

The Need to Reduce Marine Shipping Emissions

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January 2002

The Problem

- Marine shipping is largest uncontrolled source of NO_x emissions.
- Marine shipping is most important long-term threat to achieving ozone standards in coastal areas.
- Failure to reduce emissions will impact other industries.

Local, State, National Impacts

- Santa Barbara County
 - Shipping emissions already equivalent to all on-road NO_x sources.
 - Projected to **increase by 67%** by 2015 and negate all on-shore controls.
- California and national: Major impact in all coastal regions, especially those with ports.
- World: Responsible for **14% of global NO_x**, 5% of SO₂, and 2% of CO₂ from fossil fuel combustion.

Regulatory Background

- MARPOL Annex VI
- EPA regulations
- CARB Clean Air Plan

Recommendations

- EPA in leadership role.
- Aggressive new international standards.
- Low-sulfur fuel areas.
- Incentive-based programs for near-term benefits.

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The Problem

Marine shipping emissions threaten the ability of many areas of the United States to achieve air quality standards. These emissions represent the largest remaining source of uncontrolled air pollution. The failure to reduce these emissions will result in additional pressures on regional economies, as businesses and industries will be subject to more stringent regulations.

Local, State, National Impacts

Air pollution from ships is largely unregulated, projected to grow rapidly, and will particularly impact coastal regions of the United States. For example, marine shipping emissions of nitrogen oxide (NO_x) off the shore of Santa Barbara County are equivalent to emissions from all on-road sources combined, and are projected to grow by 67 percent by 2015. This increase will negate all air pollution reductions onshore, and make it difficult to maintain attainment of the federal ozone standards without additional regulation of businesses and industries. Other California air districts will be impacted. Projections by both South Coast Air Quality Management District and Bay Area Air Quality Management District show comparable increases in marine shipping emissions by 2015. Nationally, other areas with heavy shipping traffic are impacted, including Pacific Northwest states, East Coast states, and Gulf Coast states including Florida and Texas.

Regulatory Background

An estimated 85 percent of the ships going through the Santa Barbara Channel are foreign-flag ships. MARPOL 73/78 is the International Convention for the Prevention of Pollution from ships. Annex VI, adopted by the Parties to MARPOL in 1997, has NO_x requirements for Category 3 engines beginning 1/1/2000. This Annex has not been ratified by the required 15 countries (at least) representing 50 percent of the world's merchant shipping. The U.S. EPA Final Rule on Control of Air Pollution from New Marine Compression-Ignition Engines at or Above 37 kW (50 hp), effective 1/28/2000, applies to Category 1 and 2 engines, and recommends that the IMO adopt regulations for Category 3 engines that are more stringent than the Annex VI requirements. In 2000, the Bluewater Network settled a lawsuit against the U.S. EPA for failure to establish standards for Category 3 engines. The settlement required U.S. EPA to establish standards for these engines by January 2003. California Air Resources Board is currently developing a statewide Clean Air Plan that will propose measures to reduce shipping emissions.

Recommendations

U.S. EPA must address the difficult issues of regulating Category 3 Marine Engines as part of its upcoming rulemaking effort, and:

- Take a leadership role in addressing the difficult issues surrounding the international nature of the fleet, and commit to long-term progress in this area.
- Establish stronger NO_x emission standards than those in the Annex VI, and apply these standards to new and remanufactured engines.
- Consider establishing lower sulfur fuel areas (1-1.5%) on the west coast and throughout the U.S.
- Explore incentive-based programs to reduce emissions from these vessels in the near-term through a collaborative effort.

Emissions of NOx Santa Barbara County

Emissions of Nitrogen Oxides*

1999



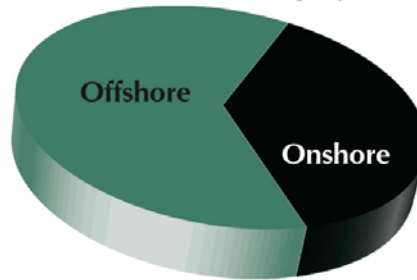
Onshore: 49.28 tons per day

Onroad motor vehicles: 25.95 tons
(cars, trucks, buses)
Other mobile sources: 17.27 tons
(equipment, trains, planes, boats to 3 miles out)
Stationary sources: 5.30 tons
(oil & gas production, agricultural, industrial)
Area-wide sources: 0.76 tons
(residential fuel consumption)

Offshore: 29.08 tons per day

Mobile sources: 28.38 tons
(ships, boats)
Stationary sources: 0.70 tons
(oil and gas production)

2015 (projected)



Onshore: 29.81 tons per day

Onroad motor vehicles: 9.96 tons
(cars, trucks, buses)
Other mobile sources: 14.19 tons
(equipment, trains, planes, boats to 3 miles out)
Stationary sources: 4.42 tons
(oil & gas production, agricultural, industrial)
Area-wide sources: 1.24 tons
(residential fuel consumption)

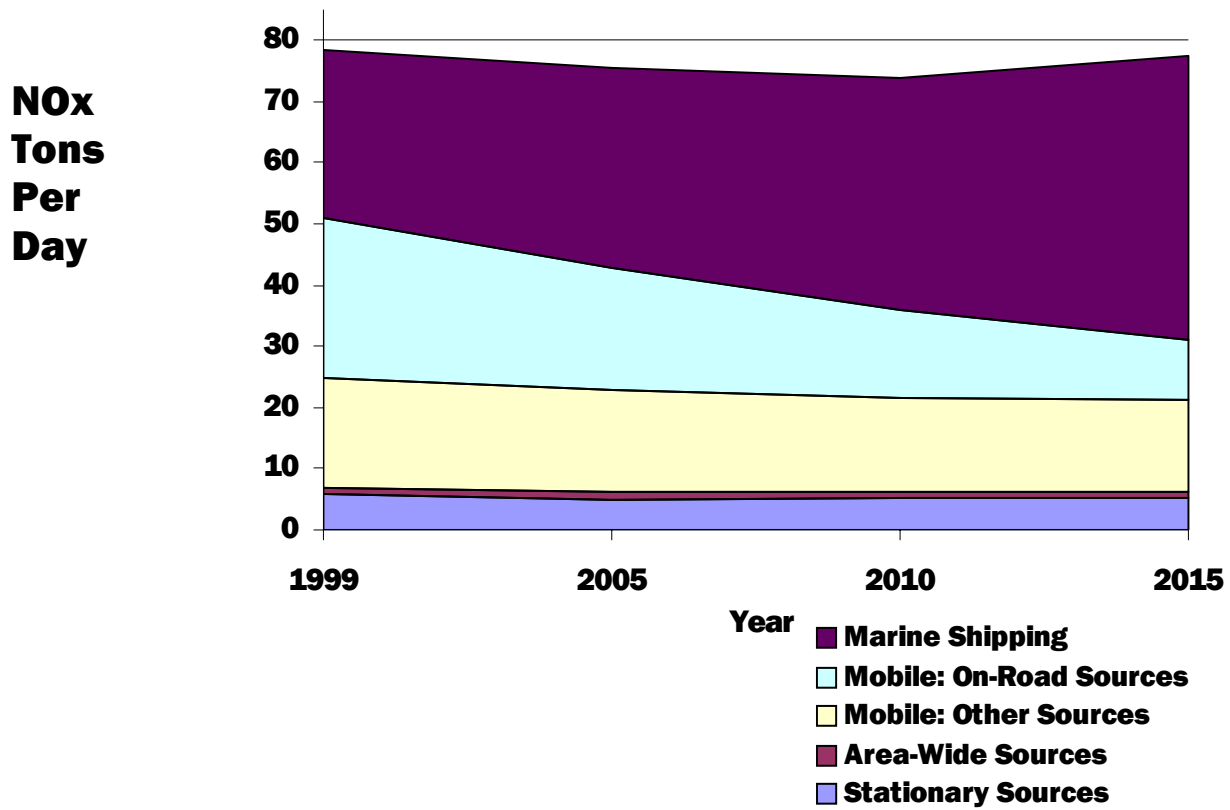
Offshore: 47.95 tons per day

Mobile sources: 47.29 tons
(ships, boats)
Stationary sources: 0.66 tons
(oil and gas production)

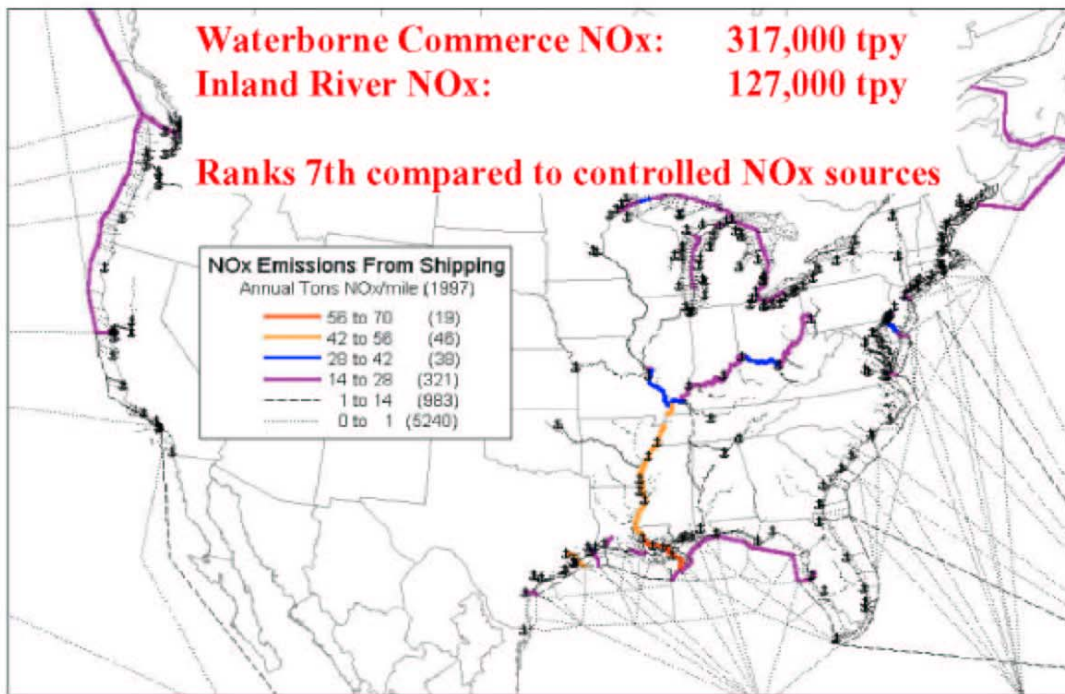
**from the final 2001 Santa Barbara County Air Pollution Control District Clean Air Plan*

Breakdown of NOx Emissions Santa Barbara County

Offshore emissions are increasing rapidly, and much of the emission-reduction gains from mobile sources are achieved.



NO_x Emissions From US Ships



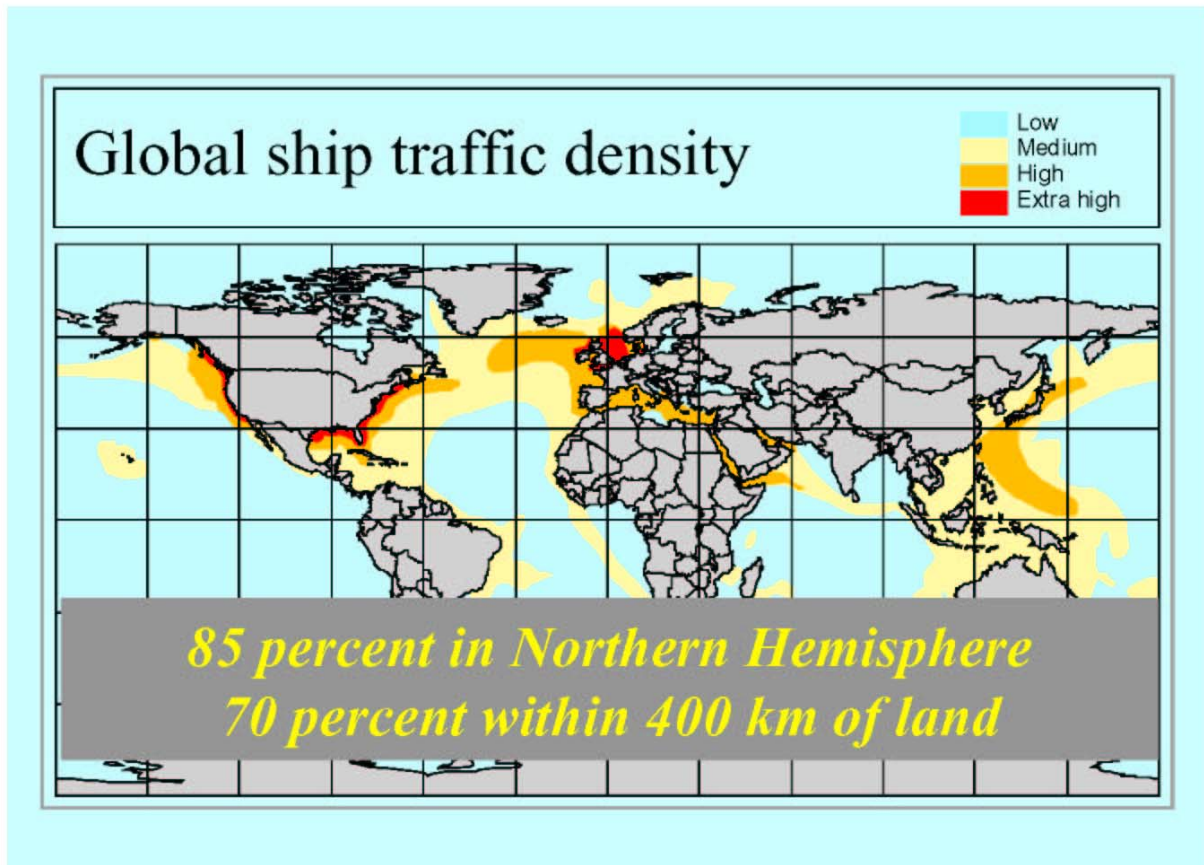
Source: J. Corbett and P. Fischbeck, ES&T, 2000



Carnegie Mellon

Traffic Density of Global Shipping

Highest off North American coasts, European shipping channels



Source: IMO Study on Greenhouse Gas Emissions from Ships, MEPC 45(8), 2000.

Santa Barbara County Marine Vessel Emissions

