

The EPA Needs to Address Increasing Air Pollution at Ports

September 21, 2023 | Report No. 23-E-0033



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Abbreviations

CAA	Clean Air Act
DERA	Diesel Emissions Reduction Act
EPA	U.S. Environmental Protection Agency
OGV	Oceangoing Vessel
OIG	Office of Inspector General

Key Definitions

Climate Change	Significant changes in average conditions—such as temperature, precipitation, wind patterns, and other aspects of climate—that occur over years, decades, centuries, or longer.
Criteria Air Pollutants	Six common air pollutants that are found all over the United States and that can harm health and the environment and cause property damage.
Emissions Inventory	A database that lists, by source, the amount of air pollutants discharged into the atmosphere during a year or other time period.
Greenhouse Gas	Gases, such as carbon dioxide, methane, nitrous oxide, and certain synthetic chemicals, that trap some of the Earth’s outgoing energy, thus retaining heat in the atmosphere
Nitrogen Oxides	A family of poisonous, highly reactive gases. These gases form when fuel is burned at high temperatures.

Cover Image

An oceangoing vessel with cargo at the Port of Los Angeles. (EPA OIG photo)

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At a Glance

The EPA Needs to Address Increasing Air Pollution at Ports

Why We Did This Evaluation

To accomplish this objective:

The U.S. Environmental Protection Agency Office of Inspector General initiated this evaluation to determine what steps, if any, the EPA is taking to address the increase in air pollution from oceangoing vessels at U.S. maritime ports.

In the *FY 2022–2026 EPA Strategic Plan*, the EPA’s goal to “ensure clean and healthy air for all communities” includes an objective to “improve air quality and reduce localized pollution and health impacts.” The Clean Air Act enables the federal government to regulate air pollution from the maritime shipping industry. Ports across the United States have experienced unprecedented levels of maritime traffic since the spring of 2020, resulting in significant amounts of air pollution in near-port communities.

To support this EPA mission-related effort:

- *Improving air quality.*

To address this top EPA management challenge:

- *Mitigating causes and adapting to impacts of climate change.*

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What We Found

The EPA needs to collect additional data to successfully track air emissions near ports. The Agency has not taken steps to address increases in air pollution at U.S. maritime ports beyond working with communities through the Ports Initiative, which is the Agency’s voluntary program that encourages ports to decrease emissions and increase efficiency. Additionally, the EPA is not fully tracking changes in air emissions from oceangoing vessels, at ports, potentially putting human health at risk in near-port communities. Air quality monitoring is nonexistent at most U.S. ports. In the absence of air monitors, community groups in near-port communities have sought to address data gaps on their own, often using low-cost air monitors. Yet, the EPA has limited guidance on how to use both the low-cost monitors and the data from them to track emissions.

Additionally, while the EPA provides technical instructions to ports that choose to complete emissions inventories, which can be used to track emissions specifically from oceangoing vessels, ports varied in the extent to which they conducted and publicly released emissions inventories. An **emissions inventory** is a database that lists, by source, the amount of air pollutants discharged into the atmosphere during a given period. Of the 57 ports continuously tracked by the EPA’s Ports Initiative, 13 ports released at least one emissions inventory before 2022. As of May 2023, the EPA could not adequately assess changes in air emissions baselines or performance metrics to measure progress toward reducing harmful health impacts from air emissions at ports because of the lack of emissions data. Both increased local air monitoring and completed emission inventories are integral parts of a successful plan for enhancing the nation’s air-monitoring network.

The EPA has no clearly defined performance measures to determine the success of its Ports Initiative. As such, the EPA will not be able to effectively track the impact of the \$3 billion in Inflation Reduction Act of 2022 funding that the Agency received to plan, procure, and install zero-emission technology at ports. Moreover, without these performance measures, the EPA cannot determine whether additional actions are needed to address air emissions from OGVs to meet the clean air goal in the *FY 2022–2026 EPA Strategic Plan*.

The EPA should track changes in air emissions in near-port communities and develop guidance for using community group air-monitoring data.

Recommendations and Planned Agency Corrective Actions

We recommend that the assistant administrator for Air and Radiation assess the air-monitoring network around ports and in near-port communities and create a plan to enhance the network where gaps are identified. In addition, we recommend that the EPA set quantifiable performance measures for the Ports Initiative, including a plan for establishing their baselines. The Agency agreed with our recommendations. Recommendation 1 is resolved with corrective actions pending. For Recommendation 2, although the Agency agreed with the intent of our recommendation, we disagree on the efficacy of the metrics that the EPA provided. Therefore, Recommendation 2 is unresolved.



OFFICE OF INSPECTOR GENERAL
U.S. ENVIRONMENTAL PROTECTION AGENCY

September 21, 2023

MEMORANDUM

SUBJECT: The EPA Needs to Address Increasing Air Pollution at Ports
Report No. 23-E-0033

FROM: Sean W. O'Donnell, Inspector General

A handwritten signature in blue ink that reads "Sean W O'Donnell".

TO: Joseph Goffman, Principal Deputy Assistant Administrator
Office of Air and Radiation

This is our report on the subject evaluation conducted by the U.S. Environmental Protection Agency Office of Inspector General. The project number for this evaluation was [OSRE-FY22-0140](#). This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

The Office of Air and Radiation is responsible for the issues discussed in this report.

In accordance with EPA Manual 2730, your office provided acceptable planned corrective actions and an estimated milestone date for Recommendation 1. This recommendation is resolved. A final response pertaining to this recommendation is not required; however, if you submit a response, it will be posted on the OIG's website, along with our memorandum commenting on your response.

Action Required

Recommendation 2 is unresolved. EPA Manual 2750 requires that recommendations be resolved promptly. Therefore, we request that the EPA provide us within 60 days its responses concerning specific actions in process or alternative corrective actions proposed on the recommendation. Your response will be posted on the OIG's website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at www.epaoig.gov.

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Purpose

The U.S. Environmental Protection Agency Office of Inspector General [initiated](#) this evaluation to determine what steps, if any, the EPA is taking to address the increase in air pollution from oceangoing vessels, or OGVs, at U.S. maritime ports.

Top Management Challenge Addressed

This evaluation addresses the following top management challenge for the Agency, as identified in the OIG's *U.S. Environmental Protection Agency Fiscal Year 2023 Top Management Challenges [report](#)*, issued October 28, 2022:

- Mitigating causes and adapting to impacts of climate change.

Background

In the [FY 2022–2026 EPA Strategic Plan](#), the Agency's goal to "Ensure Clean and Healthy Air for All Communities" includes an objective to "Improve Air Quality and Reduce Localized Pollution and Health Impacts." In the *Strategic Plan*, the EPA promises to:

[W]ork with air agencies and local communities to prioritize engagement with low-income and marginalized communities that for decades have been overburdened with air pollution and other environmental hazards. EPA will undertake air monitoring and other assessment approaches to address these long-neglected air quality and public health problems. The Agency will work to assess the current state of the nation's monitoring network and pursue collaborative approaches to modernize the technologies, equipment, and network design used to measure air quality as well as enhance the quality and security of critical data collection, handling, and reporting from the network.

Increased Maritime Traffic and Air Pollution from OGVs Since 2020

According to the U.S. Department of Transportation, U.S. ports "continue to handle unprecedented amounts of cargo." This increase in maritime traffic began in 2020 and has led to worsened air quality at several U.S. ports.¹ For example, in October 2021, a record-breaking 109 vessels anchored near the Ports of Los Angeles and Long Beach because of congestion at the ports. The amount of port activity was so large that the U.S. Coast Guard had to designate additional areas in which ships could anchor. The increase in OGV

OGVs

According to the EPA, "OGVs move cargo and people into and out of a port and typically travel long distances between foreign or domestic ports." OGVs include container ships, bulk carriers, auto carriers, and cruise ships.

—The EPA's "Ocean-Going Vessel (OGV) Best Practices to Improve Air Quality" [webpage](#) (updated December 20, 2022)

¹ U.S. Department of Transportation Bureau of Transportation Statistics' "Supply Chain Challenges" [webpage](#), (accessed February 28, 2022).

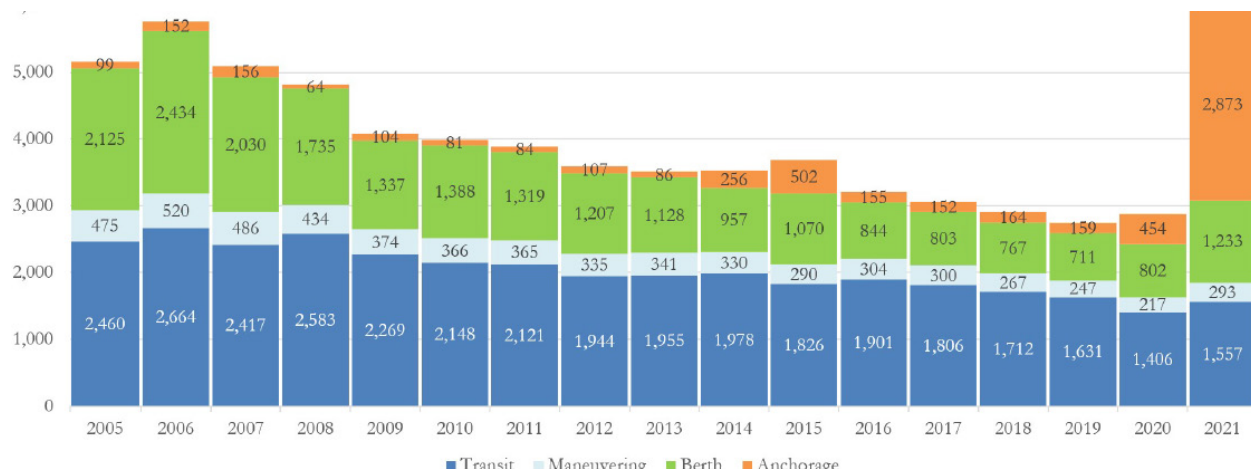
congestion at ports is due to many factors, including disruptions from the coronavirus pandemic, that is, the SARS-CoV-2 virus and resultant COVID-19 disease; labor and supply shortages; supply chain issues; and surging demand for consumer goods.

According to research by the National Aeronautics and Space Administration and emissions inventories from the Port of Los Angeles and the Port of New York and New Jersey, increased maritime traffic has caused significant amounts of pollution to be released into the atmosphere. Emissions from port operations come from sources such as OGVs, cargo-handling equipment, and trucks. As detailed in the green box below, OGVs significantly contribute to air emissions from port operations.

OGVs and Nitrogen Oxide Emissions

OGVs produce 15 percent of human-made nitrogen oxide emissions. According to the EPA’s “Nitrogen Oxides (NOx) Control Regulations” [webpage](#), **nitrogen oxides** are “a family of poisonous, highly reactive gases that are formed when fuel is burned at high temperatures.” A National Aeronautics and Space Administration study used satellite imagery to assess changes in nitrogen oxide emissions around U.S. ports between October 1 and 23, 2021. The study indicated that emissions may have increased because of supply chain issues. Figure 1 demonstrates a similar rise in nitrogen oxide emissions at the Port of Los Angeles. The Port of Los Angeles’ emissions inventory revealed that emissions from anchored ships rose dramatically from 454 tons in 2020 to 2,873 tons in 2021, which is a 633-percent increase. By October 2021, maritime traffic congestion off the coast of Southern California produced an increase in nitrogen oxides that was roughly equivalent to 5.8 million passenger cars when compared to the levels before the pandemic.

Figure 1: Nitrogen oxide emissions from OGVs by type of operation at the Port of Los Angeles



Note: *Transit* refers to OGVs operating in open water, while *maneuvering* refers to OGVs specifically operating near the ports in near-port waters. *Berth* refers to OGVs that are docked at the port. *Anchorage* refers to OGVs that are waiting outside the port.

Source: Port of Los Angeles Inventory of Emissions 2021. (Port of Los Angeles image)

Since we focused on OGV emissions from 2020 onward, we did not evaluate OGV emissions prior to 2020. For example, in the green box above titled “OGVs and Nitrogen Oxide Emissions,” we highlighted the 633-percent increase in emissions from anchored ships between 2020 and 2021. If we used earlier years, the increase would be much higher, for example, a 1,807-percent increase between 2019 and 2021.

The Human Health and Climate Change Impacts of OGV Pollution

According to the EPA, *climate change* involves “significant changes in average conditions—such as temperature, precipitation, wind patterns, and other aspects of climate—that occur over years, decades, centuries, or longer.”² OGVs can be significant contributors to climate change. The International Maritime Organization has stated that the global maritime shipping industry accounted for nearly 3 percent of all carbon dioxide produced by humans in 2018. The organization also documented a 9.6-percent increase in carbon dioxide emissions since 2012. It estimates that carbon dioxide emissions from OGVs may increase as much as 250 percent from 2012 levels by 2050 as global trade increases.

The International Maritime Organization

The International Maritime Organization is a specialized agency of the United Nations. It “is the global standard-setting authority for the safety, security and environmental performance of international shipping.”

The International Maritime Organization’s “Introduction to IMO” [webpage](#)

The EPA has stated that “[g]reenhouse gases, such as carbon dioxide, methane, nitrous oxide, and certain synthetic chemicals, trap some of the Earth’s outgoing energy, thus retaining heat in the atmosphere.”³ Furthermore, the EPA has found that greenhouse gas emissions cause human-induced climate change, which endangers human welfare through increases in the number and severity of extreme weather events;⁴ rises in sea levels; damages to critical infrastructure; and declines in agricultural productivity, air and water quality, and ecosystem health.⁵ Although alternate fuel sources like hydrogen are emerging, diesel fuel is still the primary fuel source at ports. One objective of the *FY 2022–2026 EPA Strategic Plan* is “to reduce emissions that cause climate change.”

The EPA’s Climate Partnership Programs

The EPA’s goal is to, by September 30, 2026, reduce expected annual greenhouse gas emissions by the equivalent of 545 million metric tons of carbon dioxide through its climate partnership programs.

A 2021 Yale University study on air pollution surrounding ports found that any rise in diesel-dependent maritime traffic has severe impacts on human health.⁶ The EPA reports that one of the pollutants released through the diesel combustion process, particulate matter, may remain suspended in the air for long periods of time, travel hundreds of miles from the creating vessel, and impact broad areas. Most ports are located near metropolitan areas, such as the cities of Los Angeles and New York. In 2016, millions of people lived near ports in the United States.

² The EPA’s “Frequently Asked Questions About Climate Change” [webpage](#) (updated August 19, 2022).

³ The EPA’s “Greenhouse Gases” [webpage](#) (updated March 19, 2020).

⁴ The EPA’s “Climate Change Impacts on Health” [webpage](#) (updated December 13, 2022).

⁵ The EPA’s “National Port Strategy Assessment: Reducing Air Pollution and Greenhouse Gases at U.S. Ports” [webpage](#) (updated February 10, 2023).

⁶ Kenneth Gillingham and Pei Huang, *Racial Disparities in the Health Effects from Air Pollution: Evidence from Ports* (Nat’l Bureau of Econ. Rosch., Working Paper No. 29108, 2021).

Figure 2: Top ten busiest U.S. ports



Source: EPA Ports Initiative data pulled from the Bureau of Transportation Statistics. (EPA OIG graphic)

The EPA's *National Port Strategy Assessment: Reducing Air Pollution and Greenhouse Gases at U.S. Ports* notes that people exposed to diesel emissions can have increased rates of hospitalization and premature death. It further states that those who experience chronic exposure to diesel emissions can have higher rates of lung and heart disease. People who experience long-term exposure to diesel emissions have increased risk of developing asthma or experiencing worsened asthma symptoms. The World Health Organization has found that long-term exposure to diesel exhaust causes cancer.

According to the EPA's *National Port Strategy Assessment*, although OGV emissions have geographically large impact areas, emissions have the highest impact on the communities closest to the ports. The EPA's *Environmental Justice Primer for Ports* states that these near-port communities are often low-income communities or communities of color, meaning that port activities may have disproportionate health impacts and environmental justice implications. The EPA found that communities with environmental justice concerns often experience stressors beyond health disparities, such as neighborhood disinvestment, income inequality, public safety concerns around truck routes and rail crossings, and coastal-related threats from extreme weather events and climate change. In addition, the heavy concentration of industrial facilities, rail lines, and highways surrounding ports can create barriers between residents and necessities, such as grocery stores, health services, pharmacies, retail centers, transit, and recreational spaces. Because of these factors, some near-port communities have formed community groups that conduct their own air monitoring independent of the EPA's regulatory system.

EPA and State Oversight of the U.S. Maritime Shipping Industry

The EPA uses the Clean Air Act, or CAA, to regulate air pollution from U.S. mobile sources, such as OGVs. Under the CAA, the EPA is required to set emission standards for new mobile-source engines and

vehicles, such as cars, locomotives, and maritime vessels, when the EPA administrator determines that they cause or contribute to air pollution that endangers public health or welfare. These emission standards impose limits on fuel content, as well as efficiency standards for new mobile-source engines. OGV engines are subject to exhaust emission limits on hydrocarbon, carbon monoxide, and nitrogen oxides.

Separately, the CAA requires the EPA to establish, review, and revise standards, known as the National Ambient Air Quality Standards, for six common air pollutants, called the **criteria air pollutants**, that can harm health and the environment. Criteria air pollutants include particulate matter, ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. The CAA requires states to submit to the EPA an implementation plan to specify how they will achieve the ambient air quality standards for areas in **nonattainment status**, meaning that they exceed acceptable levels of a given criteria air pollutant. The EPA delegates air quality monitoring to states, which allows states to determine the number and location of air monitors. If an area is in attainment status under the CAA, monitoring requirements are much less stringent than for an area in nonattainment status. In addition to air quality monitoring, the EPA uses modeling to estimate the relationship between sources of pollution and their effects on ambient air quality and to predict the impacts from various emission sources. According to the EPA, both models and data from state air quality monitors are used to develop the **National Emissions Inventory**, which is a comprehensive estimate of air emissions that is released every three years. We found no additional requirements under the CAA to monitor air quality specifically near ports.

The EPA's Ports Grant Funding and Voluntary Ports Initiative

The EPA largely relies on voluntary programs to encourage shipping companies, port authorities, and community organizations to adopt cleaner practices to reduce emissions at U.S. ports. Since 2008, the EPA has distributed Diesel Emissions Reduction Act, or DERA, grants with the intent of reducing diesel emissions nationwide. DERA strives to reduce diesel emissions by replacing and retrofitting older, dirtier diesel engines. DERA awards funding through a competitive application process, which prioritizes aiding ports and other goods-movement facilities in nonattainment areas under the CAA, improving air quality in communities with environmental justice concerns, and eliminating the most emissions possible per dollar of grant funding spent.⁷ The EPA distributed \$171 million in DERA grants to port projects from 2008 through 2020. In 2022, DERA received \$60 million in additional funding from the Inflation Reduction Act of 2022, which is a federal law intended to reduce emissions, energy prices, and inflation. According to the EPA, this funding is specifically allocated for goods-movement projects in low-income and disadvantaged communities.

The EPA will distribute \$3 billion in grant funding specifically to ports through a competitive application process using funding from the Inflation Reduction Act. Grant recipients may use this funding to plan, procure, and install zero-emission technology at ports and to develop qualified climate action plans. A qualified climate action plan must establish goals to reduce emissions and include an emissions

⁷ **Goods movement** is the distribution of freight, including raw materials, parts, and finished consumer products, by all modes of transportation, including marine, air, rail, and truck.

inventory and a strategy to collaborate with and address potential effects on low-income and disadvantaged near-port communities. According to the EPA, an **emissions inventory** is “a database that lists, by source, the amount of air pollutants discharged into the atmosphere during a year or other time period.”⁸ The Inflation Reduction Act allocates \$750 million of the total grant funding specifically to ports in nonattainment areas. A separate provision of the Act reserves at least \$167.5 million for air monitoring, with an additional \$3 million allocated for community air-monitoring networks. These networks are often used to fill the gaps in air-monitoring networks near ports across the country.

While DERA distributes federal funding to reduce emissions, the EPA’s Ports Initiative encourages ports to decrease emissions and to increase efficiency by offering largely nonmonetary assistance. The Ports Initiative consists of sharing information, encouraging communication and cooperation between stakeholders, and celebrating best practices. The EPA also offers technical assistance to ports, such as providing guidance on the installation of shore power, applying for DERA grants, and developing emissions inventories.

Emissions inventories allow ports and the EPA to see how different mobile sources contribute to air emissions. Emissions inventories can isolate emissions from OGVs. Since emissions inventories are not required in all states, the Ports Initiative aims to convince ports to voluntarily create emissions inventories using technical assistance from the EPA.

One central component of the Ports Initiative is community engagement. The Ports Initiative aims to increase collaboration and planning between ports, companies, and communities because “emissions from diesel equipment operating at ports disproportionately impact nearby communities that are often comprised of low-income populations and communities of color.”⁹ DERA prioritizes grant applicants if they plan to positively impact communities that are experiencing environmental justice concerns.¹⁰ Both DERA and the Ports Initiative participate in the Justice40 Initiative, which is a 2021 program that was created by executive order and is intended to allocate 40 percent of certain federal benefits to underserved or underfunded populations.

In 2016 and 2017, the Ports Initiative began a series of pilot projects with four near-port communities around the country that have environmental justice concerns to test a series of guiding documents known as the Community-Port Collaboration Toolkit. The pilot project cities included New Orleans, Louisiana; Savannah, Georgia; Seattle, Washington; and, Providence, Rhode Island. The Toolkit was intended to assist near-port communities in understanding stakeholder priorities and developing collaboration skills.

⁸ The EPA’s “Managing Air Quality - Emissions Inventories” [webpage](#) (updated December 21, 2022).

⁹ The EPA’s “Community-Port Collaboration Toolkit” [webpage](#) (updated June 30, 2023).

¹⁰ *2021 Diesel Emissions Reduction Act (DERA) National Grants Request for Application*, page 42.

Responsible Offices

The Office of Air and Radiation is responsible for the issues addressed in this report. The Office of Air and Radiation develops national programs, policies, and regulations for controlling air pollution. The Office of Transportation and Air Quality, within the Office of Air and Radiation, along with the EPA's regional offices, oversees the Ports Initiative and DERA grants and regulates mobile-source air emissions. In addition, the EPA's Office of Air Quality Planning and Standards, also within the Office of Air and Radiation, compiles and reviews air pollution data, assists states and local agencies with monitoring and controlling air pollution, and makes information about air pollution available to the public.

The EPA's annual appropriated budget for fiscal year 2023 is roughly \$10.1 billion. The Office of Air and Radiation's fiscal year 2023 budget is \$1.8 billion, or approximately 17.8 percent of the EPA's total budget, and the Office of Transportation and Air Quality's fiscal year 2023 budget is roughly \$351 million, or about 3.5 percent of the EPA's total budget. The Office of Air Quality Planning and Standards' fiscal year 2023 budget is approximately \$359 million, or about 3.6 percent of the EPA's total budget. The Inflation Reduction Act appropriated \$3 billion to award rebates and grants for the planning, procurement, and installation of zero-emission port equipment and the development of qualified climate action plans for ports.

Scope and Methodology

We conducted this evaluation from June 2022 to May 2023 in accordance with the *Quality Standards for Inspection and Evaluation* published in December 2020 by the Council of the Inspectors General on Integrity and Efficiency. Those standards require that we perform the evaluation to obtain sufficient and appropriate evidence to support our findings. We reviewed relevant policies, regulations, reports, and supporting documents concerning maritime shipping congestion and emission-reduction strategies for U.S. ports, including the CAA, DERA, the Inflation Reduction Act, the EPA's Ports Initiative and associated documentation, and the EPA's *National Port Strategy Assessment*. Our review considered all U.S. maritime ports while focusing on the largest ports. Our team also visited two U.S. ports, the Port of Los Angeles in California and the Port of Savannah in Georgia, and conducted 15 interviews with representatives of the EPA, officials from various ports, employees of nongovernmental organizations and state or local government entities.

Prior Reports

EPA OIG Report No. [09-P-0125](#), *EPA Needs to Improve Its Efforts to Reduce Air Emissions at U.S. Ports*, issued March 23, 2009, found that the EPA's "implementation of voluntary initiatives to reduce emissions from port sources has been hampered by a lack of emissions data, participation, and funding." In the report, we recommended that the Agency regulate emissions from foreign-flagged vessels under the CAA and establish an emissions-control area to better enforce the standards of the International

Convention for the Prevention of Pollution from Ships.¹¹ We also recommended that the Agency apply a transformation plan to its voluntary programs that included milestones and performance measures because the “EPA’s strategy does not include the management controls necessary to execute, oversee, and measure the success of its approach to addressing air quality issues at ports.”

In EPA OIG Report No. [18-P-0240](#), *EPA Needs a Comprehensive Vision and Strategy for Citizen Science that Aligns with Its Strategic Objectives on Public Participation*, issued September 5, 2018, we concluded that the EPA does not use, as part of the Agency’s citizen science efforts, data from low-cost community environmental monitors to guide policy and decision-making. We recommended that the Agency identify the data-management requirements for using citizen science data.

Results

The EPA has not taken any additional steps to address increases in air pollution from OGVs at U.S. maritime ports beyond working with communities through the Ports Initiative because it does not collect data at ports to track changes in air emissions and related impacts. As stated in the *FY 2022–2026 EPA Strategic Plan*, the EPA has a strategic goal to “ensure clean and healthy air for all communities” but will not be able to track its progress toward meeting this goal for near-port communities without emissions data and performance measures. Air quality is not monitored at most U.S. ports, and emissions inventories to track emissions specifically from OGVs are not available for many ports. The EPA is not using the data from air-monitoring networks established by community groups for regulatory decisions because the Agency questions the reliability of data from low-cost monitors. As of May 2023, the EPA is unable to determine the success of its Ports Initiative program. This issue has increased urgency as the EPA prepares to award \$3 billion in Inflation Reduction Act funding for the planning, procurement, and installation of zero-emission technology at ports.

Air Monitoring at Ports Is Limited

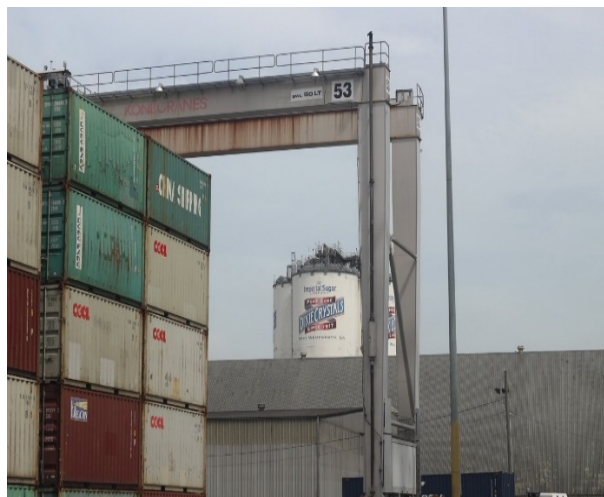
Air quality monitoring is limited at most U.S. ports. EPA staff shared that the Port of Charleston has monitors, but the EPA was not involved in establishing or approving the quality-assurance plan for the monitors.¹² The Ports of Los Angeles and Long Beach have air monitors on-site, but community leaders near the Port of Los Angeles are concerned that air monitors regularly break. Some ports have air monitors in the nearest cities but not necessarily in the communities closest to the ports, including the neighborhoods that directly border the ports. This means that, while Savannah may have a monitor elsewhere, the Hudson Hill neighborhood that directly abuts the port boundaries does not. Similarly,

¹¹ According to the International Maritime Organization, “[t]he International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. ... The Convention includes regulations aimed at preventing and minimizing pollution from ships.” The International Maritime Organization’s “International Convention for the Prevention of Pollution from Ships (MARPOL)” [webpage](#) (accessed March 1, 2023).

¹² The EPA requires all organizations conducting environmental programs that are fully or partially funded by the EPA to establish and implement a system that ensures the production of quality information.

there is a monitor in Newark, New Jersey, near the Port of New York and New Jersey, but the local community expressed concern that there is no monitor in the South Ward neighborhoods bordering the port.

EPA staff said that air monitoring is mostly the prerogative of local and state governments as part of CAA enforcement. Ports Initiative staff shared that air monitors at or near ports are usually located in those areas because they are in nonattainment status, but there is not a direct requirement for monitors at ports in nonattainment areas. Establishing air monitors at ports would typically require the approval of the ports. EPA staff shared that there has been some resistance from ports to air monitoring on their properties. We confirmed this in our interviews with port officials, who noted hesitance to establish air monitors because the monitors would include pollution from nearby industrial facilities that are outside the port's control. For example, multiple nonport industrial facilities surround the Port of Savannah, including a paper mill and a sugar factory. According to the EPA, there are many other tools to assess air quality near ports, including emissions inventories, which we describe below, and air quality modeling systems, such as the National Emissions Inventory. Despite the utility of these tools, it often takes several years to gather data and publish results. Air quality monitoring, however, provides crucial pollution data in a timely manner.



The Port of Savannah is surrounded by many industrial facilities, including a sugar factory, as shown in this photo. (EPA OIG photo)

Community Groups' Air-Monitoring Data Are Not Used by the EPA for Decision-Making

In the absence of air monitors in their communities, some environmental justice groups in near-port communities have sought to fill data gaps on their own. Air monitors that meet the EPA's standards to monitor CAA compliance can each cost tens of thousands of dollars. However, communities can purchase low-cost monitors for under \$250. Regional staff shared that there have been issues involving community air monitors that required technical assistance. EPA regional staff have provided this technical assistance to community groups, and some regions have established low-cost air monitor lending programs. However, the EPA does not use data from community air-monitoring projects for regulatory decisions. A 2018 EPA OIG report on the EPA's use of citizen science, including community air and water monitoring,¹³ indicated that the EPA did not use community environmental monitors to guide decision-making because of data-quality and technical concerns. In that report, we recommended that the Agency identify the data-management requirements for using citizen science data. Although the EPA

¹³ EPA OIG Report No. 18-P-0240, *EPA Needs a Comprehensive Vision and Strategy for Citizen Science that Aligns with Its Strategic Objectives on Public Participation*, September 5, 2018.

agreed to incorporate our recommendation by December 31, 2020, the EPA has not implemented any guidance to help make community-monitoring data more useable.¹⁴

In a June 2020 memorandum from the Office of Air and Radiation,¹⁵ the EPA acknowledged the need for guidance related to the interpretation of real-time, nonregulatory sensor data. At its September 2022 meeting, the National Environmental Justice Advisory Council also discussed the need for guidance and technical assistance for low-cost air monitors.¹⁶ Even without additional EPA guidance, many community groups are continuing their efforts to expand their air-monitoring networks with these monitors.

Emissions Inventories Can Isolate Emissions from OGVs

Of 57 ports tracked by the EPA’s Ports Initiative, 13, or roughly 23 percent, released at least one emissions inventory before 2022. As detailed in Table 1, the ten largest U.S. ports varied in the frequency and extent to which they conducted and publicly released emissions inventories. For example, the Ports of Los Angeles and Long Beach conduct and publicly release emissions inventories on an annual basis. The Port of New York and New Jersey completes emissions inventories, but the release of the 2021 inventory was delayed for over a year after the completion of the reporting period. The Georgia Ports Authority is in the beginning stages of developing an emissions inventory. This is not the case for most ports.

Table 1. Port emissions inventory publishing status for the ten largest U.S. ports

Port	Emissions inventory published
Port of Los Angeles	Yes
Port of Long Beach (California)	Yes
Port of New York and New Jersey	Yes
Port of Savannah (Georgia)	Yes (last published in 2017)
Port of Houston (Texas)	Yes
Port of Virginia	No
Port of Oakland (California)	Yes
Port of Charleston (South Carolina)	Yes (last published in 2018)
Port of Tacoma (Washington)	Yes (last published in 2018)
Port of Seattle (Washington)	Yes (last published in 2018)

Note: These are the top ten ports by 20-foot equivalent unit, which is a measure of volume in units of 20-foot-long containers.

Source: EPA Ports Initiative data. (EPA OIG table)

¹⁴ The EPA provides resources on participatory science and low-cost air sensors through webpages, such as the “Participatory Science for Environmental Protection” [webpage](#) and the “Air Sensor Toolbox” [webpage](#) (updated July 28, 2023, and August 17, 2023, respectively).

¹⁵ EPA Office of Air and Radiation [Memorandum](#), *Air Sensors*, dated June 22, 2020.

¹⁶ The National Environmental Justice Advisory Council is a federal advisory committee that provides advice and recommendations to the EPA.

In its response to our draft report, the EPA said that “air monitoring is one tool that can provide data on emissions in an area but does not create a full picture of where the emissions come from or the effects of specific port activities.” The EPA added that, rather than embarking on an initiative solely focused on monitoring, “it would be best for such communities in proximity to ports to take a broader view of air pollution impacts to their communities where ports may be one of several concerns needing attention that may be quantified through a combination of tools,” such as modeling, emission inventories, and air quality monitoring.

Without these tools, including air monitoring in near-port communities, the EPA cannot assess changes in air emissions at ports or quantify emissions based on specific port activities. As a result, the EPA cannot identify whether additional standards and actions are needed to address air emissions from OGVs to meet the goal in the *FY 2022–2026 EPA Strategic Plan*.

The EPA’s Port Emissions Program Lacks Performance Measures

There are no clearly defined performance measures to determine the success of the EPA’s voluntary Ports Initiative program. The U.S. Government Accountability Office’s *Standards for Internal Control in the Federal Government* describes the need for performance measures, which are what management uses to evaluate performance in achieving objectives.¹⁷ For quantitative objectives, the *Standards for Internal Control* notes that performance measures may be a targeted percentage or numerical value, and for qualitative objectives, management may need to design performance measures that indicate a level or degree of performance, such as milestones. One consequence of undefined performance measures is that voluntary actions to address air emissions vary widely among ports because of the lack of clear targets. While some ports have adopted best practices like vessel speed-reduction programs and shore power to reduce OGV emissions, the results of these efforts are often unclear because there are no standards by which to assess them.

Community-Port Collaboration Project: Harambee House

Starting in 2016, the EPA Ports Initiative conducted four projects with near-port communities around the United States. According to the EPA, these projects “helped to build stronger partnerships” with relevant actors and empowered near-port communities to conduct “collaborative actions to improve air quality at ports.” For one of these projects, the Agency partnered with the Harambee House and community leaders from Hudson Hill, which is adjacent to the Port of Savannah. This community has a population that is 99.9 percent people of color, and the EPA classifies 60 percent of the community’s residents as low income. According to the EPA, Hudson Hill and the surrounding area is in the 97th percentile nationally for diesel particulate matter emissions because of the area’s 17 local industrial facilities, including the Port of Savannah.

The EPA showcased this project as a success, claiming that trust between all participants grew. Representatives from the Harambee House disagreed with the Agency’s position, reporting that community members were disappointed with the EPA and are reluctant to work with it again.

¹⁷ GAO-14-704G, *Standards for Internal Control in the Federal Government*, published in September 2014, sets internal control standards for federal entities. **Internal control** is a process used by management to help an entity achieve its objectives and run its operations efficiently and effectively, report reliable information about its operations, and comply with applicable laws and regulations.

One area in which the results of voluntary efforts are particularly unclear is in relation to the EPA's efforts working with near-port communities. The EPA published case studies and reports on its public website to illustrate voluntary efforts of ports to address air emissions as part of the Ports Initiative. However, these case studies and reports did not capture local environmental justice groups' disappointment with the program. For example, the EPA highlighted the community port collaboration project in Savannah with Harambee House as a success. The Ports Initiative claimed the development of "tangible action steps" as an accomplishment, but Harambee House said that the recommendations were formed by an outside consultant and that the Agency offered insufficient technical and financial assistance for implementation of the action steps. The EPA may have become aware of this difference in opinion if it used performance measures. The EPA could have used surveys of community residents or air-monitoring data to support the results of these pilot projects, but the EPA did not put such measures in place.

Conclusions

The EPA has set a strategic goal of ensuring clean and healthy air for all communities. The increase in maritime traffic since 2020 has heightened air pollution concerns in many near-port communities. Without assessing the air-monitoring network or implementing a plan for enhancing the network, including modeling, the EPA may not be able to efficiently address air emissions from OGVs. In addition, without performance measures for the Ports Initiative, the EPA cannot determine the initiative's success. With the \$3 billion in Inflation Reduction Act funding for the planning, procurement, and installation of zero-emission technology at ports, it will be essential for the EPA to evaluate the air-monitoring network and to establish performance measures.

While the validation of low-cost air monitors was outside the scope of our work, we identified the use of such monitors by near-port community groups during our evaluation and noted that the EPA does not use the data from these monitors. We suggest that the EPA consider creating a plan for evaluating new and low-cost monitoring technologies. As part of this plan, the EPA should consider developing guidance for incorporating these technologies into the Agency's air-monitoring network and related regulatory decisions.

Recommendations

We recommend that the assistant administrator for Air and Radiation:

1. Assess the air-monitoring network around ports and in near-port communities and create a plan to enhance the air-monitoring network where any gaps are identified.
2. Set quantifiable performance measures for the Ports Initiative, including a plan for identifying the measures' baselines.

Agency Response and OIG Assessment

Appendix A includes the Office of Air and Radiation's response to our draft report. The office also provided technical comments, which we considered and incorporated, as appropriate, as we finalized this report.

For Recommendation 1, the EPA said that it agreed with the spirit of our recommendation and provided corrective actions that it will take. We agree that the proposed corrective actions, including assessing the network, using modeling data, identifying gaps, and targeting grant funding, could make up a plan for assessing air quality and enhancing the network in near-port communities. EPA will need to provide documentation demonstrating how these corrective actions, once completed, suffice in lieu of a written plan. Because the proposed corrective actions meet the intent of Recommendation 1, we consider it resolved with corrective actions pending.

For Recommendation 2, while the EPA agreed with the recommendation, the planned corrective actions that it provided do not meet the full intent of our recommendation. The four clean air practices that the Agency states that it uses as indicators of progress toward reducing air pollution at major U.S. ports are important best practices, but they are not performance measures because they lack defined objectives. For this reason, Recommendation 2 is unresolved.

Lastly, the Office of Air and Radiation's response to the draft report and technical comments emphasized the Agency's commitment to multiple methods of assessing air quality in near-port communities. We acknowledge that air monitoring is not the only way to track air quality and made changes to cite alternatives in our report.

Status of Recommendations

Rec. No.	Page No.	Recommendation	Status*	Action Official	Planned Completion Date
1	13	Assess the air-monitoring network around ports and in near-port communities and create a plan to enhance the air-monitoring network where any gaps are identified.	R	Assistant Administrator for Air and Radiation	9/30/24
2	13	Set quantifiable performance measures for the Ports Initiative, including a plan for identifying the measures' baselines.	U	Assistant Administrator for Air and Radiation	

* C = Corrective action completed.

R = Recommendation resolved with corrective action pending.

U = Recommendation unresolved with resolution efforts in progress.

Agency Response



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

August 17, 2023

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Response to Office of Inspector General's Draft Report No. OSRE-FY22-0140
"The EPA Needs to Address Increasing Air Pollution at Ports," dated July 5, 2023

FROM: Joseph Goffman
Principal Deputy Assistant Administrator
Office of Air and Radiation

TO: Laretta Joseph, Director
Programs, Offices, and Centers Oversight Directorate
Office of Special Review and Evaluation

Thank you for the opportunity to respond to the issues and recommendations in the draft audit report titled "The EPA Needs to Address Increasing Air Pollution at Ports." OAR's general reaction to the report is followed by individual responses to each of the report's recommendations, including appropriate corrective actions and estimated completion dates. Additional technical comments are provided in a supplemental attachment for your consideration.

General

The Office of Air and Radiation (OAR) understands that the OIG audit team focused its work on steps EPA is taking to address air pollution from oceangoing vessels (OGVs) at U.S. maritime ports. EPA has several regulatory and non-regulatory programs to address OGV air pollution. The premise of the investigation is that OGV emissions are increasing at ports. While that is not the case for every port, OAR recognizes that OGV emissions nevertheless continue to be a significant source of pollution. We also recognize that air monitoring can be a useful tool to evaluate air quality, but we believe other tools such as emissions inventories and air quality modeling can also be informative for purposes of tracking OGV emissions. We also agree that performance measures for EPA's Ports Initiative are important, and we will continue to update and enhance performance measures over time.

RESPONSE TO REPORT RECOMMENDATIONS

Recommendation 1: Assess the air-monitoring network around ports and in near-port communities and create a plan to enhance the air-monitoring network where any gaps are identified.

Response 1: OAR agrees with the spirit of the recommendation but believes the focus on monitoring is too narrow and may not achieve the intended goal of addressing OGV emissions at ports. Air monitoring is one tool for assessing air quality but cannot necessarily be used to assess changes in OGV emissions or associate specific activities with emissions outcomes since there are typically many sources impacting air quality near ports. Given significant required resources (money and staff) necessary for air monitoring and the availability of other air quality data and information, EPA suggests that air monitoring should not be the sole focus of efforts to assess OGV emissions and related air quality. Emissions inventories, air quality modeling, and other relevant information are important aspects of assessing air quality.

In response to the recommendation, EPA commits to assessing the relevance of the monitoring network for addressing OGV emissions in the context of other types of information EPA and others are collecting (e.g., air quality modeling, emissions data, and other relevant information or tools) and identify gaps that, if filled, could better inform efforts to reduce OGV emissions and improve air quality in port areas. Recognizing that air monitoring is an expensive undertaking, EPA also commits to continue to identify ways to support monitoring at ports, including where it is within the general scope of competitive grant competitions funded through Congressional appropriations.

EPA will also continue to maintain a variety of existing tools – including the National Emissions Inventory¹⁸, Air Toxics Screening Assessment¹⁹, and Emissions Modeling Platforms²⁰ – that can help EPA, state and local partners, and others understand emissions sources, model air quality impacts, and assess additional measures to meet clean air goals. Through the Ports Initiative, EPA²¹ has also developed Port Emissions Inventory Guidance document and will continue to encourage port stakeholders to create and publish emissions inventories, including by providing funding for emissions inventories through the Inflation Reduction Act Clean Ports Program.

- **Planned Completion Date: Q4, FY 2025**

Recommendation 2: Set quantifiable performance measures for the Ports Initiative, including a plan for identifying their baselines.

Response 2: OAR agrees with this recommendation. Performance measures are important. The program currently has two indicators to track the impact of EPA’s Ports Initiative and will continue to develop additional measures in the future.

¹⁸ <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>

¹⁹ <https://www.epa.gov/AirToxScreen>

²⁰ <https://www.epa.gov/air-emissions-modeling/emissions-modeling-platforms>

²¹ <https://www.epa.gov/ports-initiative/port-and-goods-movement-emission-inventories>

EPA's Ports Initiative is a partnership program between EPA, port operators, communities, state and local governments, and other port stakeholders. Through implementation of the Ports Initiative, the agency tracks four specific clean air practices as indicators of progress towards reducing air pollution at major U.S. ports. An interactive map²² displays which major ports have publicly available emissions inventories, emission reduction targets, emission reduction projects/plans, and community engagement efforts. These metrics are indicators of the efforts port operators are taking to address air pollution from their operations and areas for improvement. The agency also tracks DERA awards for port projects and associated emissions reductions. One of the main elements of the Ports Initiative is helping port operators identify high-quality projects to reduce emissions and encouraging them to apply for funding from DERA and other programs to implement those projects. Through the Ports Initiative, EPA conducts a great deal of outreach on the DERA program and prioritizes port and other goods movement projects in DERA to help ensure continued progress in reducing emissions at ports. OAR is still working to design the \$3B Inflation Reduction Act Clean Ports Program but commits to establishing measures to evaluate the program in the future. We will also consider additional steps to evaluate the impact of EPA's Ports Initiative.

- **Planned Completion Date: Q4, FY 2025**

²² <https://www.epa.gov/ports-initiative/best-port-wide-planning-practices-improve-air-quality>

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