ONLY BILATERAL AGREEMENTS CAN STOP WILDFIRES: WHY DIPLOMACY THROUGH THE U.S.–CANADA AIR QUALITY AGREEMENT (AQA) IS A SOLUTION FOR WILDFIRE RELATED TRANSBOUNDARY POLLUTION

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I. INTRODUCTION

Air pollutants know no borders. They can traverse any geopolitical or internationally-recognized boundary without consequence. The physical environment, atmosphere, human health, and relationships between nations face detrimental ramifications. International customary law is the vessel for assigning the responsibility of damage one country causes to another regarding transboundary pollution.[1] For example, black carbon (in the form of smoke from wildfires) is crossing between the U.S. and Canada's border, causing environmental damage in the other's jurisdiction.[2] Wildfires may not be a new emission source, but recently they are a rising concern because they are starting at an "unprecedented" rate.[3] Hundreds of thousands of acres of land have burned in both the U.S. and Canada, costing both countries billions of dollars annually in damages.[4] Wildfires damage the physical land, air quality, and human health. Additionally, latent environmental damage occurs when wildfires release black carbon into the atmosphere, which can travel at high speeds for long distances into another country.[5]

The U.S. and Canada have historically been able to amicably create solutions to divide the responsibility of air and water resources and the responsibility of damage caused to those resources.[6] For example, U.S. and Canadian citizens advocated for their governments to address acid rain.[7] Both

1. *See Customary International Law*, CORNELL L. SCH., https://www.law.cornell.edu/wex/customary_international_law (last visited July 31, 2022) (defining "customary international law").
2. *See infra* note 16 ("[r]ecognizing the existence of possible adverse effects, in the short and long term, of air pollution including transboundary air pollution").
3. *See* Jonathon Lash & Fred Wellington, *Competitive Advantage on a Warming Planet*, HARVARD BUS. REV., Mar. 2007, at 1, 2–3 (describing wildfire's growing threat to the physical environment).
4. *Id.* at 2
5. *See infra* note 9 (defining and discussing black carbon).
6. *See infra* Part III (discussing the U.S. and Canada Air Quality Agreement).
7. *See* MICHAEL I. JEFFREY, *Transboundary Pollution and Cross-Border Remedies*, 18 CAN.-U.S. L. J. 173, 175 (1992).

nations entered into the U.S. and Canada Air Quality Agreement (AQA) to address the issue of transboundary acid rain pollution.[8] Pollutants released from one location travel long distances affecting air quality many miles away from the original source.[9] The President of the Canadian Association of Fire Chiefs (CAFC) stated in July 2021 that Canada surpassed "what we would have the whole wildfire season, so it's quite daunting right now."[10] On the other side of the border, the U.S. is dealing with the same problem. The Canadian Government investigated the impacts of climate-change-driven wildfires, which revealed that people across the country are breathing in more wildfire smoke than before.[11] The investigation also found a significant increase in the number of days people are exposed to wildfire smoke.[12] The dangerous black carbon from these fires can travel and affect people more than 3,000 miles away.[13] Yet, the real issue is more profound than just wildfires. The AQA must be a vessel to extinguish the cause of wildfires: poor land use planning and forest management.

Part I in this note explains why poor land use planning and forest management cause significant transboundary wildfire pollution. Part II establishes: background on transboundary pollution's definition and history; impact on geopolitics and the environment; and distinguishes between different forest types concerning their deposition and climate. Next, Part II explains the extensive issues with current land-use practices and forest mismanagement in the U.S. and Canada. Lastly, Part II details the natural and anthropogenic causes of wildfires and their significant contribution to air pollution. Part III analyzes the U.S. and Canada AQA as a mechanism for addressing transboundary pollution. Then, Part III goes into the Agreement's procedures, using acid rain as an example. Next, Part III mirrors acid rain's journey through the Agreement with a theoretical investigation into wildfires as a transboundary pollutant. Finally, within this examination, Part III suggests policies, practices, and regulated and unregulated activities that the International Joint Commission (IJC) could implement to solve transboundary wildfire pollution.

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8. *See infra* Part III (discussing the U.S. and Canada Air Quality Agreement).

9. *U.S.-Canada Air Quality Agreement*, U.S. ENV'T. PROT. AGENCY, https://www.epa.gov/airmarkets/us-canada-air-quality-agreement (last visited Mar. 17, 2022).

10. Saba Aziz, *A look at Canada's Wildfires in Numbers and Graphics Over the Decades*, GLOB. NEWS (July 21, 2021), https://globalnews.ca/news/8045796/canada-wildfires-yearly-trends/.

11. *See* Alison Saldanha et al., *Dangerous Air: As California Burns, America Breathes Toxic Smoke*, INSIDE CLIMATE NEWS, Sept. 28, 2021 (stating "Americans across the country are breathing more wildfire smoke—and the harmful particles it carries—than they did 10 years ago, and their health is suffering the consequences.")

12. *Id.* at 2.

13. CAMP FIRE AIR QUALITY DATA ANALYSIS, ii (Cal. Air Res. Bd. Jul. 2021).

II. BACKGROUND

A. Defining Transboundary Pollution and its Impacts on Geopolitics and the Environment.

Polluted air particles do not stop at an invisible line for border patrol.[14] Transboundary pollution is not a recent development nor a simple policy problem for neighboring countries. The EPA defines transboundary pollution as "pollution [which] neither recognizes nor respects territorial boundaries."[15] Typically, anthropogenic means are a common cause of pollution that traverses geopolitical borders.[16] Such pollution could taint the shared air, public and private waters, and groundwaters between two or more nations.[17] "Transboundary air pollution occurs when a pollution source in one country creates a pollutant that crosses into the territory of another country."[18] Transboundary air pollution has become an increasing issue between North American countries, especially in light of the intense wildfires in the U.S. and Canada.[19] Air pollution, such as Clean Air Act (CAA) regulated greenhouse gasses (GHGs) or National Ambient Air Quality Standards (NAAQS) regulated black carbon particles,[20] can travel hundreds of miles away from the emission's source.[21] Consequently, transboundary air pollution poses an increasing threat to international legal systems protecting multiple nations' sovereignty, health, and environment.[22]

In a geopolitical sense, transboundary pollution is difficult to regulate and strains the legal and political relationships between countries. For example, a country with a pollutant source may be reluctant to impose legal directives over relevant, pollution-causing industries (i.e., the land use

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14. *Transboundary Air Pollution*, U.S. ENV'T. PROT. AGENCY, https://www.epa.gov/international-cooperation/transboundary-air-pollution (last visited Mar. 17, 2022).

15. Michael I. Jeffrey, *Transboundary Pollution and Cross-Border Remedies*, 18 CAN.-U.S. L. J. 173, 173 (1992).

16. *See* Geneva Convention on Long-Range Transboundary Air Pollution art. 1, Jun. 6, 1981, 6 U.S.T. 0129 (defining air pollution and long-range transboundary air pollution).

17. *Id.*

18. Jeffrey L. Roelofs, *United States-Canada Air Quality Agreement: A Framework for Addressing Transboundary Air Pollution Problems*, 26 CORNELL INT'L L.J. 421, 421 (1993); *see also Canada-United States Air Quality Agreement*, INT'L JOINT COMM. § 1 https://ijc.org/en/mission/air-quality-agreement (last visited Jan. 23, 2022) (defining "air pollution" as, "the introduction by man, directly or indirectly, of substances into the air resulting in deleterious effects of such a nature as to endanger human health, harm living resources and ecosystems and material property and impair or interfere with amenities and other legitimate uses of the environment").

19. *Transboundary Air Pollution*, *supra* note 14.

20. NAAQS TABLE, U.S. ENV'T. PROT. AGENCY https://www.epa.gov/criteria-air-pollutants/naaqs-table (last visited Mar. 17, 2022).

21. Ophelia Eglene, *Transboundary Air Pollution: Regulatory Schemes & Interstate Cooperation*, 7 ALB. L. ENVT'L. OUTLOOK, 131 (2002).

22. *See* Elena M. McCarthy, *International Regulation of Transboundary Pollutants: The Emerging Challenge of Ocean Noise*, 6 OCEAN & COASTAL L.J. 257, 257 (2001).

industry and forest management industry). Unfortunately, regulation can be expensive, making it unattractive for some source countries (countries with a transboundary pollutant source). Yet, the country on the receiving end of the pollution cannot obtain jurisdiction over the source country.[23] This phenomenon occurs even when parties are unable to pin down the source. Leading to strained political relationships and countries playing the "blame game."[24]

Looking towards the science, air pollutants may travel farther when they develop from their precursor compounds (i.e., smoke, black carbon, smog, or acid rain) over an extended period.[25] For example, sulfur dioxide (SO_2) emissions from burning coal and fuel can cause transboundary acid rain pollution.[26] Forty years ago, the U.S. and Canada were reporting "dead lakes," meaning lakes that had become too acidic for fish eggs to evolve or for fish to survive.[27] Studies show that winds between the U.S. and Canada carried high concentrations of SO_2 from coal plants, over long distances.[28] During this time, the SO_2 transformed into acids that precipitated over lakes and the land (which is an example of air pollutants being developed from their precursor compound, coal).[29] Anthropogenic and natural sources emit pollutants into the atmosphere, traveling several hundreds of meters to thousands of miles.[30] When these airborne pollutants cross "geopolitical boundaries"—physical boundaries defined and created by governments—

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23. The international legal systems surrounding the issue of transboundary pollution is customary. Countries make small adjudications, declarations, and unofficial comments. Transboundary pollution puts a strain on these relationships because it has proven difficult for countries to take responsibility for pollution sources. *See* Thomas Merrill, *Golden Rules for Transboundary Pollution*, DUKE L. J., 931–1020, 940 (Mar. 1997) (noting that transboundary pollution is an interstate externality and provides strong economic justification for federal intervention by any affected party).

24. *See generally* Helena Varkkey, *Transboundary Pollution*, OXFORD BIBLIOGRAPHIES (last modified Nov. 26, 2019), https://www.oxfordbibliographies.com/view/document/obo-9780199756223/obo-9780199756223-0290.xml (explaining how transboundary pollution does not remain within political boundaries and is thus challenging for environmental governance).

25. Franco DiGiovanni & Philip Fellin, *Transboundary Air Pollution*, 1 ENV'T MONITORING § 1–3 (2019).

26. *See id.* at § 4.1 (explaining that with SO2 and NOX are released into the atmosphere they oxidize to produce both sulfuric and nitric acid).

27. *See id.* at 1.1, *see also* Michigan Sea Grant, *Dead Zones*, MICH. SEA GRANT, https://www.michiganseagrant.org/lessons/lessons/by-broad-concept/physical-science/dead-zones/#:~:text=Technically%2C%20a%20dead%20zone%20is,bottom%20waters%20do%20not%20mix. (last visited Aug, 13, 2022) (explaining that dead zones are areas without enough dissolved oxygen to support fish etc.).

28. *See* DiGiovanni*, supra* note 25 at § 4.2 (estimating that between 3.5–4.2 millions of tons per year of SO2 flows from the U.S. to Canada).

29. *Id* at 4.1.

30. "Micro-scale" is used when discussing that the pollutant merely traveling meters and "macro-scale" refers to when the pollutant travels hundreds or thousands of kilometers. Both are important to determine where the source of the pollutant. Again, it is difficult to distinguish air pollutant sources and looking through various lenses is a tool that climate scientists use to distinguish where pollutants are emitted. *Id*. at § 1.1.

they become transboundary pollution.[31] The EPA considers GHGs (carbon dioxide (CO_2), methane, nitrous oxide, and fluorinated gases) to be transboundary pollutants.[32] Additionally, the Air Quality Index (AQI) measures the air quality in a given area and shows scientists specific air pollutants.[33]

Determining which pollutants are regulated by the CAA and NAAQS is critical because this determination allows for collective legal action for parties to identify pollutant sources. To a greater extent, customary international law allows affected parties (i.e., the U.S. and Canada) to impose procedural duties before or after damages.[34] This is a predominately proactive approach.

One principle of customary international law requires a conscious effort from parties to avoid transboundary pollution. *Sic utere tuo ut alienum non laedas's* (*sic utere*) translates to the idea that "one must use one's property not to injure another."[35] The U.S. and Canada may use *sic utere* to establish that the CAA and NAAQS pollutants are threats to property, then make agreements to remove pollutant sources proactively and procedurally. *Sic utere* gives both countries the international customary authority and precedent to address new transboundary pollution threats.[36]

The landmark *sic utere* principle case is the Trail Smelter case of 1941.[37] In this case, the United States claimed Canada emitted fumes from a smelter

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31. Pollutants are still designated transboundary even if they only meander a short distance to cross internationally recognized boundaries. Distance is not a critical element to distinguish what is and what is not transboundary pollution. If it crosses a geopolitical border, it is transboundary pollution. *Id.*

32 . *Overview of Greenhouse Gases*, U.S. ENV'T. PROT. AGENCY https://www.epa.gov/ghgemissions/overview-greenhouse-gases (last visited Jan. 24, 2022).

33. *See generally Air Quality Index (AQI) Basics*, AIRNOW, https://www.airnow.gov/aqi/aqi-basics/ (last visited Mar. 17, 2022) (discussing what AQI is an how it works).

34. International environmental law takes three basic forms: customary international law, international agreements, and non-binding soft law. *See generally* Brian Popiel, *From Customary Law to Environmental Damage Between Canada and the United States*, 22 B.C. ENVT'L. AFF. L. REV. 447, 461 (1995) (describing customary international law's importance when assessing and mitigating damages).

35. This international customary legal principal arose once more between the U.S. and Canada during the Gut Dam arbitration of 1968. Canada constructed a dam which spanned the international boundary of the St. Lawrence River and caused flooding and property damage on the U.S.' side of the river. The two Parties agreed to codify the *sic utere* principle and impose responsibility on Canada. *Sic utre* is an essential principal for transboundary pollution—especially between the U.S. and Canada because both countries have agreed that the concept has legal merit. Sic utere is the exact principal that bolsters the AQA. *See* Canada-United States Settlement of Gut Dam Claims, 8 INT'L L.M. 118 (1969) (detailing that that Canada agreeds to pay the U.S. a settlement for harm done); s*ee generally Developments in the Law–International Environmental Law*, 104 HARV. L. REV. 1484, 1493 (1991) (explaining the background and providing the Latin translation of the *sic utere* principle).

36. *Developments in the Law, supra* note 35, at 1496.

37. McCarthy, *supra* note 22, at 258. *See* Trail Smelter Arbitration (U.S. v. Can), 3 U.N. Rep. Awards 1905, 1965 (1941), *reprinted in* 35 AM J. INT'L L. 684, 716 (1941) [hereinafter Trail Smelter or (final decision)]. (In which the court found the Government of Canada responsible for the damage caused by their smelter. The Government of Canada deposited $350,000 into the United States Treasury as payment for all damage that occurred in the United States).

located merely seven miles away from the State of Washington, causing damage to the environment in the form of noxious fumes and odor.[38] The smelter released up to seventy tons of SO_2 per day over twenty years.[39] Throughout the smelter's operation, this release caused thirty miles of the surrounding Canadian–U.S. forests to deteriorate.[40] Arbitration determined that the Canadian Government holds responsibility for any environmental damage it creates, even if that damage goes beyond its border or territorial limit.[41] Trail Smelter is significant because it highlights that "ecological effects" do not stop at geopolitical borders and provides one of the first instances of addressing an "amorphous type" of transboundary pollution.[42] The case also introduced and relied on the international customary law principle of *sic utere*.[43]

Ecological effects (i.e., black carbon, smog, acid rain) can create negative externalities on an international scale.[44] The Trail Smelter case set a precedent in international law that a country is responsible for the environmental damage it causes to a neighboring country.[45] This case opened the door for North American countries to address their air pollution grievances with neighboring nations, making confronting new transboundary pollutants both relevant and possible.[46] Neighboring states or nations must show collective and corrective efforts to remedy air pollution breaches across

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38. *Id*. at 684

39. *Id.*

40. *See id.* at 691 (explaining that the agriculture industry, groundwater, and air quality in general also suffered from the smelter fumes).

41. McCarthy, *supra* note 22, at 258.

42. *See id.* (asserting that the Trail Smelter case is the only international adjudication about air pollution).

43. *See* Trail Smelter Arbitral Tribunal (United States v. Can.), 33 AM. J. INT'L L. 182 (1939) [hereinafter Trail Smelter (initial decision) or (Initial Decision)] (initial decision) (explaining the questions presented for Trail Smelter); *see also* Trail Smelter (final decision) *supra* note 37, at 684 (accounting for the further proceedings and final decision in the Trail Smelter Arbitration).

44. DiGiovanni*, supra* note 25 at § 1.1.

45. *Id.*

46. *See generally* Her Majesty the Queen in Right of Ontario v. U.S. EPA, 912 F.2d 1525 (D.C. Cir. 1990). In a more historical case, *Her Majesty the Queen*, the court found that when allocating responsibility for air pollution, "[t]he dispute. . . is whether the EPA has a present obligation, under section 115, to promulgate endangerment and reciprocity findings as proposed rules with respect to U.S. emissions that allegedly result in harmful levels of acid deposition in Canada." Under § 115 of the Clean Air Act, a remedy is only applicable to "a foreign country [where] the Administer determines has given the [U.S.] essentially the same rights with respect to the prevention or control of air pollution occurring in that country as is given that country by this section" (also known as a "Reciprocity Finding"); *see* 42 U.S.C. §§ 7401-7431 (codifying air quality and emissions limitations across political boundaries; a Reciprocity Finding, made by the EPA Administrator, requires the U.S. to act in accordance with other nations and negotiations, and vice versa); *see also* Michael Burger et al., *Legal Pathways to Reducing Greenhouse Gas Emissions under Section 115 of the Clean Air Act*, 28 GEORGETOWN ENV'T L. REV. 359, 387 (2016) (using the Trail Smelter case as one of the defensible bases for with the EPA has to create reciprocity agreements with other countries).

geopolitical boundaries.[47] Otherwise, the efforts of a single state or nation may be ineffective.[48]

B. Distinguishing Between Boreal and Temperate Forests: Climate, Land Use Practices Generally, Forest Management Generally, and How Wildfires Start and Spread.

There are different types of forests in the U.S. and Canada that all vary in structure and climate. Additionally, respective countries have varying land use and forest management practices depending on the forest type. There are many issues regarding these practices that scientists have concluded contribute to the exponentially worsening wildfire phenomenon. Therefore, poor land use practices and forest management are the primary culprits to transboundary wildfire pollution.

1. Boreal versus Temperate Forest Structure and Climate.

Boreal forests have adapted to withstand frigid temperatures and are home to caribou and other animals that migrate long distances every winter. These forests predominately cover Canada and reach into the northern U.S.[49] A belt of boreal forests encircles the northern hemisphere through North America.[50] Evergreen temperate forests are less common in most of the U.S., but typical in Alaska, New England, Michigan, and Minnesota. Most other U.S. forests are temperate forests.[51] These forests are made up of evergreen trees with year-round leaves and cycle through all four seasons. Deciduous and coniferous forests are frequently mixed within temperate forests. Various animals and plants call these forests home, and many of the animals hibernate or migrate during the winter months.[52] The seasons of both forest types are divided into "short, moist, and moderately warm summers and long, cold, and dry winters."[53] The U.S. and Canadian logging industry relies on these forests, and the forest product industry generates just under $300 billion per

47. Eglene, *supra* note 21 at 142.

48. *Id.*

49. Lorin Hancock, *What's a boreal forest? And the three other types of forests around the world*, WORLD WILDLIFE FOUND. (Mar. 21, 2019), https://www.worldwildlife.org/stories/what-s-a-boreal-forest-and-the-three-other-types-of-forests-around-the-world.

50. *Id.*

51. *Id.*

52. *See The Forest Biome,* UNIV. CAL. BERKELEY, https://ucmp.berkeley.edu/exhibits/biomes/forests.php#:~:text=Seasons%20are%20divided%20into%20short,%2C%2040%2D100%20cm%20annually (last visited Mar. 17, 2022) (explaining that deer, songbirds, bears, wolves, squirrels, and a multitude of plant life reside in both boreal and temperate forests).

53. *Id.*

year.[54] The reality is that these beautiful forests permit land use and require forest management to maintain their good nature.

2. Boreal versus Temperate Land Use Practices and Forest Management Generally.

Land use is simply the human use of land.[55] Land use encompasses all economic and cultural activities (e.g., agriculture, residential, industrial, and recreational) that occur in a given area.[56] Land in boreal and temperate forests have different uses, even if it does not appear that way. For example, land used for timber production and forested land designated for wilderness will appear as forest-covered land, despite having various uses. Wildfires are a significant threat to land use and a naturally occurring forest systems process.[57] To curb the increasing risk of wildfires near residential areas, land must be used more intentionally.[58] These escalating residential losses have had significant economic and ecological consequences.[59]

Economically, people, organizations, and agencies are losing millions of dollars every year from wildfire damages. Further, over 35,000 structures were destroyed or damaged by wildfire in 2017-2018 alone.[60] This is a recurring cost because structures will be rebuilt and then re-burned because many homes, structures, and buildings are placed in the most hazardous parts of the landscape, for instance, within areas of woody fuel types and higher fuel loads.[61] Yet, the conversation has steered clear from discussing how land use planning could ease wildfire risk. The arrangement and location of structures strongly affect their susceptibility to wildfire, making it essential for law and policymakers to consider future land use practices.

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54. U.S. FOREST SERV., *Forest Products Research Actives*, https://www.fs.fed.us/research/forest-products/ (last visited Mar. 17, 2022).

55. *See* Van Butsic et al., *Land Use and Wildfire: A Review of Local Interactions and Teleconnections*, 4 LAND 140,141 (2015) (reviewing and exploring the concept of land use).

56. *See id.* (discussing that land use changes are driven by economic and other local conditions).

57. *Id.*

58. *Land Use Planning Can Reduce Wildfire Risk to Homes and Communities*, HEADWATERS ECON., https://headwaterseconomics.org/natural-hazards/land-use-planning-wildfire/ (last visited Mar. 17, 2022) (stating that "In areas with high wildfire hazard, land use planning can reduce wildfire risks to homes and communities by requiring new developments to comply with wildfire-resistant design and building techniques.").

59. *Id.*

60. Christopher C. French, *America on Fire: Climate Change, Wildfires & Insuring Natural Catastrophes*, 54 UC Davis L. REV. 817, 817 (2020) (stating that: "Despite spending approximately $3.7 billion annually on fire suppression, more than 35,000 structures were lost to wildfires in 2017 and 2018, approximately $32 billion in property losses occurred and more than 100 people were killed").

61. *See* Stephanie Pincetle et al., *It's the Land Use, Not the Fuels: Fires and Land Development in Southern California*, 37 REAL EST. REV. 25, 25–43 (2008) (explaining that woody fuels encompass shrubbery and trees which make up boreal forests).

Ecologically, land use affects the resilience of forests against wildfires. New land use practices should focus on reducing fuel loads. In Canada, fuel reduction treatments in their boreal zone are used mainly for residential protection.[62] The Canadian government focuses on reducing fuel loads and thereby reducing wildfire risk. Fuel reduction treatments aim to impede the spread of fast-spreading, high-intensity wildfires to susceptible boreal forest ecosystems.[63] The U.S. does not focus on reducing fuel loads and instead defers to excluding and suppressing fires the minute they start.[64] High fuel loads are a paramount issue because the smoke emitted from wildfires in the U.S. is still making its way into Canada; even though Canada is intentionally reducing their fuel loads, with hopes of reducing black carbon pollution. The land use policies in the U.S. still have a transboundary effect on Canada and implementing policies via the AQA can remedy this issue.

Turning to forest management, the U.S. Forest Service is editing its wildfire policies per new understandings of wildfire's ecological services.[65] For decades, the agency's standard response to wildfires was immediate suppression by attempting to stifle the fires right when they form.[66] The U.S. can effectively suppress fresh wildfires because the U.S. government solely focuses on the short-term risks of wildfires. Or, more likely, the possibility of property damage.[67] The U.S. Forest Service's research has changed the way agencies view and manage wildfires by forcing the transition to a method of igniting prescribed fires—the controlled application of fire by a team of fire experts—to restore the health of stressed overcrowded forests. [68] Improving forest management approaches is an additional means of limiting wildfire pollution. Management methods include thinning overcrowded forests (too dense with dead foliage) with hopes of restoring them to what forests typically have been: meadows, shrublands, and woodlands. [69] Thinning is the removal of some trees from a stand to give other trees more

62. Jennifer L. Beverly, *Stand-Level Fuel Reduction Treatments and Fire Behaviour in Canadian Boreal Conifer Forests*, MDPI J. 1 (July 27, 2020) (discussing the aim of their fuel treatments is to minimize fast-spreading, high-intensity crown fires).

63. *Id.*

64. *Science and Technology*, U.S FOREST SER., https://www.fs.usda.gov/science-technology/fire (last visited Mar. 17, 2022).

65. *Id.*

66. *Id.*

67. *See id.* (explaining how U.S. policies place more of a focus on property damage than environmental effects).

68. *Id.; see also* Nathan Rott, *Fire Ecologists say more fires should be left to burn. So why aren't they?* NPR https://www.npr.org/2018/09/27/649649316/fire-ecologists-say-more-fires-should-be-left-to-burn-so-why-arent-they (Sep. 27, 2018) (asserting that immediately smothering a wildfire is problematic because it is both short-sighted and dangerous. This is because forest overgrowth is the largest contributor to the kinds of huge, catastrophic, and extremely hot fires that are becoming more common.).

69. *See* John Punches, *Thinning: An Important Forest Management Tool*, OR. STATE UNIV., (Sept. 2004), https://extension.oregonstate.edu/forests/health-managment/thinning-important-forest-management-tool (explaining the process of thinning a forest).

space.[70] Right now, the conversation on thinning is mainly economic-based.[71] Landowners see thinning as a tool for improving timber value and making forest sites more productive.

Not only is forest management flawed, but wildfire legislation has been a contributor to net black carbon emissions.[72] For example, there have been legislative proposals in California, both to improve "wildfire surveillance and warning systems" and to require private property owners to clear brush and dead trees near residential areas.[73] Lawmakers are skeptical about passing the proposed legislation because intentionally lighting fires to halt wildfires seems counterintuitive. Lawmakers want to protect homes and businesses and the lawmakers see wildfires as a threat to that goal. Due to wildfire's potential for impacting the health and safety of humans and the environment (in both countries), current policies surrounding wildfire management predominately focus on the method of excluding.[74] Exclusion (also known as suppression) is the act of extinguishing or fighting fires.[75] Additionally, exclusion is the de facto policy of attempting to eliminate fires versus letting them burn.[76] Common sense would say that immediately extinguishing wildfires is the safe, wise, and correct choice. Although well-intentioned, Canada's utilization of a de facto exclusion policy is misguided because excluding wildfires increases the fuel loads and alters the forest's composition and structure.[77] The de facto policies are leading to hotter and larger fires.[78] Hotter and larger fires return to the same landscape under this traditional method,[79] meaning more emissions of black carbon will traverse the U.S. and Canada border. Altering fire management from exclusion to new

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70. *Id.*

71. *See* French, *supra* note 60 (explaining the economic costs of wildfires).

72. Chuck DeVore, *Wildfires Caused by bad environmental policy are causing California Forests to be Net CO2 emitters*, FORBES (Feb. 25, 2019), https://www.forbes.com/sites/chuckdevore/2019/02/25/wildfires-caused-by-bad-environmental-policy-are-causing-california-forests-to-be-net-co2-emitters/?sh=216704475e30.

73. A common theme with the U.S. regarding wildfire management is real estate and property protection. As discussed *supra*, and *infra*, the U.S. will immediately extinguish fires (or try to) once identified. The hope is to prevent homes, businesses, and other structures from going up in flames. This method will only make fires burn hotter, wilder, faster, and larger as exclusion remains the go to method. California is a perfect example of this phenomenon. Every year during "wildfire season," fires rage across the state through residential areas causing millions of dollars in damages. *Id.*

74. *Fire Exclusion and Changing Patterns of Fire Behavior*, KARUK CLIMATE CHANGE PROJECTS (last visited July 28, 2022), https://karuktribeclimatechangeprojects.com/chapter-2-fire-exclusion-and-changing-patterns-of-fire-behavior/.

75. *Id.*

76. Sean C.P. Coogan & Mike D. Flannigan, *Scientists' warning on wildfire—a Canadian Perspective*, NRC RES. PRESS 1015, 1019 (May 30, 2019), https://cdnsciencepub.com/doi/pdf/10.1139/cjfr-2019-0094.

77. *Id.*

78. *Id.*

79. Jennifer Sherry et al., *Rethinking the maps: a case study of knowledge incorporation in Canadian wildfire risk management and planning*. J. ENV'T. MANAGE. 494, 494 (2019).

methods proven to be effective must be in the International Joint Commission's (IJC's) wildfire regulation conversation.

Reducing air pollution is overlooked during wildfire legislation creation. Exclusion may aid in protecting property during the short term. Still, this archaic method ultimately creates more significant property damage from more unwieldy fires and air pollution from those fires. Fire suppression does nothing to reduce fuel loads and wildfire likelihood and instead is an aggravative method. Wildfire management must change to mitigate and alleviate transboundary pollution, and the AQA could be a vessel for that change.[80]

3. How Wildfires Start and Spread: On Land and in the Air.

The U.S. and Canada must address wildfires as a growing threat to air quality. For example, in 2021, jurisdictions along the northern U.S.-Canada border—New York City, New York; Detroit, Michigan; Cleveland, Ohio; parts of Idaho and Montana; and the Canadian provinces of Manitoba and Ontario—hit the "unhealthy air quality zone," reaching above 150 on the AQI.[81] This past year, in New York City, a gray haze shrouded the city while the AQI for delicate particulate matter reached 170 and lasted over three weeks.[82] Surprisingly, Canadian wildfires were partly to blame for the U.S.' poor air quality. Black carbon diffused from Canadian wildfires drifted across the geopolitical border into the U.S.[83] At the same time, the AQI in U.S. cities (Detroit, Michigan and Cleveland, Ohio) reached above 125, which was "considered unhealthy for sensitive individuals" and continued to

80. *See generally Salvage Logging*, SIERRA FOREST LEGACY (last visited Mar. 17, 2022), https://www.sierraforestlegacy.org/FC_FireForestEcology/FFE_SalvageLoggingScience.phpe (describing salvage logging and its intricacies, along with its controversial issues) (Salvage logging could be another useful forest management tool. Although controversial, salvage logging is a long-practiced method of forest management. Theoretically, it aids with forest restoration following wildfires. Salvage logging involves the Forest Service or private companies salvaging trees post-fire. Although promising, salvage logging is scientifically unsupported and would likely not be able to be implemented via the AQA.).

81. Peter Szekely & Steve Gorman, *Western wildfire smoke causes cross-country air pollution*, REUTERS (July 21, 2021), https://www.reuters.com/world/us/smoke-us-west-wildfires-leaves-easterners-gasping-2021-07-20/ (defining AQI, which measures the quality of the air. AQI works similarly to that of a thermometer. AQI gives the quality of the air a numerical value from 0 to 500 which shows the changes in the amount of pollution in the air. For example: 0–50 is good air quality and at 150 it treads into unhealthy air quality. Five major air pollutants include: ground level ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, airborne particles/aerosols.); *See also* Popiel, *supra* note 34, at 447. (discussing the imminent threat to transboundary pollution Canadian's face because of their proximity to the U.S.-Canada border. Notably, 90% of Canadians live within 100 miles of the U.S. border. The proximity to the U.S. has allowed for effective and friendly dispute management, but also puts Canadians at a higher risk for negative effects of air pollution.).

82. Szekely & Gorman, *supra* note 81.

83. *Id.*

worsen.[84] Wildfire smoke has prompted widespread government air quality warnings from the U.S. and Canada.[85] The biomass that burns from these fires is an "important intermittent source" of black carbon.[86] Wildfires also emit large amounts of "light-absorbing carbon" particles into the atmosphere.[87] Wildfires (and the resulting pollution) are expected to increase in frequency and intensity as climate change advances.[88] Light-absorbing particles cause extreme climate impacts by burdening the atmosphere, reducing snow albedo, increasing solar radiation absorption, and accelerating ice melting.[89] This cycle continues to pollute the atmosphere and, in turn, pollute the human environment.[90]

Concerning climate change, absent a global climate policy average temperatures in the western U.S. are projected to increase by another 7–12 degrees Fahrenheit by 2100 from their previous increase of 2.34 degrees Fahrenheit since 1895.[91] This shows that wildfires are increasing in temperature and intensity.[92] Climate change will catalyze wildfires to burn with more intensity and frequency.[93] Climate-change-exacerbating wildfires

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84. *Id.*

85. *Id.*

86 S.E. MARTENIES, ASSESSING THE IMPACT OF WILDFIRES ON THE USE OF BLACK CARBON AS AN INDICATOR OF TRAFFIC EXPOSURES IN ENVIRONMENTAL EPIDEMIOLOGY STUDIES 2 (L, Hoskovec, A. Wilson eds., 2021).

87. *See* Dantong Liu, et al., *Lifecycle of light-absorbing carbonaceous aerosols in the atmosphere*, 40 CLIMATE ATMOSPHERIC SCI. 1, 2–3 (2020) https://www.nature.com/articles/s41612-020-00145-8 (explaining that the term light-absorbing carbonaceous aerosols (LACs) is a broad term that includes black carbon and light absorbing carbon. LACs contribute to heating the atmosphere, dimming the Earth's surface, and reducing snow/ice albedo (whiteness of the surface of the snow/ice).).

88. MARTENIES, *supra* note 86, at 2.

89. *See* Liu, et al., *supra* note 87, at 3 (describing how LACs emit into the atmosphere, then evolve into further deposition).

90. MARTENIES, *supra* note 86, at 1.

91. *See generally* French, *supra* note 60, at 826 (summarizing the affect climate change has had on the average temperature of North America and stating that there has been an increase of 2.34 degrees Fahrenheit in the U.S. since 1895); *See also* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Climate Change 2022: Impacts, Adaptation, and Vulnerability Summary for Policymakers Report*, UNEP at 11. (Climate change has caused "widespread, pervasive impacts to ecosystems, people, settlements, and infrastructure have resulted from observed increases in the frequency and intensity of climate and weather extremes, including hot extremes on land and in the ocean, heavy precipitation events, drought and fire weather (*high confidence*)."); *See also Climate Change Indicators: U.S. and Global Temperature*, U.S. ENV'T. PROT. AGENCY, https://www.epa.gov/climate-indicators/climate-change-indicators-us-and-global-temperature#:~:text=Since%201901%2C%20the%20average%20surface,F%20per%20decade%20since%201979 (last visited Mar. 17, 2022) (The EPA published a report stipulating that since 1901, the average surface and air temperature across the contiguous 48 states has risen at a rate of 0.16 degrees Fahrenheit per decade. Additionally, this rise has grown exponentially as 2016 was the warmest year on record and 2020 was the second warmest.).

92. MARTENIES, *supra* note 86, at 2.

93. French, *supra* note 60, at 823.

are a longstanding issue.[94] Dating back to 2002, wildfires burning in Quebec, Canada resulted in a smoke plume that could be shown in satellite images that blanketed the U.S. East Coast.[95] This lead to enhanced "CO mixing ratios . . . seen in the [U.S.] from Maine down to northern Virginia."[96] Wildfires needlessly and violently ravage both the U.S. and Canada.[97] As wildfires continue to destroy parts of North America, health experts and scientists are warning the public about the dangerous levels of air pollution and its adverse effects.[98] While contributing to the climate crisis and exacerbating transboundary pollution, wildfires are emitting black carbon at an exponential rate. This puts humans and the environment (physical and atmospherically) at risk.

Additionally, black carbon is a major player in climate change.[99] A recent study found that black carbon is the second-largest contributor to climate change after CO_2 because it traps heat.[100] When fossil fuels or wood incompletely combust, soot forms—this is known as black carbon.[101] Black carbon can be produced naturally or by human activity and exists in high concentrations in areas where trees are burning.[102] Black carbon particles strongly absorb sunlight, which makes the soot appear black.[103] The EPA deems this pollutant "a global environmental problem that has negative

94. *Smoke from Canadian Fires Blankets Eastern U.S.*, NASA, https://earthobservatory.nasa.gov/images/2596/smoke-from-canadian-fires-blankets-eastern-us (July 9, 2002).

95. *Id.*

96. J. William Munger, *A Major Regional Air Pollution Event in the Northeastern United States Caused by Extensive Forest Fires in Quebec, Canada*, 109 J. GEOPHYSICAL RSCH. 1, 8 (2004).

97. Elizabeth Gamillo, *Plumes of Smoke From Fires in the North American West Stretch Across the Continent*, SMITHSONIAN MAG., (July 27, 2021), https://www.smithsonianmag.com/smart-news/plumes-smoke-north-american-wildfires-are-stretching-across-continent-180978288/.

98. *Black Carbon Research and Future Strategies: Reducing Emissions, Improving Human Health, and Taking Action on Climate Change*, U.S. ENV'T. PROT. AGENCY (Oct. 2011) https://www.epa.gov/sites/default/files/2013-12/documents/black-carbon-fact-sheet_0.pdf.

99. Black carbon is not one of the GHG chemicals regulated under the CAA despite petitions from the EPA. Instead, it is a fine particulate subject to regulation under the NAAQS.

100. *See T.C.* Bond & S.J. Doherty, *Bounding the role of black carbon in the climate system: A scientific assessment*, J. GEOPHYSICAL RSCH.: ATMOSPHERES 5380, 5381 (2013), https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/jgrd.50171 (sharing the results of a four-year research collaboration by 31 scientists, that analyzed and synthesized what is known about black carbon's contributions to climate change); Brooke Jarvis, *Black Carbon: A Golden Opportunity to Fight Climate Change?,* ENSIA (Jul. 15, 2013), https://ensia.com/features/black-carbon-golden-climate-change/ (stating that black carbon traps even more heat than methane).

101. Black Carbon, CLIMATE & CLEAN AIR COAL., https://www.ccacoalition.org/en/slcps/black-carbon (last visited Dec. 10, 2021).

102. *Id.*

103. *Black Carbon and Climate Change: What is Black Carbon?* CEN. CLIMATE ENERGY SOLUTIONS 1 (Apr. 2010) (last visited Dec. 10, 2021), https://www.c2es.org/document/what-is-black-carbon/.

implications for human health and our climate."[104] One can infer that the EPA acknowledges that black carbon is a significant contributor to climate change. Black carbon has imminent health and environmental effects and accelerates glacial and ice sheet melting—increasing the rate of global warming. The direct-warming effect comes from the particulate matter absorbing atmospheric solar radiation and converting it to heat radiation.[105] The indirect effect stems from black carbon reducing the reflectivity of snow and ice in the arctic.[106] Climate scientists recognize black carbon as a considerable contributor to the overarching issue of climate change[107] and, more specifically, transboundary pollution.

III. ANALYSIS

A. The U.S. and Canada Air Quality Agreement: Overview and Procedural Aspects.

1. Overview of the AQA's history and purpose

In 1991, after years of protests in Canada and near the boundary waters of the U.S., former President George H. W. Bush and former Prime Minister Brian Mulroney signed the bilateral Air Quality Agreement (AQA).[108] The bilateral accord was then integrated into the U.S. Clean Air Act of 1990 (CAA) and the Canadian Acid Rain Program of 1985.[109] AQA is one of the most successful bilateral agreements tackling transboundary air pollution.[110] After receiving political and social pushback to reduce acid deposition and acid rain levels,[111] both countries agreed to sign the AQA.[112] Acid rain caused

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104. *Black Carbon Research and Future Strategies: Reducing Emissions, Improving Human Health, and Taking Action on Climate Change*, U.S. ENV'T. PROT. AGENCY (Oct. 2011) https://www.epa.gov/sites/default/files/2013-12/documents/black-carbon-fact-sheet_0.pdf.

105. *Black Carbon*, SCIENCEDIRECT, https://www.sciencedirect.com/topics/earth-and-planetary-sciences/black-carbon (last visited Dec. 10, 2021).

106. *Id.*

107. *Id.*

108. Brian Mulroney, *Acid Rain: A case study in Canada-US relations*, POL'Y OPTIONS (Apr. 12, 2012) https://policyoptions.irpp.org/magazines/harpers-foreign-policy/acid-rain-a-case-study-in-canada-us-relations/.

109. *Id*.

110. *See generally* Roelofs, *supra* note 18, at 421 (concluding that the AQA is one of the most successful transboundary air pollution agreements).

111. *See generally* Don Munton, *Acid Rain and Transboundary Air Quality in Canadian-American Relations*, 27 AM. R. CAN. STUD. (stating that acid rain was a major environmental issues during the 1980s).

112. *Canada-United States Air Quality Agreement: Overview*, GOV'T CAN., https://www.canada.ca/en/environment-climate-change/services/air-pollution/issues/transboundary/canada-united-states-air-quality-agreement-overview.html (last visited Oct. 29, 2021).

adverse effects on human and environmental health in both countries; at the time, there was no remedial legal or diplomatic instrument.[113] Thus, the AQA was born. The AQA successfully mitigates acid rain sources and causes from both countries.[114] Yet, the diplomatic potential expands beyond acid rain.

The initial purpose of the AQA was to serve only as the Acid Rain Accord.[115] But, as Prime Minister Mulroney noted, the AQA's impact and purpose can, and should, expand beyond tackling transboundary acid rain.[116] Mulroney mentioned, "it could well serve as a template for a bilateral accord on climate change, as it has on other cross-border air issues."[117] Initially, the Agreement's goal was to lower SO_2 emissions by 50% by 1994.[118] The Agreement was so successful that the goal of reducing SO_2 was met early in 1993.[119] The U.S. and Canada have an active, successful agreement, and both countries continue to use this channel to mitigate transboundary air pollution.

Scientists found that an estimated three to four times as much SO_2 travels up to Canada from the U.S. versus the other way around.[120] Typically, most transboundary pollution disproportionately affects one country due to natural causes, such as prevailing winds, and anthropogenic means (i.e. improper land-use practices and forest management).[121] The AQA has led to significant progress between Canada and the U.S. in reducing acid rain sources.[122] As of 2017, SO_2 emissions decreased by 69% and 88% from their initial levels in 1990 in Canada and the U.S., respectively.[123] Additionally, nitrogen dioxide emissions decreased by 59% and 61% in Canada and the U.S., respectively.[124] Impressively, both countries continue to meet their commitments as established in the original Agreement.[125]

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113. Carol Garland, *Acid Rain Over the United States and Canada: The D.C. Circuit Fails to Provide Shelter Under Section 115 of the Clean Air Act While State Action Provides a Temporary Umbrella*, 16 BOS. COLL. ENV'T AFFS. L.R. 1, 1–2 (1988).

114. *See generally* Agreement Between the Government of the United States of America and the Government of Canada on Air Quality, U.S.-Can., Mar. 13, 1991, T.I.A.S. 11783 [henceforth Air Quality Agreement] (establishing an international framework to address acid rain).

115. Mulroney, *supra* note 108.

116. *Id.*

117. *Id*.

118. *Id*.

119. *Id*.

120. Roelofs, s*upra* note 18, at 423.

121. Increased wind speeds tend to mean that there is a higher dispersion of air pollutant particles. This phenomenon results in lower air pollution concentrations in areas with stronger and faster winds. Further, when the ground heats up during the day, the air becomes more turbulent which causes air pollutant particles to disseminate in the air. Essentially, pollutants will disperse at a higher rate where the air is warmer. *Transboundary Air Overview*, GOV'T CAN. (last visited Aug. 13, 2022), https://www.canada.ca/en/environment-climate-change/services/air-pollution/issues/transboundary/overview.html.

122. GOV'T CAN., *supra* note 121.

123. *Id.*

124. *Id.*

125. *Id.*

Each year, both countries hold the New England Governors and Eastern Canadian Premiers (NES/ECP) conference. The NES/ECP has stressed "the need for appropriate controls on sources outside the region that pose an environmental threat."[126] This conference complements the AQA. In 1999, the NES/ECP created a resolution "calling upon the [EPA] and Environment Canada [the Canadian counterpart to the U.S. EPA] to pursue additional reduction strategies for those sources outside the region that significantly contribute to air quality problems in New England and eastern Canada."[127] Thus, the neighboring countries created a platform for discussing environmental threats. Both countries formed the International Joint Commission (IJC) (an independent binational commission) to administer new bilateral agreements (including transboundary air pollution-focused agreements)[128] and revisit active agreements—such as the AQA.[129] To upkeep the AQA, the bilateral Air Quality Committee must issue a progress report every two years.[130] Each report spotlights each country's progress on the commitments included in the AQA and reports each country's continued efforts to address transboundary air pollution.[131] The motivation behind the annual NES/ECP conference is to pinpoint new and recurring sources that cause adverse effects across the geopolitical U.S. and Canada border.[132]

To summarize the motivation behind the AQA's creation: the Canadian Government realized that, because of the disproportionate effect of acid rain, it would be unable to slow down the problem absent a bilateral effort.[133] Likewise, transboundary pollution from wildfires requires similar

126. Eglene, *supra* note 21, at 144.

127. *Id.*; *see also* Bradley C. Karkkainen, *The Great Lakes Water Resources Compact and Agreement: A model for Transboundary Governance at Subnational Scales*, 9 SEA GRANT L. & POL'Y J. 37, 40 (2018) (noting that the U.S. and Canada have coordinated an agreement for the purpose of managing the "world's largest freshwater system." The Boundary Waters Treaty was created over 100 years ago and is still a strong piece of legislation. Its purpose is to guarantee full freedom of navigation and commerce on the great lakes and other boundary waters, to maintain the natural flow of the waters, and ensure that the boundary waters and great lakes are healthy.); *see* Trail Smelter *supra* note 37, at 716 (mentioning that the IJC recommended remedial measures and a formula for payments to compensate for damages).

128. Air Quality Agreement, *supra* note 114 at 7.

129. *Id*.

130. *Id*. at 6.

131. *Canada-United States Air Quality Agreement: Overview*, https://www.canada.ca/en/environment-climate-change/services/air-pollution/issues/transboundary/canada-united-states-air-quality-agreement-overview.html GOV'T CAN. (Last visited Oct 29, 2021).

132. *See generally id*. (stating that the purpose of the agreement was to reduce emissions of SO2 and NOx, and that the bilateral committee issues reports highlighting progress on these commitments).

133. James C. Brockmann, *Acid Rain: Corroding United States-Canadian Relations*, 6 J. ENERGY L. & POL'Y 357, 366 (1985); *see also* Air Quality Agreement, *supra* note 114, at 4, 19 (stipulating the specific objectives for emissions limitations or reductions of sulfur dioxide and nitrogen oxides).

collaboration. Article V of the AQA is the catalyst for incorporating new measures and new transboundary pollution threats—like wildfires.[134]

2. The AQA's Procedures

The AQA is structured to be a set of five prescribed provisions that, if the U.S. and Canada follow, will maintain the original objective of the AQA. The five provisions are: (1) establish objectives and then implement programs to meet these objectives; [135] (2) undertake environmental assessments, notify the counterparty, and enact mitigation measures;[136] (3) carry out cooperative and coordinated scientific and technological activities while also conducting economic research; [137] (4) exchange pertinent information;[138] and (5) review, assess, consult, address rising concerns, and settle disputes.[139] The AQA has a very systematic and thorough roadmap. The document intends to "keep up" with the changing climate by identifying every new (and old) transboundary pollutant and then going through the AQA's provided steps to eliminate those pollutants. For the AQA to consider an activity, the IJC must determine whether such activity causes "significant transboundary air pollution."[140] Following SO_2's journey through these steps is helpful to fully understand the effectiveness and particulars of the AQA's provisions.

First, both Parties must establish objectives and then implement programs in their respective country to meet these objectives.[141] Annex 1 of the AQA contains both Parties' objectives for emission limitations of SO_2. The U.S. followed this provision by implementing an SO_2 control program.[142] At the same time, Canada committed itself to a permanent cap on SO_2 emissions.[143] Right off the bat, both countries have shown commitments to

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134. Air Quality Agreement, *supra* note 114, at 5. The Agreement goes way beyond addressing acid rain and hopes to control every type of transboundary air pollution except for those which have a global effect (i.e., ozone depletion). The reason for exempting global transboundary air pollution is not stated within the text of the Agreement itself. The Agreement's reach, and purpose is to remain narrow and only involve the U.S. and Canada and the AQA is not the document to expand beyond that scope. Other larger and broader multilateral treaties are better suited for global transboundary pollution (such as the Paris Climate Accord). *See id* at 3 (stating that transboundary air pollution in the AQA only includes "air pollution whose physical origin is situated wholly or in part within the area under the jurisdiction of one Party and which has adverse effects, *other than effects of a global nature*, in the area under the jurisdiction of the other Party" (emphasis added)).

135. Air Quality Agreement, *supra* note 114, at 3.

136. *Id.* at 4.

137. *Id.*

138. *Id.*

139. *Id.*

140. *Id.* at 5.

141. *Id.* at 3.

142. The SO2 Control program was established under the 1990 CAA Amendments. *Id.* at 19.

143. *Id.*

each other that they are taking SO_2 seriously through implementing programs and are making concrete remedial steps to alleviate SO_2 within these programs. Three joint projects were completed under the AQA strategy: the Great Lakes Basin Airshed Management Framework,[144] Maintaining Air Quality in a Transboundary Air Basin,[145] and A Study on the Feasibility of Emissions Cap and Trading for Nitrogen Oxides (NO_X) and SO_2.[146] According to both countries' objectives and commitments, all of these projects aid in the overall decrease in SO_2 and NO_X emissions (and their existence in the atmosphere).[147]

Second, each Party must conduct an environmental assessment, notify its counterparty, and enact mitigation measures.[148] Both Parties are specifically required to assess any proposed activity or project within the country's jurisdiction that "would be likely to cause significant transboundary air pollution."[149] Parties must then notify the other of the assessment results and include mitigation propositions.[150]

Third and fourth, both Parties must carry out cooperative and coordinated scientific and technological activities while also conducting economic research and exchanging that information.[151] Canada and the U.S. both agreed to coordinate their monitoring activities through the:

> coordination of existing networks[,] . . . additions of monitoring tasks of existing networks[,] . . . addition of stations or networks where no existing monitoring facility can perform [the] necessary function[,] . . . the use of compatible data management procedures,

144. *See generally* Canada–United States Air Quality Agreement, *Great Lakes Basin Airshed Management Framework Pilot Program*, U.S. ENV'T. PROT. AGENCY (2005) https://www.epa.gov/sites/default/files/2015-07/documents/great_lakes_basin_airshed_management_framework.pdf (detailing a pilot program to address air quality issues in the Great Lakes Basin).

145. *See generally Maintaining Air Quality in a Transboundary Air Basin: Georgia Basin-Puget Sound,* U.S. ENV'T. PROT. AGENCY (2005) https://www.epa.gov/sites/default/files/2015-07/documents/maintaining_air_quality_in_a_transboundary_air_basin_georgia_basin_-_puget_sound.pdf (reporting on the pilot program to establish the Georgia Basin-Puget Sound International Airshed Strategy).

146. *See generally United States–Canada Emissions Cap and Trading Feasibility Study*, U.S. ENV'T. PROT. AGENCY (2005) https://www.epa.gov/sites/default/files/2015-07/documents/emissions_cap_and_trading_feasibility_study.pdf (reporting on a cross-border cap and trade program for sulfur dioxide and nitrogen oxides emissions).

147. Air Quality Agreement, *supra* note 114, at 19.

148. *Id*. at 5.

149. *Id*. *See* Roelofs, *supra* note 18 at 446 (stating that consultations must begin "as soon as practicable, but in any event not later than thirty days from the date of receipt of the request for consultation, unless otherwise agreed by the Parties").

150. Air Quality Agreement, *supra* note 114 at 5.

151. *Id.* at 4.

> formats and methods[,] . . . [and] the exchange of monitoring information.[152]

The specifics of monitoring activities are not necessarily mentioned in the AQA's text, but one can infer that the intent was to include coordinated activities that will better understand SO_2 transboundary pollution. Further, Annex 2 of the AQA lays out the specifics for coordinating all air pollutant monitoring activities.[153] From this step of the AQA, Environment Canada produced the Canadian Air and Precipitation Monitoring Network (CAPMoN). [154] Article VI of the AQA was a channel for connecting CAPMoN to the U.S.. After IJC discussions regarding cooperative scientific and technological activities, the U.S. now contributes information to the CAPMoN system.[155] This allows for both Parties to assess the impact of SO_2 emission decreases on a broad scale while exchanging pertinent SO_2 transboundary pollution in real-time and adjusting as needed per Articles X through XIII.[156]

Finally, even after following all the AQA's steps for eliminating pollution, both Parties recognize that the AQA is not static. Articles X–XIII are instruments for reviewing, assessing, consulting, and addressing concerns.[157] In 1996, both Parties agreed, after reviewing their respective and joint programs and policies, that the "control of transboundary air pollution has not occurred to the extent necessary to protect the environment" regarding SO_2 emissions fully.[158] The IJC enacted remedial measures after

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152. *Id.* at 26.

153. *Id*. The details of SO2 monitoring activities are not written as an additional clause or amendment in the AQA itself. Again, the AQA is a process.

154. 135 Environment Canada is a federal agency comparable to the EPA. CAPMoN is comparable to the Canadian Wildland Fire Information System (CWFIS), the Wildfire Threat Rating System (WTRS), and the Canadian Fire Effects Model (CanFIRE). The latter three programs deal with monitoring wildfires, fuel loads, and wildfire threats whereas CAPMoN measures SO2 air pollutant deposits. The difference with CAPMoN is that the United States contributes to its measuring system through well-established networks created by Article VI of the AQA. The same can, and should, be done with CWFIS, WTRS, and CanFIRE. All are programs that could benefit from cooperative monitoring, which is the purpose behind Article VI. *Canadian Air and Precipitation Monitoring System*, GOV'T CAN., https://www.canada.ca/en/environment-climate-change/services/air-pollution/monitoring-networks-data/canadian-air-precipitation.html (last visited Jul. 20, 2022).

155. EPA's AIRNOW program measures the air quality in real time. Through AQA discussions and negotiations, AIRNOW expanded to include data and develop maps of Canada. This is another example of Article VI successfully allowing for collaboration and coordination regarding technology and scientific programs. AIRNOW could and should be utilized for measuring air quality during and after wildfires. AIRNOW, *supra* note 33 (showing the current AQA in every city and zip code).

156. *See* Air Quality Agreement, *supra* note 114, at 7–8 (explain that both parties must assess and adjust their SO2 impact).

157. *Id.*

158. INT'L JOINT COMM'N, *U.S.–Canada Air Quality Agreement: 2002 Progress Report* 41, U.S. ENV'T. PROT. AGENCY (2002) https://www.epa.gov/sites/default/files/2015-07/documents/2002_u.s.-canada_progress_report.pdf.

this review, and Canadian Prime Minister Jean Chrétien and U.S. President William "Bill" Clinton committed to developing a Joint Plan of Action.[159] AQA's first review ended with both Parties recognizing the value of expanding the Agreement to address concerns of other and or new transboundary pollution. Overall, the AQA is a successful bilateral agreement. The Joint Plan of Agreement purports that the AQA is valuable beyond thwarting transboundary SO_2 pollution. The AQA is an ideal instrument for diminishing transboundary wildfire pollution because wildfire pollution constitutes "significant transboundary air pollution."[160]

B. Diplomacy Through the AQA is a Solution for Wildfire Related Transboundary Pollution.

Article II of the AQA prescribes a simple purpose: "to establish, by this Agreement, a practical and effective instrument to address shared concerns regarding transboundary air pollution."[161] The IJC should, and must, use this instrument to suppress transboundary wildfire pollution.

1. Step zero: proving that poor land use and forest management are activities that likely cause significant transboundary pollution.

Before anything, if both Countries want to bring wildfires through the AQA's process, they must assess which activities or projects "would be likely to cause significant transboundary air pollution."[162] Informing the IJC of the U.S.' exclusion and suppression practices, residential planning, and high fuel loads will be the cause for imposing the AQA. As previously discussed, the U.S.' poor land use and forest management practices have been the initial cause of wildfires and have exacerbated raging fires. SO_2's journey through its AQA application required both governments to receive tremendous pushback from their respective citizens.[163] Public outrage and engagement are the sparks this movement demands.

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159. The Joint Plan of Action sets in motion that a bilateral negotiation addressing ground-level ozone would benefit air quality health in both the U.S. and Canada. To solidify their commitments to each other, both Parties included an "ozone Annex" in the AQA. The Joint Plan of Action is a quintessential example of both Parties recognizing the need to review their own programs continuously and periodically. *See generally* Air Quality Agreement, *supra* note 114, 19–25 (setting objectives that are not always met by the initial programs to curb transboundary pollution).

160. *Id.* (stipulating that the AQA's scope is narrow in that it only considers pollution that is considered by both Parties to be "significant transboundary air pollution").

161. *Id*. at 3.

162. *Id*. at 5.

163. This starts with educating the public on the gravity of wildfire pollutions. The public was impossible to ignore during the acid rain discussions. *See generally Trail Smelter, supra* note 37 (showing how both the U.S. and Canada were forced by their citizens to address the significant transboundary pollution that was coming from these wildfires).

Canada and the U.S.' success with curbing acid rain has shown the value of using the AQA's provisions for tackling significant transboundary pollution. In addition, there is potential and precedent for extending that success to suppress wildfires because wildfires are a significant transboundary pollutant.[164] Wildfires often result from acts like leaving campfires unattended, burning debris, malfunctioning equipment,[165] discarding cigarettes, and arson.[166] Wildfires have significantly impacted human health and exacerbated climate change—the most significant threat to

164. Not referring to pollutants in the CAA, but instead the NAAQS. *Treatment of Air Quality Data Influenced by Exceptional Events* (Homepage for Exceptional Events), U.S. ENV'T. PROT. AGENCY, https://www.epa.gov/air-quality-analysis/treatment-air-quality-data-influenced-exceptional-events-homepage-exceptional. *Wildfire Causes and Evaluations*, NAT'L PARK SERV. https://www.nps.gov/articles/wildfire-causes-and-evaluation.htm (last visited Jan. 20, 2022). *See also* Water Science School, *Acid Rain and Water*, USGS 9 https://www.usgs.gov/special-topics/water-science-school/science/acid-rain-and-water#overview (last visited Dec. 10, 2021) (distinguishing acid rain precipitation sources such as volcanoes and human activities (emissions of sulfur dioxide and nitrogen oxides over long periods of time) which is, in some ways, similar to anthropogenic black carbon sources). This technology may be useful and could potentially be used during future AQA discussions to show that it is possible to anticipate black carbon breakouts (wildfires). S*ee also Distinguishing Black Carbon Sources*, ANSTO (Jul. 22, 2019), https://www.ansto.gov.au/news/distinguishing-black-carbon-sources (describing new technology created for the purpose of distinguishing sources of black carbon. "Experts in the monitoring of fine particle pollution have developed a research instrument to measure the concentration of black carbon in the atmosphere and determine its source.").

165. Pacific Gas & Electric Co.'s downed power lines have caused more than 1,500 wildfires since 2012. One of which was the deadliest wildfire in California's history, killing 85 people and destroying more than 19,000 structures. Morgan McFall-Johnsen, *Over 1,500 California fires in the past 6 years—including the deadliest ever—were caused by one company*, INSIDER (Nov. 3, 2019) https://www.businessinsider.com/pge-caused-california-wildfires-safety-measures-2019-10.

166. The AQA was created to curb acid rain sources, damages, and externalities. Comparing the process of locating acid rain sources to that of wildfire sources may prove useful for the IJC during wildfire discussions. Finding wildfire sources is difficult, but not impossible, and lawmakers/policymakers should look to the new technology that assists in predicting when or where wildfires will start. *Human vs. Naturally Occurring Wildfires*, U.S. DEP'T INT. INDIAN AFF. (last visited Dec. 10, 2021) https://www.bia.gov/bia/ots/dfwfm/bwfm/wildfire-prevention-and-education/home-bureau-indian-affairs-bia-trust-services-division-forestry-and-wildland-fire-management-branch; *id.* (highlighting the difficulty for firefighters to find and distinguish wildfire sources). Acid rain emitters and emission sources are easier for scientists to distinguish and locate. *See* GOV'T CAN., *supra* note 121 (identifying primary emission sources for acid rain and addressing those issues). SO2 consistently emits from acid rain sources over a longer period of time in comparison to wildfires. Wildfires have a "shorter lifespan" in that they do not last years at a time; It is difficult to ascertain how removing a source of sulfur emissions in the U.S. would have a positive effect on sulfur deposits or acid rain in Canada—it is hard to track how one specific emission source affects a specific part of a country. Thus, like regional SO2 evaluations, the IJC would have to discuss at a regional level how and what their plans are for curbing wildfires. *See generally* INT'L JOINT COMM. UNITED STATES-CANADA AIR QUALITY AGREEMENT PROGRESS REPORT 2004, https://www.epa.gov/sites/default/files/2015-07/documents/2004_u.s.-canada_progress_report.pdf (asserting that scientists cannot guarantee that a 50% reduction in, for example, a sulfur emission reduction in the Midwest, would assure a 50% reduction in the Northeast). Additionally, it is important to note that climate scientists believe acid rain sources originate in urban areas whereas black carbon emissions are found in rural locations. *See generally The Rural Fire Problem in the United States*, FED. EMERGENCY MGMT. AGENCY U.S. FIRE ADMIN. 7 (Aug. 1997) (touching on the phenomenon of urban acid rain sources and rural wildfire sources).

living creatures, resources, and ecosystems.[167] Many wildfires are human-caused through small, negligent actions.[168] Yet, as previously discussed, poor land use practices and forest management are to blame for both starting and exacerbating wildfires.[169] Wildfires are a significant transboundary pollutant and will exponentially magnify as fuel loads from poor forest management increase and people continue to construct residential areas near large fuel loads.

2. Step one: what are the necessary objectives and programs for curbing these activities?

First, the IJC must create specific objectives and programs to mitigate black carbon pollution resulting from widespread wildfires. Determining wildfire sources requires law and policymakers to make an inferential leap past a simply discarded cigarette butt. Poor land use and forest management practices are to blame for large, raging fires.[170] Law and policymakers should acknowledge that certain forest types—boreal and temperate—require forest management and land use practices.

These practices look like implementing prescribed fires as the "go-to" fire treatment method for forest management and straying from fire suppression. The Texas Department of Agriculture created a Prescribed Burn Program, run by the Prescribed Burning Board (PBB).[171] The PBB regulates certified and insured prescribed burns (and the people who operate and manage such burns) that limit fuel loads to control vegetation's health and protect residential areas.[172] A nationally implemented prescribed burning program (in the critical areas previously discussed) would be an essential program that the IJC should implement through the AQA. Canada is already

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167. Mulroney, *supra* note 108; *see generally Black Carbon Research and Future Strategies: Reducing Emissions, Improving Human Health, and Taking Action on Climate Change*, U.S. ENV'T. PROT. AGENCY (Oct. 2011) https://www.epa.gov/sites/default/files/2013-12/documents/black-carbon-fact-sheet_0.pdf (highlighting the human and environmental impacts from wildfires and black carbon emissions).

168. *Id.* at 167.

169. Mulroney, *supra* note 108; *see generally* U.S. ENV'T. PROT. AGENCY *supra* note 167.

170. French, *supra* note 60, at 828.

171. Texas has little to no boreal/temperate forests, but it is still a useful comparison. The Texas government recognizes the benefit and need for prescribed fires in their public lands. An epiphany that should come to policymakers in the IJC. Interestingly enough, 98% of Texas' land is privately held, making having a statewide plan difficult, but the PBB is able to establish connections with private landowners. *Prescribed Burn Program*, TEXAS DEP'T AGRIC., https://www.texasagriculture.gov/home/productionagriculture/prescribedburnprogram.aspx (last visited Mar. 17, 2022).

172. *Id.*

funding prescribed fires nationwide.[173] Specifically, Parks Canada carefully plans prescribed fires to restore forest health and protect residential areas.[174] Parks Canada operates on a larger scale than Texas' PBB, but bringing both programs to the IJC's discussion will show the potential for success in both countries. Forest management is currently contributing to many black carbon emissions, which is a significant transboundary pollutant. Solving the poor forest management issues are one of the pieces for aiding transboundary wildfire pollution.

Additionally, the IJC must focus on transforming land use practices. Without specific and intentional practices, wildfires will exponentially increase in size, occurrence, and temperature, exacerbating black carbon transboundary pollution. Minimizing wildfires comes down to better land use planning. Houses and buildings are fuel too, which endangers neighborhoods. Research shows that the fuel loads in the immediately surrounding area and how the building's design and construction determines home loss. Reducing fuel loads surrounding current residential areas is critical to limit the ease with which a wildfire could start and spread. Here is where programs can mix forest management and land use goals. The IJC should create programs that distinguish dangerous areas to build homes and avoid those areas. Reducing new home development in the areas of highest risk minimizes danger to neighborhoods and reduces transboundary wildfire pollution.[175]

3. Step two: conducting environmental assessments and enacting mitigation measures.

U.S. and Canadian lawmakers, fire management agencies, and experts will be severely challenged by growing wildfire threats and should conduct environmental assessments and mitigation measures in anticipation of these threats.[176] Article V of the Agreement states that each Party "as required by its laws, regulations and policies, assess those proposed actions, activities and projects within the area under its jurisdiction that, if carried out, would be likely to cause significant transboundary air pollution, including consideration of appropriate mitigation measures."[177] Essentially, per their

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173. *Prescribed Fires,* PARKS CAN.: SCIENCE AND CONSERVATION https://www.pc.gc.ca/en/nature/science/conservation/feu-fire/feuveg-fireveg/dirige-prescribed (last visited Mar. 17, 2022).

174. *Id.*

175. These programs can be regulated and unregulated. *See* generally Air Quality Agreement, *supra* note 114 (explaining that the AQA has resulted in both regulated and unregulated programs).

176. Flannigan et al., *Impacts of climate change on fire activity and fire management in the circumboreal forest* 14 GLOBAL CHANGE BIOL. 1, 9 (2008).

177. Air Quality Agreement, *supra* note 114, at 5.

laws, the U.S. and Canada must conduct an environmental assessment for the appropriate proposed activities (prescribed fires and better land use planning). The EPA directed such a report in 2021.[178] While a "prescribed fire can reduce the overall size of future wildfires and the associated smoke emissions and smoke-related health impacts, smoke is still emitted."[179] However, the benefits still greatly outweigh the costs. Although there are still smoke emissions, they are on a much smaller scale compared to wildfire emissions.[180] The IJC must consider this assessment (or conduct an independent assessment in each country's respective jurisdictions) during project proposals.

As for mitigating these risks, countries should ensure that prescribed fires remain prescribed and not evolve into wildfires. The solution is hiring fire experts and funding training for those overseeing prescribed fires. Also, conducting these burns at the right time and place is critical to guarantee safety and minimize black carbon emissions.[181] This concept extends into land use mitigation. Countries are reducing fuel loads with prescribed burns and regulating homeowners to remove dead material from around their homes.[182] Overall, black carbon emissions from prescribed fires are significantly less than what is currently coming from wildfires. Therefore, the IJC should implement these mitigation strategies.

4. Step three and four: carrying out cooperative and coordinated scientific and technology programs, directing economic research, and sharing pertinent information.

Canada has already been conducting scientific and technological research that will bring essential tools to the IJC's discussion. There has been a significant attitude shift regarding wildfire management over the past decade in Canada. Canadian researchers have expanded their government's knowledge on how wildfires operate by providing many tools. These include the Canadian Wildland Fire Information System (CWFIS), the Wildfire

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178. *EPA Releases Report Comparing Air Quality and Public Health Impacts from Prescribed Fire and Wildfire Smok*e, U.S. ENV'T. PROT. AGENCY (Sept. 30, 2021), https://www.epa.gov/newsreleases/epa-releases-report-comparing-air-quality-and-public-health-impacts-prescribed-fire#:~:text=The%20%E2%80%9CComparative%20Assessment%20of%20the,impacts%2C%20smoke%20is%20still%20emitted.

179. *Id.*

180. *Id.*

181. *See generally id.* (stipulating what time of the year, time of day, and where exactly the safest and most effective areas are to conduct prescribed burns).

182. *See e.g., Defensible Space*, READY FOR WILDFIRE (last visited Aug. 13, 2022), https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/ (stating that in some zones in California, defensible spaces are mandatory).

Threat Rating System (WTRS), and the Canadian Fire Effects Model (CanFIRE).[183] All of these tools assist in furthering the overall aim of reducing fuel loads, which reduces wildfires and thereby reduces transboundary black carbon emissions. IJC negotiations and discussions should highlight the success of CWFIS, WTRS, and CanFIRE, in reducing transboundary pollution, while also suggesting the U.S. implement the same or similar resources in their fire management practices. Canada created additional resources, such as General Circulation Models,[184] which address the impact of climate change on weather severity. The IJC should reference this model when discussing the growing wildfire threat while also acknowledging the expansive new technology and research to mitigate wildfire damage and pollution.

Overall, the Canadian Government spent between $800 million to $1.4 billion annually on forest management over the past decade in preemptive attempts to mitigate wildfire damage.[185] Yet, the U.S. spends billions of dollars cleaning up after wildfires, and the Forest Service spends billions fighting fires—this spending is the most significant component of the Forest Service's budget.[186] Unfortunately, there is little to no funding going into preemptively preventing wildfires.[187] Instead, billions of dollars are retroactively spent on wildfire damage. Luckily for the U.S., Canada has already fronted the expense of developing wildfire prevention tools and

183. CANADIAN WILDLAND FIRE INFORMATION SYSTEM (CWFIS), GOV'T CAN. https://cwfis.cfs.nrcan.gc.ca/home (last visited Jan. 24, 2022) (providing data and maps of fire danger conditions across Canadian provinces). The WTRS assesses and maps four main components of fire risk: ignition, values at risk, suppression capability and expected fire behavior. This system can generate an overall fire-threat rating that assists forest management in determining how land-use decisions are able to affect future fire threats in any given area. *See generally Wildfire Threat Rating System,* GOV'T CAN., https://www.nrcan.gc.ca/our-natural-resources/forests/wildland-fires-insects-disturbances/forest-fires/fire-management/13157 (last visited Jan. 24, 2022). CanFIRE is used to predict the behavior of a wildfire that is currently taking place. The CanFIRE behavior models allow firefighters to make more informed decisions on where to allocate firefighting resources. *See generally* CanFIRE, GOV'T CAN. https://www.nrcan.gc.ca/our-natural-resources/forests/wildland-fires-insects-disturbances/forest-fires/canadian-fire-effects-model/23333 (last visited Jan. 24, 2022) (describing the CanFIRE model and how it is calculated).

184. *See* Flannigan, *supra* note 176 (explaining that "[General Circulation Models] simulate the future climate by include[ing] three-dimensional representations of the atmosphere, ocean, cryosphere and land surface. . . . Future climate scenarios are built based on the effects of various concentrations of greenhouse gases and other pollutants within the atmosphere.").

185. Long term investments in reducing fuel loads, better forest management, and improved land use are critical steps to mitigating transboundary air pollution. *See generally* Sean C.P. Coogan & Francois-Nicolas Robinne, *Scientists' warning on wildfire–a Canadian perspective*, 49 NRC RES. PRESS CAN J. FOR. RES. 1015, 1018 (2019) .

186. *See e.g.,* FY 2022 BUDGET JUSTIFICATION, U.S. FOREST SERV. (2022), https://www.fs.usda.gov/sites/default/files/usfs-fy-2022-budget-justification.pdf (listing Wildfire Management budget justification spending).

187. *Id.*

models.[188] CWFIS, WTRS, and CanFIRE are some of Canada's many advanced practices for reducing wildfires (both the quantity and magnitude) and air pollution. The IJC must focus on encouraging the implementation of some of these tools in the U.S..[189] Wildfires will exponentially continue to cause more damage to the physical environment and air quality in the U.S. and Canada unless both countries collaboratively implement Canada's technologies.[190]

5. Step five and beyond: assessing continuously.

Finally, the IJC must continue to assess each country's programs long after enactment. Every two years the IJC puts out a progress report. In the report, they invite public comments and provide a synthesis of comments to the Governments of the U.S. and Canada to assist them with implementing the AQA and its programs.[191] The report states, "working collaboratively under the Agreement, both countries have made remarkable progress in reducing acid rain and controlling ozone in the transboundary region, improving the environment and achieving better air quality for citizens in the U.S. and Canada."[192] Both countries are adamant about the AQA being a collaborative, continual, and persistent process. The bi-annual reports mirror such a statement, as SO_2 and NO_X have decreased to meet both countries' initial objectives.[193] This needs to be the case with wildfires. Incorporating the progress made from regulated and unregulated programs in the report will allow wildfire reduction to remain an open conversation.

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188. An expense the U.S. will be able to avoid and a point the IJC should call attention to during transboundary air pollution discussions.

189. *See* Douglas Thomas et al., *The Costs and Losses of Wildfire*s, Special Publ'n 1215 NAT'L INST. STANDARDS & TECH. 1, 11–13 (Nov. 2017) (giving examples of how wildfire mitigation is more cost effective) (The procedure for this implementation will be discussed further below. CWFIS, WTRS, and CanFIRE are a financial investment in the safety of the air between the border and physical landscape. The implementation of defensible space may be expensive, but the long-term benefits drastically outweigh the short-term cost).

190. In comparison to collaborative acid rain technologies. Wet deposition of sulfate and nitrate is measured by precipitation chemistry monitoring networks in Canada and the U.S., and the results are published in the bi-annual report. A similar report from each of Canada's technologies could be included in the same report. It is unknown which country founded the acid deposition technology, but both were able to collaborate and coordinate data into the same program. The same can be done with Canada's technologies. *See* Thomas et al., *supra* note 189, at 23 (explaining the damage that wildfires cause to humanity, the environment, and the atmosphere); s*ee generally* Air Quality Agreement, *supra* note 114 (showing how both countries collaborate and coordinate data).

191. *Canada-United States Air Quality Agreement: Progress Report: Introduction***,** GOV'T CAN., (2016) https://www.canada.ca/en/environment-climate-change/services/air-pollution/publications/canada-united-states-air-quality-report-2016/introduction.html#s1.

192. *Id.*

193. *Id.*

IV. CONCLUSION

The AQA is an ideal mechanism for addressing significant transboundary pollutants. Historically, the AQA had shown positive results when both countries curbed SO_2 emissions and acid rain. This victory should build confidence for both countries to extend the AQA to more activities causing significant transboundary pollution. Land use planning and forest management schemes are causing this phenomenon in wildfires, thereby making wildfires emit black carbon at more intense, severe, and exponential rate. Black carbon emissions are traveling across the U.S.-Canada geopolitical border, giving rise to environmental damage outside of both countries' respective jurisdictions. The Countries could permanently curb wildfires and transboundary wildfire emissions by: following the AQA's procedures and implementing programs; stating objectives; conducting environmental assessments; enacting mitigation measures; carrying out cooperative and coordinated scientific and technological activities; and continuing to assess the progress made.

The U.S. and Canada AQA is an example of two nations with a common problem, both trying to find diplomatic solutions. The AQA is a unique agreement in that it is an ongoing process—the AQA is not static. Both Countries must continuously collaborate and communicate what activities the Countries are concerned about. Both Countries can diplomatically address activities that cause significant transboundary pollution through this international comparative legal mechanism starting with wildfire emissions. If the IJC successfully confronts wildfires through this Agreement, the AQA could open the door to tackling many other activities that cause significant transboundary pollution.