

## Public Workshop to Discuss Proposed Amendments to the Regulations for Ocean-going Ship Main Engines, Auxiliary Engines and Auxiliary Boilers



October 12, 2010  
Port of Long Beach

California Environmental Protection Agency



Air Resources Board

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## Overview

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- ◆ **Background and Status**
- ◆ **Implementation Activities**
- ◆ **Proposed Amendments**
- ◆ **Next Steps**
- ◆ **Contacts**



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## Background and Status

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## California's Ocean-Going Vessel Clean Fuel Regulation

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- ◆ 8 years in development
- ◆ Consultative process
- ◆ Adopted by ARB in July 2008
- ◆ Implementation began July 2009
- ◆ Provides immediate and significant emissions reductions
  - Diesel PM: 83% reduction
  - SOx: 96% reduction
  - NOx: 6% reduction
- ◆ Establishes “bridge” to ECA in the 2015 timeframe

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## Requirements-California's Ocean-Going Vessel Clean Fuel Regulation

- ◆ Requires use of cleaner fuels in main engines, auxiliary engines and auxiliary boilers
- ◆ Two-phase implementation
  - July 1, 2009
    - use marine gas oil (averages 0.3% sulfur), or
    - use marine diesel oil with a 0.5% sulfur limit
  - January 1, 2012
    - use marine gas oil with a 0.1% sulfur limit, or
    - use marine diesel oil with a 0.1% sulfur limit

\*ARB 2012 fuel sulfur limit is the same as the 2015 North American ECA fuel sulfur limit (0.1%)

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## Requirements-California's Ocean-Going Vessel Clean Fuel Regulation

- ◆ Applies to US and foreign-flagged ocean-going vessels
- ◆ Requires use of cleaner fuels within 24 nautical mile zone of the California coastline



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## Enforcement and Compliance Status

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- ◆ ~12,000 vessel calls since regulation began in July 2009
- ◆ ARB inspectors board vessels at dockside
  - fuel samples collected for testing and analysis
  - records and fuel switching procedures reviewed
- ◆ Nearly 400 inspections since July 1, 2009\*
  - 22 notices of violation issued (~94% compliance)
- ◆ Most notices of violation involve fuel switching within regulated zone or recordkeeping

\*Summary from July 1, 2009 to October 1, 2010

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## Implementation Activities



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## Use of Provisions in Regulation Facilitates Implementation

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- ◆ **30 Safety exemptions used**
  - ARB staff work closely with USCG to implement
- ◆ **3 Noncompliance fees**
- ◆ **Essential Modifications Exemptions**
  - majority of applications are for auxiliary boilers on tankers
  - 436 exemptions provided for vessels that demonstrated the need for essential modifications

\*Summary from July 1, 2009 to Sept. 1, 2010

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## Outreach Efforts and Investigations to Support Implementation

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- ◆ **Six advisories issued**
- ◆ **Contract with California Maritime Academy to investigate root causes of vessel LOPs**
  - final report expected late 2010
- ◆ **Maritime Working Group Meeting**
  - held April 28, 2010 (Oakland)
  - CMA Analysis of LOP – preliminary findings
  - presentations available at [www.arb.ca.gov/ports/marinevess/ogv/ogvmeet.htm](http://www.arb.ca.gov/ports/marinevess/ogv/ogvmeet.htm)
- ◆ **Coordinated with the SNAME Conference on Fuel Switching under the IMO ECA**

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## **Vessel Loss of Propulsion (LOP) Incidents Have Declined**

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- ◆ **About 12,000 vessel calls since regulation began in July '09**
- ◆ **Vessel LOP incidents tracked by USCG**
  - temporary spike in LOP incidents upon implementation of Rule
  - 30 incidents occurred since July 2009 that may be related to use of cleaner fuel
  - all managed effectively
- ◆ **Fuel related LOPs have decreased from 6 per month in July '09 to 1 per month in Sept. '10**

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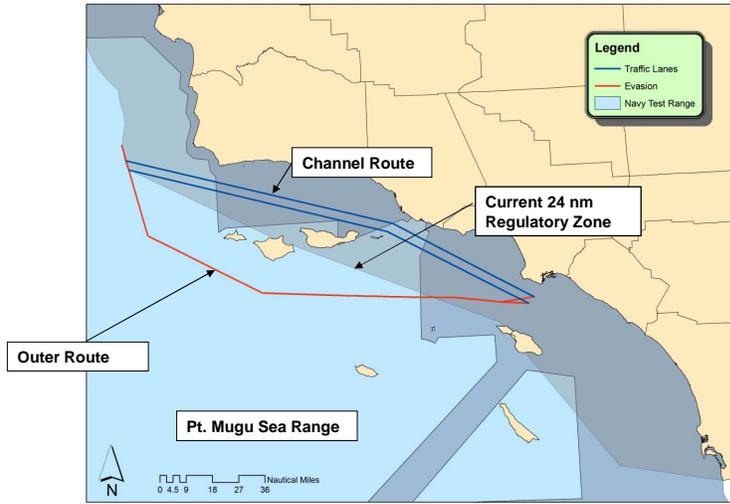
## **Changes in Vessel Traffic Patterns Impact Expected Emission Reductions**

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- ◆ **Many vessel operators choosing to not transit through the established shipping lanes in Santa Barbara Channel**
  - results in increased vessel traffic south of the Channel Islands (about 50% of POLA/POLB visits)
- ◆ **Changes in vessel routing impacting anticipated emissions reductions**
- ◆ **Changes in vessel routing through Mugu Sea Range**

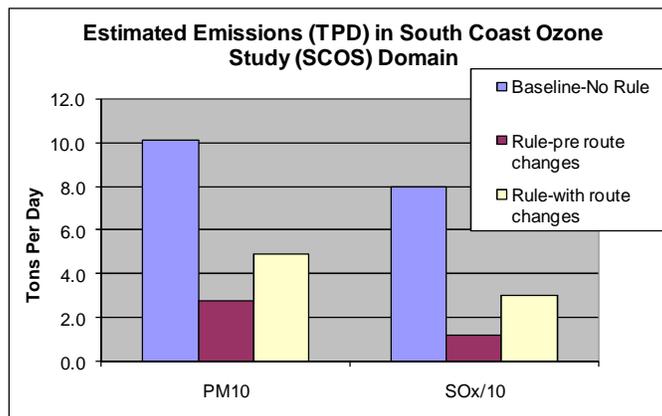
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## Current Rule Status- Vessels are Changing Routes from the Established Santa Barbara Channel Shipping Lanes and Using a Route Outside the Channel Islands



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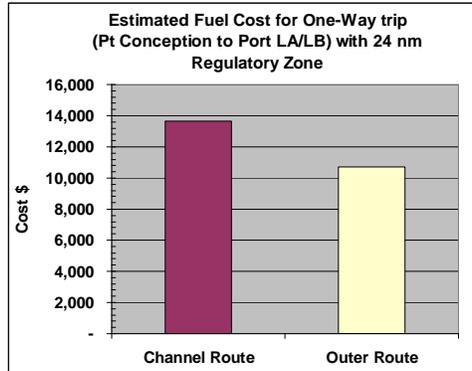
## Emissions Reductions are Lost Due to Changes in Vessel Routing (in Southern California Region\*)



\*Year 2010, 50% of POLA/POLB vessel visits using outer route

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## Change in Vessel Routing is Driven by a Fuel Cost Differential



Route	Distance (nm)	Cost	Time (hrs)
Channel Route (150 nm)	MGO: 150 nm	\$13,700	9
Outer Route (163 nm)	MGO: 31 nm HFO: 132 nm	\$10,700	10

**Estimated Cost differential \$3,000**

\*Assumptions: MGO 700 \$/MT, HFO 440 \$/MT, average transit speed 17.4 knots, 20 nm Port VSR at 12 knots 15

## Proposed Amendments Necessary to Address Impacts of Route Changes

- ◆ Recapture lost emission reductions due to vessel route changes
- ◆ Reduce vessel traffic through the Pt. Mugu Sea Range



# U.S. Navy Presentation



# Proposed Amendments



## Goals for Proposed Amendments

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- ◆ **Goals**
  - recapture lost emission reductions due to vessel route changes
  - reduce vessel traffic through the Point Mugu Sea Range
- ◆ **Achieve goals by**
  - removing economic incentive for vessels to change historic travel patterns

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## Proposed Amendments

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- ◆ **Extend the clean fuel zone in Southern California**
  - extended zone is consistent with Contiguous Zone
  - provide a small “window” to reduce the amount of more expensive clean fuel needed for the channel route
- ◆ **Other minor amendments**

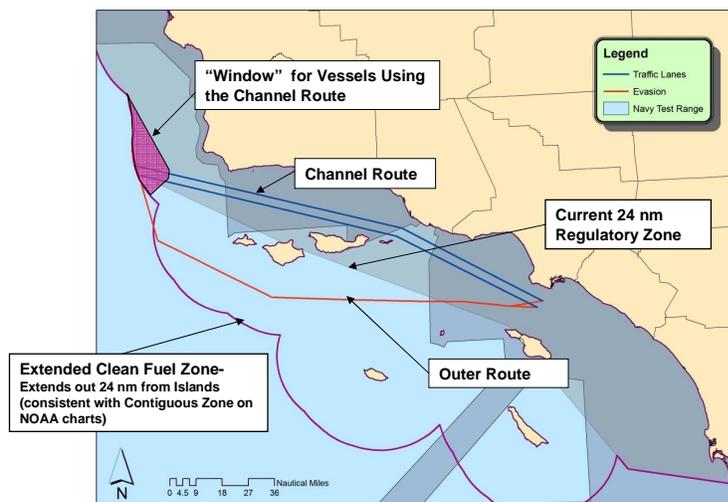
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## Proposed Amendments Consider Impacts on Emissions and Sea Range

- ◆ **Contiguous Zone is a recognized nautical zone and is depicted on NOAA maritime charts**
- ◆ **Extended clean fuel zone retains reduction levels anticipated with original vessel routing**
- ◆ **Eliminate economic advantage of transiting through the Point Mugu Sea Range**

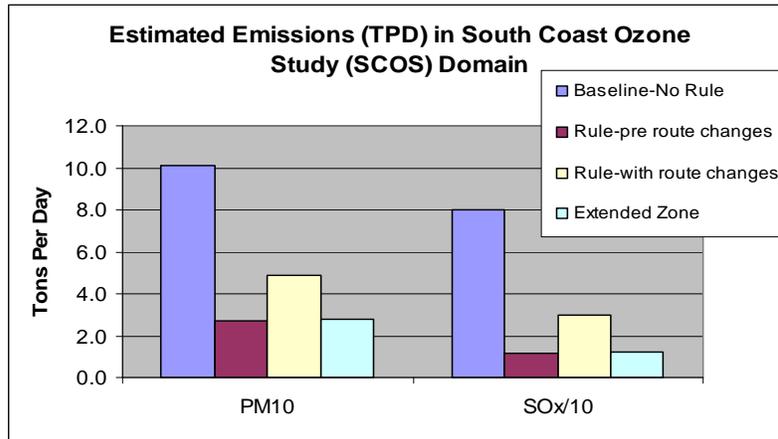
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## Proposed Extended Clean Fuel Zone



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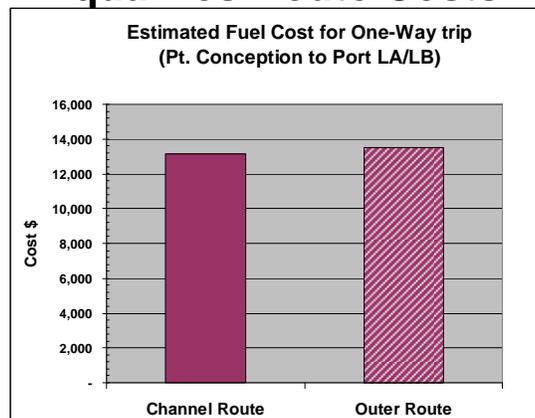
## Proposed Extended Clean Fuel Zone Recaptures Emissions Reductions



\*Year 2010, 50% of POLA/POLB vessel visits using outer route

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## Proposed Extended Clean Fuel Zone Equalizes Route Costs



Route	Distance (nm)	Estimated Cost	Time (hrs)
Channel Route (150 nm)	MGO: 133 nm HFO: 17 nm	\$13,100	9
Outer Route (163 nm)	MGO: 143 nm HFO: 20 nm	\$13,500	10

\*Assumptions: MGO 700 \$/MT, HFO 440 \$/MT, average transit speed 17.4 knots, 20 nm Port VSR at 12 knots

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## **Air Quality Modeling Will Help to Evaluate Air Quality and Health Impacts**

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- ◆ **Air Quality modeling underway**
  - evaluate the onshore impacts of changes in vessel routes
  - evaluate the onshore impacts of extending the regulatory zone to ensure that anticipated health benefits are maintained
- ◆ **Completion – late 2010**

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## **Summary**

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- ◆ **Regulation results in large emission reductions and significant public health benefits**
- ◆ **Excellent compliance with the regulation**
- ◆ **Changes in vessel traffic patterns are impacting anticipated emission reductions**
- ◆ **More vessels are going through the Sea Range**
- ◆ **Extending the clean fuel zone is necessary**
  - to achieve anticipated emissions reductions
  - eliminate the economic incentive for vessels to go through the Sea Range

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## Next Steps

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- ◆ Next workshop in early 2011
- ◆ Complete air quality modeling to evaluate air quality and public health impacts
- ◆ ARB Board Date: March, 2011



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## Contact Information

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**Bonnie Soriano**  
(Lead Staff)

(916) 327-6888

[bsoriano@arb.ca.gov](mailto:bsoriano@arb.ca.gov)

**Peggy Taricco**  
(Manager)

(916) 323-4882

[ptaricco@arb.ca.gov](mailto:ptaricco@arb.ca.gov)

**Paul Milkey**  
(Staff)

(916) 327-2957

[pmilkey@arb.ca.gov](mailto:pmilkey@arb.ca.gov)

**Dan Donohoue**  
(Branch Chief)

(916) 322-6023

[ddonohou@arb.ca.gov](mailto:ddonohou@arb.ca.gov)

<http://www.arb.ca.gov/marine>

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