

# The North American Emissions Control Area

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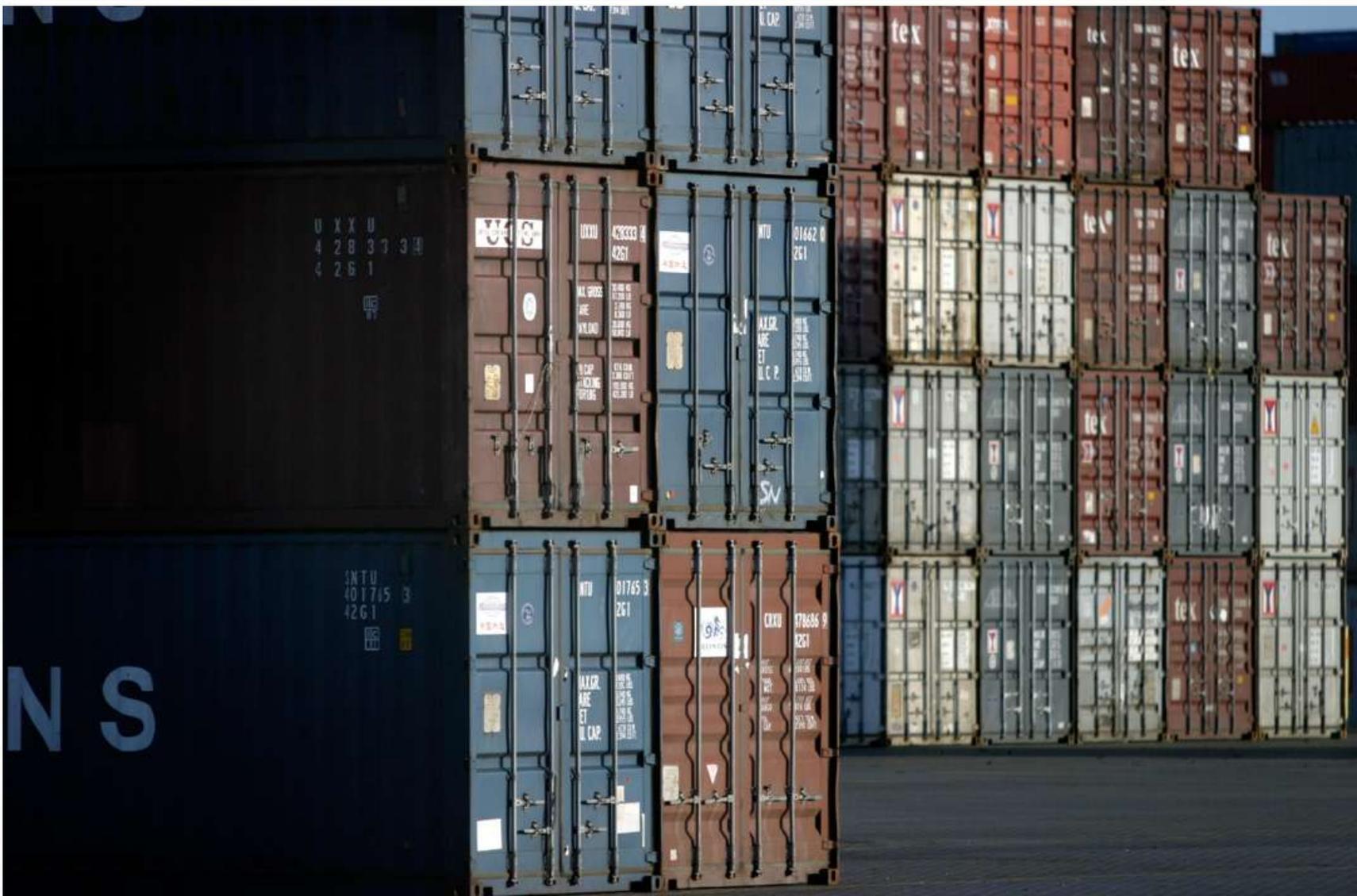


# North American ECA

- Why?
- What?
- How?



# Why?

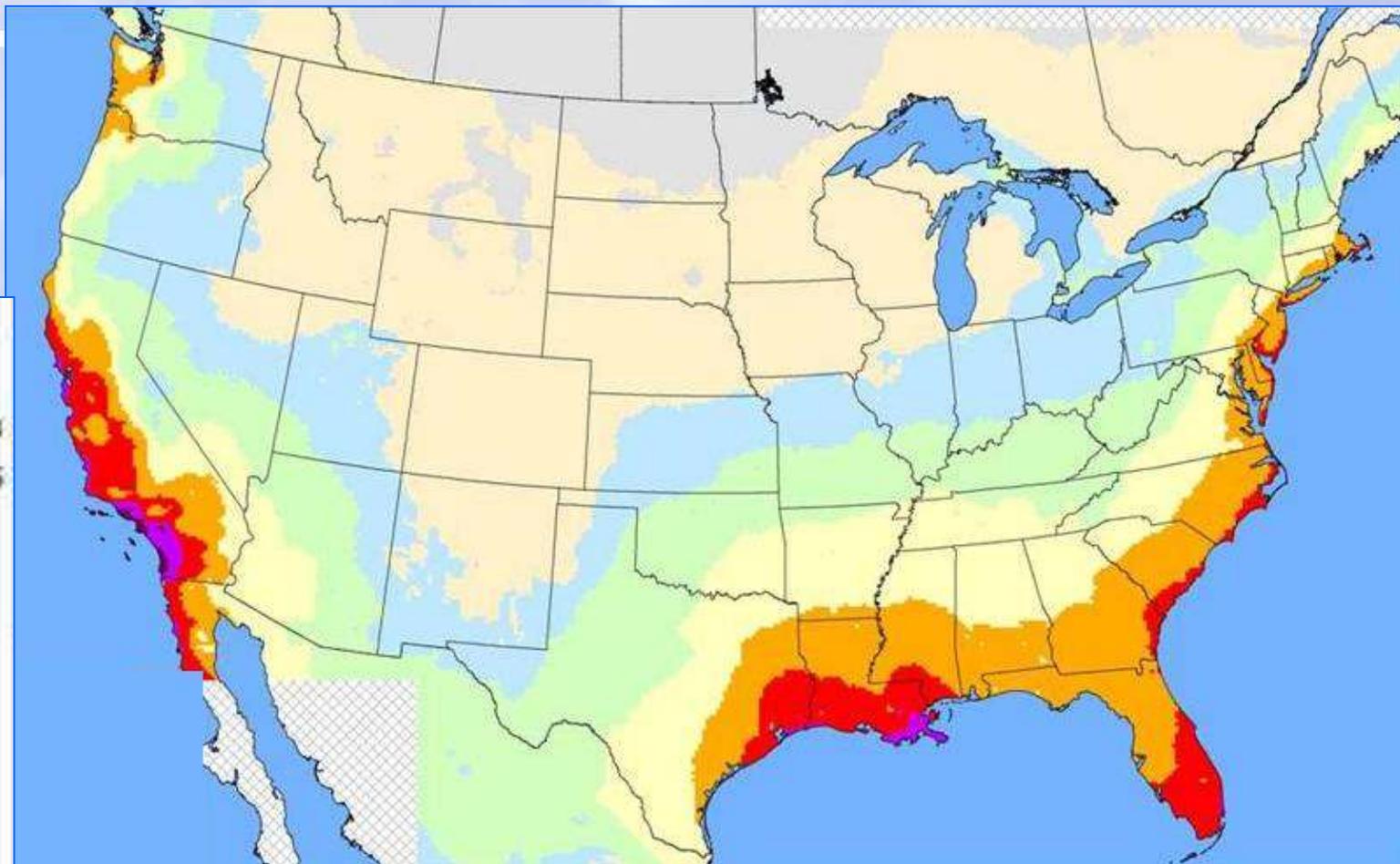
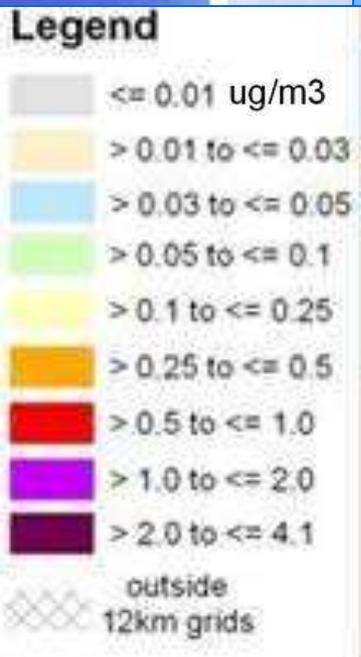


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# OGVs—the last Emitter?

- Large container ship coming into LA/LB has NO<sub>x</sub> and SO<sub>2</sub> emissions similar to LA refineries (pre-ECA)
- OGVs (pre-ECA) were essentially uncontrolled
- Highway truck fuel=15 ppm sulfur
- World-wide OGV fuel=35,000 ppm sulfur
- Marine vessels (LA/LB) emit as much NO<sub>x</sub> as 1/5 of all cars
- Projections showed ½ of LA 2020 SO<sub>2</sub> inventory to be OGV

# ECA Benefits—PM-2.5



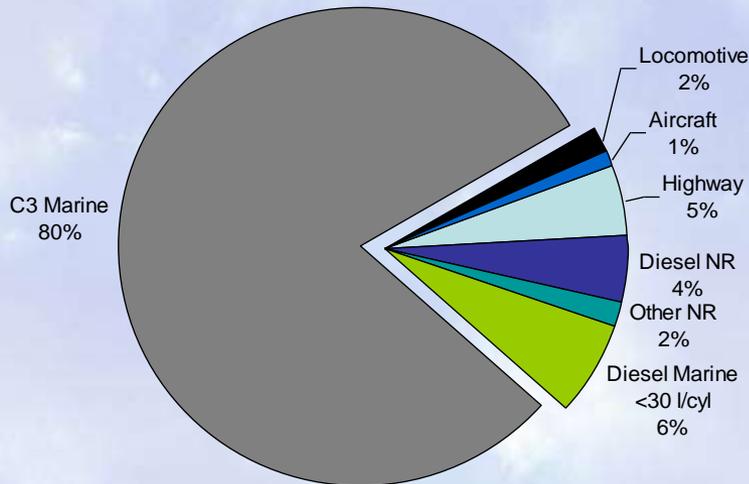
PM-2.5 standard

Current: Current: 12ug/m<sup>3</sup> (annual) (12/14/12) (was 15 ug/m<sup>3</sup>)  
35ug/m<sup>3</sup> (24 hour)

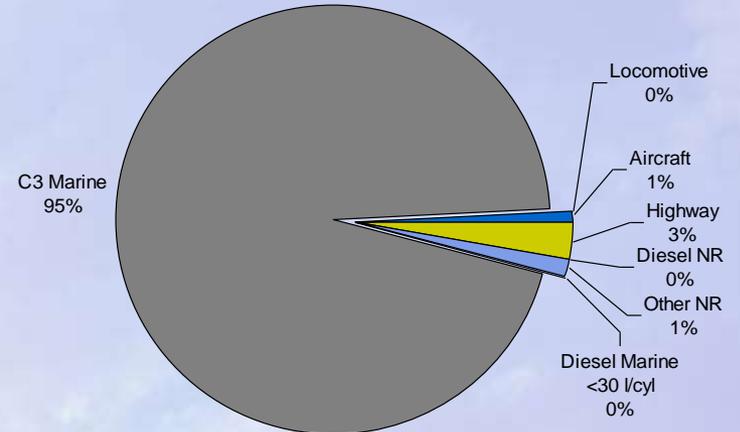


# Ship Emissions are a growing % of the inventory

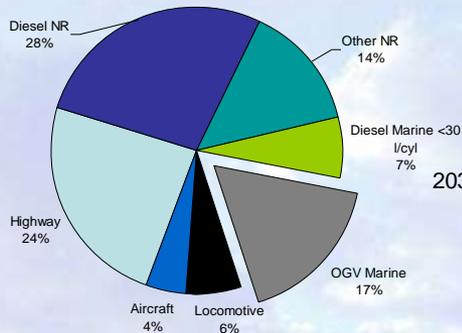
2009 Mobile Source SOx Inventory



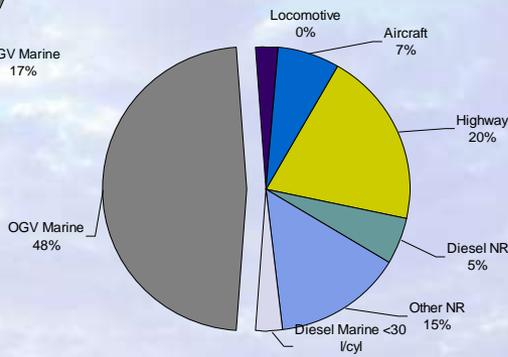
2030 Mobile Source SOx Inventory



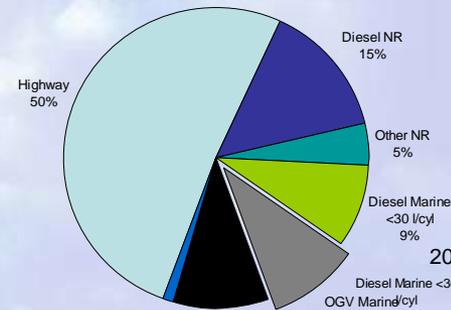
2009 Mobile Source PM2.5 Inventory



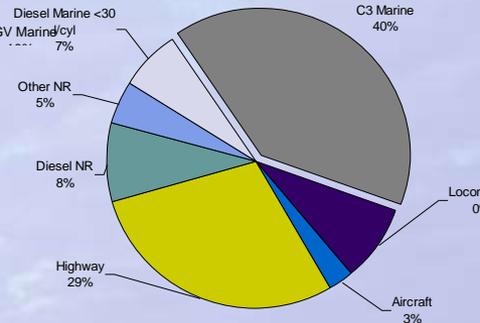
2030 Mobile Source PM2.5 Inventory



2009 Mobile Source NOx Inventory



2030 Mobile Source NOx Inventory



# North American ECA – Benefits

- Compliance with ECA standards is expected to result in annual reductions starting 2020 of:
  - 320,000 tons of NOx
  - 90,000 tons of PM-2.5
  - 920,000 tons of SOx
  - 23%, 74% and 86% reduction of predicted levels absent the ECA
- ECA benefits include preventing as many as 14,000 premature deaths and relieving respiratory symptoms for nearly 5 million annually.
- ECA sulfur requirements effective August 1, 2012.

# It's not just North America

Ships overtake power plants in sulphur emissions

14th January 2013 06:16 GMT

Ships have overtaken power plants as the biggest source of sulphur pollution, according to a Hong Kong politician.

Hong Kong Secretary for the Environment Wong Kam-sing has said that since 2011, new emissions data shows that vessels are the main emitters of sulphur dioxide (SO<sub>2</sub>), on top of nitrogen oxides (NO<sub>x</sub>) and suspended particles.

Wong said the new figures show that marine pollution needs to be addressed.

He was speaking at a meeting organised by think tank Community Development Initiatives last Thursday night, according to the South China Morning Post.

Wong added that the pollution problem would not be adequately addressed by the voluntary Fair Wind Charter, a membership comprising major shipping lines which have pledged to use low-sulphur fuel in **Hong Kong**.

He said it was not a "level playing field" as not all shipping lines had signed up to the charter.

Chief Executive Leung Chun-ying is expected to announce measures in his policy address next week to deal with emissions from ocean-going vessels, local ferries and ships.

Wong did not comment on any future moves Leung would make in introducing mandatory measures to clean up marine pollution.

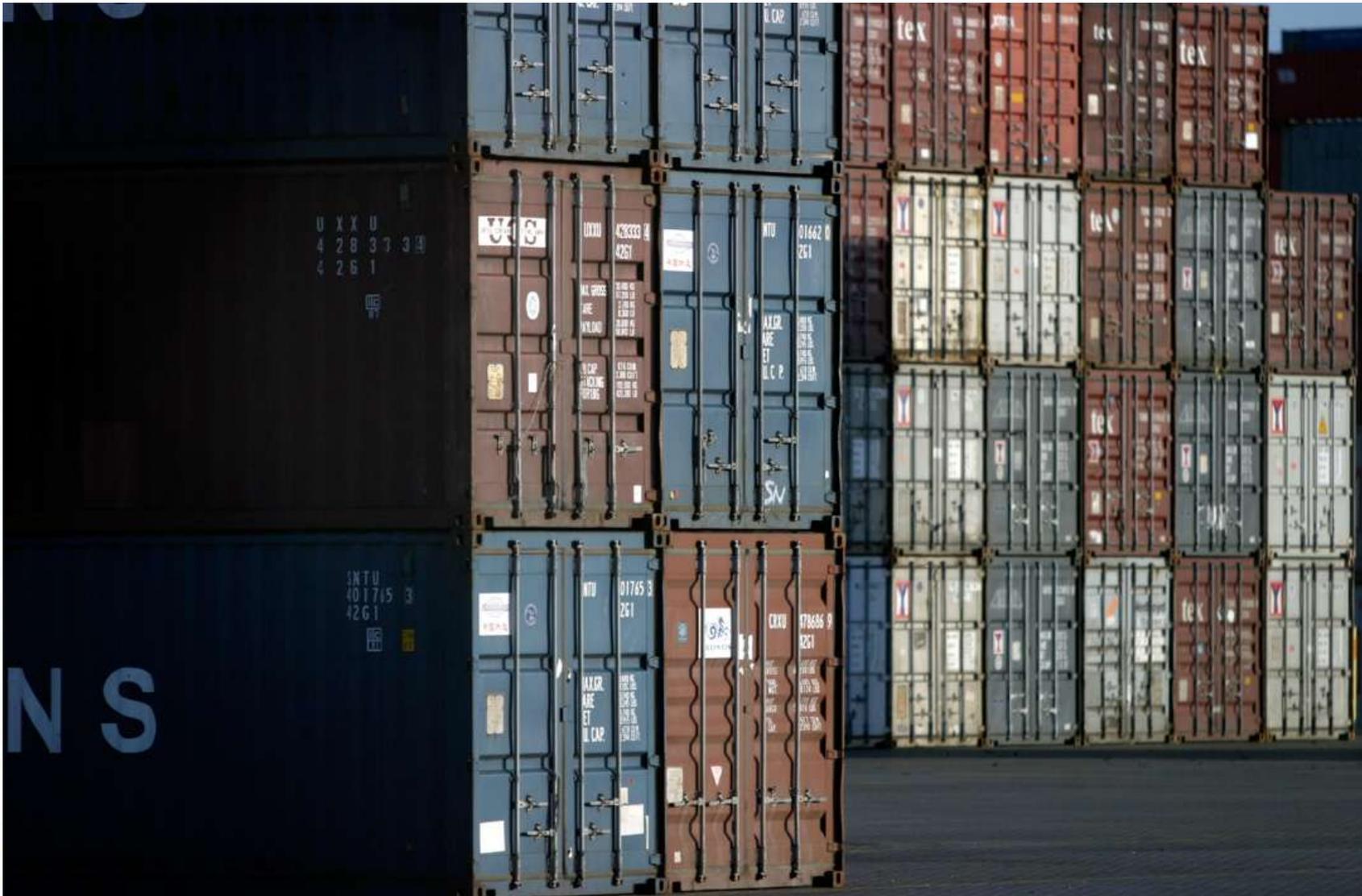
Vessels became the largest emitter of nitrogen oxides in 2010 and for respirable suspended particles in about 2005, accounting for 32% and 36% of emissions of these pollutants in 2010 respectively.

Marine pollution has been climbing, while power plants have cut emissions by using scrubbers to remove pollutants before they are released into the atmosphere.



**Wong says that marine pollution needs to be addressed**

# What?





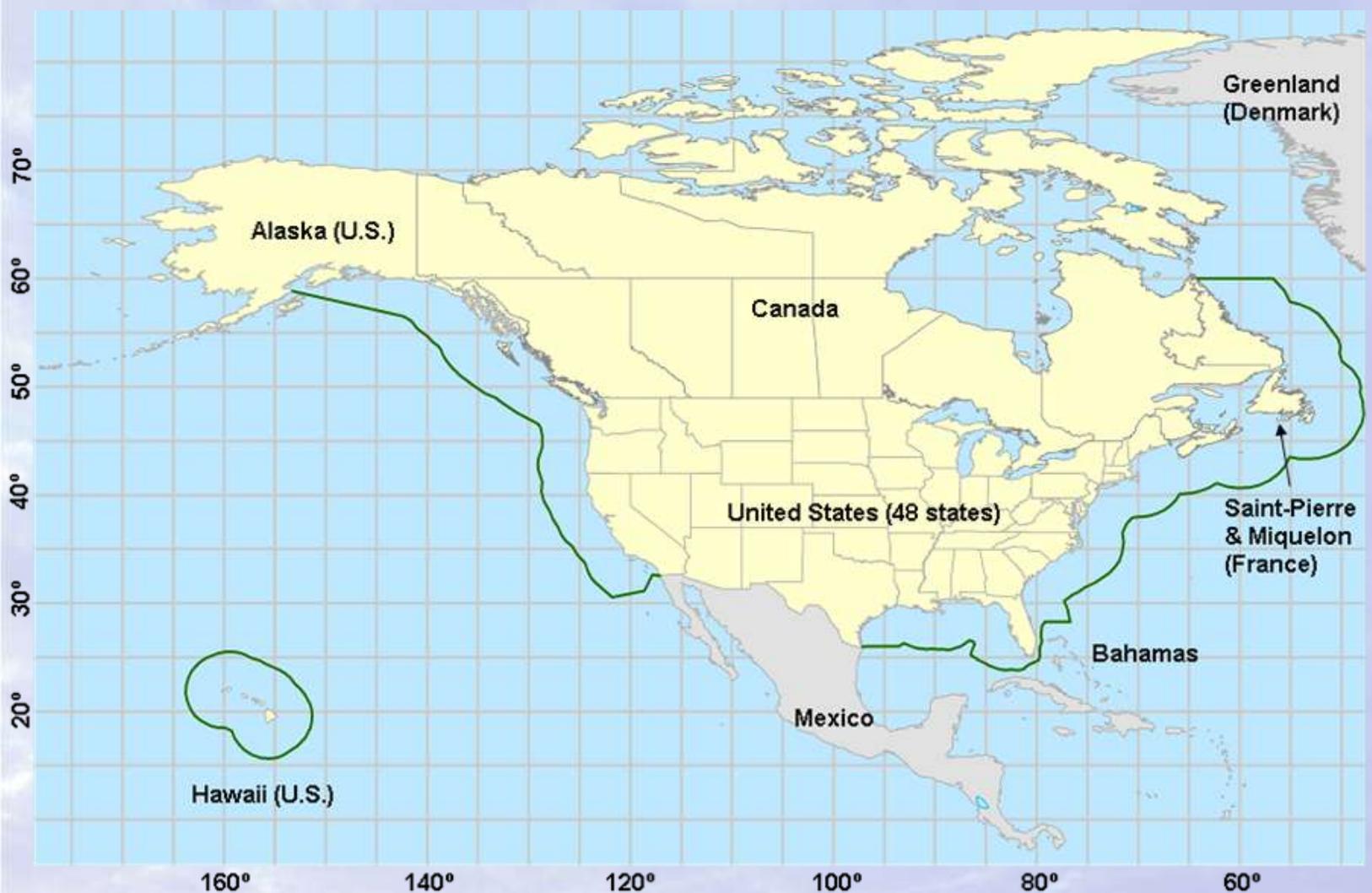
# Sulfur standard, 2008 Annex VI Amendments\*

- “Global standard”\*\* (Regulation 14.1)
  - 4.5% < 2012
  - **3.5% (2012-19)**
  - 0.5% 1 Jan. 2020
- Emission Control Area (ECA) standard (Reg. 14.4)
  - 1.5% < Jul. 2010
  - **1.0% after January, 2010**
  - **0.1% after January, 2015**

\*All dates are subject to 12 month grace period. Reg. 14.7.

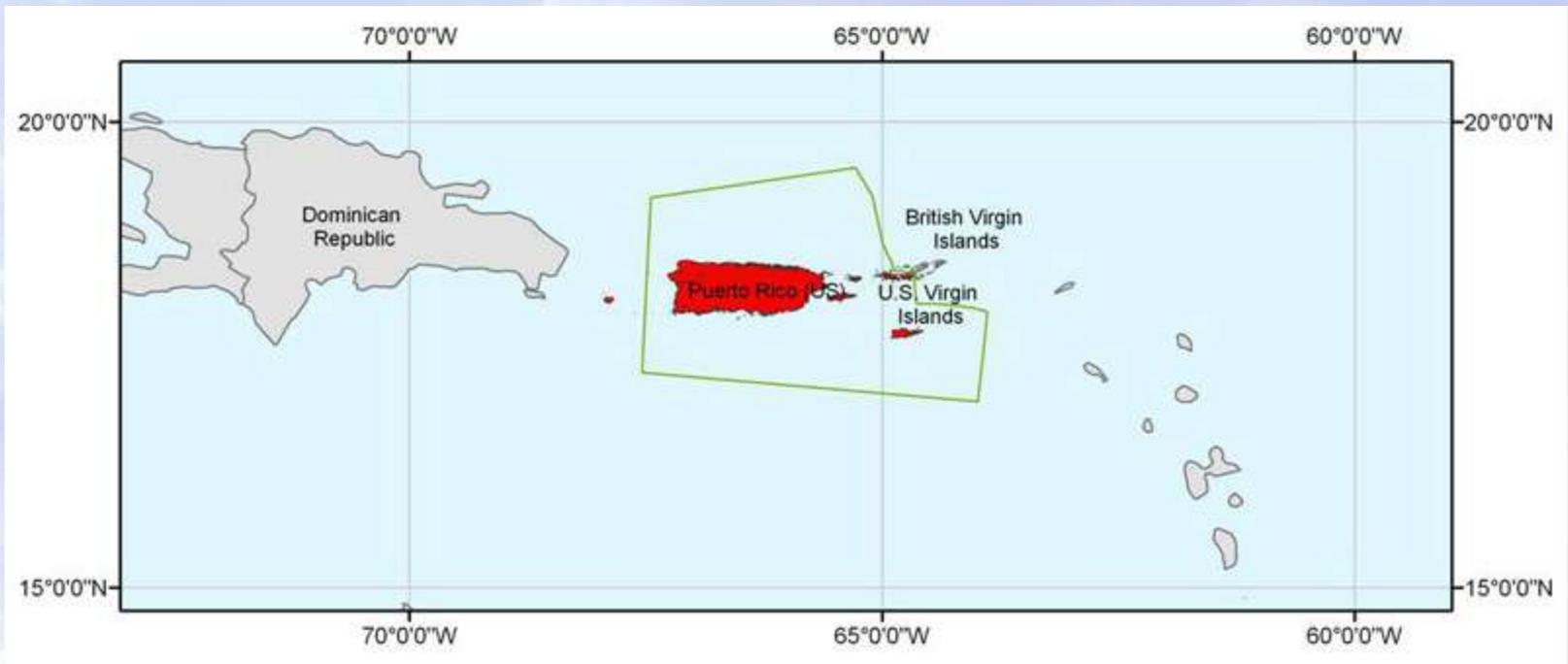
\*\* 2020 Global Standard is subject to feasibility review in 2018; may be delayed to 2025.

# North American ECA Boundaries



# What's Coming: Caribbean ECA January 2014

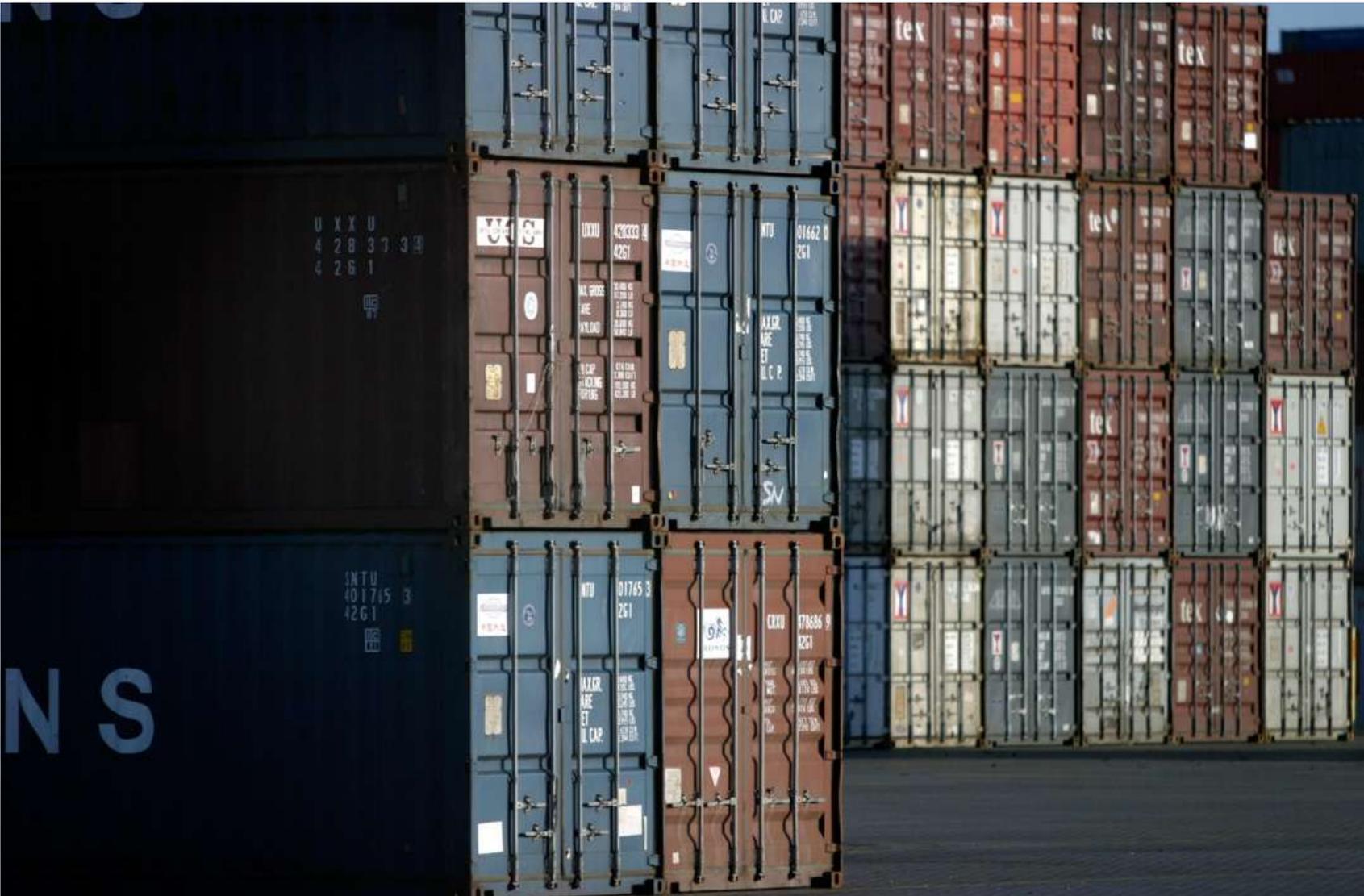
- IMO designated July 15, 2011  
Enforceable January 2014



# What's Coming: Tier III Nox January 2016

- Will require after treatment
  - selective catalytic reduction, exhaust gas recirculation, water injection strategies, dual fuel diesel/natural gas engines
- Applies in ECAs only (Tier II otherwise)

# How?



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# Enforcement

- How is ECA enforcement different?
- On board
- Shoreside





# ECA enforcement is different

- ECA is codified in APPS
  - Act to Prevent Pollution from Ships
    - Regulations in 40 CFR 1043 (next slide)
- Clean Air Act not directly relevant
- Enforcement split between Coast Guard and EPA
- Those subject to enforcement may have limited or no US corporate presence

# EPA 40 CFR Part 1043 Regulations

- Codify MARPOL Annex VI requirements
- apply Annex VI requirements to U.S. internal waters, or “ECA-associated areas”
- exemption for Great Lakes steamships (1043.95(a))
- “hardship waiver” available for other Great Lakes ships (1043.95(b))
- apply Annex VI requirements to non-Party vessels
- describe procedures, requirements for Engine International Air Pollution Prevention Certificates

# How will we enforce?

- Coast Guard/EPA MOU
- Coast Guard Lead
  - Ship Inspections
- EPA Lead
  - Shore side inspections



# Remedies

- USCG specific remedies
  - Deficiency Notice
  - Detentions
  - Revoke IAPP
- APPS driven penalties (33 USC § 1908)
  - Civil Penalties
  - Injunctive Relief
  - Criminal Liability



# What's Criminal?

- Lying/Falsifying information (18 USC 1001)
  - On vessel records
  - Bunker delivery notes
  - Causing GPS/fuel delivery systems to mis-report location of fuel switching
  - Improper/doctored records for companies with equivalent emissions documents
- Knowingly Violating Annex VI (33 USC 1908(a))

# What's Happened?

- FONARs
- Overall Compliance
- Flexibility





# Fuel Availability

- Annex VI allows for a case where compliant fuel is not available
  - E.g. a vessel sails from Brazil, where 1% bunker is not available, to Philadelphia
  - Guidance released 6/26/12
    - <http://www.epa.gov/enforcement/air/documents/policies/mobile/finalfuelavailabilityguidance-0626.pdf>
      - Reports now submitted through FOND:  
<http://www.epa.gov/compliance/enforcement/air/documents/policies/mobile/fondinstructions.pdf>
  - Does not require distillate before 2015
    - <http://www.epa.gov/otaq/regs/nonroad/marine/ci/420f12040.pdf>
  - Requires report to CG/EPA
  - Case specific
    - Frequent caller vs once every year or less
    - Port of origin
    - How did they attempt to obtain compliant fuel?
    - Requires that they get compliant fuel in first US port of call.
- Many submissions in August 2012, much lower now
- Are there ports, carriers that are cheating?

# General Annex VI Compliance

- Coast Guard reports high compliance
- BUT
  - Data gaps
  - Known inspections
  - CARB suspects more non-compliance



# Flexibility

- Options available
  - Regulation 3 tech demonstration
  - Regulation 4 equivalence
- Success!
  - TOTE
  - RCL
  - NCL
  - Others in discussion
- Caution!
  - Flexibility requires greater accountability
  - Many stakeholders paying attention

# Vessel Note of Protest

- Recommended by class societies if
  - MARPOL Annex VI requirements for fuel not met by supplier
  - E.g. When ship tests fuel that turns out to be >1.00% S, but BDN says <1.00% S
- Consider sending to [marine-eca@epa.gov](mailto:marine-eca@epa.gov)

# Questions?

- OTAQ Fuels hotline
  - 202-343-9755
  - [marine-eca@epa.gov](mailto:marine-eca@epa.gov)



Thank you



# Appendix

- IAPP
- EPA-CG MOU



# International Air Pollution Prevention Certificate

- Required for inspected vessels greater than 400 gross tons engaged in international routes
  - CG issues, amends, revokes
- Pre-cert inspection includes:
  - **SO<sub>x</sub>**
    - **Bunker Delivery Notes**
    - **Bunker Samples**
  - **Ozone Depleting Substances (ODS)**
    - New installations of ODS prohibited after May 19, 2005 (with the exception of HCFCs, which are permitted until January 1, 2020).
  - Shipboard Incineration
- **Volatile Organic Compounds**
  - If a vessel is equipped with a vapor recovery system, the system must be in compliance with 46 CFR Part 39

# MOU Between USCG and EPA to Enforce Annex VI

- USCG and EPA entered into a Memorandum of Understanding to enforce the provisions of Annex VI.
- <http://www.epa.gov/compliance/resources/agreements/caa/annexvi-mou062711.pdf>



# MOU—Significant Provisions

- USCG and EPA agree to mutually cooperate in implementing Annex VI
- USCG and EPA agree to jointly develop protocols for carrying out enforcement activities on board ships, in ports and at facilities
- Roles are based primarily on each agencies areas of expertise
- USCG has primary authority to conduct ship inspections, examinations and investigations. EPA may request to or USCG may request that EPA attend or assist in on board activities.
- EPA has primary authority to verify compliance with fuel oil availability and quality requirements (shoreside fuel requirements)
- Both USCG and EPA have authority to take enforcement actions. Actions may be referred from one agency to the other