



NATURAL RESOURCES DEFENSE COUNCIL

**Testimony of the
Natural Resources Defense Council
In Support Of
S. 1499,
The Marine Vessel Emissions Reduction Act of 2007**

**U.S. Senate
Committee on Environment and Public Works
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My name is Richard Kassel, and I am pleased to testify in support of S. 1499, the Marine Vessel Emissions Reduction Act of 2007, on behalf of the Natural Resources Defense Council (NRDC). NRDC is a national, non-profit environmental organization dedicated to protecting human health and the environment. On behalf of our more than 1.2 million members and online activists in all fifty states, I thank you for the opportunity to testify today.

The Continuing—and Chronic—Problem of Ocean-Going Ship Pollution

As the Committee knows, the nation's marine ports are major hubs of economic activity for our nation. Every year, more than 2.5 billion tons of cargo enter the U.S. through our ports,¹ including roughly three-quarters (by weight) of all goods shipped in and out of the nation.²

All of us rely on the goods that arrive on our shores from distant ports. It is highly likely that the coffee that started our day, the car or subway that we took to this hearing, and the clothes we are wearing first entered the United States on a large, ocean-going ship. Much of the nation's economic growth of the past decade has been inextricably linked to the globalization of trade, and the growth of ocean-going cargo traffic to and from our shores.

But these ships come with a price: they are also major sources of the diesel pollution that threatens the health of nearby residents and communities that are miles away. The engines on these ships emit huge amounts of particulate matter (PM) and nitrogen oxides (NOx), as well as dozens of other toxic air contaminants that can cause or exacerbate an array of environmental impacts that seriously affect millions of Americans. These impacts include increased asthma attacks and emergencies, chronic bronchitis, emphysema, heart disease, and premature death, among others. The California Air Resources Board (CARB) has estimated that, in 2005, port-related activities (i.e., the ships and related trucks, trains and equipment servicing the ports) were linked with a long laundry list of health and economic impacts, including more than 2,400 premature deaths, 360,000 lost work days, more than 1.1 million school absences and other health impacts that collectively cost their state roughly \$19 billion dollars³

Moreover, these dirty diesel engines hamper state and local efforts to attain and maintain EPA's National Ambient Air Quality Standards (NAAQS) for PM and ozone. Indeed, the map below, which illustrates the most serious health

¹ US ports handled 2,631,429,240 tons of cargo in 2005 according to the US Army Corps of Engineers Waterborne Commerce Statistics Center. <http://www.iwr.usace.army.mil/ndc/wcsc/portname05.htm>

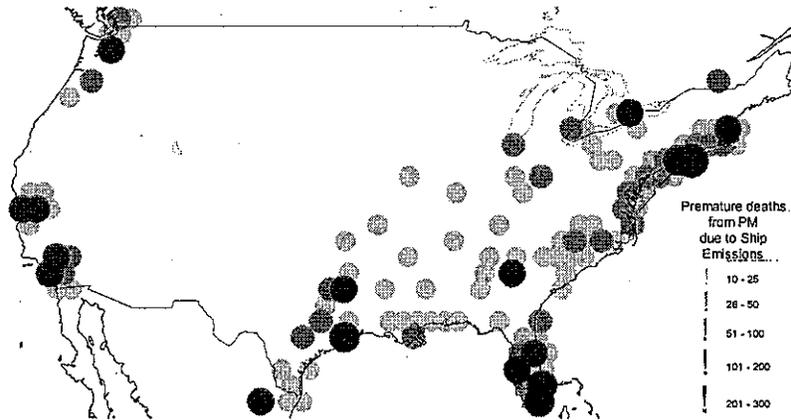
² US Department of Transportation. Research and Innovative Technology Administration. Bureau of Transportation Statistics. *Freight in America*, January 2006. Washington, DC: 2006. Pg 44

³ California Air Resources Board, *Emission Reduction Plan for Ports and Goods Movement*. March 22, 2006. Appendix A, pp. 71, 79.

impacts from ships, would dovetail well with a map of the nation's most serious ozone and soot nonattainment areas—and would include the homes of tens of millions of Americans, including much of Southern California, the Pacific Northwest, Houston and east Texas, New Orleans, most of Florida, Atlanta, Chicago, Detroit, and the entire east coast from Virginia to Boston and beyond.

Health Impacts from Ships are a Nationwide Problem

Pollution from oceangoing vessels causes at least 2,000 to 5,000 premature deaths in the U.S. every year

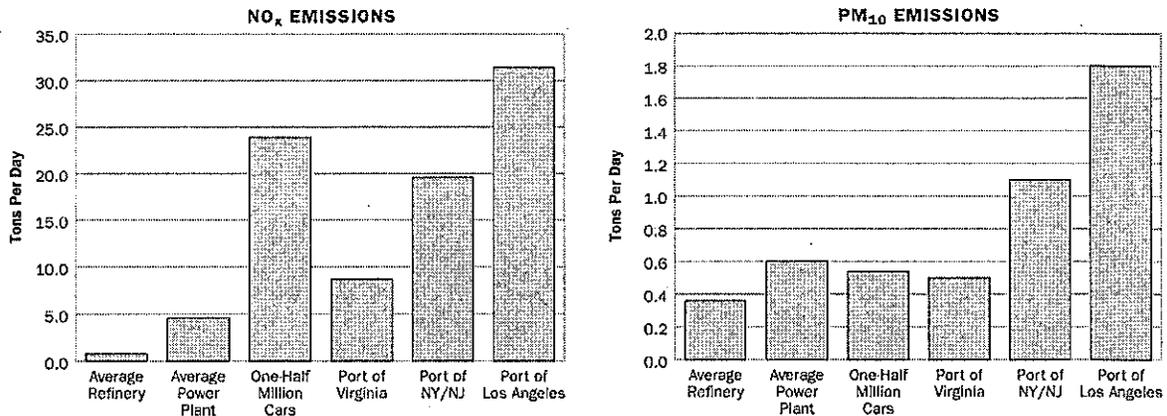


Cleaner marine fuels would reduce nationwide ship health impacts by ~ 60 %.

Source: Corbett, J. J.; Winebrake, J. J.; Green, E. H.; Kasibhalla, P.; Eyring, V.; Lauer, A. Mortality from Ship Emissions: A Global Assessment. *Environmental Science & Technology* 2007, 41, (24), 8512-8518

In March 2004, NRDC analyzed the ten largest marine ports in the nation. In its report, *Harboring Pollution: The Dirty Truth About U.S. Ports*, NRDC compared the aggregate PM and NOx emissions from several large ports to the average refinery, power plant and cars (each of which is subject to significant emissions regulations and/or permit requirements, unlike ocean-going ships). We found that marine terminals at the Port of Seattle, for example, emit more NOx than the average power plant and more PM than the average refinery, and marine vessels account for roughly half of those emissions—and those are the emissions at the marine terminals, not even counting the emissions of the ships going out 200 miles from shore. Additional findings are shown in the figure below. These findings underscore the critical need to close the regulatory loopholes that the shipping trade currently enjoys.

Nitrogen Oxide (NO_x) and Particulate Matter (PM₁₀) Pollution from Ports Compared to Refineries, Power Plants, and Cars



Sources:

Seaports of the Americas, American Association of Port Authorities Directory, p. 127, 2002; www.aapa-ports.org/industryinfo/statistics/htm.

U.S. EPA, National Emission Trends, Average Annual Emissions, All Criteria Pollutants, 1970–2001, August 13, 2003; www.epa.gov/ttn/chieftrends/index.html.

Energy Information Administration, Petroleum Supply Annual 1982, Volume 1, DOE/EIA-0340(82)/1 (June 1983, Washington, DC), pp. 97-103 and Petroleum Supply Annual 2000, Volume 1, DOE/EIA-0340(2000)/1 (Washington, DC, June 2001), Table 40; and company press releases; as posted at www.eia.doe.gov/emeu/finance/mergers/fefcap_tab2.html.

Energy Information Administration, Form EIA-861, "Annual Electric Utility Report." As posted at www.eia.doe.gov/cneaf/electricity/public/t01p01.txt.

US Dept of Transportation, Federal Highway Administration, 2000 Highway Statistics, State Motor-Vehicle Registrations, www.fhwa.dot.gov/ohim/hs00/xls/mv1.xls

Unless strong action is taken, the heavy toll of shipping-related pollution will only get worse. EPA estimates that by 2030, marine diesel engines on ocean-going vessels will emit 12% of all mobile source NO_x emissions, 21% of mobile source direct PM emissions, and approximately 83% of mobile source SO_x emissions, nationwide.⁴ According to these projections, PM_{2.5} emissions from ocean-going ships in the U.S. will exceed those from all of the engines covered by EPA's current locomotive and marine diesel engine proposal.⁵

A recent study of global shipping emissions commissioned by the Clean Air Task Force, and conducted by Dr. James Corbett and his team, projects that global shipping emissions, under business-as-usual conditions, will roughly

⁴ U.S. EPA Activities Related to Marine Air Pollution at 7-10. See also U.S. Sub-committee on Bulk Liquids and Gases, "Review of Marpol Annex VI and the NO_x Technical Code," 11th Session, 2 (February 9, 2007), available at http://www.sname.org/committees/tech_ops/O44/imo/blg/11-5-15.pdf (stating that EPA predicts ocean going vessels to claim an even higher percentage of NO_x emissions—28% rather than 12%).

⁵ 72 Fed. Reg. 15,964.

double by 2020 and triple by 2030.⁶ The chart below summarizes projected SOx emissions for various scenarios:

Projected SOx emissions (millions of metric tons) under several BAU and global sulfur-control scenarios.

	2002	2010	2015	2020	2025	2030
BAU: 4.1% Growth	4.72	6.51	7.96	9.73	11.89	14.54
1.5% Fuel-sulfur at 4.1% Growth	4.72	3.62	4.42	5.40	6.61	8.08
1.0% Fuel-sulfur at 4.1% Growth	4.72	2.41	2.95	3.60	4.40	5.39
0.5% Fuel-sulfur at 4.1% Growth	4.72	1.21	1.47	1.80	2.20	2.69
BAU: IMO GHG-study growth (3%)	4.72	5.98	6.93	8.04	9.32	10.80
1.5% Fuel-sulfur at 3% Growth	4.72	3.32	3.85	4.46	5.18	6.00

Obviously, given the growth rate of international shipping, “business-as-usual” emissions are unacceptable. And, it may be that the future shipping off our shores may grow even faster—in another study, Dr. Corbett and his colleagues projects even higher rates of emissions growth (5.9% compounded annually) for shipping in North American waters.⁷

There are significant health impacts from this rate of emissions growth. In Dr. Corbett’s most recent publication, he compared a “No-Action” scenario with a global adoption of a 1000 ppm sulfur cap within 200 nautical miles of the coast (“Coastal_0.1”), and estimated the impacts of these two scenarios in 2012. They found that switching to the lower sulfur fuel in coastal areas can reduce premature mortalities by 50-60 percent from the “No-Action” case. They estimated that adopting the Coastal_0.1 scenario would eliminate more than 40,000 premature deaths annually around the world. They further estimated that such a change would reduce North American premature mortality from ships by more than 50 percent.⁸ Avoiding these deaths and other related health impacts would result in benefits to society that the Clean Air Task Force, using EPA methodologies, estimates at \$225 – 275 billion per year.⁹

⁶ Corbett, J., Wang, C, Winebrake, J and Green, E., “Allocation and Forecasting of Global Shipping Emissions,” (January 11, 2007).

⁷ Corbett, J. and Wang, C, “Estimation, Validation and Forecasts of Regional Commercial Marine Vessel Inventories,” (2006), available on the Internet at: <http://www.arb.ca.gov/research/seca/jctask12.pdf> and <http://www.arb.ca.gov/research/seca/jctask34.pdf>.

⁸ Corbett, et al., *Mitigating Health Impacts of Ship Pollution through Low Sulfur Fuel Options: Initial Comparison of Scenarios*, January 23, 2008, submitted to IMO MEPC on January 25, 2008.

⁹ News report in SSustainableShippingNews.com, February 4, 2008.

Diesel Pollution is a Solvable Problem

Over the past decade, diesel fuels and emission control technologies have progressed dramatically, thanks to a series of EPA regulations that have been implemented over the course of the past eight years. Today, ultra-low sulfur diesel (ULSD) fuel, capped at 15 parts-per-million (ppm), is now the norm for all highway diesel trucks and buses. This ULSD will be standard for all farm, construction, industrial and other so-called "non-road" diesel engines by June 2010, and for domestic locomotive and marine diesel engines by June 2012.

Again, thanks to EPA's regulatory programs for diesel engines, tailpipe emissions from these engines will be dramatically cut—in most cases, by more than 90 percent, as advanced emission-cutting catalysts and filters become standard equipment. (The last of the EPA diesel rule-makings, covering locomotives and marine diesel engines less than 30 liters/cylinder, is under review at the White House Office of Management and Budget, and is expected to be finalized shortly). When all of today's dirty diesels have been replaced by new, cleaner engines that meet these new standards, EPA estimates that more than 20,000 premature deaths and more than \$150 billion in health costs will be eliminated, nationwide, every year.

The key first step in each of EPA's diesel programs—or in any other meaningful diesel clean-up program in the world—is to reduce sulfur levels in the fuel. Just as lead had to be removed from gasoline to reduce car emissions in the 1970s and 1980s, sulfur has to be removed from diesel fuel to enable the use of effective pollution-cutting devices for diesel engines.

As with removing lead, reducing sulfur in diesel fuel has two emissions-cutting benefits. First, removing sulfur reduces the emissions of sulfur-based pollutants (e.g., sulfur dioxides and sulfate-based PM) from all diesel engines, immediately. Second, removing sulfur to ultra-low levels (e.g., below 50 ppm, but preferably as close to zero as possible) enables the use of sulfur-sensitive catalysts and filters that remove almost all of the smog-forming and particulate soot emissions.

It is worth noting that reducing sulfur levels to the S. 1499 levels should not pose a meaningful cost to the shippers or consumers who might bear any cost. Estimates for the incremental cost of 1000 ppm fuel are only a few pennies a gallon. Indeed, Maersk, Inc., which operates the largest container terminal in the Port of Los Angeles, voluntarily switched all 37 of its cargo ships to low-sulfur fuel in 2006. Certainly, this step helps prove the feasibility of fuel-switching close to shore. More important, given the intense competition in the shipping industry, this move demonstrates that switching to a cleaner fuel doesn't impair a shipper's ability to compete in an intensely-competitive marketplace. And, indeed, that seems to be the case: in the February 4, 2008 edition of *The Journal of Commerce*, the chairman and CEO of Trailer Bridge, a U.S.-flagged company,

said his company would also use lower sulfur distillate fuels. He was convinced by the argument that, in California, there is one premature death per 20,888 TEUs handled.¹⁰ The bottom line: if Maersk and Trailer Bridge can switch fuels in LA without economic impact, so can any other shipper.

Why S. 1499 Can Bring Significant Benefits to the Nation

With EPA soon to finalize its current locomotive and marine diesel engine rule, ocean-going vessels will soon be the last bastion of dirty diesel engines. S. 1499 can help speed up their clean-up in several ways.

First, NRDC believes that S. 1499 adds leverage and momentum to the growing calls for an international resolution to the global problem of ship pollution. Earlier this week, we read about the progress on efforts to reduce sulfur levels at the most recent International Maritime Organization (IMO) meeting. In sum, the IMO subcommittee on bulk liquids and gases announced that it would present three proposals for consideration by the IMO's Marine Environment Protection Committee (MEPC). Of the three,¹¹ one foresees a 1000 ppm sulfur cap in the Sox Emission Control Areas (SECAs) that already exist in Europe or that may be added later,¹² starting in 2012. Another envisions a similar sulfur cap for "micro-emission control areas" in 2015. The bottom line: 1000 ppm is clearly feasible, especially in the dense shipping corridors off the U.S. and European coasts.

The IMO news may include some promising components, but should not be mistaken for the promise of actual action. Here's why: many steps remain between this week's news and an IMO agreement that has been ratified by its member countries. First, the IMO subcommittee on bulk liquids and gases will present its three new options to the IMO's marine environment protection committee (MEPC) in April. Then, if an acceptable option (of the three) passes the MEPC, it would go to the full IMO for consideration in October. Then, assuming that one of these three proposals is actually approved by the IMO in October, the IMO's member countries would have to ratify the IMO's action before it is implemented globally. In other words, there has been some progress this week, but implementing a global agreement still seems to be a long way off.

¹⁰ John McCown, Chairman and CEO of Trailer Bridge, writing in *The Journal of Commerce*, February 4, 2008, page 42.

¹¹ One of the three proposals that will be reviewed by the IMO MEPC in April foresees a sulfur cap similar to S. 1499. Another calls for a 5000 ppm cap worldwide, in 2015, and a third calls for a global cap of 30,000 ppm (more than today's average global sulfur level in ocean-going shipping vessels, which is roughly 27,000 ppm) and more localized sulfur caps in the 1000-5000 ppm range.

¹² Currently, SECAs are in place in the Baltic Sea, the North Sea, and the English Channel. SECAs are being considered for the west coast of the U.S. and other locations around the world. In addition, California state law requires 1000 ppm sulfur fuel to be used in its coastal waters and ports by 2010, and European law requires this fuel to be used in European ports and inland waterways by 2010.

Moreover, the IMO has a long history of adopting final standards that merely reflect the lowest common denominator of the international community. Through that lens, it seems as likely that the option that includes the 30,000 ppm global cap will be adopted as that our preferred option will be chosen, unless the substantial threat of national action (whether via S. 1499, by European nations, or by other key government stakeholders) alters the pattern of the IMO's past decisions. In sum, notwithstanding the positive efforts of the U.S. EPA and others to convince the IMO to adopt stronger global standards for marine fuels, NRDC believes strongly that legislation like S. 1499 adds to the leverage and political pressure that is necessary to eventually adopt a global standard.

Second, a coastal sulfur reduction brings most of the benefits of reduced sulfur levels to the communities that are most affected by ship pollution. From the perspective of reducing the public health impacts of port communities, lowering sulfur standards within a coastal zone of 200 miles makes a lot of sense. Recently, the International Council on Clean Transportation, an organization that represents leading regulators and experts around the world, reported that 70-80 percent of all ship emissions occur within 400 kilometers (248 miles of land).¹³ So, in fact, the sulfur limitations in S. 1499 will not only make sense to coastal communities that are home to the nation's ports, but would effectively target roughly three-quarters of the overall ship pollution problem if applied globally. Plus, many of the communities that neighbor the nation's ports are low-income communities and/or communities of color, and already bear a disproportionate impact of the truck, rail, and terminal emissions at these ports. Reducing ship emissions would bring a well-deserved relief to these communities. For these reasons, NRDC recommends that the 200 mile coastal zone be applied off the east and Gulf coasts of the U.S., in addition to the Pacific coast.

Third, reducing sulfur opens the door to adding emission control technologies that can reduce NOx and other pollutants further. This model, first used on a large scale by New York City's transit buses (where diesel transit buses are now 97 percent cleaner than they were in the mid-1990s) and adapted by EPA for use in its recent rulemakings, would be feasible for the ocean-going vessels also. At 1000 ppm, selective catalytic reduction (SCR), a time-tested pollution-control technology used in stationary and mobile applications around the world, would be feasible.

The IMO information supports this notion that SCR or other technologies could provide dramatic emission reductions once 1000 ppm sulfur levels were in place. In one of the IMO scenarios, NOx emissions would be cut by as much as 80 percent by 2016 in the sulfur control areas that were capped at 1000 ppm. In other words, if S. 1499 were adopted, similar NOx reductions could be considered for ocean-going vessels serving American ports. Consequently, NRDC strongly supports the requirement in S. 1499 that directs EPA to

¹³ International Council on Clean Transportation, *Air Pollution and Greenhouse Gas Emissions from Ocean-Going Ships*, Executive Summary, p. 5 (March 2007).

promulgate new emission standards for newly-manufactured and in-use main and auxiliary engines in ocean-going vessels that enter or leave a port or offshore terminal in the U.S.

Conclusion

NRDC strongly supports S. 1499, the Marine Vessels Emissions Reduction Act of 2007. We look forward to working with the Senate Environment and Public Works Committee towards its passage, and towards cleaner ships in our ports in the future.

Thank you very much for the opportunity to testify today.