

Does the Criminal Enforcement of Federal Environmental Law Deter Environmental Crime? The Case of The U.S. Clean Air Act

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ABSTRACT

The U.S. EPA and Department of Justice are tasked with the investigation and prosecution of environmental crimes occurring under the U.S. Clean Air Act (CAA). Criminal sanctions are meant to increase the cost of CAA crimes relative to the economic benefit, with the goal of deterring specific individuals and firms from offending and providing general deterrence indirectly via observation of other potential offenders. Prior research has examined sanctioning under the CAA, but little examines the plausibility of the deterrent effect of criminal sanctions. Through content analysis of all 2,588 criminal prosecutions resulting from the EPA's criminal investigations between 1983 and 2019, we explore the probability of detection and prosecution for all CAA prosecutions. Results show the probability of detection and

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prosecution to be very low across the regulated community. We conclude by offering three remedies for improving the plausibility of deterrence, including enhancing resources to impose sanctions, developing greater community involvement in enforcement efforts, and raising the profile and salience of criminal enforcement activities.

INTRODUCTION

Sending toxic air emissions into the atmosphere for less than two centuries has created a structural shift in the world's climate that we can no longer stop, only mitigate.¹ Rising temperatures, more violent hurricanes, dramatic losses of sea ice and subsequent sea level rise, and increased drought in many areas of the world are expected to increase significantly over the next century.² While we imperil our own species and the planet with our continued reliance on fossil fuels, whether we can overcome our collective action problem by direct and concerted action is still unknown.³ While the United States has generally dithered on its commitment to reducing carbon emissions, what is certain is that the primary federal regulatory vehicle for curbing them will be the U.S. Clean Air Act (CAA).⁴ The CAA authorizes the U.S. Environmental Protection Agency (EPA) to identify, set permitting standards, and develop tools to regulate a plethora of harmful air emissions in the United States.⁵ The United States has no comprehensive and overarching environmental law at the federal level, and the modern CAA has been culled together from many previous efforts, giving it a significant number of flaws when it comes to the EPA passing various regulations aimed at curbing environmental problems that cross various media and jurisdictions.⁶ When the EPA

¹ *The Effects of Climate Change*, NASA (Nov. 8, 2022), <https://climate.nasa.gov/effects> [<https://perma.cc/VC7V-4Q8D>]; see also John Cook et al., *Quantifying the Consensus on Anthropogenic Global Warming in the Scientific Literature*, 8 ENV'T RSCH. LETTERS *passim* (2013).

² See Naomi Oreskes, *Beyond the Ivory Tower: The Scientific Consensus on Climate Change*, 306 SCI. 1686, 1686 (2005).

³ Peter T. Doran & Maggie Kendall Zimmerman, *Examining the Scientific Consensus on Climate Change*, 90 EOS 22 (2009).

⁴ U.S. Clean Air Act of 1970, Pub. L. No. 91-604.

⁵ *Clean Air Act Requirements and History*, EPA (Aug. 10, 2022), <https://www.epa.gov/clean-air-act-overview/clean-air-act-requirements-and-history> [<https://perma.cc/Y5L6-WCW7>].

⁶ Victor B. Flatt, *Gasping for Breath: The Administrative Flaws of Federal Hazardous Air Pollution Regulation and What We Can Learn from the States*, 34 ECOLOGY L.Q. 107 *passim* (2007). EPA has offices and programs narrowly tailored for specific responsibilities

has acted on regulating greenhouse gas emissions under the CAA as it did in the Obama Administration, its actions often provoke an immediate and protracted court battle and subsequent efforts by Republican administrations to roll back such regulations.⁷

While much attention is paid to how and why the EPA uses the CAA to craft regulations and the legal ramifications of those decisions, much less effort is paid to exploring how the CAA is actually enforced.⁸ The enforcement of CAA rules on the ground is fraught with a series of practical and technical problems, including lack of enforcement staff, inefficient monitoring, the absence of objective data that is not self-reported by industry, and numerous regulatory loopholes provided by state environmental regulators.⁹ For the substance of the CAA to prevail in the form of better public health and environmental outcomes, a stronger scholarly focus on how administrative agencies enforce the Act and whether the enforcement regime is effective at ensuring compliance with the law is critical if we are to expect the EPA to

and thus suffers when trying to deal with policy issues, such as air emissions that cross various state and international boundaries. Thus, the agency often takes much too long to act, if at all, in many circumstances and is bogged down by this structure, which often reflects the way in which federal statutes are written. *See* Richard Arnold & Andrew B. Whitford, *Organizational Dilemmas of the US EPA: Why Structures Matter for Environmental Protection*, 14 ENV'T POLS. 118, 118–21 (2005).

⁷ EPA issued rules to curb greenhouse gas emissions from large stationary sources of emissions in the United States that would be required under CAA permitted rules in January 2011. These were covered under the Title V permitting rules and Prevention of Significant Deterioration (PSD) standards. This action prompted an immediate court battle leading to the Supreme Court case of *Utility Air Regulation v. EPA*, where the Court brought into question the ability of the EPA under the CAA to regulate greenhouse gas emissions for purposes of permitting a major stationary source. The Trump Administration has since acted to roll back related requirements set on the states to reduce carbon dioxide emissions, instead incentivizing coal plants to adopt new technology. *See* *Util. Air Regul. Grp. v. EPA*, 537 U.S. 302 (2014); *Clean Air Act Permitting for Greenhouse Gases*, EPA, <https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases> [<https://perma.cc/4MRB-K6RK>] (Dec. 30, 2022); Alex Guillén, *Trump Rolls Back Obama's Biggest Climate Rule*, POLITICO (June 19, 2019), <https://www.politico.com/story/2019/06/19/trump-coal-climate-rule-1539616> [<https://perma.cc/4CHJ-8Q3W>].

⁸ Joshua Ozymy & Melissa L. Jarrell, *Wielding the Green Stick: Criminal Enforcement at the EPA Under the Bush and Obama Administrations*, 24 ENV'T POLS. 38, 40–43 (2015).

⁹ Eric V. Schaeffer & Huma Ahmed, *Accidents Will Happen*, ENV'T INTEGRITY PROJECT 27–28 (Oct. 17, 2002), http://environmentalintegrity.org/pdf/publications/Report_Accidents_Will_Happen.pdf [<https://perma.cc/9EP3-DDHS>]; Joshua Ozymy & Melissa Jarrell, *Upset Events, Regulatory Drift, and the Regulation of Air Emissions at Industrial Facilities in the United States*, 21 ENV'T POLS. 451, 457–60 (2012); Scott de Marchi & James T. Hamilton, *Assessing the Accuracy of Self-Reported Data: An Evaluation of the Toxics Release Inventory*, 32 J. OF RISK AND UNCERTAINTY 57, 57–59 (2006).

effectively regulate public health problems caused by air pollution, such as smog, respiratory illness, and even climate change.¹⁰

Although many studies focus on CAA civil enforcement, this Article addresses an important issue often ignored in the law and policy literatures, which is the value of the environmental criminal enforcement regime for deterring violations of federal clean air laws.¹¹ Building on studies that have assessed the topic more generally, in this Article we focus on the probability of detection and prosecution under criminal provisions of the CAA.¹² While it is difficult to know directly if detection and prosecution rates can sufficiently raise the cost of offending relative to the benefit of polluting or provide general deterrence effects across industries, we gather data from 1983 to 2019 on all CAA criminal prosecutions stemming from the EPA's criminal investigations to explore the plausibility of deterrence under the Act. We hope to add to the discussion of not only whether the CAA's statutory provisions need strengthening to tackle major issues with air emissions, but whether the same bolstering is needed for how we enforce the Act via a criminal process. We provide an overview of the CAA below, a discussion of the criminal enforcement process, our analysis, and plausible remedies for enhancing the criminal enforcement regime.

I

OVERVIEW OF THE U.S. CLEAN AIR ACT

In 2020, it was important to reflect on the exceptional value and importance of the CAA at the 50th anniversary of the modern Act's

¹⁰ *Ambient (Outdoor) Air Pollution*, WORLD HEALTH ORG. (Sep. 22, 2021), [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health) [<https://perma.cc/K24K-FMQT>]; Joshua Ozymski & Melissa Jarrell, *Upset Over Air Pollution: Analyzing Upset Event Emissions at Petroleum Refineries*, 28 REV. OF POL'Y RSCH. 365, 372–75 (2011); Joseph Goffman & Laura Bloomer, *Disempowering the EPA: How Statutory Interpretation of the Clean Air Act Serves the Trump Administration's Deregulatory Agenda*, 70 CASE W. RESV. L. REV. 929, 929–35 (2020).

¹¹ See Wayne B. Gray & Ronald J. Shadbegian, *When and Why Do Plants Comply? Paper Mills in the 1980s*, 27 L. & POL'Y 238, 238–40 (2005); Wayne B. Gray & Jay P. Shimshack, *The Effectiveness of Environmental Monitoring: A Review of the Empirical Evidence*, 5 REV. ENV'T ECON. & POL'Y 3, 3–6 (2011).

¹² See Michael J. Lynch et al., *The Weak Probability of Punishment for Environmental Offenses and Deterrence of Environmental Offenders: A Discussion Based on USEPA Criminal Cases, 1983-2013*, 37 DEVIANT BEHAV. 1095, 1096–97 (2016).

passage.¹³ While the 1970 amendments represent what we typically think of as the modern CAA, the Act has really been culled together from a series of congressional efforts dating back to the 1950s, when focusing events, such as the Donora Smog, made it impossible for the federal government to avoid acknowledging and eventually taking the lead on managing air pollution as a national environmental problem.¹⁴ The Air Pollution Control Act of 1955 was the first substantive act of Congress that acknowledged air pollution as a national public policy problem but did little to measure or regulate air emissions.¹⁵ In 1963, the Clean Air Act was passed to authorize the U.S. Public Health Service to research methods for monitoring and controlling air emissions.¹⁶ In 1965, the National Emissions Standards Act was passed, which began developing a federal process to regulate vehicle emissions from 1968 onward.¹⁷

The Clean Air Act Extension of 1970 was exceedingly important, as it put the federal government in the driver's seat for regulating air emissions from stationary and mobile sources throughout the United States.¹⁸ The Act also transferred authority for regulating air emissions to the EPA.¹⁹ Before the Act, the federal government had regulated some emissions and taken the lead in studying monitoring and control methods but failed to take ownership and leadership over air pollution as a national problem, which would have centralized regulatory functions under a single agency.²⁰ With authority centralized in one agency and empowered to take a leadership role over what had become a serious public health crisis by 1970, the states would now work in

¹³ *Clean Air Act Requirements and History*, EPA (Aug. 10, 2022), <https://www.epa.gov/clean-air-act-overview/clean-air-act-requirements-and-history> [https://perma.cc/6T87-YJYQ].

¹⁴ Elizabeth T. Jacobs & Jeffrey L. Abbott, *The Donora Smog Revisited: 70 Years After the Event That Inspired the Clean Air Act*, 108 AM. J. PUB. HEALTH S85 *passim* (2018).

¹⁵ Air Pollution Control Act of 1955, Pub. L. No. 84-159; David M. Driesen et al., *Half a Century of Supreme Court Clean Air Interpretation: Purposivism, Textualism, Dynamism, and Activism*, 75 WASH. & LEE L. REV. 1781 *passim* (2018).

¹⁶ Clean Air Act of 1963, Pub. L. 88-206.

¹⁷ National Emissions Standards Act of 1965, Pub. L. 89-272.

¹⁸ Clean Air Act Extension of 1970, Pub. L. 88-206; Paul Rogers, *EPA History: The Clean Air Act of 1970*, EPA (1990), <https://archive.epa.gov/epa/aboutepa/epa-history-clean-air-act-1970.html> [https://perma.cc/YC5R-GT97].

¹⁹ Phil Wisman, *EPA History (1970-1985)*, EPA (1985), <https://archive.epa.gov/epa/aboutepa/epa-history-1970-1985.html> [https://perma.cc/V6WY-SPEY].

²⁰ Richard K. Lattanzio, *Clean Air Act: A Summary of the Act and Its Major Requirements* CONG. RSCH. SERV. (Sept. 13, 2020), <https://fas.org/sgp/crs/misc/RL30853.pdf> [https://perma.cc/6JZW-KPLB].

partnership with the EPA on policymaking, permitting, monitoring, and enforcement, but they would have to meet certain obligations and minimum standards set by the EPA.²¹

With the modern CAA's passage, Congress was reacting to the significant environmental problems caused by rapid expansion of industrial sources of pollution, traffic congestion and the proliferation of air pollution from automobiles, and other environmental effects of air pollution.²² EPA's primary responsibility early on was to identify the worst sources of air pollution, find the most expedient and reasonable methods for control, and set appropriate technological or regulatory standards to meet certain goals.²³ The EPA mostly focused on meeting regional goals for air quality, developing technology-forcing solutions to immediate problems, such as catalytic converters for automobiles or removing lead from gasoline, rather than taking broad strokes to develop command-and-control standards for a variety of industries responsible for the bulk of the country's air pollution.²⁴ One of the primary actions taken by the EPA under the CAA was to develop the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants such as sulfur oxides (SO_x), atmospheric particulate matter (PM₁₀ and PM_{2.5}), carbon monoxide (CO), ozone (O₃), nitrogen

²¹ Jonathan H. Adler & Nathaniel Stewart, *Is the Clean Air Act Unconstitutional? Coercion, Cooperative Federalism and Conditional Spending After NFIB v. Sebelius*, 43 *ECOLOGICAL* L.Q. 671 *passim* (2016).

²² *History of Reducing Air Pollution from Transportation in the United States*, EPA, <https://www.epa.gov/transportation-air-pollution-and-climate-change/accomplishments-and-success-air-pollution-transportation> [<https://perma.cc/BFK3-4WBS>] (May 16, 2022).

²³ Because of this approach, many stationary sources, such as coal-fired power plants have been able to resist regulation as individual firms, despite pressure on the industry for years. Many plants today lack appropriate and widely available technologies, such as stack scrubbers to reduce SO₂ and other harmful emissions. Attempts to regulate certain pollutants under the CAA have always engendered long court battles. The Obama Administration's attempt to regulate climate change via greenhouse gas regulations, particularly targeted at the coal industry, met with stiff opposition from industry. Without an overarching federal environmental law or significant and clear powers given to EPA by Congress, the development and extension of the CAA to regulate emissions has always been difficult. See Arnold W. Reitze, Jr., *The Intersection of Climate Change and the Clean Air Act Stationary Source Programs*, 43 *ARIZ. STATE L.J.* 901 *passim* (2011); *Clean Air Act—Stationary Source Greenhouse Gas Regulation—Utility Air Regulatory Group v. EPA*, 128 *HARV. L. REV.* 361 *passim* (2014).

²⁴ *History of Reducing Air Pollution from Transportation in the United States*, EPA (May 16, 2022), <https://www.epa.gov/transportation-air-pollution-and-climate-change/accomplishments-and-success-air-pollution-transportation> [<https://perma.cc/7ZYL-5Z5P>]; Tim Palucka, *Doing the Impossible*, *INVENTION & TECH. MAG.* (2004), <https://www.inventionandtech.com/content/doing-impossible-0> [<https://perma.cc/8E7M-W6AX>].

oxides (NO_x), and lead (Pb).²⁵ States were provided discretion to develop State Implementation Plans (SIPs) to comply with ambient air quality standards, rather than be forced to adopt a singular method by the EPA.²⁶ Cross-state air pollution was and continues to represent a significant regulatory problem causing the EPA to promulgate rules to manage such environmental problems as coal-fired power plants in the Northeast that cause deforestation and acid rain in the Mid-West and Mid-Atlantic states.²⁷

The EPA would also make strong distinctions between rules promulgated for new sources of pollution versus extant sources, such as the introduction of New Source Performance Standards (NSPS) for pollution controls that set permitting standards for new stationary sources.²⁸ NSPS focused on developing pollution control rules based on the best available pollution control technology at the time of permitting.²⁹ The National Emissions Standards for Hazardous Air Pollutants (NESHAP) rules were then created to regulate stationary source air emissions not covered by the NAAQs. NESHAP standards cover any hazardous emissions known to cause cancer or seriously adverse health or environmental effects and affect a significant number of industries, including refineries, pharmaceutical manufacturing plants, plastic coatings manufacturers, fertilizer manufacturers, and many other facilities that produce hazardous emissions.³⁰

²⁵ NAAQS standards can be found here: *Reviewing National Ambient Air Quality Standards (NAAQS): Scientific and Technical Information*, EPA, <https://www.epa.gov/naaqs> [<https://perma.cc/3BCX-V8HE>] (July 28, 2022).

²⁶ *Basic Information About Air Quality SIPs*, EPA, <https://www.epa.gov/sips/basic-information-air-quality-sips> [<https://perma.cc/WTX6-8M29>] (Jan. 25, 2022).

²⁷ *Cross-State Air Pollution Rule (CSAPR)*, EPA, <https://www.epa.gov/csapr> [<https://perma.cc/V8PB-88GR>] (June 27, 2022).

²⁸ Casey Roberts, *New York v. EPA: State Response to a Federal Regulatory Rollback*, 33 *ECOLOGICAL L.Q.* 613, 613–52 (2006); Brian H. Potts, *The U.S. Supreme Court's New Dukedom: The Hour and Year, or a Proposal Quieter Near*, 33 *ECOLOGICAL L.Q.* 517, 517–43 (2006).

²⁹ See Hilda A. Akopyan, *The EPA's Threat to The New Source Performance Standards*, *ENV'T LITIG.* (Feb. 19, 2019), <https://www.defenselitigationinsider.com/2019/02/19/the-epas-threat-to-the-new-source-performance-standards/> [<https://perma.cc/K3RU-5DWL>]. Determining the Best Available Control Technologies for a NSPS permit is a very difficult and often political process. Trying to review a new chemical plant's air permit to determine what a company argues is sufficiently available for maximum control versus other options is quite difficult.

³⁰ *Halogenated Solvent Cleaning: National Emission Standards for Hazardous Air Pollutants (NESHAP)*, EPA, <https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-9> [<https://perma.cc/B75S-FN4R>]

As the country continued to industrialize and the EPA began to identify and measure the primary causes of urban air pollution, it became apparent that many areas of the country were now in non-attainment for one or more of the NAAQS, and areas that were once in attainment were beginning to fall out of attainment for those standards.³¹ The 1977 Clean Air Act amendments required the development of Prevention of Significant Deterioration (PSD) standards for areas already meeting air quality standards and developed rules for non-attainment areas that do not meet NAAQS for one or more criteria pollutants.³² PSD standards do not prevent air emissions from new facilities or those seeking major modifications, but attempt to balance economic and public interests in the area when a facility undergoes New Source Review permitting in these instances.³³ The 1990 Clean Air Act Amendments developed amended rules for operating permits for stationary sources of pollution, introduced new measures to control acid rain, created a cap and trade system known as the Acid Rain Program, began the gradual reduction in use of Ozone-Depleting Substances (ODS) in the United States, and introduced citizen lawsuit provisions under the Act.³⁴

(Apr. 7, 2022). Hazardous Air Pollutants or air toxics known to cause cancer and/or other health effects are the basis of the regulation.

³¹ *Current Nonattainment Counties for All Criteria Pollutants*, EPA (Oct. 31, 2022), <https://www3.epa.gov/airquality/greenbook/ancl.html> [https://perma.cc/LH8C-K9VJ]; *Air Quality System (AQS)*, EPA, <https://www.epa.gov/aqs> [https://perma.cc/9ZMP-F4JB] (June 24, 2022).

³² The Clean Air Act Amendments of 1977, Pub. L. No. 95-95, 91 Stat. 685 (1977) (codified as amended at 42 U.S.C. §§ 7401–7642); Chris Zajchowski et al., “*Now Is Not the Time to Take a Breather*”: *United States Federal Land Management Agency Professionals’ Perceptions at the 40th Anniversary of the Clean Air Act Amendments of 1977*, 32 SOC’Y & NAT. RES. 1003 *passim* (2019).

³³ *Prevention of Significant Deterioration Basic Information*, EPA, <https://www.epa.gov/nsr/prevention-significant-deterioration-basic-information> [https://perma.cc/6TZR-T32J] (Feb. 14, 2022).

³⁴ The Clean Air Act Amendments of 1990, Pub. L. No. 101-549 (1990); *The Clean Air Act – Highlights of the 1990 Amendments*, EPA, https://www.epa.gov/sites/production/files/2015-11/documents/the_clean_air_act_-_highlights_of_the_1990_amendments.pdf [https://perma.cc/JKA2-UTKP] (last visited Apr. 9, 2023); A. Denny Ellerman & Juan-Pablo Montero, *The Efficiency and Robustness of Allowances Banking in the U.S. Acid Rain Program*, 28 ENERGY J. 47 *passim* (2007); Anuradha Sivaram, *Why Citizen Suits Against States Would Ensure the Legitimacy of Cooperative Federalism Under the Clean Air Act*, 40 ECOLOGY L. Q. 443 *passim* (2013).

II ENFORCING THE U.S. CLEAN AIR ACT

The EPA's compliance monitoring strategy for the CAA provides good insight into how it focuses its enforcement resources to ensure the regulated community complies with air pollution regulations.³⁵ The EPA monitors compliance with the CAA in several program areas that cover thirteen individual programs.³⁶ The first program area selected for a compliance focus is the Acid Rain Inspection and Trading Program.³⁷ The second program area is the Applicability Determination Index (ADI) that helps owners and operators of a point source with a database of regulatory interpretations to determine who and what come under specific guidelines or regulations.³⁸ The third program area is compliance with asbestos NESHAP regulations.³⁹ The fourth program area is the Mobile Source Program containing emissions standards for vehicles and fuel.⁴⁰ The fifth program area is the regulation of Hazardous Air Pollutants under NESHAP and Maximum Achievable Control Technology standards for emissions reductions.⁴¹ The sixth program area centers on New Source Review permitting requirements to achieve Best Available Control Technologies or Lowest Achievable Emission Rate (LAER) standards that will not violate NAAQS when applicable.⁴² The seventh program area oversees facility safety and the

³⁵ Robert J. Jackson Jr. & David Rosenberg, *A New Model of Administrative Enforcement*, 93 VA. L. REV. 1983 (2007).

³⁶ *Clean Air Act (CAA) Compliance Monitoring*, EPA, <https://www.epa.gov/compliance/clean-air-act-cao-compliance-monitoring> [<https://perma.cc/6FD2-HCGP>] (June 29, 2022).

³⁷ *Acid Rain Program*, EPA, <https://www.epa.gov/acidrain/acid-rain-program> [<https://perma.cc/E5PY-PQKA>] (June 24, 2022).

³⁸ *Resources and Guidance Documents for Compliance Assistance*, EPA, <https://www.epa.gov/compliance/resources-and-guidance-documents-compliance-assistance> [<https://perma.cc/BLH5-9ZM2>] (June 15, 2022).

³⁹ *Asbestos NESHAP Regulations for Demolition and Renovation*, ARIZ. DEP'T OF ENV'T QUALITY (Nov. 2011), http://www.azdeq.gov/air/asbestos/download/neshap_demo.pdf [<https://perma.cc/D55F-KBYA>].

⁴⁰ *Mobile Sources Compliance Monitoring Program*, EPA, <https://www.epa.gov/compliance/mobile-sources-compliance-monitoring-program> [<https://perma.cc/MBB3-X46U>] (Nov. 30, 2021).

⁴¹ *MACT NESHAP Standards*, W. VA. DEP'T OF ENV'T PROT. (2022), <https://dep.wv.gov/daq/Air%20Toxics/Pages/MACTNESHAPStandards.aspx> [<https://perma.cc/P52J-JSBL>].

⁴² *RACT/BACT/LAER Clearinghouse (RBLC) Basic Information*, EPA, <https://www.epa.gov/catc/ractbactlaer-clearinghouse-rbhc-basic-information> [<https://perma.cc/PC2M-GXYX>] (Oct. 21, 2022).

oversight of accidental emissions releases.⁴³ The eighth program area oversees NSPS for new stationary sources.⁴⁴ The ninth program area oversees CFCs and ODS.⁴⁵

Outside this broader compliance monitoring strategy, the CAA contains a series of criminal provisions for punishing serious and willful violations. Negligent violations involve actions undertaken without reasonable care that violate any of the provisions of the CAA.⁴⁶ Knowing violations are intentional actions that demonstrate willful intent to violate any provision of the CAA.⁴⁷ We list these in Table 1.⁴⁸

Other provisions include penalties for owners or operators of a stationary source that construct or modify a new source; fail to comply with design, workplace, or operational standards; or emit a hazardous pollutant in violation of NESHAP. Individuals who are owners or operators of an organization that demolishes or removes asbestos-containing materials exceeding 260 linear feet on pipes, 160 square feet on another facility component, or thirty-five cubic feet of facility components, or fail to comply with NESHAP workplace standards or waste disposal standards, can be criminally prosecuted under the CAA. Stratospheric ozone protections focus on actions that involve the negligent or knowing release of refrigerants or other ozone-depleting materials. Making false statements on official reports or records, tampering with an emission-monitoring device or method, failing to report or notify the EPA of violations, violating state SIPs, violating NSPS, operating a regulated source in violation of or without a proper and valid permit, violating a requirement or prohibition of an emergency order provided by the EPA, or releasing a regulated substance

⁴³ *Accidental Release Prevention Requirements*, U.S. GEN. ACCT. OFF. (July 5, 1996), <https://www.gao.gov/assets/200/197749.pdf> [<https://perma.cc/5T57-5HCK>].

⁴⁴ *Clean Air Act Stationary Source Compliance Monitoring Strategy*, EPA, <https://www.epa.gov/compliance/clean-air-act-stationary-source-compliance-monitoring-strategy> [<https://perma.cc/7EQS-XAJA>] (Nov. 30, 2022).

⁴⁵ See *Clean Air Act (CAA) Compliance Monitoring*, EPA, <https://www.epa.gov/compliance/clean-air-act-cao-compliance-monitoring> [<https://perma.cc/Y23E-X8K5>] (June 29, 2022). The four additional areas of compliance monitoring include regulation of residential wood heaters, stack testing, rules for risk management plans, and guidelines for area source rules.

⁴⁶ Amanda Burns et al., *Environmental Crimes*, 50 AM. CRIM. L. REV. 857 *passim* (2013).

⁴⁷ *Basic Information on Enforcement*, EPA, <https://www.epa.gov/enforcement/basic-information-enforcement> [<https://perma.cc/B5G9-58PW>] (Nov. 2, 2022).

⁴⁸ Data for Table 1 are derived from the following: *Criminal Provisions of the Clean Air Act*, EPA, <https://www.epa.gov/enforcement/criminal-provisions-clean-air-act> [<https://perma.cc/5ALR-FULB>] (Mar. 30, 2022).

that negligently or knowingly places another person in imminent danger of death or serious bodily injury are all potentially criminal violations of the CAA.

Table 1. *Criminal Provisions of the U.S. Clean Air Act*

Violation	Maximum Penalty per Violation
Stationary Source NESHAP	(5) Years and/or Fines
Asbestos NESHAP	(5) Years and/or Fines
Stratospheric Ozone Protections	(5) Years and/or Fines
False Statements in CAA Documents	(2) Years and/or Fines
Tampering w/ a Monitoring Device or Method	(2) Years and/or Fines
Failure to Notify or Report	(2) Years and/or Fines
Negligent Endangerment	(1) Year and/or Fines
Knowing Endangerment	(15) Years and/or Fines
State SIPs	(5) Years and/or Fines
NSPS	(5) Years and/or Fines
Operating Permits	(5) Years and/or Fines
Emergency Order	(5) Years and/or Fines

Developing the tools to engage in the criminal enforcement of the CAA and federal environmental law generally stretches back over a century.⁴⁹ Misdemeanor provisions to criminally punish federal environmental crimes began with the Rivers and Harbors Act of 1899, which prohibited illegal dumping and obstruction of the navigable waters of the United States.⁵⁰ This was followed by the Lacey Act of 1900, which prohibited the unpermitted interstate trade in wildlife.⁵¹ With the passage of the CAA and other major federal statutes in the 1960s and 1970s, federal environmental law continued to add misdemeanor provisions across a range of areas. It was not until the passage of the Resource Conservation and Recovery Act (RCRA) in 1976 and then its hazardous and solid waste disposal amendments in

⁴⁹ *History*, U.S. DEP'T OF JUST. ENV'T & NAT. RES. DIV., <https://www.justice.gov/enrd/history> [<https://perma.cc/6Q9B-W5QY>] (May 18, 2021).

⁵⁰ The Rivers and Harbors Act of 1899, 33 U.S.C. § 403.

⁵¹ The Lacey Act of 1900, 16 U.S.C. § 3371–3378.

the 1980s that felony provisions made their way into federal environmental law.⁵²

Once felony provisions were included in federal environmental statutes, the other major development was the institutionalization of a criminal enforcement apparatus.⁵³ This came in 1981 with the founding of the EPA's Office of Enforcement and the Environmental Crimes Section (ECS) of the DOJ in 1982.⁵⁴ Organizing these entities created an apparatus for the investigation and prosecution of federal environmental crimes and the professional specialization required of these professions.⁵⁵ In 1987, the ECS became a fully independent unit within the Environment and Natural Resources Division and employed approximately eighteen prosecutors.⁵⁶ In 1988, Congress granted EPA's Criminal Enforcement Division full law enforcement authority.⁵⁷ The Office of Criminal Enforcement, Forensics and Training was organized in 1995 to house criminal investigative work within the broader Office of Environmental Compliance Assurance (OECA) that replaced the Office of Enforcement.⁵⁸ Civil judicial actions are overseen by the Environmental Enforcement Section of the Environment and Natural Resource Division.⁵⁹ Today, EPA-CID

⁵² The Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901; *Historical Development of Environmental Criminal Law*, U.S. DEP'T OF JUST. ENV'T & NAT. RES. DIV., <https://www.justice.gov/enrd/about-division/historical-development-environmental-criminal-law> [<https://perma.cc/FK4X-LCKV>] (May 13, 2015).

⁵³ The Environment and Natural Resource Division has a longer history dating back to 1909, when it was referred to officially as the Public Lands Division. *History*, U.S. DEP'T OF JUST., <https://www.justice.gov/enrd/history> [<https://perma.cc/62BW-EMRC>] (May 18, 2021).

⁵⁴ *Criminal Enforcement Program*, EPA (Oct. 2011), <https://www.epa.gov/sites/production/files/documents/oceft-overview-2011.pdf> [<https://perma.cc/Q9QS-2APJ>].

⁵⁵ Theodora Galactos, *The United States Department of Justice Environmental Crimes Section: A Case Study of Inter- and Intra-branch Conflict Over Congressional Oversight and the Exercise of Prosecutorial Discretion*, 64 *FORDHAM L. REV.* 587 *passim* (1995).

⁵⁶ *Historical Development of Environmental Criminal Law*, U.S. DEP'T OF JUST. ENV'T & NAT. RES. DIV. (May 13, 2015), <https://www.justice.gov/enrd/about-division/historical-development-environmental-criminal-law> [<https://perma.cc/H9QE-8BGV>].

⁵⁷ Criminal investigators were deputized by the U.S. Attorney General in 1984 as Special Deputy United States Marshals, which required regular renewal until 1988. *See* Memorandum from John Peter Suarez on Management Review of the Office of Criminal Enforcement Forensics and Training to ALL-OCEFT (Dec. 15, 2003), <https://www.epa.gov/sites/production/files/documents/oceft-review03.pdf> [<https://perma.cc/75NP-GS7G>] [hereinafter Suarez].

⁵⁸ *Basic Information on Enforcement*, EPA, <https://www.epa.gov/enforcement/basic-information-enforcement> [<https://perma.cc/6RQ7-PYFC>] (Nov. 2, 2022).

⁵⁹ *Environmental Enforcement Section (EES): An Overview of Our Practice*, U.S. DEP'T OF JUST. ENV'T & NAT. RES. DIV., <https://www.justice.gov/enrd/overview-our-practice> [<https://perma.cc/26Y9-HPMC>] (May 14, 2015).

contains approximately 200 criminal investigators located across forty-one offices who carry firearms and view themselves as “America’s environmental crime fighters.”⁶⁰

While there are many factors that determine which CAA violations are selected for criminal investigation by EPA-CID, significant harm and culpable conduct are the general requirements.⁶¹ The EPA’s criminal investigators, also known as special agents or 1811s, enjoy a significant degree of autonomy in determining which cases to investigate.⁶² Sources for investigations typically come from official documents, civil inspectors, state or local environmental agencies, and former employees.⁶³ Criminal investigations are typically undertaken with other relevant local, state, and federal regulatory and law enforcement agencies.⁶⁴ If special agents feel there is sufficient evidence to proceed with prosecution, they will typically approach prosecutors in ECS or the U.S. Attorney’s Office to file a criminal information in District Court or to seek an indictment from a grand jury.⁶⁵

EPA-CID and DOJ-ECS focus on deterring serious and willful violations of federal environmental laws.⁶⁶ Their respective

⁶⁰ U.S. Environmental Protection Agency Criminal Enforcement Program: *America’s Environmental Crime Fighters*, EPA, <https://www.epa.gov/sites/production/files/documents/oceftbrochure.pdf> [<https://perma.cc/652A-34PU>].

⁶¹ Earl E. Devaney, *The Exercise of Investigative Discretion*, EPA 3–4 (Jan. 12, 1994), <https://www.epa.gov/sites/production/files/documents/exercise.pdf> [<https://perma.cc/SBE4-DAGL>].

⁶² See Suarez, *supra* note 57.

⁶³ Joel A. Mintz, “Treading Water”: *A Preliminary Assessment of EPA Enforcement During the Bush II Administration*, 34 ENV’T L. REP. 10933 (2004).

⁶⁴ See Joel A. Mintz, *Some Thoughts on the Interdisciplinary Aspects of Environmental Enforcement*, 36 ENV’T L. REP. 10495 (2006).

⁶⁵ *Id.*

⁶⁶ The EPA faces very strong incentives to pursue civil rather than criminal enforcement. Criminal guilt rests on a higher standard of “beyond a reasonable doubt,” while civil guilt rests on a lower “preponderance of the evidence” standard. Civil enforcement can take a range of options that are generally less costly, and administrative actions can be handled internally. Civil actions may include injunctive relief, supplemental environmental projects (SEPs), mitigation plans, orders of consent, civil settlements, or other penalties. Given the lower burden of proof, cost of criminal prosecution, and range of civil options, it is unsurprising EPA and DOJ both tend to pursue civil remedies much more frequently than criminal prosecution. Jeremy Firestone, *Agency Governance and Enforcement: The Influence of Mission on Environmental Decisionmaking*, 21 J. OF POL’Y ANALYSIS & MGMT. 409, 410 (2002); Evan J. Ringquist & Craig E. Emmert, *Judicial Policymaking in Published and Unpublished Decisions: The Case of Environmental Civil Litigation*, 52 POL. RSCH. Q. 9, 12 (1999).

organizational cultures emphasize punishment and deterrence.⁶⁷ The logic of deterrence is that, if penalties are to have any real deterrent effect on the decision to commit an environmental crime, the cost of a violation must outweigh the financial benefits of the offense for rational individuals and firms.⁶⁸ For the criminal investigation and prosecution of environmental crimes to effectively deter future crimes, the chance of being caught must be certain and robust enough to punish and deter specific offenders and to indirectly deter others by example.⁶⁹

Exploring the plausibility of a deterrent effect for environmental criminal enforcement is a bit trickier than street crime, because criminal prosecution is decidedly rare, the number of criminal investigators is relatively small, many crimes often go unreported, pollution itself may not necessarily be categorized as a criminal act, and data and research on criminal deterrence of environmental crimes are difficult to find.⁷⁰ EPA-CID and DOJ-ECS have always had to act with limited resources and political constraints on their actions. Their enforcement efforts have always been targeted. Earl E. Devaney, a past Director of the Office of Enforcement, noted in a now-famous guidance issued in 1994 to all staff that because

it is unlikely OCE will ever be large enough in size to fully defeat the ever-expanding universe of environmental crime . . . [it] must maximize its presence and impact through discerning case-selection, and then proceed with investigations that advance the EPA's overall goal of regulatory compliance and punishing criminal wrongdoing.⁷¹

Moreover, most studies on environmental enforcement tend to focus on civil enforcement, which is more prevalent and for which data is more available and widespread than criminal enforcement.⁷² These

⁶⁷ A management review noted of the Division in 2003, "to the extent any single pattern dominates, it is the law enforcement orientation of the Immediate Office, CID, and (to a lesser extent) LCRMD [Legal Counsel and Resources Management Division]." Suarez, *supra* note 57, at 21.

⁶⁸ Gary Becker, *Punishment: An Economic Approach*, 169 J. OF POL. ECON. 183 (1968).

⁶⁹ See Richard A. Posner, *An Economic Theory of the Criminal Law*, 85 COLUM. L. REV. 1193-1200 (1985).

⁷⁰ See Carol Gibbs & Sally S. Simpson, *Measuring Corporate Environmental Crime Rates: Progress and Problems*, 51 CRIME L. SOC. CHANGE 87-90 (2009); See also Harland Prechel & Alesha Istvan, *Disproportionality of Corporations' Environmental Pollution in the Electrical Energy Industry*, 59 SOCIO. PERSP. 505-07 (2016) (providing studies on the difficulties of measuring corporate crime rates and deterrence).

⁷¹ Earl E. Devaney, 1994 *The Exercise of Investigative Discretion*, 3, <https://www.epa.gov/sites/production/files/documents/exercise.pdf> [<https://perma.cc/NA6G-WUUC>].

⁷² See Sarah L. Stafford, *The Effect of Punishment on Firm Compliance with Hazardous Waste Regulations*, 44 J. OF ENV'T ECON. & MGMT. 290-93 (2002); Jay P. Shimshack and

limitations have caused scholars to question the deterrent value of environmental criminal enforcement.⁷³ We follow the lead of other studies, with a specific focus on exploring the plausibility of CAA criminal investigation and prosecution by EPA-CID and DOJ-ECS, respectively.⁷⁴

III ANALYTICAL APPROACH

Data on all environmental criminal prosecutions stemming from EPA-CID investigations are gathered via content analysis from the EPA's *Summary of Criminal Prosecutions Database*.⁷⁵ We analyzed every case in the database from fiscal year (FY) 1983 through the end of calendar year 2019. OECA and DOJ-ECS were founded immediately in the years prior to 1983, so this data range provides a very substantive source for cataloging and understanding the nature of criminal prosecutions.⁷⁶ Coding by FY, we coded all 2,588 cases and selected all 378 cases where the CAA was used as a primary charging statute. We coded the following variables for each case summary: a brief narrative summary of the case, fiscal year identifier, docket number, state of the crime, total number of defendants identified in the case, presence of at least one company/corporate defendant in a case, and major charging statutes utilized in the case.

To analyze the data, we developed coding protocols analyzing a series of cases through FY 2015 with two coders for four weeks and checked weekly for discrepancies. Once patterns became clear and our intercoder reliability exceeded ninety percent, two coders analyzed data

Michael B. Ward, *Enforcement and Over-Compliance*, 55 J. OF ENV'T ECON. & MGMT. 90–92 (2008); Harland Prechel and Lu Zheng, *Corporate Characteristics, Political Embeddedness and Environmental Pollution by Large U.S. Corporations*, 90 SOC. FORCES 947–50 (2012), for examples of the literature on environmental compliance, monitoring, and enforcement.

⁷³ See Lori S. Benneer, *What Do We Really Know? The Effect of Reporting Thresholds on Inferences Using Environmental Right-to-Know Data*, 2 REGUL. & GOVERNANCE 293–95 (2008); See also Carole M. Billiet and Sandra Rousseau, *How Real Is the Threat of Imprisonment for Environmental Crime?*, 37 EUR. J. OF L. AND ECON. 183–86 (2014) (providing examples of studies questioning aspects of the deterrence value of environmental enforcement).

⁷⁴ See Michael J. Lynch, *The Sentencing/Punishment of Federal Environmental/Green Offenders, 2000-2013*, 38 DEVIANT BEHAV. 991–92 (2017).

⁷⁵ *Summary of Criminal Prosecutions Database*, EPA, <https://www.epa.gov/enforcement/summary-criminal-prosecutions> [<https://perma.cc/6MVJ-J3R8>] (July 25, 2022).

⁷⁶ Ozymy & Jarrell, *supra* note 8, at 40–45.

independently, and the lead author reviewed discrepancies until the coders reached a consensus. Intercoder reliability for the whole data set was approximately ninety-five percent.⁷⁷

Our analytical approach and use of the data present a few limitations. First, analyzing case summaries does not allow us to substantively understand the role of key players, such as the judge, the prosecutors, or the EPA's special agents in the case. Our primary goal for the manuscript does not hinge on knowledge of these factors, but we realize they play a significant role. Second, we are unable to control for any changes in federal environmental laws, how the courts interpret those laws, and how prosecutors utilize them over time. This does not detract from our analysis, but these factors would influence the data universe. Third, if any prosecutions under the CAA occurred outside EPA-CID investigative involvement, we would be unlikely to capture those prosecutions in the dataset if the EPA failed to include them. Finally, our analysis concludes at the end of calendar year 2019 and not FY 2019.

IV

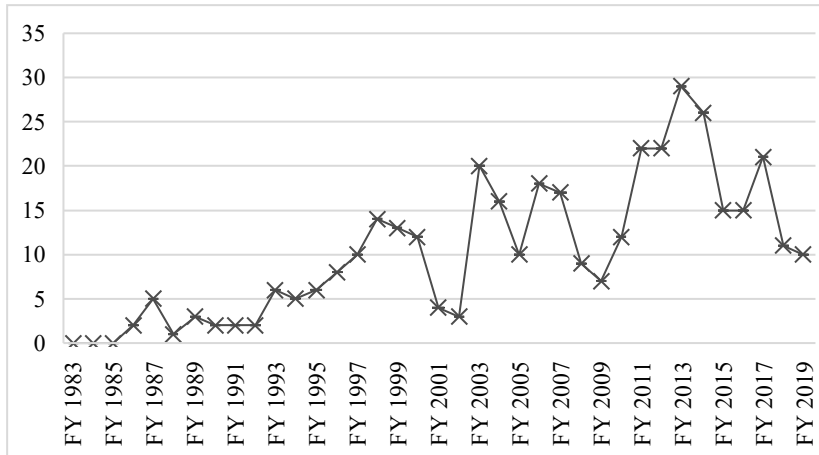
RESULTS OF THE ANALYSIS

We begin the analysis in Figure 1 by plotting the total number of CAA-focused prosecutions occurring by EPA fiscal year, from 1983 to 2019. Since 1983, we find that the CAA was used in criminal prosecutions a total of 378 times. We find a total of 2,588 prosecutions undertaken as the result of EPA-CID investigations, meaning that CAA prosecutions made up almost fifteen percent of all prosecutions occurring over the last thirty-seven years. The first prosecutions settled under the CAA occurred in FY 1986, with two prosecutions completed in that fiscal year. The annual number rose to ten by FY 1997 and then fourteen in FY 1998. There were twenty CAA prosecutions settled in FY 2003, twenty-two in FY 2011, and a high point of twenty-nine in FY 2013. The number of prosecutions dropped again to a low of eleven in FY 2018.⁷⁸

⁷⁷ Clíodhna O'Connor & Helene Joffe, *Intercoder Reliability in Qualitative Research: Debates and Practical Guidelines*, 19 INT'L J. OF QUALITATIVE METHODS 1, 9 (2020).

⁷⁸ The total number of prosecutions completed each fiscal year is less important than the overall pattern. Many prosecutions persist over a series of years. The year they were completed and included in the database is not always representative of prosecutorial success in a given year using the number of prosecutions alone.

Figure 1. *Total CAA Criminal Prosecutions by EPA Fiscal Year, 1983–2019*



Source: U.S. EPA Summary of Criminal Prosecutions Database

The total number of CAA prosecutions annually suggests most offenders have little chance of being criminally prosecuted for CAA crimes. Calculating the probability of detection involves quantifying the number of special agents on duty relative to the regulated community in any given year. EPA-CID special agents, also referred to as criminal investigators or 1811s, are charged with investigating CAA crimes.⁷⁹ The number of special agents was relatively low in the 1980s. In 1982, the Office of Enforcement employed twenty-three agents, which grew to fifty-five by 1990 and then 210 by 1995.⁸⁰ In this same year, the Pollution Prosecution Act helped to professionalize the criminal investigation process by creating a statutory minimum of 200 special agents.⁸¹ We plot the number of special agents by EPA fiscal year from 1997 to 2019 to show the evolution of the environmental agents on the street when they numbered 210 in 1995. By 1997, the number of agents dropped to 200, and then the number rose to 217 by 2002. In the mid-2000s, we see a drop to 168 by 2007, and then an increase to 195 in 2010, and 215 by 2011. The number of agents then

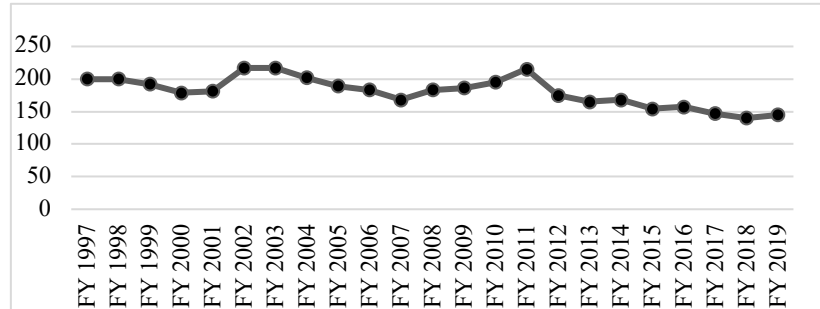
⁷⁹ *Criminal Enforcement: Special Agents*, EPA, <https://www.epa.gov/enforcement/criminal-enforcement-special-agents> [<https://perma.cc/P84W-XC5F>] (Aug. 26, 2022).

⁸⁰ WASHINGTON LEGAL FUND, ENVIRONMENTAL PROTECTION AGENCY CRIMINAL ENFORCEMENT POLICIES 2-2, <https://s3.us-east-2.amazonaws.com/washlegal-uploads/upload/Chapter2EPA.pdf> [<https://perma.cc/D5EQ-QKW5>] (last visited Apr. 9, 2023).

⁸¹ The Pollution Prosecution Act of 1990, Pub. L. No. 101-593, 104 Stat. 2954.

begins a marked decline to 175 in 2012, 165 in 2013, and then to a decade low of 140 in 2018 and 146 at the end of 2019 (see Figure 2).⁸²

Figure 2. *Total EPA-CID Special Agents by EPA Fiscal Year, 1997–2009*



Source: OECA, EPA, and PEER

The next step in assessing the plausibility of criminal deterrence under the CAA involves measuring the regulated community in order to assess the probability of punishment. Capturing all the potential environmental criminals that commit CAA violations is very difficult, given that the EPA's oversight of the CAA involves an innumerable amount of nonpoint sources of pollution. Because it is virtually impossible to assess this number without resorting to implausible general population estimates, we choose to use a more conservative measure of the number of stationary sources of pollution with air permits regulated by the EPA. To determine the number of regulated firms with air permits, we use the EPA's Enforcement Compliance History Online (ECHO) data-gathering tool.⁸³ Using ECHO, we begin by selecting air enforcement data and limiting our search to all active air facilities linked to ICIS-AIR, which contains emissions and compliance data for all "air pollution point sources regulated by the . . .

⁸² Data from Figure 2 comes from author requests of OECA, data from U.S. EPA, and PEER. Measures of total special agents can be slightly different, and sources vary some on whether they include supervisors or only criminal investigators. The variation in any given year on this point is not severe. As an example of one of the greater disparities, our requests of OECA gave us 195 agents one year, but EPA figures below give us 206. We will use the term special agent and criminal investigator generally throughout the analysis. *Criminal Enforcement Program*, U.S. EPA, 8–11, <https://19january2017snapshot.epa.gov/sites/production/files/documents/oceft-overview-2011.pdf> [<https://perma.cc/58GV-7T8R>] (2011); *EPA CID Agent Count*, PUB. EMP. FOR ENV'T RESP. (PEER) (2019), https://www.peer.org/wp-content/uploads/2019/11/11_21_19-Federal_Pollution_EPA_CID_Agent_Count.pdf [<https://perma.cc/9W8V-ABVX>].

⁸³ *Enforcement Compliance History Online (ECHO)*, EPA, <https://echo.epa.gov/> [<https://perma.cc/FF9D-5NMR>] (2022).

EPA and/or state and local air regulatory agencies.”⁸⁴ This allows us to capture all stationary sources of pollution regulated by the EPA and contained in the database. We then choose the number of facilities meeting these criteria that report emissions data to the EPA’s Toxics Release Inventory (TRI) and thus have a TRI ID in the database. ECHO contains data on the number of these facilities by TRI reporting year, from 2006 to 2019.⁸⁵ Total facilities meeting these criteria do not vary significantly from a low of 10,198 in 2019 to 10,713 in 2015, with an average of 10,459 over this time period. We use this data, combined with our data on special agents and criminal prosecutions, and adapt the methodology from Lynch et al., a seminal piece on deterrence and criminal environmental enforcement, to begin assessing the plausibility of detection and prosecution under the CAA.⁸⁶

Using the number of total regulated point sources by year, we are able to begin estimating the size of the regulated community and the probability of both detection and prosecution for a CAA crime. We estimate the probability of detection by comparing the number of special agents annually to the number of regulated facilities from 2006 to 2019. In the first column in Table 2, we list the fiscal year, the second column contains the number of special agents employed that year, followed by the number of regulated facilities in column three. In column four, we divide the number of facilities by the number of special agents to measure the number of hypothetical facilities each investigator must police in a given year. Because not all investigators focus all their attention on CAA crimes, this number is somewhat misleading. In column five, we correct for this general estimate by creating a measure for the number of agents available to police CAA crimes. To create this measure, we find it plausible to return to our previous findings that out of 2,588 historical criminal prosecutions since 1983, about fifteen percent were CAA-focused, leading us to assume that roughly that amount of human capital was expended on CAA crimes. We divide the number of agents in Column 2 by .15 to derive a measure of agents dedicated exclusively to CAA crimes. In Column 6, we take this measure and then divide the number of annual regulated facilities by the number of CAA agents to develop what we

⁸⁴ *ICIS-AIR Search User Guide*, EPA, <https://www.epa.gov/enviro/icis-air-search-user-guide> [<https://perma.cc/6GQR-FU6T>] (Oct. 27, 2022).

⁸⁵ *Toxics Release Inventory (TRI) Program*, EPA, <https://www.epa.gov/toxics-release-inventory-tri-program> [<https://perma.cc/Q3C3-4VQJ>] (Jan. 20, 2023).

⁸⁶ Lynch et al., *supra* note 12, at 1101–03.

would argue is a better measure estimate of the number of annual facilities that would be hypothetically policed by special agents focusing exclusively on CAA crimes.

Table 2. *Estimating the Probability of a CAA Criminal Investigation, 2006–19*

Year	Agents	Facilities	Facilities /Agent	CAA Agents	Facilities/ CAA Agents
2006	183	10,371	57	27	378
2007	168	10,374	62	25	412
2008	183	10,481	57	27	382
2009	186	10,255	55	28	368
2010	195	10,370	53	29	355
2011	215	10,498	49	32	326
2012	175	10,370	59	26	395
2013	165	10,642	64	25	430
2014	168	10,675	64	25	424
2015	154	10,713	70	23	464
2016	157	10,582	67	24	449
2017	147	10,489	71	22	476
2018	140	10,410	74	21	496
2019	145	10,198	70	22	469

Source: OECA, EPA Summary of Criminal Prosecutions Database, ECHO, TRI, and PEER

In 2006, there were 183 criminal enforcement special agents patrolling for environmental crimes in the United States. For permitted, stationary sources of air pollution, these agents would be responsible for policing some 10,371 facilities across the country which equates to roughly fifty-seven facilities per agent. This data obscures the fact that these mere 183 men and women must police not only facilities with air permits but many more facilities without air permits, mobile sources of pollution, and other criminals that are not permitted. When we recalculate these numbers and use our metric considering that fifteen percent of historical criminal prosecutions were CAA-focused, we estimate in column five that EPA-CID employed twenty-seven full-time equivalent agents to investigate CAA crimes. Comparing this to the number of facilities with air permits this year gives us an estimate

of 378 regulated facilities per special agent equivalent focused on the CAA. Even by this logic, a criminal investigator taking a total of four weeks of personal, sick, and vacation time, as well as holidays per year, would work forty-eight weeks or, at five days a week, a total of 240 days per year. Discounting complex investigation work, professional development, meetings, court hearings, and other professional duties, a special agent would need to patrol about 1.6 facilities per day, every day, simply to visit each facility once per year.

While the number of facilities does not vary substantially over fourteen years, the large number of facilities relative to a small and declining investigative staff has had an effect on the probability of detection over time. In 2018, the number of EPA-CID investigators dropped to a decade low of 140 agents. Using our metric, we estimate there were only twenty-one full-time equivalent investigators policing CAA crimes that year across 10,410 facilities. This seemingly modest change in the number of investigators had a dramatic effect on the plausibility of detection. Now, a special agent overseeing CAA crimes has an average workload of 496 facilities to visit annually, representing an almost twenty-five percent increase from 2006. Working the same 240 days a year, an agent would now need to visit 2.06 facilities each day, every day, in order to pose a cursory presence to potential offenders.⁸⁷

The years following the 2009 financial crisis have not been kind to EPA-CID investigative personnel. A major dip in 2012 began a continuous decline, resulting in 145 agents today. The scenarios we have painted are hypothetical. Criminal investigators do not typically make unannounced visits to regulated facilities. It would certainly not be a bad idea if there were sufficient staff to do so. State environmental agencies may also visit facilities. Furthermore, as noted above, a significant number of facilities remain in chronic violation of state and federal law at any given time, and arguably many more are not caught. The greater issue is, even using the most conservative estimates, the number of investigators is small relative to their obligations. These criminal investigations do not present a significant police presence in the regulated community, let alone a presence for monitoring mobile sources of pollution, midnight dumping, and other illegal activities that

⁸⁷ Lynch et al., *supra* note 12, at 1101 (estimating that in New York City there is one police investigator for every 1,365 residents over age ten).

often made up the bulk of EPA-CID investigations historically under the CAA, as opposed to policing stationary sources.⁸⁸

Our analysis in Table 4 does not consider that many prosecutions that occurred involved individuals and not regulated companies. Ignoring this fact overestimates the probability of a company being prosecuted under the CAA. In our analysis of the EPA database, we tried to control for this issue by coding whether or not at least one company is a named defendant in each case. We cannot properly account for the probability of unregulated individuals in the data as they are not part of the regulated universe, but we can create better estimates of the probability a regulated firm is prosecuted. We find a total of 133 CAA prosecutions undertaken since 1983 and plot them by year, from 1983 to 2019, in Figure 3. Total annual prosecutions containing at least one company ranged from one (1987) to eleven (2006), with an average number of prosecutions of about 3.6.

In Table 3, we now turn from the plausibility of detection to the likelihood of criminal prosecution under the CAA. In 2006, we find there were eighteen CAA prosecutions and 10,371 regulated stationary sources with air permits that report to the TRI. The raw probability of a firm being prosecuted under the CAA in 2006 was about 0.002. In 2013, there were twenty-nine prosecutions completed by DOJ across 10,642 firms, or a probability of about 0.003. As prosecutions dipped to eleven in 2018 across 10,410 firms, the probability of prosecution dropped that year to about a 0.001 chance of being prosecuted. The average probability of criminal prosecution under the CAA for these regulated firms over the last 14 years is low.

⁸⁸ Joshua Ozymy, Bryan Menard & Melissa L. Jarrell, *Persistence or Partisanship: Exploring the Relationship Between Presidential Administrations and Criminal Enforcement by the U.S. Environmental Protection Agency, 1983–2019*, 81 PUB. ADMIN. REV. 49, 54 (2020).

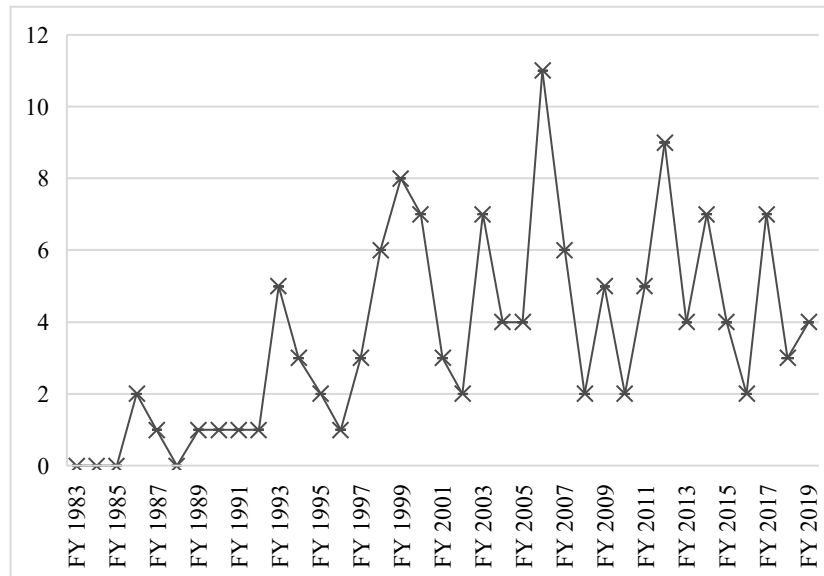
Table 3. *Estimating the Probability of Being Prosecuted Under the CAA, 2006–19*

Year	Total Prosecutions	Total Facilities	Probability of Prosecution
2006	18	10,371	.0017
2007	17	10,374	.0016
2008	9	10,481	.0009
2009	7	10,255	.0007
2010	12	10,370	.0012
2011	22	10,498	.0021
2012	22	10,370	.0021
2013	29	10,642	.0027
2014	26	10,675	.0024
2015	15	10,713	.0014
2016	15	10,582	.0014
2017	21	10,489	.0020
2018	11	10,410	.0011
2019	10	10,198	.0010

Source: OECA, EPA Summary of Criminal Prosecutions Database, ECHO, and TRI

Our analysis in Table 4 does not consider that many prosecutions that occurred involved individuals and not regulated companies. Ignoring this fact overestimates the probability of a company being prosecuted under the CAA. In our analysis of the EPA database, we tried to control for this issue by coding whether or not at least one company is a named defendant in each case. We cannot properly account for the probability of unregulated individuals in the data as they are not part of the regulated universe, but we can create better estimates of the probability a regulated firm is prosecuted. We find a total of 133 CAA prosecutions undertaken since 1983 and plot them by year, 1983–2019, in Figure 3. Total annual prosecutions containing at least one company ranged from one (1987) to eleven (2006), with an average number of prosecutions of about 3.6.

Figure 3. *Total Annual CAA Criminal Prosecutions Containing at Least One Company as a Defendant, 1983–2019*



Source: U.S. EPA Summary of Criminal Prosecutions Database

In Table 4, we use these estimates to produce the annual probability of a regulated facility being prosecuted under the CAA, 2006–19. In 2006 we find eleven prosecutions completed under the CAA containing at least one company as a named defendant. With 10,371 regulated facilities with air permits that report to the TRI, we estimate the probability of any of these facilities being prosecuted in 2006 for CAA crimes was 0.1%. While this probability is very low, it declines markedly in years with fewer prosecutions. In 2008 we find that two CAA prosecutions with at least one company as a named defendant were completed. With 10,481 facilities in our regulatory universe, a facility had a 0.02% chance of being prosecuted under the CAA that year. The average probability of a facility being prosecuted across these fourteen years was very low at about a 0.05% chance of prosecution.

Table 4. *Estimating the Probability of a Firm Being Prosecuted Under the CAA, 2006–19*

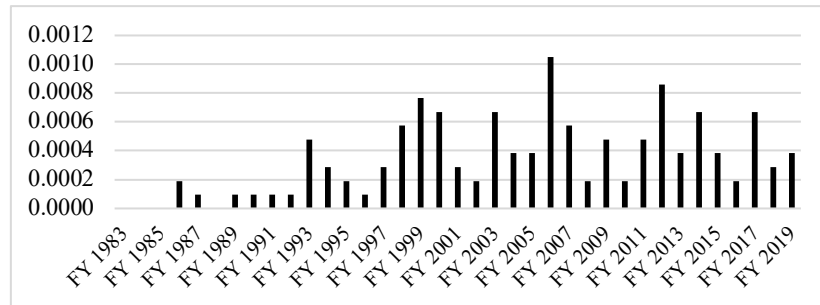
Fiscal Year	Total Prosecutions	Total Facilities	Probability of Prosecution
2006	11	10,371	.0011
2007	6	10,374	.0006
2008	2	10,481	.0002
2009	5	10,255	.0005
2010	2	10,370	.0002
2011	5	10,498	.0005
2012	9	10,370	.0009
2013	4	10,642	.0004
2014	7	10,675	.0007
2015	4	10,713	.0004
FY 2016	2	10,582	.0002
FY 2017	7	10,489	.0007
FY 2018	3	10,410	.0003
FY 2019	4	10,198	.0004

Source: U.S. EPA Summary of Criminal Prosecutions Database, ECHO, and TRI

Appropriate ECHO data on the number of regulated facilities is available from 2006–19. While it is a rough estimate, given the number of facilities varies little annually, we assume we can safely calculate the average number of facilities from 2006–19 (10,459) and then use our prosecution data going back to 1983 to compare the number of company-focused prosecutions occurring annually to 10,459 firms, to generate probabilities of a facility being prosecuted criminally over the past thirty-seven years in Table 4. Our analysis shows the chance of being prosecuted under the CAA in any given year is decidedly low. In some of the earlier years with no prosecutions prior to 1986, the probability was zero. Through the 1980s, the chance of any individual firm being prosecuted criminally under the CAA was about 0.01%. In the 1990s, this increased to about a 0.03% chance on average of being prosecuted. From 2000–10 the odds increased to 0.05%, and from 2011–19 the probability did not change. While these probabilities change across our metrics, the major takeaway here is that the chance

of any particular facility being prosecuted for CAA crimes is extremely low, with a historical average of about 0.03%. A general expectation of deterrence from the probability of a CAA crime being uncovered or prosecuted historically seems low as well.

Figure 4. *Estimating the Probability of a Facility Being Criminally Prosecuted Under the CAA, 1983–2019*



Source: U.S. EPA Summary of Criminal Prosecutions Database

If the probability of detection and punishment is low for CAA crimes, perhaps large-penalty cases serve more of a specific and general deterrence function, but these are few and far between and more recent. We list the most punitive financial penalties levied against corporations for CAA penalties in Table 5 as an example. Refrigeration USA was indicted in March 1996 for violations of the CAA, smuggling, conspiracy, and tax evasion. The company illegally imported more than 4,000 tons of CFC-12 (Freon) and submitted false bills of lading to the EPA to cover up the crime. On August 22, 1997, the company was sentenced to 60 months of probation and ordered to pay a fine exceeding \$37 million. Louisiana Pacific was indicted in 1995 for tampering with emissions equipment and falsifying emissions data submitted to state and federal regulators. The company was charged under the CAA for tampering with a monitoring device, conspiracy, fraud, and false statements. On May 27, 1998, the company was sentenced to sixty months of probation, \$235,000 in restitution, \$500,000 for community projects, and \$36.5 million in other fines. AAR, Inc. engaged in a ten-year conspiracy to remove asbestos in violation of NESHAP regulations across hundreds of buildings in New York State.⁸⁹ The company, its owners, and codefendants were indicted in 2002 for conspiracy, RICO, CAA violations, income tax evasion,

⁸⁹ *Father and Son Sentenced to Longest U.S. Jail Terms for Environmental Crimes*, EPA, https://archive.epa.gov/epapages/newsroom_archive/newsreleases/324c5937dc68015a85256f7e0076a213.html [<https://perma.cc/QQ9D-FGX3>] (Dec. 23, 2004).

and other charges. AAR, Inc. was sentenced on December 23, 2004, to pay \$22,875,567 in restitution and \$2,033,457 in forfeiture.

BP Products North America was charged with knowing violations of the CAA for their negligence that caused an explosion at the company's Texas City Refinery, which killed fifteen and injured more than 170 workers.⁹⁰ The company was sentenced on March 12, 2009, to thirty-six months of probation and ordered to pay a \$50 million federal fine. In the largest environmental fine ever levied in the United States, Volkswagen was sentenced on April 21, 2017, to pay a \$2.8 billion criminal penalty for their long-term emissions rigging conspiracy.⁹¹ The company defrauded consumers, and engaged in wire fraud, obstruction, false statements, and violations of the CAA for installing cheat devices in supposed clean diesel vehicles that could not meet stated emissions standards. In a related case, IAV GmbH, the company that designed the cheating software used in Volkswagen's massive emissions fraud prosecution, pleaded guilty in 2018 to participating in the conspiracy. The company was sentenced on May 22, 2019, to pay a \$35 million criminal penalty.⁹²

⁹⁰ *BP Texas City Clean Air Act Settlement*, EPA, <https://www.epa.gov/enforcement/bp-texas-city-clean-air-act-settlement> [<https://perma.cc/R3C9-ERRB>] (Sept. 7, 2022).

⁹¹ *Volkswagen AG Sentenced in Connection with Conspiracy to Cheat U.S. Emissions Tests*, U.S. DEP'T OF JUST. (Apr. 21, 2017), <https://www.justice.gov/usao-edmi/pr/volkswagen-ag-sentenced-connection-conspiracy-cheat-us-emissions-tests> [<https://perma.cc/PCW7-84C7>].

⁹² *IAV GmbH Sentenced to Pay \$35 Million Criminal Fine for Its Role in Volkswagen AG Emissions Fraud*, U.S. DEP'T OF JUST. (May 22, 2019), <https://www.justice.gov/opa/pr/iav-gmbh-sentenced-pay-35-million-criminal-fine-its-role-volkswagen-ag-emissions-fraud> [<https://perma.cc/K7VH-QTVU>].

Table 5. *The Most Punitive Corporate Monetary Penalties Levied in CAA Criminal Prosecutions, 1983–2019*⁹³

Year	Company	Crime	\$ Penalty
1997	Refrigeration USA	Unlawful Importation of CFC-12	>37 million
1998	Louisiana Pacific	Emissions Tampering	>37 million
2005	AAR, Inc.	RICO/NESHAP Violations	>24 million
2009	BP Products	Negligence	50 million
2017	Volkswagen AG	Conspiracy/ Emissions Tampering	2.8 billion
2019	IAV GmbH	Conspiracy	35 million

Source: U.S. EPA Summary of Criminal Prosecutions Database

We turn in Table 6 to some examples of the most punitive prison sentences handed down in CAA prosecutions since 1983. These cases provide examples of significant prosecutions pursued by the DOJ and major crimes adjudicated against environmental criminals. Many of them focus on asbestos violations or biodiesel fuel credit fraud. Joseph Thorn was prosecuted for the illegal removal of asbestos at some 1,000 facilities from 1995 and 1999 in New York State. Thorn oversaw an extensive operation of removing asbestos from schools, office buildings, and even the State Legislative Office buildings without proper protection for workers or occupants. He was indicted in 2000 for violations of the CAA, as well as money laundering.⁹⁴ The original sentence was vacated upon appeal, but Thorn was sentenced on September 2, 2003, to 168 months of incarceration, 36 months of

⁹³ Cases listed in Table 5: *United States v. Refrigeration USA*, No. CR:96-0267-CR-MORENO (S.D. Fla. 1997) (EPA Summary of Criminal Prosecutions); *United States v. La. Pac. Corp.*, No. 95-CR-215 (D. Colo. 1998) (EPA Summary of Criminal Prosecutions); *United States v. AAR Contractor, Inc.* No. 5:02-CR-51 (N.D. N.Y. 2005) (EPA Summary of Criminal Prosecutions); *United States v. BP Prods. N. Am.*, No. North America: 4:07-CR-434 (S.D. Tex. 2009) (EPA Summary of Criminal Prosecutions); *United States v. Volkswagen AG*, No. 16-CR-20394 (E.D. Mich. 2017) (EPA Summary of Criminal Prosecutions); *United States v. IAV GmbH*, No. 16-CR-20394 (E.D. Mich. 2019) (EPA Summary of Criminal Prosecutions).

⁹⁴ *New York Man Convicted of Asbestos Crimes*, EPA (Nov. 2, 2000), https://archive.epa.gov/epapages/newsroom_archive/newsreleases/237c19af5b773a8c8525698b00662993.html [<https://perma.cc/8WSK-HUCA>].

probation, and roughly \$1,248,672 in forfeiture, assessments, and restitution.⁹⁵ Another important prosecution involved AAR Contractor, Inc., which participated in an elaborate conspiracy to illegally abate and dispose of asbestos over a decade and to provide false laboratory analysis.⁹⁶ The Salvagnos, along with codefendants Michael Shanahan and Thomas Reed, were sentenced in 2004 and 2005 collectively to 619 months of incarceration.⁹⁷

The Energy Independence and Security Act (EISA) of 2007 incentivized the production of biodiesel. Producers and importers that generate biofuels can generate credits known as Renewable Identification Numbers.⁹⁸ An example of prosecution in this area includes the case of Alexander Jariv and his codefendants, who were sentenced for engaging in fraud, conspiracy, false statements, money laundering, and violations of the CAA by fraudulently claiming to produce biofuels and then generating and selling the RINs.⁹⁹ The three defendants claimed to produce some 4.2 million gallons of biodiesel and generated \$7 million from selling the RINs.¹⁰⁰ They proceeded to engage in an illegal exportation scheme and defrauded the U.S. government of more than \$34 million in RINs.¹⁰¹ Stoliar was sentenced to two years in prison, Alexander Jariv to thirty months in prison, and

⁹⁵ Cases listed in Table 6: *United States v. Thorn*, No. 5:00 CR 88 (N.D. N.Y. 2003) (EPA Summary of Criminal Prosecutions); *United States v. AAR Contractor, Inc.*, No. 5:02-CR-51 (N.D. N.Y. 2005) (EPA Summary of Criminal Prosecutions); *United States v. Gunselman*, No. 5:12-CR-00078-C-BG (N.D. Tex. 2013) (EPA Summary of Criminal Prosecutions); *United States v. Jariv*, No. 2:14-CR-00006-APG-NJK (D. Nev. 2015) (EPA Summary of Criminal Prosecutions); *United States v. E-biofuels, LLC*, No. 1:13-CR-0189SEB-TAB (S.D. Ind. 2017) (EPA Summary of Criminal Prosecutions).

⁹⁶ *More than a Dozen Defendants Plead Guilty to Violating Asbestos Rules; One Indicted for Numerous Allegations of Wrong-Doing*, EPA (Feb. 24, 2000), https://archive.epa.gov/epapages/newsroom_archive/newsreleases/7ff3d8aaaf0a276885257173006bd933.html [<https://perma.cc/X4HL-RB3G>].

⁹⁷ See *United States v. AAR Contractor, Inc.*, No. 5:02-CR-51 (N.D. N.Y. 2005) (EPA Summary of Criminal Prosecutions). Eric Farbent and his coconspirators were prosecuted in New York in connection to the prosecution of AAR, Inc. The case is treated separately in the database but includes the Salvagnos in the sentencing totals although they are not listed as defendants. The total punishment of 746 months' incarceration across all defendants is the largest in all CAACC prosecutions. See *United States v. Farbent*, No. 02-CR-51 (N.D. N.Y. 2007) (EPA Summary of Criminal Prosecutions).

⁹⁸ Energy Independence and Security Act (EISA) of 2007, 42 U.S.C. § 7545(o) (2007).

⁹⁹ *2015 Major Criminal Cases*, EPA, <https://www.epa.gov/enforcement/2015-major-criminal-cases> [<https://perma.cc/6722-D484>] (Nov. 18, 2021).

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

James Jariv was sentenced to ten years of incarceration.¹⁰² The defendants collectively were ordered to pay over \$16 million in forfeiture and restitution.¹⁰³ Another prosecution related to biofuel fraud was the case of Jeffrey David Gunselman, who was prosecuted in Texas for fraudulent production of biofuels that netted the defendant almost \$42 million.¹⁰⁴ He was charged in 2012 with making false statements under the CAA, wire fraud, and money laundering; he was sentenced to 188 months of incarceration, fined \$175,000, and ordered to pay more than \$54.9 million in restitution.¹⁰⁵ E-biofuels LLC and the three brothers who operated it were prosecuted for defrauding the biodiesel production tax system as well.¹⁰⁶ Collectively, the individual defendants were sentenced to serve 650 months of incarceration.¹⁰⁷ This case was particularly significant, as it netted prosecutors one of the largest historical incarceration sentences under the CAA.¹⁰⁸

Table 6. *Significant Incarceration Sentences in CAA Criminal Prosecutions, 1983–2019*

Year	Primary Defendant	Crime	Months Incarceration
2003	Joseph Thorn	Illegal Asbestos Abatement	168
2005	Alexander Salvagno	Illegal Asbestos Abatement	619
2013	Jeffrey David Gunselman	Biofuel Credit Fraud	188
2015	Alexander Jariv	Biofuel Credit Fraud	174
2017	E-Biofuels, LLC.	Biofuel Credit Fraud	650

Source: U.S. EPA Summary of Criminal Prosecutions Database

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Bio-diesel Fuel Company Owner Sentenced to 188 Months in Federal Prison on Wire Fraud, Money Laundering and False Statements Convictions*, U.S. DEP'T OF JUST. (June 22, 2015), <https://www.justice.gov/usao-ndtx/pr/bio-diesel-fuel-company-owner-sentenced-188-months-federal-prison-wire-fraud-money> [<https://perma.cc/7D7C-VCYM>].

¹⁰⁵ *Id.*

¹⁰⁶ *Three Brothers Plead Guilty to \$145 Million Biofuels Fraud Scheme in Indiana*, U.S. DEP'T OF JUST. (Apr. 29, 2015), <https://www.justice.gov/usao-sdin/pr/three-brothers-plead-guilty-145-million-biofuels-fraud-scheme-indiana-0> [<https://perma.cc/URU9-MXJX>].

¹⁰⁷ *Id.*

¹⁰⁸ *See id.*

V

DISCUSSION OF FINDINGS: IS DETERRENCE SUBOPTIMAL?

Significant resources are expended to police and prosecute federal environmental crimes in the United States. As regulation grows, it is questionable whether EPA-CID and DOJ-ECS have a sufficient presence to create any significant level of specific or general deterrence when it comes to CAA crimes. Our general answer from the previous analysis is that deterrent value exists, but the how and why are conditional, and the effect is probably not terribly significant on criminal behaviors in the broadest sense. We would argue this conclusion stems from the weak chance of detection, low probability of punishment, limited focus of criminal prosecution on certain areas of the CAA at the expense of others, stagnant budgetary appropriations over time, and the nature of the legal and regulatory system that often makes it difficult to establish criminal guilt, given the nature of compliance under federal statutes.

The first problem with environmental criminal enforcement is detection. The regulated universe is substantial, and there are many conditions for what qualifies to be regulated under the CAA. Compounding this problem is that many mobile sources, whether it be midnight dumping, illegal disposal of asbestos, or discharge of other hazardous substances regulated under the Act, are often difficult to regulate or punish. The number of special agents on duty has diminished over time relative to the growing scope and complexity of their work. The Pollution Prosecution Act brought up the statutory minimum of criminal investigators/special agents to 200, and today only about 145 investigators patrol the entire country, leaving ample opportunity for environmental criminals, both known and unknown to regulators, to ply their trade.¹⁰⁹ Our estimates suggest investigators focused on CAA crimes may have the equivalent of over 400 known facilities to police annually, excluding other responsibilities and other crimes to police in the unregulated community.

¹⁰⁹ *EPA CID Agent Count*, PUB. EMP. FOR ENV'T RESP. (PEER) (2019), https://www.peer.org/wp-content/uploads/2019/11/11_21_19Federal_Pollution_EPA_CID_Agent_Count.pdf [<https://perma.cc/9W8V-ABVX>]. The Pollution Prosecution Act of 1990 creates a statutory minimum of 200 investigative staff for EPA-CID. Pollution Prosecution Act of 1990, Pub. L. No. 101-593, 104 Stat. 2954 (1990). The number of current criminal investigators varies from 145 to around 200 depending on source and whether one includes support staff. See *America's Environmental Crime Fighters*, U.S. ENV'T PROT. AGENCY CRIM. ENF'T PROGRAM, <https://www.epa.gov/sites/production/files/documents/oceftfbrochure.pdf> [<https://perma.cc/8LJ5-PJHG>] (last visited Jan. 22, 2023).

The probability of punishment is also very low. In any given year since the criminal enforcement apparatus was institutionalized, criminals committing CAA crimes faced at worst the possibility of being prosecuted about two-dozen times a year or about an annual average of eighteen prosecutions over the last decade. We find that the average chance of being prosecuted for a CAA crime was about 0.16% or 0.05% over the last fourteen years depending on how we measured the regulated community. Over the last thirty-seven years, our estimate is about a 0.03% average chance of being prosecuted. In 2015, for example, DOJ-ECS employed forty-three prosecutors, and that number is unlikely to grow in the near to medium term, making the expectation for more frequent and substantive prosecutions minimal.¹¹⁰

Next, when stiff punishments are handed down to companies and individuals, they tend to be centered on a few sectors, such as asbestos crimes and biofuel credit fraud. The largest penalties, such as those against BP or Volkswagen, may in fact set precedents for specific sectors, as managers, executives, lawyers, and their insurers take note of the worst-case scenarios, which may have a larger deterrent effect. For this effect to hold, prosecutors must be willing to continue some of their more recent efforts to indict large companies and pay the price to engage in complex litigation. Many of these cases are more recent, but they likely also reflect DOJ-ECS's professional learning and institutionalization over time to be able to pursue such difficult cases; the same can be said of EPA-CID's investigative work.

The greatest challenge for environmental criminal enforcement as it begins to reach middle age is a growing lack of consistent political and budgetary support. Understaffed for criminal investigation and prosecution for such a large regulated community, the EPA and DOJ must make hard choices with limited resources. The EPA often "treads water" trying to keep up employee morale and the good work they undertake.¹¹¹ Prosecuting environmental crimes has always been politically contentious,¹¹² and budgetary support for the work has been

¹¹⁰ *Historical Development of Environmental Criminal Law*, THE U.S. DEP'T OF JUST. (May 13, 2005), <https://www.justice.gov/enrd/about-division/historical-development-environmental-criminal-law> [<https://perma.cc/UD3M-JLYH>].

¹¹¹ Mintz, *supra* note 64.

¹¹² See Judson W. Starr, *Turbulent Times at Justice and EPA: The Origins of Environmental Criminal Prosecutions and the Work That Remains*, 59 GEO. WASH. L. REV. 900, 900-02 (1991). See also Theodora Galactos, *The United States Department of Justice Environmental Crimes Section: A Case Study of Inter-and Intra-branch Conflict over Congressional Oversight and the Exercise of Prosecutorial Discretion*, 64 FORDHAM L. REV. 587, 590-91 (1995).

inconsistent over time.¹¹³ As other budgetary priorities, such as debt service, healthcare, and Social Security continue to push out other federal spending, it seems unlikely, even in the era of climate change, that criminal enforcement will see a resurgence in funding and support.¹¹⁴

Finally, the deterrent effect of the environmental criminal enforcement apparatus must also be taken into context. Many companies need not go so far as to commit crimes for economic gain. They can simply game the regulatory system through litigation, paying nominal fines or forestalling regulatory action via the political process, rather than engaging in criminal activity. Additionally, unlike typical policing and prosecution, what constitutes a criminal violation is sometimes legally ambiguous.¹¹⁵ Criminal enforcement also exists within a broader enforcement and compliance framework that involves federal civil enforcement as well as state enforcement efforts. but the low number of criminal investigators and prosecutors for the entire country make deterrence difficult.¹¹⁶ The EPA and DOJ have always had to make hard choices.¹¹⁷ Whether those choices to investigate and prosecute environmental crimes will be made with enough resources in the coming years, and how they will be made in the context of the broader enforcement and compliance apparatus, and whether they will function to produce deterrence, remains to be seen.

CONCLUSION: REMEDIES TO ENHANCE THE DETERRENT EFFECT OF CRIMINAL SANCTIONS

We conclude by offering three prescriptions for the suboptimal deterrence problem in the environmental criminal enforcement apparatus in the United States. The first is an increase in resources. EPA-CID has suffered over the last decade or so from having less than

¹¹³ Real funding for EPA has been flat or declining when adjusted for inflation. Staffing has been declining since the late 1990s. *EPA's Budget and Spending*, EPA (May 16, 2022), <https://www.epa.gov/planandbudget/budget> [<https://perma.cc/KJA7-6PC3>]; U.S. INFLATION CALCULATOR, <https://www.usinflationcalculator.com/> [<https://perma.cc/B9A3-9DX2>] (last visited Jan. 22, 2023).

¹¹⁴ See *How Much Has the U.S. Government Spent This Year?*, FISCALDATA, <https://datalab.usaspending.gov/americas-finance-guide/spending/trends/> [<https://perma.cc/6NFX-BJSW>] (last visited Apr. 9, 2023); *EPA's Budget and Spending*, EPA (May 16, 2022), <https://www.epa.gov/planandbudget/budget> [<https://perma.cc/G9UH-X59G>].

¹¹⁵ Ozymy & Jarrell, *supra* note 8, at 40.

¹¹⁶ Suarez, *supra* note 57.

¹¹⁷ See Mintz, *supra* note 64, at 10.

the statutory minimum of 200 special agents required by law. EPA-CID should be allowed to hire at least the minimum number of criminal investigative staff as required by law and to greatly expand this number, as should DOJ-ECS be allowed to hire additional prosecutors. This criminal enforcement apparatus is effective under resource constraints, and modest additions to the staff are warranted. For example, these collaborations result in a sixty-seven percent filing rate for criminal charges and a ninety percent conviction rate, which is a significant value for the investment.¹¹⁸

A second remedy would be to enhance community involvement in helping control environmental crime. Systematic community policing of polluting facilities would greatly aid limited EPA-CID staff in the investigation of environmental crimes. In the decade since the “Report a Violation” website was introduced in January 2006, EPA-CID opened thirty-five cases and six of those cases were successfully prosecuted.¹¹⁹ This program could be greatly enhanced with outreach and funding, particularly through the Office of Environmental Justice. The Office of Environmental Justice is responsible for stakeholder participation among environmental justice communities that live near heavy industry throughout the country and face the worst health burdens of any marginalized group.¹²⁰

A final remedy would be to enhance the visibility of environmental criminal enforcement. Environmental crimes are often not viewed by policymakers and the general public as serious crimes, even if their effects are just as severe or worse than street crime.¹²¹ Criminal prosecutions often received little attention from the mass media.¹²² The EPA’s Fugitives program does well to expose environmental criminals that evade the law.¹²³ It is meant to bring salience to the agency’s actions and the seriousness of environmental crimes and is modeled on

¹¹⁸ *Criminal Enforcement Program*, EPA 5, 8 (May 3, 2016), <https://19january2017snapshot.epa.gov/sites/production/files/documents/oceft-overview-2011.pdf> [<https://perma.cc/GJ3D-JRPX>] (total OEFCT budgeting in real dollars according to EPA estimates as one example was flat at \$65 million between FY 2007–11).

¹¹⁹ *Id.* at 6–7.

¹²⁰ See *Tools and Products for Environmental Justice Action*, EPA, https://www.epa.gov/sites/production/files/2017-09/documents/epa_office_of_environmental_justice_factsheet.pdf [<https://perma.cc/AXR2-BYU3>] (last visited Apr. 9, 2023).

¹²¹ See ROBERT D. BULLARD, ET AL., *THE QUEST FOR ENVIRONMENTAL JUSTICE: HUMAN RIGHTS AND THE POLITICS OF POLLUTION* 286–89 (Robert D. Bullard ed., 2009).

¹²² Melissa L. Jarrell, *Environmental Crime and Injustice: Media Coverage of a Landmark Environmental Crime Case*, 6 SW. J. OF CRIM. JUST. 25, 27–28 (2009).

¹²³ See *EPA Fugitives*, EPA, <https://www.epa.gov/enforcement/epa-fugitives> [<https://perma.cc/94WA-KVVH>] (July 11, 2022).

the Federal Bureau of Investigation's Ten Most Wanted Fugitives List.¹²⁴ Unless public interest is drawn to these endeavors and they begin to see the importance of criminal enforcement for making environmental laws work in practice, policymakers will not sufficiently fund these important endeavors.¹²⁵

¹²⁴ *Ten Most Wanted Fugitives*, FED. BUREAU OF INVESTIGATION, <https://www.fbi.gov/wanted/topten> [<https://perma.cc/B7LH-AGLM>] (last visited Apr. 9, 2023).

¹²⁵ Melissa L. Jarrell & Joshua Ozymy, *Real Crime, Real Victims: Environmental Crime Victims and the Crime Victims' Rights Act (CVRA)*, 58 *CRIME, L. & SOC. CHANGE* 373, 374–77 (2012).

