

US EPA ARCHIVE DOCUMENT

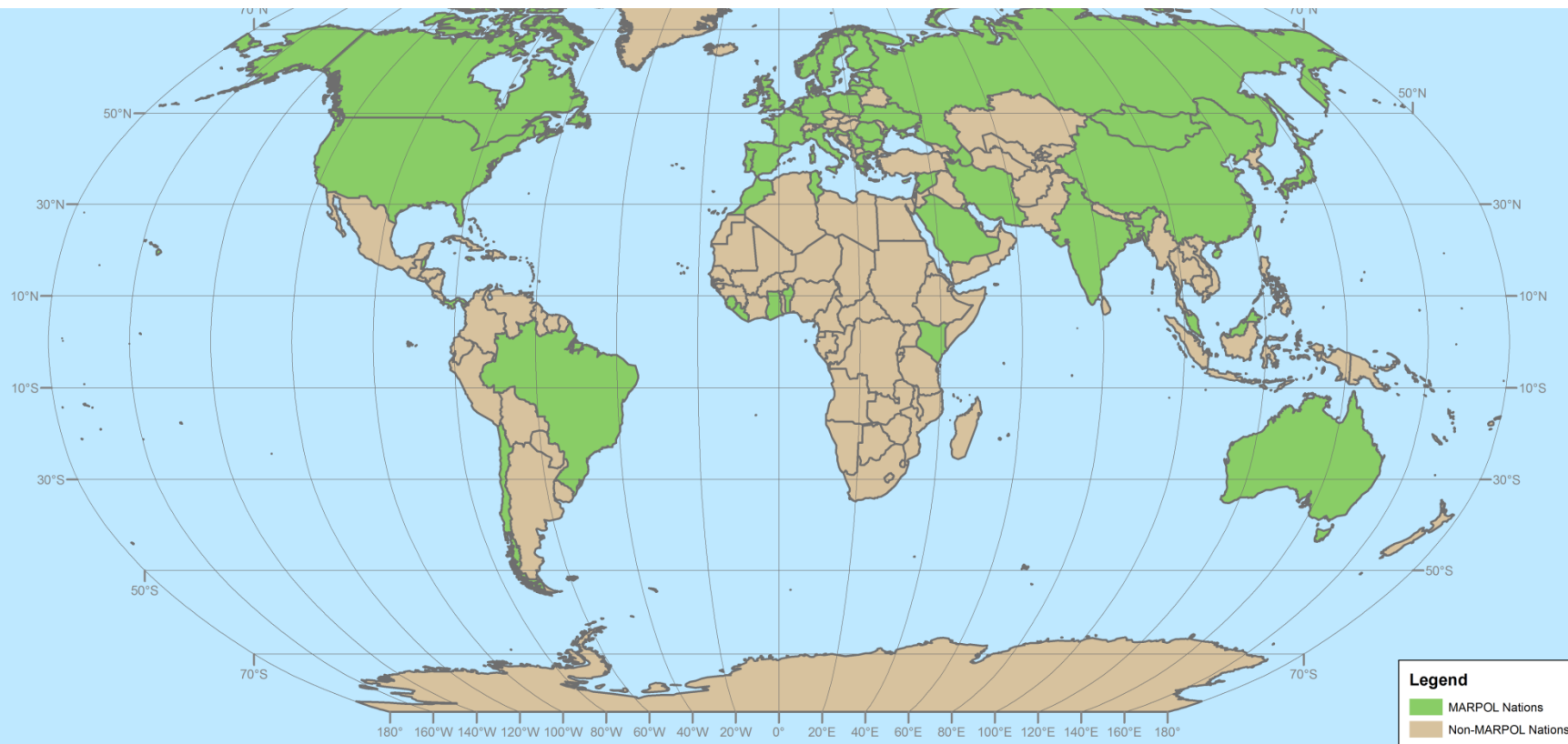


MARPOL Annex VI and the North American Emission Control Area

Angela Bandemehr
U.S. EPA Office of Global Affairs and Policy

*Mexico City, Mexico
September 26, 2012*

Currently 68 nations representing ~91% of ship tonnage a part of MARPOL VI



MARPOL International Convention for the Prevention of Pollution from Ships

Annex VI Prevention of Air Pollution from Ships (19 May 2005)

Sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances; designated emission control areas set more stringent standards for SO_x, NO_x and particulate matter.

In 2011, after extensive work and debate, IMO adopted ground breaking mandatory technical and operational energy efficiency measures which will significantly reduce the amount of greenhouse gas emissions from ships; these measures were included in Annex VI and are expected to enter into force on 1 January 2013.

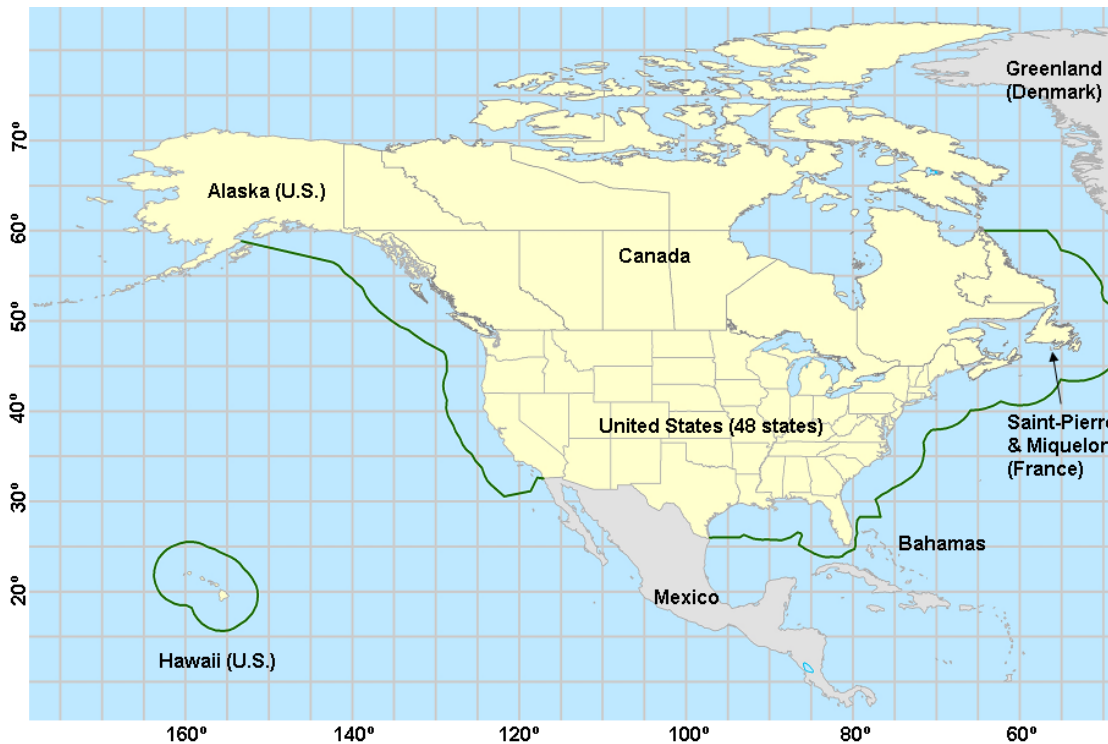
Source: International Maritime Organization <http://www.imo.org>

1 Antigua & Barbuda	18 Denmark	35 Liberia	52 St. Kitts & Nevis
2 Australia	19 Estonia	36 Lithuania	53 Samoa
3 Azerbaijan	20 Finland	37 Luxembourg	54 Saudi Arabia
4 Turks & Caicos Is.	21 France	38 Malaysia	55 Serbia
5 Bangladesh	22 Germany	39 Malta	56 Sierra Leone
6 Barbados	23 Ghana	40 Marshall Is.	57 Singapore
7 Belgium	24 Greece	41 Mongolia	58 Slovenia
8 Belize	25 India	42 Morocco	59 Spain
9 Benin	26 Iran	43 Netherlands	60 St. Vincent & the Grenadines
10 Brazil	27 Ireland	44 Norway	61 Sweden
11 Bulgaria	28 Italy	45 Palau	62 Syria
12 Canada	29 Jamaica	46 Panama	63 Tunisia
13 Chile	30 Japan	47 Poland	64 Tuvalu
14 China	31 Kenya	48 Portugal	65 Ukraine
15 Cook Is.	32 Kiribati	49 South Korea	66 United Kingdom
16 Croatia	33 Kuwait	50 Romania	67 United States
17 Cyprus	34 Latvia	51 Russia	68 Vanuatu

Benefits of U.S. Ratifying MARPOL Annex VI

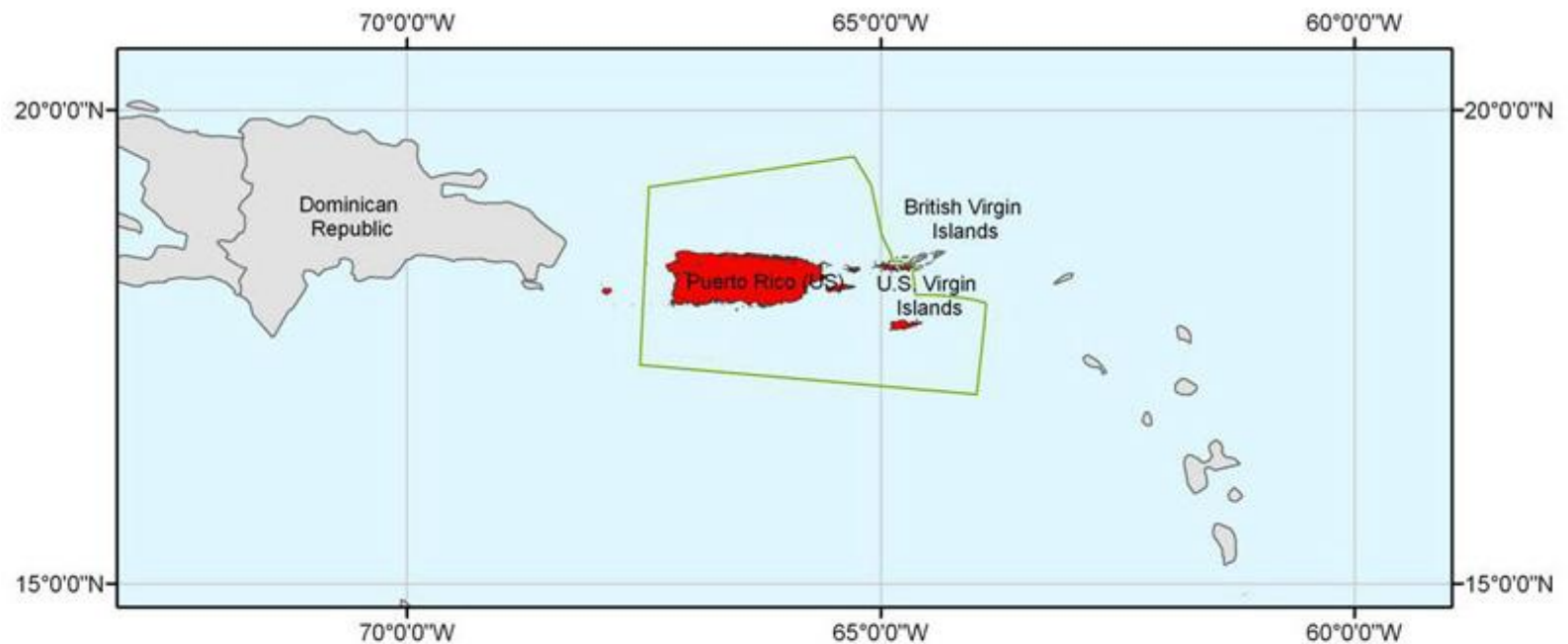
- Growing ship emissions reducing air quality (most from non-U.S. ships)
- Consistent standards across all U.S. ports and internationally
- Benefits significantly outweigh costs
- Requires reduced fuel sulfur/PM levels and ship emissions controls
- Established North American ECA

North American ECA



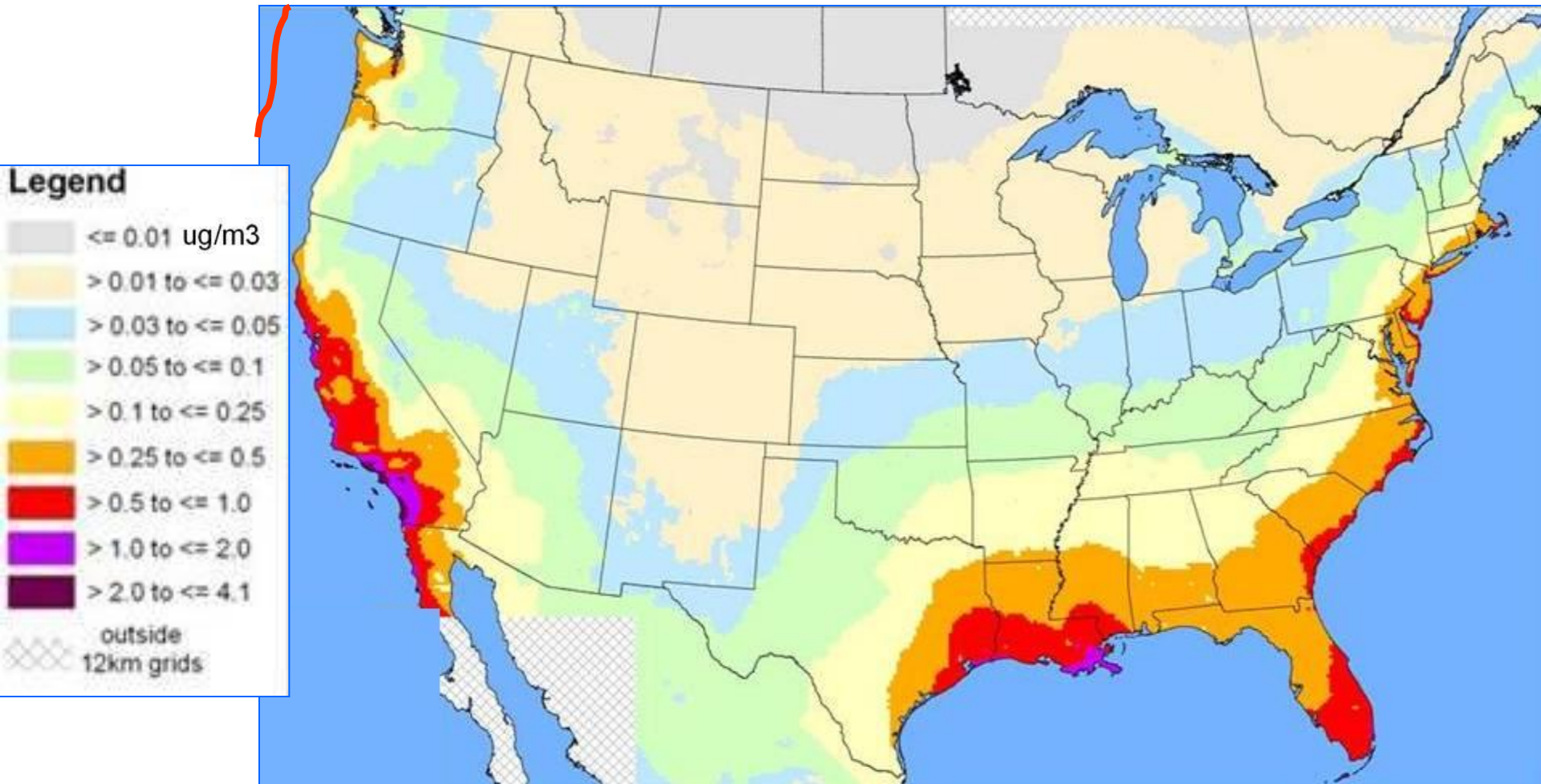
Began on August 1, 2012

Caribbean ECA

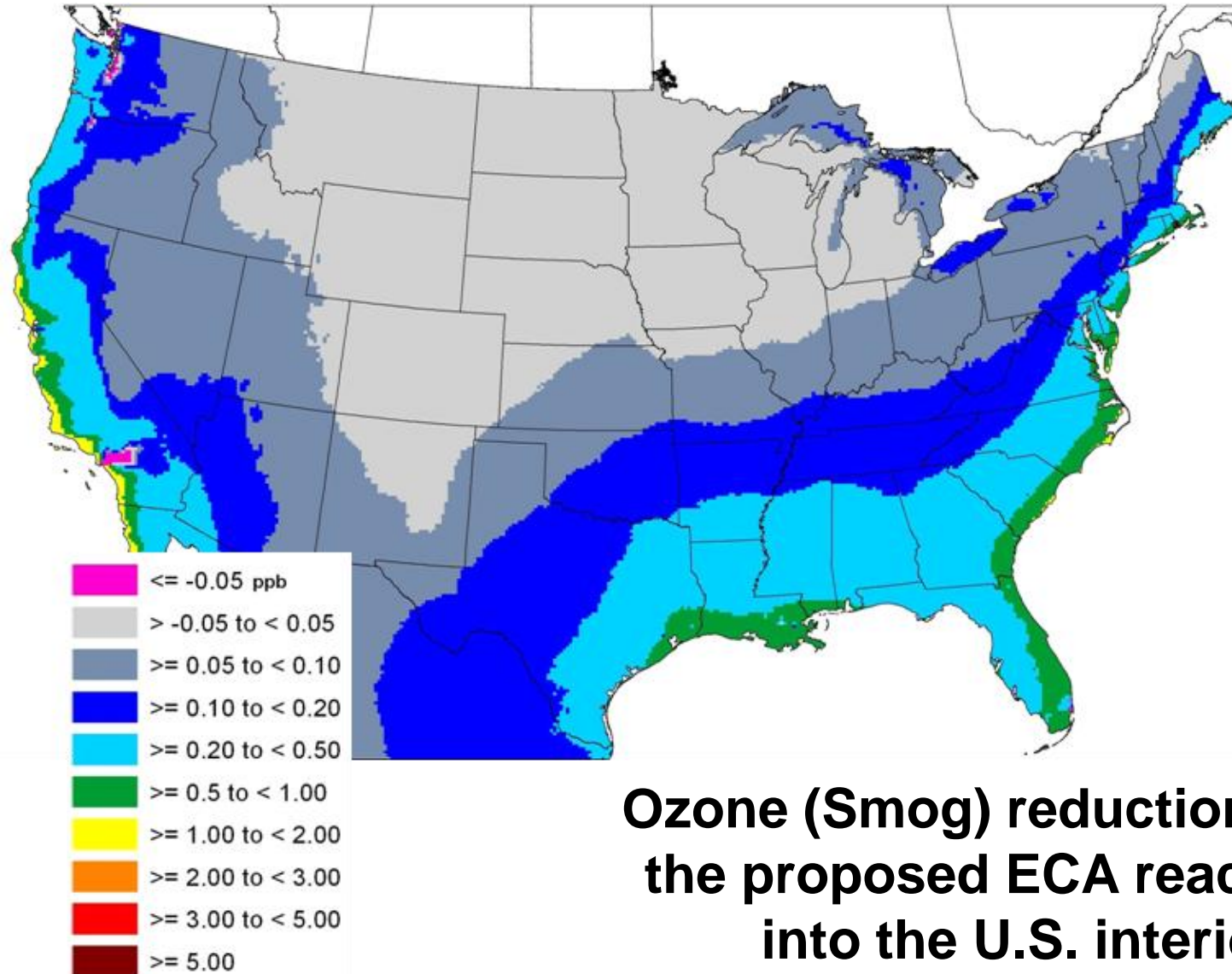


Begins on January 1, 2014

North American ECA 2020 Potential PM_{2.5} Reductions



North American ECA 2020 Potential Ozone Reductions

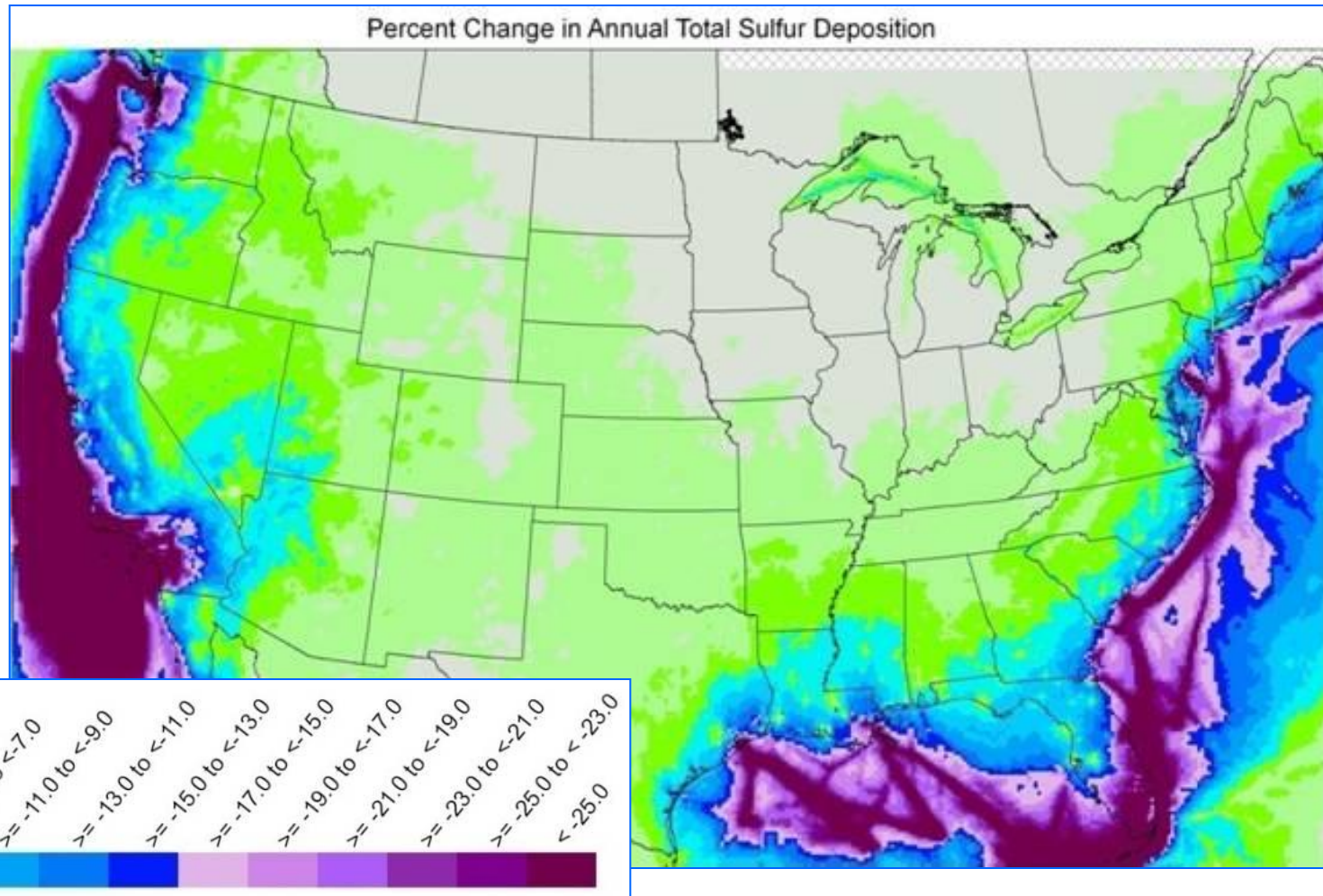


**Ozone (Smog) reductions from
the proposed ECA reach well
into the U.S. interior**

North American ECA

2020 Potential Sulfur Deposition Reductions

**Improvements
in deposition
for marine and
terrestrial
ecosystems**



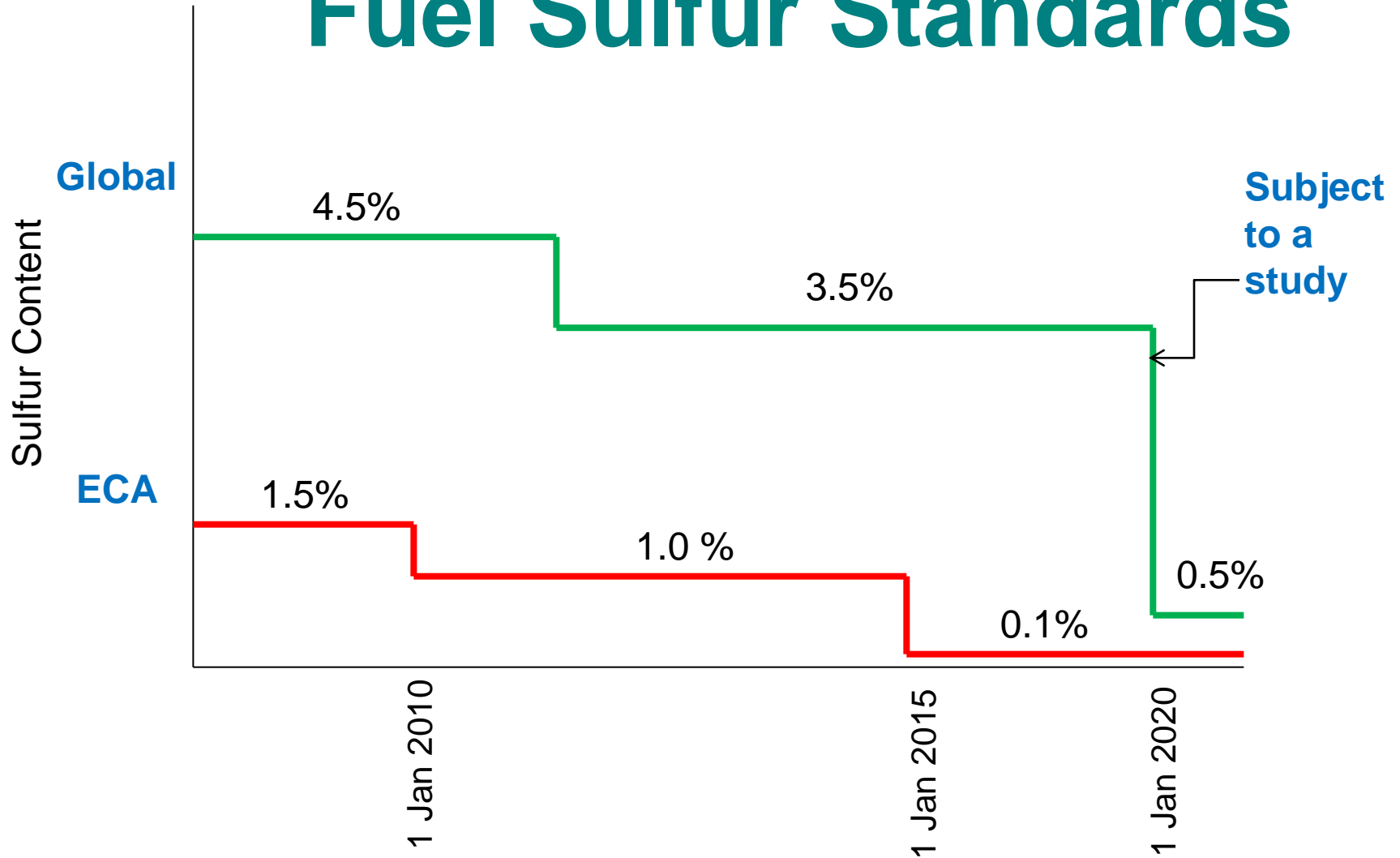
Cost-Benefit of the NA ECA

- Health Benefits (U.S. and Canada) by 2020
 - Annually 14,000 lives saved; respiratory relief for 5,000,000
 - U.S. monetized annual benefits \$ 47-110 billion
- Cost per tonne of emission reduction compare favorably with land-based emission control programs
- Total costs in 2020 estimated to be \$3.2 billion

MARPOL Annex VI – SO_x and PM

- Global fuel sulfur standards
- ECA standards (27x less than global fuel sulfur average by 2015)
- Or other technological methods that achieve equivalent reductions
 - No commercially available methods identified to date
 - IMO guidelines for evaluating exhaust gas cleaning systems

MARPOL Annex VI Fuel Sulfur Standards



MARPOL Annex VI -- NO_x

- Reduction requirements are defined by the IMO NO_x Technical Code
 - Applies to diesel engines of 130kW
- NO_x standards for ships built after 2000
 - Tier I, II, III (ECA)
 - Tier III met with selective catalytic reduction (SCR)
- Certificates required for Ships – EIAPP
 - Certification of the engine on manufacture and checked on installation for settings

MARPOL Annex VI Nox Requirements

Tier	Ship build date	Emission limit (g/kWh) N=rpm		
		N < 130	N = 130 – 1999	N ≥ 2000
I	Jan 1, 2000	17	$45.n^{-0.2}$ e.g. 720 rpm – 21.1	9.8
II	Jan 1, 2011	14.4	$44.n^{-0.23}$ e.g. 720 rpm – 9.7	7.7
III (in ECA only)	Jan 1, 2016	3.4	$9.n^{-0.2}$ e.g. 720 rpm – 2.4	2.0

NA ECA Implementation

- EPA and U.S. Coast Guard implement
- Compliant fuel made available in U.S.
- Guidance available:
 - IMO: NOx technical code
 - Coast Guard
www.homeport.uscg.mil
 - EPA
www.epa.gov/oms/oceanvessels
 - Fuel availability guidance
 - EIAPP

U.S. Department of
Homeland Security
United States
Coast Guard



Commandant
United States Coast Guard

2100 2nd Street, S.W.
Washington, DC 20593-0001
3rd Floor, Room 3030
Phone: (202) 372-1234
Fax: (202) 372-1234
cg-cvc@uscg.mil

16711/
CG-CVC Policy Letter
12-04
July 25, 2012

From: K. P. McAVOY, CAPT
COMDT – Commercial Vessel Compliance (CVC)

To: Distribution

Subj: GUIDELINES FOR COMPLIANCE AND ENFORCEMENT OF THE EMISSION
CONTROL AREAS ESTABLISHED WITHIN THE UNITED STATES
JURISDICTION AS DESIGNATED IN MARPOL ANNEX VI REGULATION 14

Ref: (a) CG-543 Policy Letter 09-01 dated February 4, 2009
(b) Resolution MEPC.170(58) – Revised MARPOL Annex VI
(c) Resolution MEPC.177(58) – NOx Technical Code 2008
(d) Resolution MEPC.190(62) – North American ECA
(e) Resolution MEPC.202(62) – United States Caribbean Sea ECA
(f) EPA Interim Guidance on the Non-Availability of Compliant Fuel Oil for the North
American Emission Control Area
(g) Coast Guard and EPA Memorandum of Understanding (MOU) signed June 27, 2011
(h) U.S. Coast Guard ECA Job Aid

1. Purpose. This policy letter outlines the Coast Guard's methods and procedures for verifying compliance with MARPOL Annex VI Regulation 14 (Sulfur Oxides (SOx) and Particular Matter (PM)) and Regulation 18 (Fuel Oil Availability & Quality), and how violations identified by the Coast Guard regarding these two regulations are documented and referred to the Environmental Protection Agency (EPA) for enforcement. The Coast Guard, pursuant to the Act to Prevent Pollution from Ships (APPS) at 33 U.S.C. § 1907(f), has the authority and responsibility to conduct ship inspections, examinations, investigations, and to undertake enforcement action. The EPA has the authority specified in 33 U.S.C. § 1907(f) to enforce the requirements of MARPOL Annex VI Regulations 13, 14 & 18. In general, the Coast Guard is responsible for verifying compliance with all of MARPOL Annex VI and the EPA is responsible for the enforcement of violations pertaining to Regulations 13, 14 & 18.

2. Directives Affected. None.

3. Action. Sector Commanders/Officers in Charge, Marine Inspection (OCMIs) should direct their Marine Inspectors (MIs) and Port State Control Officers (PSCOs) to utilize this policy for procedures pertaining to compliance verification and enforcement with the provisions of MARPOL Annex VI regulation 14 (as amended) and regulation 18. Reference (a) remains in effect and should be followed by MIs/PSCOs when verifying compliance with the other

Summary

- Many countries have ratified MARPOL Annex VI
- Increased awareness of ship emission control technologies and best practices
- MARPOL (e.g., NA ECA) delivers
 - Substantial health benefits
 - Extremely favorable cost-benefit ratio
- Requirements driving technology development