.A. 1360. (Wisconsin did not submit modeling of a zero-out scenario for Door County.) EPA suggests in its briefing that the agency considered HYSPLIT trajectories at all heights, "as memorialized by a map in the final designations showing trajectories at all three levels." EPA Br. 41. But that is belied by EPA's own record statement immediately following the map, adopting Wisconsin's position that only 100-meter paths are relevant and pointing out the position of those paths on the map. As it had in the Sheboygan final designation, EPA cautioned with respect to Door County that it "[d]id not have the details necessary to fully review the emissions reduction modeling analyses" underlying Wisconsin's claim that "emissions reductions from sources in Door County and other upwind lakeshore counties [would] have little to no impact on high ozone values at the violating monitor." Wisconsin Final TSD 69, J.A. 1362. Wisconsin simply "did not provide any details" on either the source-apportionment or ten-percent emissions cut modeling, *id.* at 69 n.48 & 49, J.A. 1362, which prevented EPA from fulfilling its "duty to examine key assumptions as part of its affirmative burden of promulgating and explaining a non-arbitrary, noncapricious rule," *Columbia Falls*, 139 F.3d at 923 (quoting *Small Refiner*, 705 F.2d at 534). As we have explained above, EPA cannot reasonably rely on those analyses, at least without explaining how EPA could rely on their conclusions without validating, or even understanding, their methodology.

Rather than countering petitioners' arguments, EPA contends that the initial Door County designation, like the final designation, reflected a judgment that no sources within the county contributed to Door County's recorded violation; the

final designations merely narrowed EPA's estimation of the area shown to be in violation due to external sources. Even assuming that to be the case, EPA's final reasons for disavowing local contribution are flawed for the reasons just identified. EPA also utterly failed to explain why it believes violating design values vanish at the boundaries of a state park rather than extending further inland or along the coastline of the peninsula, as EPA believed to be the case for Sheboygan and Manitowoc Counties.

We therefore remand to "give EPA another opportunity to provide a coherent explanation for its designation." *Catawba*, 571 F.3d at 52.

G. McHenry, Porter, El Paso, Manitowoc, and Milwaukee-area Counties

In response to the petitions challenging EPA's designations for McHenry County, Illinois; Porter County, Indiana; El Paso County, Texas; Manitowoc County, Wisconsin, and several Milwaukee, Wisconsin-area counties, EPA offers no defense. Instead, it asks us to remand those designations for further explanation.

"We generally grant an agency's motion to remand so long as the agency intends to take further action with respect to the original agency decision on review." *Util. Solid Waste Activities Grp. v. EPA*, 901 F.3d 414, 436 (D.C. Cir. 2018) (internal quotation marks omitted). That said, "[w]e have broad discretion to grant or deny [such a motion]," and in exercising that discretion "we consider whether remand would unduly prejudice the non-moving party" and the reasons for the remand. *Id.* We have explained, for example, that remand may be appropriate to "allow[] agencies to cure their own mistakes rather than wasting the courts' and the parties' resources reviewing a record that both sides acknowledge to be incorrect

or incomplete,” or “in response to intervening events outside of the agency’s control,” including “a new legal decision or the passage of new legislation.” *Id.* (internal quotation marks omitted); *see also, e.g., id.* at 426 (explaining that statutory revisions authorized new regulatory options and EPA sought an opportunity to “decide[] whether or not to alter some of its regulatory choices” (internal quotation marks omitted)); *Ethyl Corp. v. Browner*, 989 F.2d 522, 523 (D.C. Cir. 1993) (noting “[t]he Administrator[’s] acknowledg[ment] that evidence developed since denial of the waiver has undermined the stated basis for denial”); *Nat’l Fuel Gas Supply Corp. v. FERC*, 899 F.2d 1244, 1249-50 (D.C. Cir. 1990) (remanding to afford agency “the first word on how an intervening change in law affects an agency decision pending review”).

Here, EPA has neither conceded the record’s infirmity nor identified any intervening events. Indeed, EPA told us virtually nothing about why it has chosen not to defend the designations or how it would proceed upon remand. Instead, expressly disclaiming any “error or impropriety,” EPA informs us that

in hindsight (including after considering Petitioners’ brief), EPA believes that the Court could benefit from additional explanations of the remaining designations. . . . [Remand] could potentially entail a range of actions, such as supplementing the record, additional communications with states, . . . undertaking the 120-day notice process[,] . . . or modify[ing] the remaining designations in ways that could moot Petitioners’ challenges or at least narrow issues for judicial review.

EPA Br. 59-60. Although an agency need not “confess error or impropriety in order to obtain a voluntary remand,” *Limnia*,

Inc. v. U.S. Dep't of Energy, 857 F.3d 379, 387 (D.C. Cir. 2017), we have found no cases where, as here, an agency has neither explained why it seeks remand nor committed to a course of action. *Cf. Util. Solid Waste*, 901 F.3d at 436 (noting that “even if there are no intervening events, the agency may *request* a remand . . . to reconsider its previous position” (emphasis added) (internal quotation marks omitted)).

Emphasizing that EPA has not “identif[ied] any new evidence or intervening events that undermine the . . . designations,” intervenors oppose EPA’s motion, urging us to reach the petitions’ merits. Wisconsin Br. 35. But they identify no “undu[e] prejudice” from granting the motion. *Util. Solid Waste*, 901 F.3d at 436. True, as intervenors argue, remand could require them “to submit new or updated evidence and analysis, participate in another round of notice and comment, and re-litigate the next petition for review.” Wisconsin Br. 36; *see also, e.g.,* El Paso Chamber of Commerce Br. 13-14. As this court has explained, however, “[b]y statute EPA can *at any time* redesignate [areas designated as attainment]”—like those in question here—“with nothing more than a reasoned explanation.” *Masias v. EPA*, 906 F.3d 1069, 1074 (D.C. Cir. 2018) (citation omitted) (internal quotation marks omitted); *see also* 42 U.S.C. § 7407(d)(3)(A) (authorizing the Administrator to “at any time” redesignate areas designated as attainment or unclassifiable, using the same general process as for initial designations). Intervenors, in other words, face these potential costs regardless of whether we grant EPA’s motion and, given this, such costs hardly constitute “undu[e] prejudice,” *Util. Solid Waste*, 901 F.3d at 436.

Petitioners argue that simply remanding the designations will permit “uncabined agency delay” and, accordingly, that we should also vacate the designations so that EPA will again be “subject . . . to a firm deadline for corrective actions it claims

it wants to undertake.” Reply Br. 58, 60. In support, they invoke the Act’s requirement that EPA issue designations “as expeditiously as practicable, but in no case later than 2 years from the date of promulgation of [a] . . . revised [NAAQS].” 42 U.S.C. § 7407(d)(1)(B)(i).

Based on the particular circumstances of this case—EPA’s failure to give any reason for the remand and the absence of any undue prejudice—and given the “extreme degree of deference [we owe] to the EPA’s evaluation of scientific data within its technical expertise,” *Maryland*, 958 F.3d at 1197 (internal quotation marks omitted), we think the best course of action is to treat EPA’s motion as a concession that its explanations fall short of the Clean Air Act’s requirement of reasoned decisionmaking, grant the motion to remand, and impose a deadline on the issuance of revised designations. Regarding the timing requirement, both circuit precedent and the Clean Air Act support our authority to direct EPA to complete the remand “as expeditiously as practicable.” 42 U.S.C. § 7407(d)(1)(B)(i); *see also, e.g., Nat. Res. Def. Council v. EPA*, 22 F.3d 1125, 1136-37 (D.C. Cir. 1994) (per curiam) (imposing “accelerat[ed] deadlines for EPA’s approval or disapproval of state implementation plans “because the EPA, by ignoring the statutory deadline for promulgating guidance, was responsible for the tardy submission of [those plans]”); *Env’tl. Def. Fund v. EPA*, 852 F.2d 1316, 1331 (D.C. Cir. 1988) (“EPA’s history of delay and missed deadlines with respect to its statutory obligations . . . indicates that a court-imposed schedule is necessary here.”); *Sierra Club v. EPA*, 719 F.2d 436, 469-70 (D.C. Cir. 1983) (directing EPA to promulgate new Clean Air Act regulations within six months, i.e., “the period originally specified by Congress”). EPA offers no reason, nor can we think of one, why it should be permitted to evade the Clean Air Act’s statutory deadline through a voluntary remand.

To be sure, as EPA points out, in *Vermont Yankee Nuclear Power Corp. v. Nat. Res. Def. Council*, 435 U.S. 519 (1978), the Supreme Court cautioned that, “[a]t least in the absence of substantial justification for doing otherwise, a reviewing court may not, after determining that additional evidence is requisite for adequate review, proceed by dictating to the agency the . . . time dimension of the needed inquiry and ordering the results to be reported to the court without opportunity for further consideration on the basis of the new evidence by the agency.” *Id.* at 544-45 (quoting *Fed. Power Comm’n v. Transcon. Gas Pipe Line Corp.*, 423 U.S. 326, 333 (1976)). Here, however, Congress, not “the reviewing court,” has “dictat[ed] . . . the time dimension” for EPA action. *Id.* Far from “propelling the court into the domain which Congress has set aside exclusively for the administrative agency,” *id.* at 545 (quoting *SEC v. Chenery Corp.*, 332 U.S. 194, 196 (1947))—the Court’s concern in *Vermont Yankee*—imposing a deadline is in keeping with Congress’s purpose of ensuring timely area designations. We therefore require EPA to issue revised designations as expeditiously as practicable.

IV.

This brings us, finally, to petitioners’ argument that with respect to the petitions we grant, we should vacate the area designations rather than simply remand them to EPA for further explanation. As we have recognized, the Act “confers broad discretionary authority” on EPA to determine when an area “contributes” to a “nearby” violation. *Catawba*, 571 F.3d at 39. Given this, despite the deficiencies in EPA’s current explanations, we think there is at least a realistic possibility that EPA will be able to substantiate the relevant designations on remand. See *Allied-Signal, Inc. v. NRC*, 988 F.2d 146, 150-51 (D.C. Cir. 1993) (explaining that “[t]he decision whether to vacate depends on the seriousness of the order’s deficiencies (and thus the extent of doubt whether the agency chose

correctly) and the disruptive consequences of an interim change that may itself be changed” (internal quotation marks omitted)). Petitioners concede, moreover, that vacatur would leave areas “undesignated” for purposes of the 2015 ozone NAAQS, Reply Br. 60, and nothing about that status will immediately subject the areas to more stringent environmental controls. We accordingly remand the unlawful attainment designations to EPA without vacating them.

V.

For the foregoing reasons, we (1) grant EPA’s motion to remand the designations of McHenry County, Porter County, El Paso County, Manitowoc County, and the Milwaukee-area counties for further explanation; (2) grant the petitions for review of the designations of Jefferson County, Monroe County, Ottawa County, Weld County, Door County, and Sheboygan County; and (3) deny the petition for review of Lake County’s designation. The defective designations are remanded to EPA with directions to complete the remand as expeditiously as practicable.