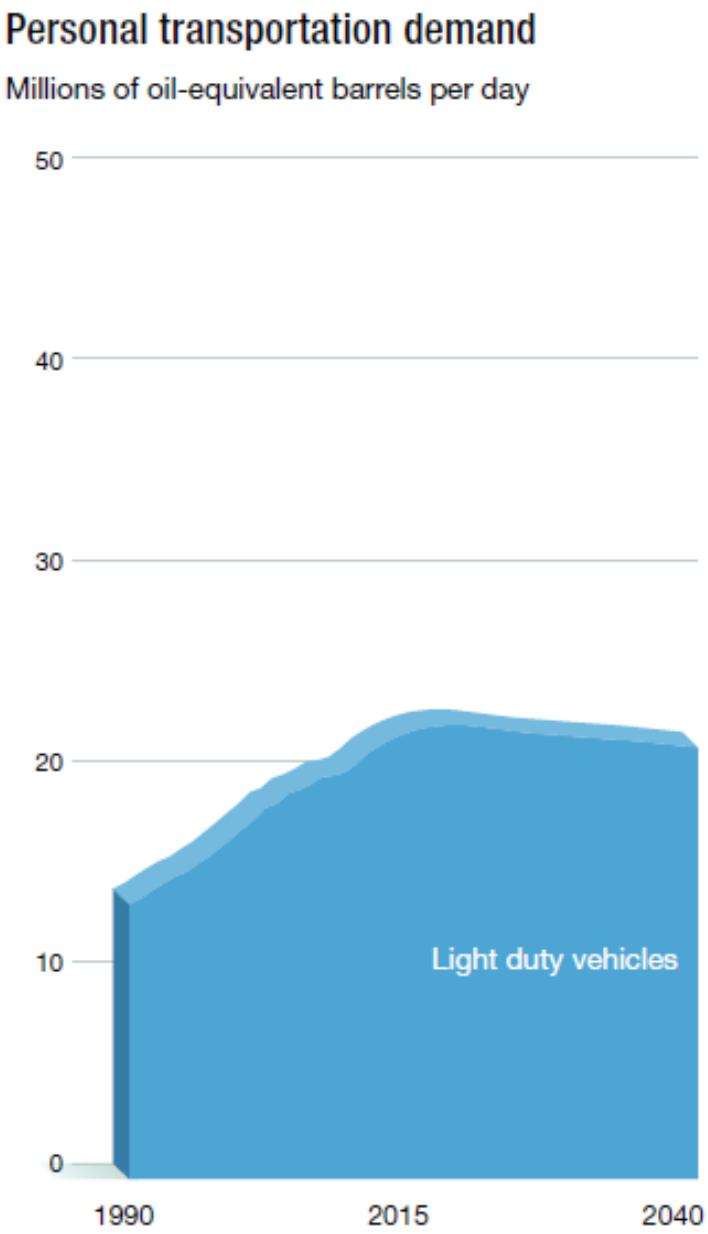
NGOs and the Value Add

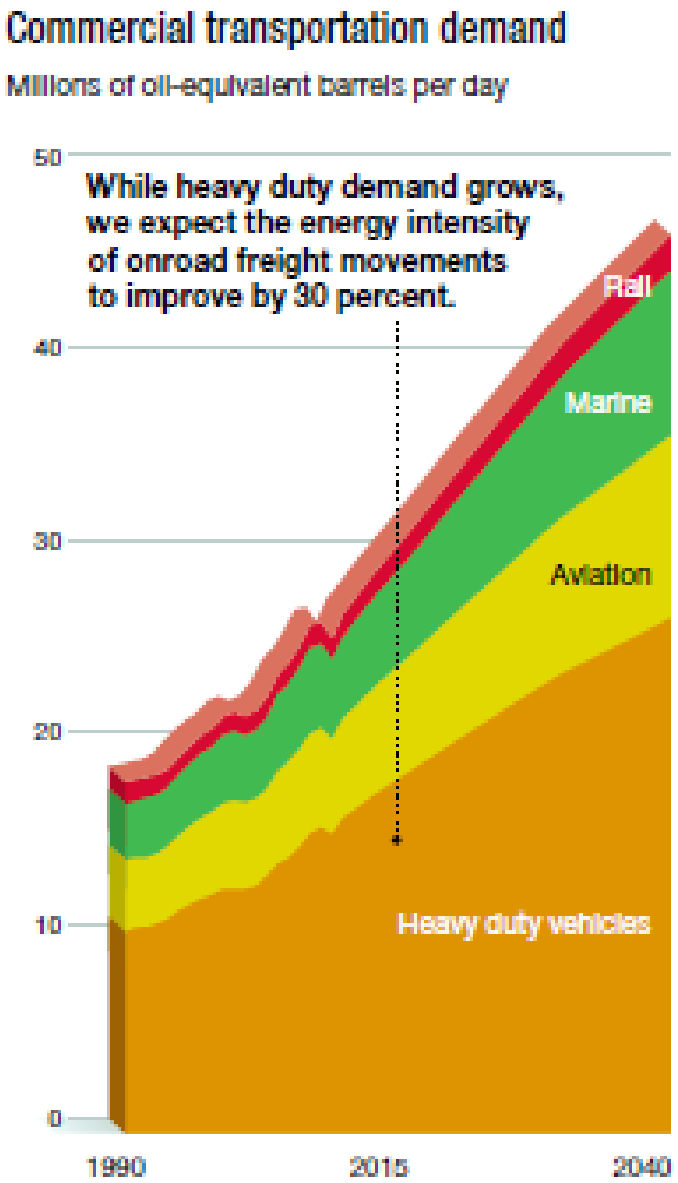
AAPA
Energy & Environment Seminar

Elena Craft, PhD
Senior Scientist
Sept 17, 2014

EDF
ENVIRONMENTAL DEFENSE FUND®
Finding the ways that work

Freight Growing Globally





Record Setting Growth

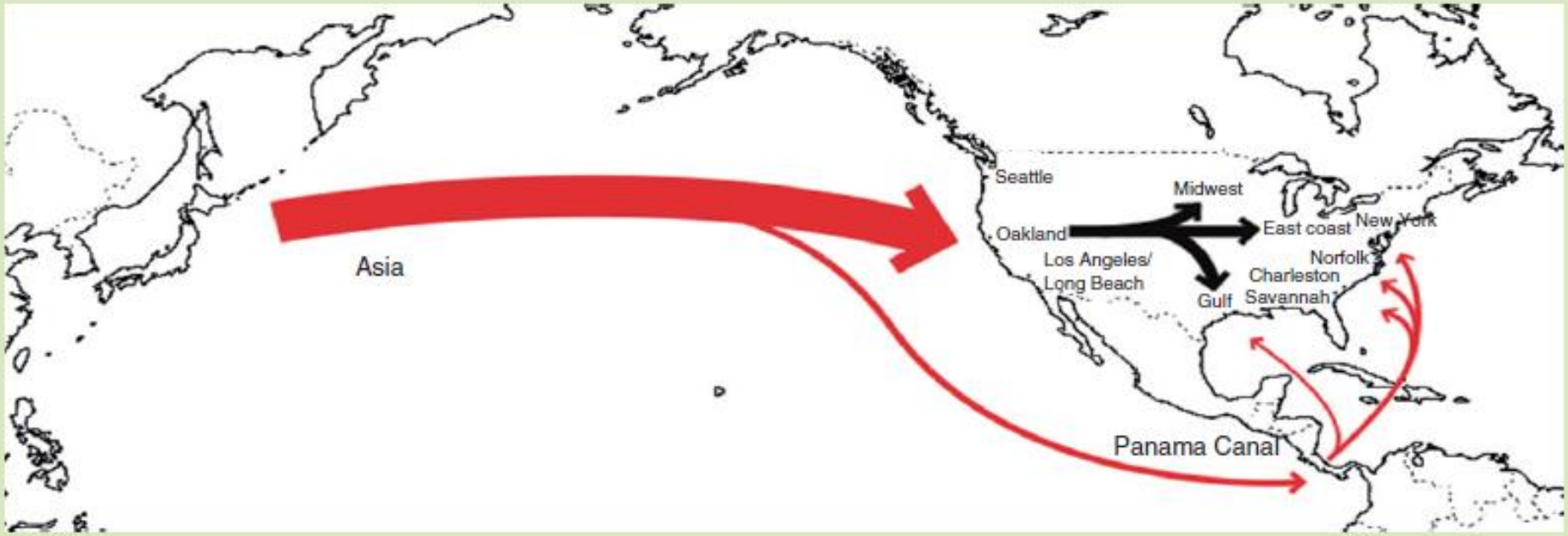
- Research
- Grants & Technology Advancement
- Policy

Panama Canal expansion: emission changes from possible US west coast modal shift

Carbon Management (2012) 3(6), 569–588

James J Corbett*[1,2], Eric Deans[1,3], Jordan Silberman[1,4], Erica Morehouse[5], Elena Craft[5] & Marcelo Norsworthy[5]

Background: We analyzed the potential for the Panama Canal expansion to change CO_2 and criteria pollutant emissions (oxides of nitrogen, oxides of sulfur and particulate matter) from Asia–US container flows by estimating the modal shift from landside truck/rail network to larger ships enabled by canal expansion. We develop an intermodal case study comparison within the Geospatial Intermodal Freight Transportation framework, assuming potential diversion of 1.2 million 20-foot equivalent units (TEUs) to 5000 origin–destination pairs. **Results:** Potential TEU diversions of land-bridge transport through an expanded canal reduced mode-specific emissions substantially, but land-bridge emission reductions due to cargo diversion to post-Panamax vessels, with lower emissions per TEU, cannot offset higher waterborne emissions from longer routes. **Conclusion:** Green-freight policy measures must consider multimodal network solutions to maximize emission benefits.



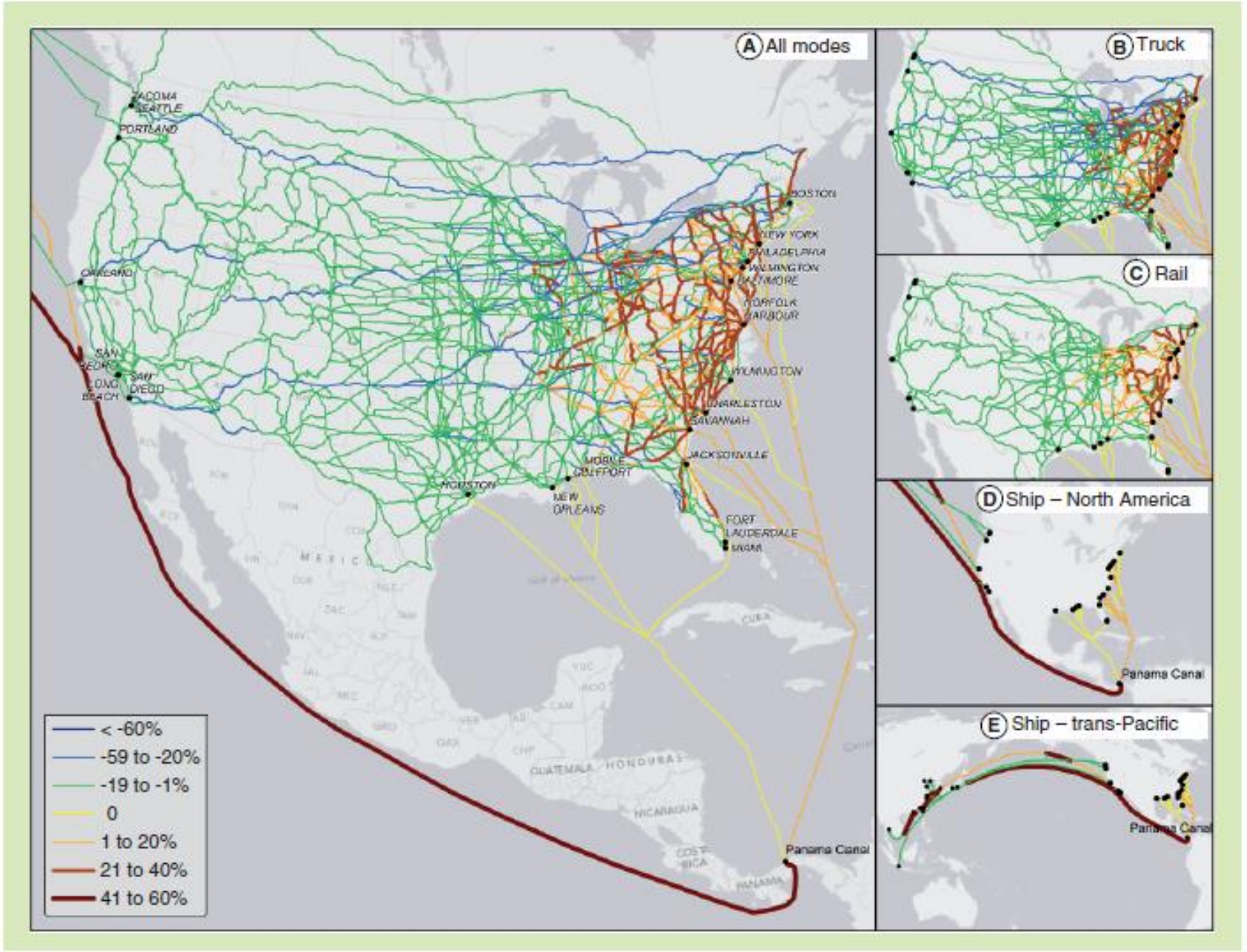


Figure 5. Percentage change in CO_2 emissions from base-case to diversion scenario. (A) All modes, (B) truck, (C) rail, (D) Ship – North America and (E) Ship – trans-Pacific.

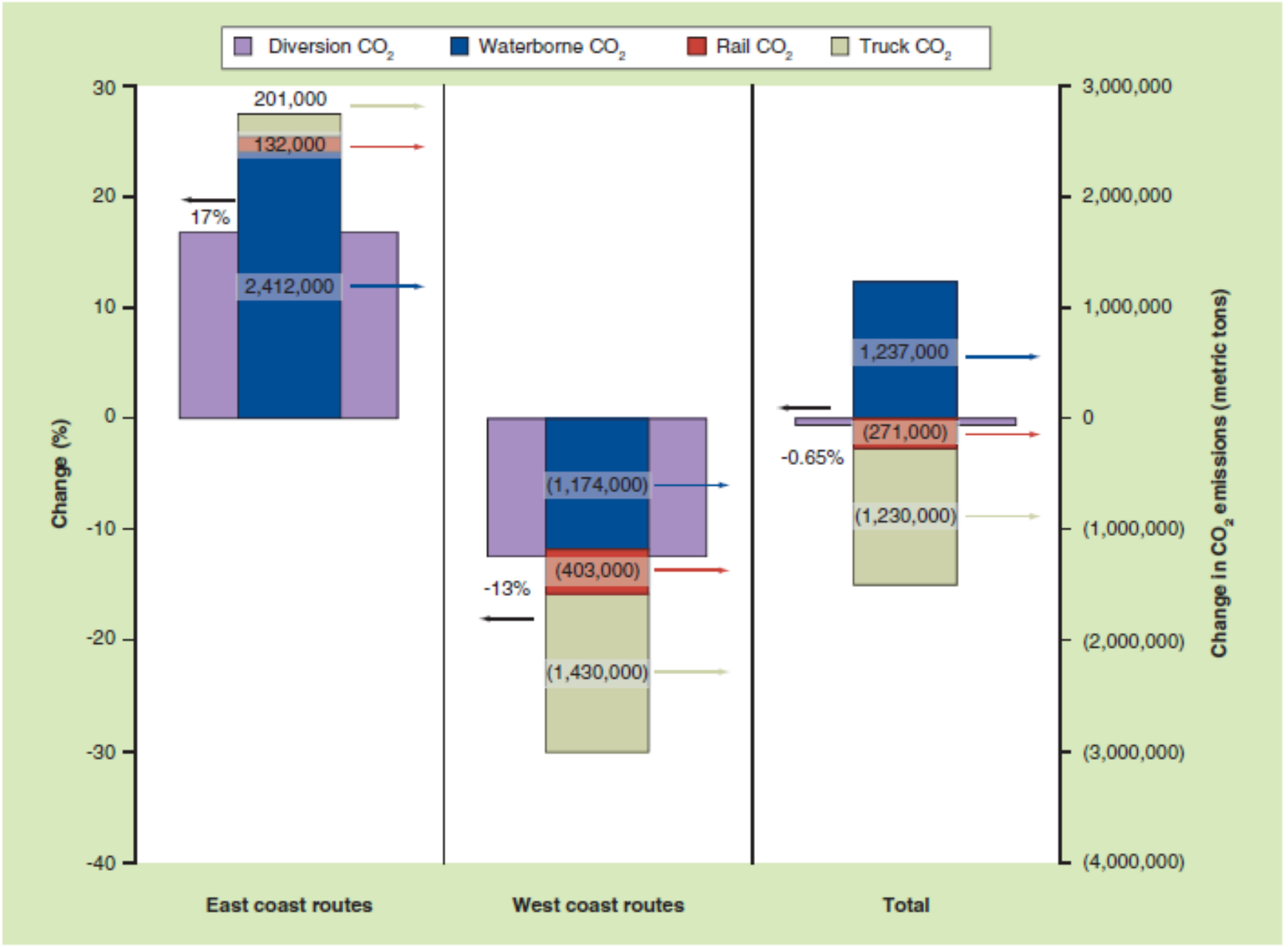


Figure 6. CO_2 emissions changes due to diversion scenario.
Please see color figure at: www.future-science.com/doi/full/10.4155/CMT.12.65.

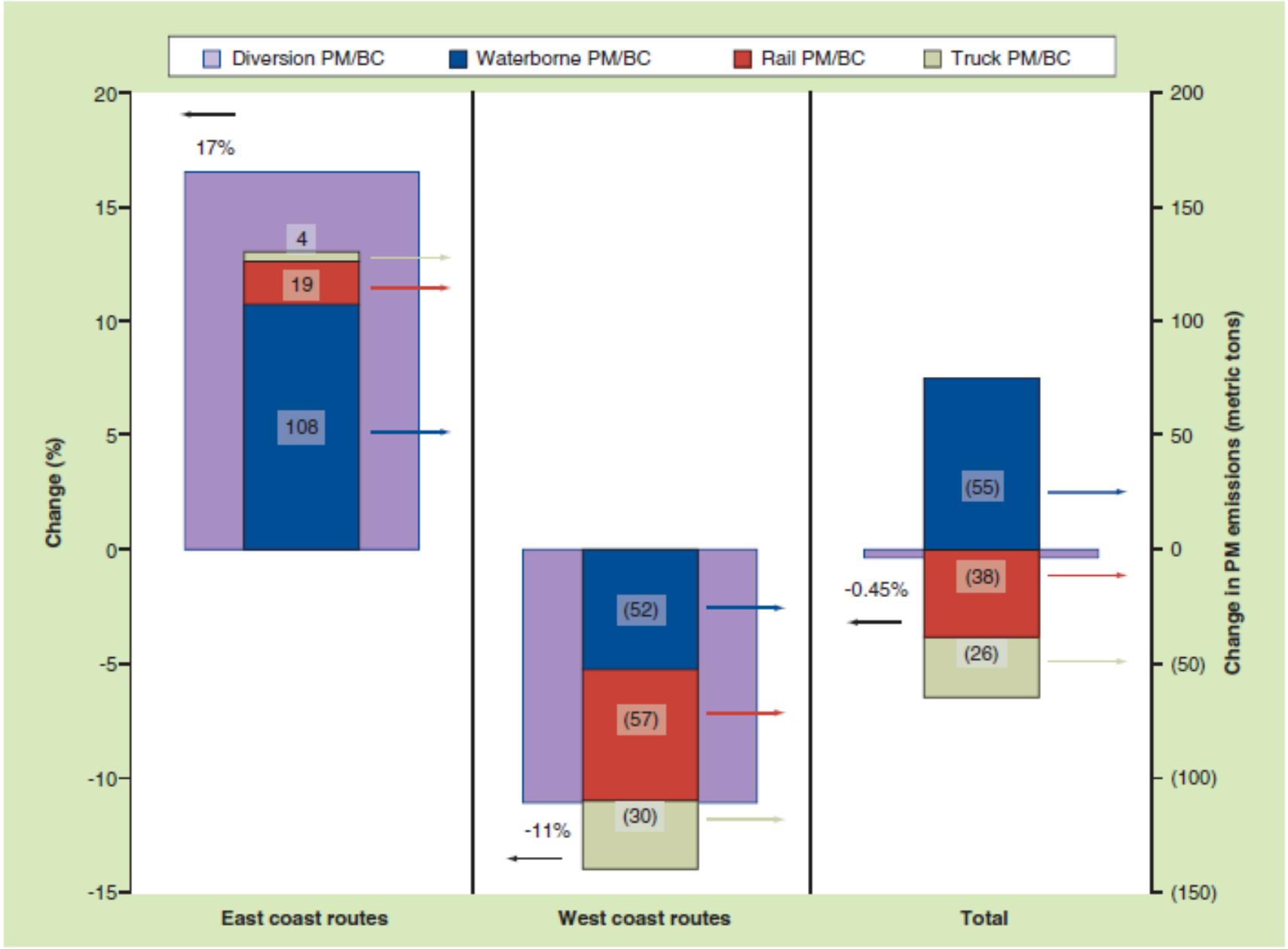


Figure 7. Particulate matter/black carbon emissions changes due to diversion scenario. PM on first (left) axis; BC on second (right) axis.
BC: Black carbon; PM: Particulate matter.
Please see color figure at: www.future-science.com/doi/full/10.4155/CMT.12.65.

Comparison of drayage truck standards adopted at US Ports

Model Year	LA/LB	CARB	SEA/TAC	OAKLAND	NY/NJ	HOUSTON
ADOPTED	NOV 2007	DEC 2008	APRIL 2009	JUNE 2009	MAR 2010	JAN 2011
PRE-1994	BANNED JAN 2010	BANNED JAN 2010	BANNED JAN 2011	BANNED JAN 2010	BANNED JAN 2011	10% REDUCTION BY 2014
1994-2003	RETROFIT BY JAN 2010 BANNED JAN 2012	RETROFIT BY JAN 2010 BANNED JAN 2014	BANNED JAN 2018	RETROFIT BY JAN 2010 BANNED JAN 2014	BANNED JAN 2017	-
2004-2006	BANNED JAN 2012	RETROFIT BY JAN 2012 BANNED JAN 2014	BANNED JAN 2018	RETROFIT BY JAN 2012 BANNED JAN 2014	BANNED JAN 2017	-
2007+	REQUIRED JAN 2012	REQUIRED JAN 2014	REQUIRED JAN 2018	REQUIRED JAN 2014	REQUIRED JAN 2017	RECCOMEN-DED BY 2021

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journal homepage: www.elsevier.com/locate/trd

Emissions reduction analysis of voluntary clean truck programs at US ports

Marcelo Norsworthy*, Elena Craft

Environmental Defense Fund, 301 Congress Avenue, Austin, TX 78701, USA

Table 2
Comparison clean truck program replacement data.

	Norfolk	Charleston	Houston
Truck program			
Baseline truck fleet size	2500	2606	3050
Number of trucks replaced	80	29	49
Avg. MY of retired engine	1996	1992	1997
Avg. MY of replacement engine	2007	2005	2009
Avg. difference in years	11	13	12
PM			
Emission standard change avg. retired engine to avg. replacement engine	0.10–0.01	0.25–0.10	0.10–0.01
Emissions reduced per truck per year (g)	19,653	29,847	15,794
Emissions emitted per replacement truck per year (g)	2266	14,050	1420
Yearly tons reduced	1.73	0.95	0.85
Reduction as percentage of baseline emissions	3.5%	2.7%	1.4%
Potential reduction 1 (pre-1994 to 2007+) as % of baseline	24.7%	33.6%	31.9%
Potential reduction 2 (pre-2007 to 2007+) as % of baseline	91.9%	92.1%	92%
NOx			
Emission standard change avg. retired engine to avg. replacement engine	5.0–0.2	5.0–2.4	5.0–0.2
Emissions reduced per truck per year (g)	682,068	575,273	677,499
Emissions emitted per replacement truck per year (g)	50,895	365,428	30,300
Yearly tons reduced	60.15	18.39	36.59
Reduction as percentage of baseline emissions	3.6%	1.0%	1.79%
Potential reduction 1 (pre-1994 to 2007+)	12.8%	18.2%	14.9%
Potential reduction 2 (pre-2007 to 2007+)	95%	95.1%	95.2%

Environmental Defense Fund (EDF) Logistics Project: The Greening of Rubber-Tired Gantry Cranes in Ports

In partnership with the Port of Oakland

15.915 Laboratory for Sustainable Business

Mentor: Prof. John Sterman, MIT Sloan School of Management

Prepared by:

Kathy Lin (MBA 2015)
Chris Meier (SDM 2014)
John Nelson (MBA 2014)
Zaahir Papar (MBA 2015)

May 15, 2014

EDF ENVIRONMENTAL

PORT OF OAKLAND

MIT Sloan MANAGEMENT

AUGUST 2009

THE PORT REPORT

Port of Houston Authority

Harris County Attorney Vince Ryan; EPA Assistant Administrator Gina McCarthy; PHA Chairman James T. Edmonds; Dr. Elena Craft, air quality specialist, EDF; Karl Pepple, director, environmental programming, city of Houston; Rick Maddox, president, Canal

EPA Announces $9 Million SmartWay℠ Funding

PHA, EDF, H-GAC partnered to help fund truck engine retrofits, upgrades

In a major move to help improve regional air quality, Environmental Protec
Administrator Gina McCarthy on Aug. 26 announced a $9 million America
SmartWay℠ Diesel Emissions Reduction Act (DERA) award to the Houston

Environmental Defense Fund (EDF), with the Port of Houston Authority (P
on the grant application for SmartWay℠ program funds to tackle one
difficult-to-address sources of pollution at any port: drayage trucks.

"The Port of Houston Authority is pleased to continue its support of p
reduction of air emissions," said PHA Chairman James T. Edmonds. "T
one part of an important series of strategies in PHA's Clean Air Strateg
stewardship program designed to help improve air quality in our region

Drayage trucks are diesel-fueled, heavy-duty trucks that transport shipp
its or
ng at

Port of Houston's test trucks handle like golf carts

By Jeannie Kever

April 12, 2013 | Updated: April 12, 2013 9:32pm

For decades, the image of the 18-wheeler has been that of a smoke-belching behemoth, the grinding gears and hissing brakes synonymous with the power of the diesel engine.

But a 20-truck fleet powered by hydrogen fuel cells will begin rolling across the Port of Houston later this year in a test of whether the vehicles can improve air quality and still provide enough heavy lifting to handle cargo.

In the largest demonstration project of its kind, the electric fleet will unload containers from ships and deliver them to a Wal-Mart warehouse.

Vision Motor Corp.

A federal grant will help pay for 20 hydrogen-powered trucks to make deliveries at the Port.

Port Recognition Program

REQUEST FOR PROPOSAL (RFP)

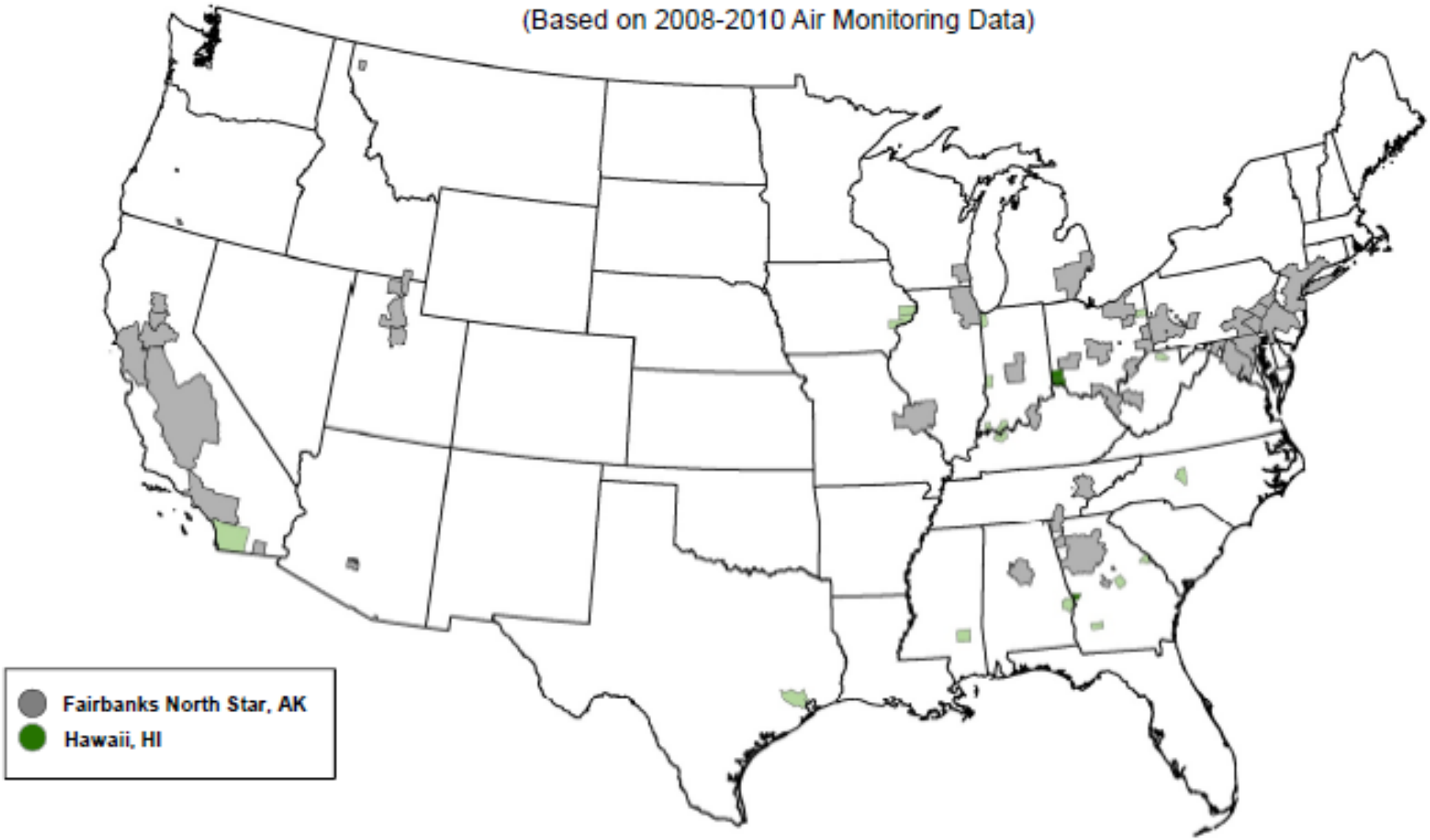
ENVIRONMENTAL RECOGNITION PROGRAM FOR PORTS

ENVIRONMENTAL DEFENSE FUND
301 CONGRESS AVE SUITE 1300
AUSTIN, TX 78701

PROPOSALS DUE: AUGUST 2, 2013

Particulate Matter

(Based on 2008-2010 Air Monitoring Data)



Existing fine particle nonattainment areas for annual and/or 24-hour standards

4 counties that are not currently designated as nonattainment don't meet a proposed annual fine particle standard of 13.0 ug/m^3

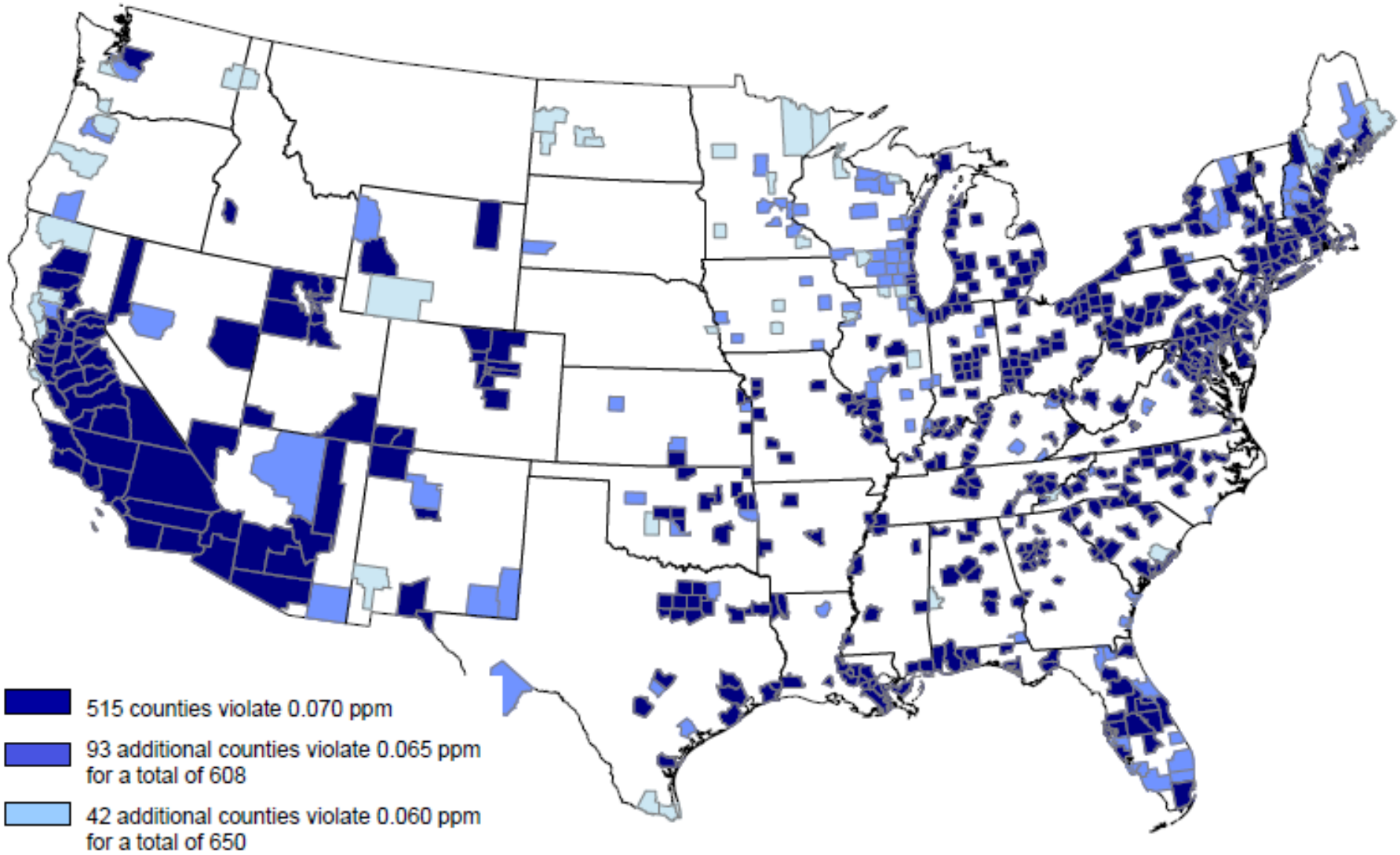
18 additional counties that are not currently designated as nonattainment don't meet a proposed annual fine particle standard 12.0 ug/m^3

Note: EPA will not designate areas as nonattainment on these data, but likely on 2011-2013 data which are expected to show improved air quality

Counties With Monitors Violating Primary 8-hour Ground-level Ozone Standards
0.060 - 0.070 parts per million

(Based on 2006 – 2008 Air Quality Data)

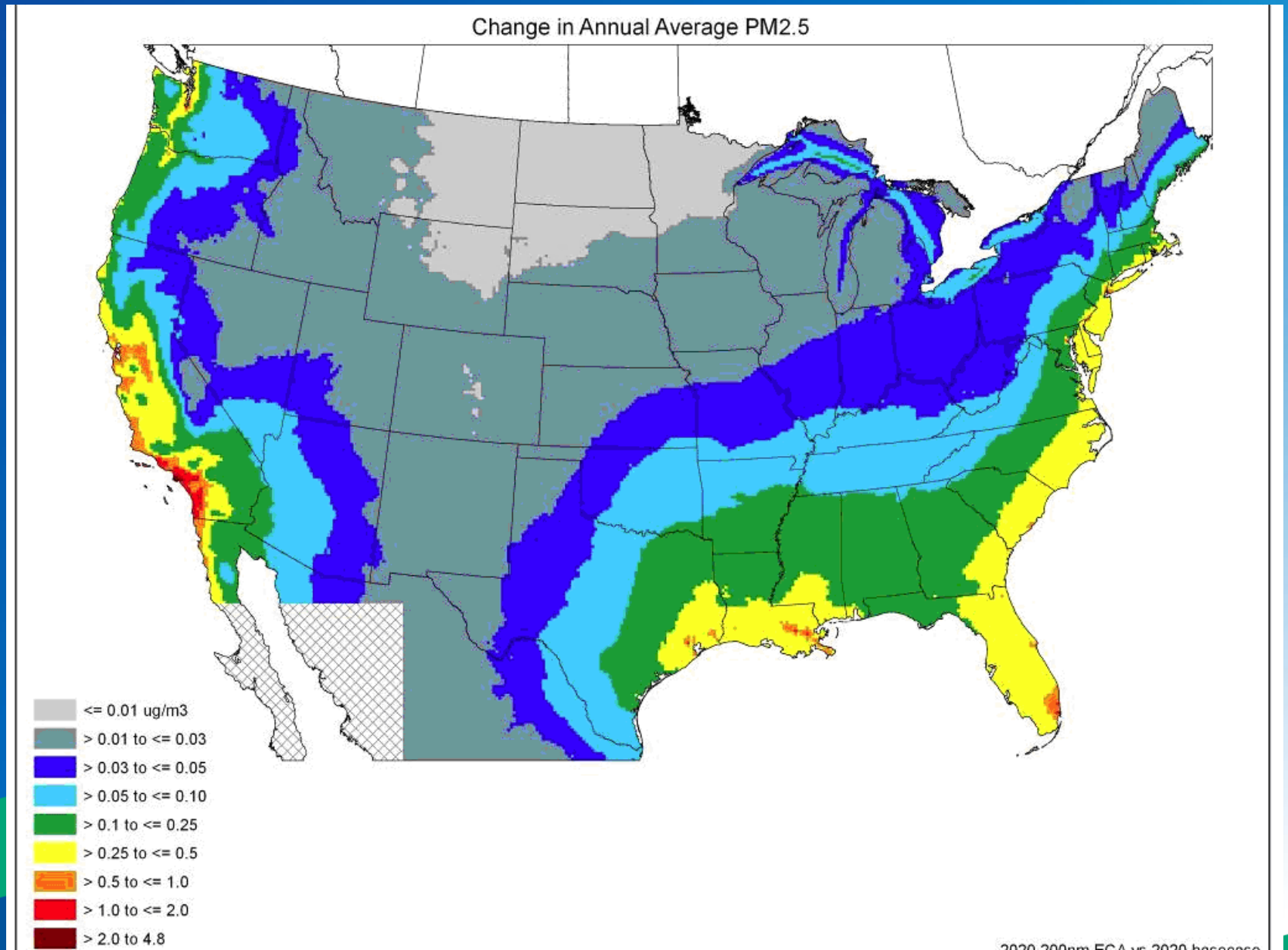
EPA will not designate areas as nonattainment on these data, but likely on 2008 – 2010 data which are expected to show improved air qualit



Notes:

1. No monitored counties outside the continental U.S. violate.
2. EPA is proposing to determine compliance with a revised primary ozone standard by rounding the 3-year average to three decimal places

Absolute Improvement in PM2.5 concentrations by 2020 due to emission control areas



Heavy-duty Diesel Vehicle Standards

CUTTING TRUCK FUEL CONSUMPTION 40% BY 2025

Strong federal fuel efficiency standards can dramatically cut oil use and greenhouse gas emissions from our nation's trucks. Combined with current standards for new trucks sold through 2018, the next round of standards could cut fuel consumption of new trucks 40% by 2025, compared to 2010 trucks.

BENEFITS

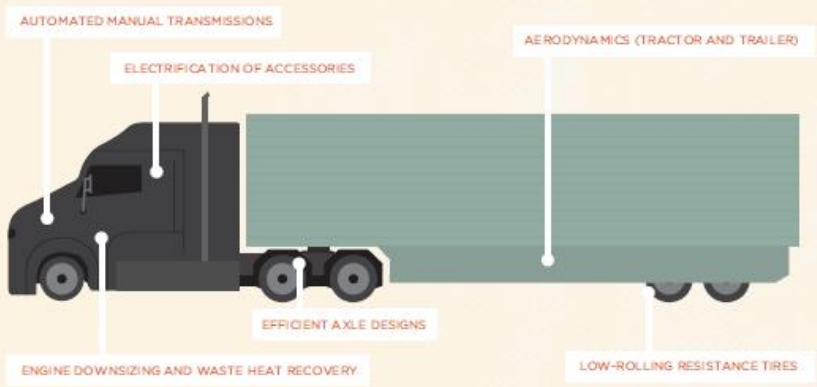
40% REDUCTION in fuel consumption from new trucks

$30,000 ANNUAL FUEL SAVINGS for tractor-trailer drivers

1.4 MILLION BARRELS OF OIL saved daily by 2030

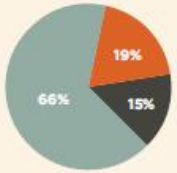
270 MILLION METRIC TONS of carbon pollution kept out of the atmosphere annually by 2030

FUEL SAVING TECHNOLOGIES

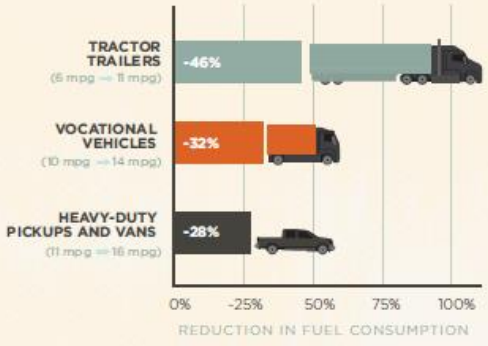


HOW TO GET THERE

SOURCES OF OIL CONSUMPTION IN THE TRUCK SECTOR



- TRACTOR TRAILERS
- VOCATIONAL VEHICLES
- HEAVY-DUTY PICKUPS AND VANS



Elena Craft, PhD
ecraft@edf.org
512-691-3452