

West Coast Region Conference on Marine Port Air Quality Impacts

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Emissions Inventory Overview Session

Activity-Based Emissions Inventories

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Overview

The Emissions Inventory is the Foundation by which
Sound Actions, Policy, & Decisions are Based

What are Marine Related EIs Used For?

- What are Marine Related EIs Used For?
 - Updating State Implementation Plans (New & Old)
 - NEPA/SEPA/CEPA/EIS/EIR
 - Policy Considerations/Avoiding Bad Policies
 - Emission Reduction Planning
 - General & Transportation Conformity
 - Health/Risk Assessments
 - Community Concerns/Interests
 - Regional Ozone Modeling
 - Comments on Proposed Regulations
 - Public Relations/Press Statements/Education
 - Grant Funding Applications
 - Demonstrating Redevelopment/Modernization Emission Reductions

Emissions Inventory Approaches

- “Top Down” EIs or Non-coordinated EIs
 - Traditionally Used for Nonroad EIs
 - Uses Regional/National Data Sources & Assumptions to Develop Estimates
 - State/National Estimating Methods
- “Activity-Based” EIs or Coordinated EIs
 - Varying Levels of Detail Depending on EI Function
 - Uses Location Specific Information to Develop Estimates
 - Takes Into Account Local Geography & Conditions
 - Leverages Local Knowledge & Partnering Arrangements to Develop Activity Characteristics
 - Provides Greater Understanding & Resolution of Activity
 - State/National Estimating Methods
 - Improves Accuracy of EI
 - Can Help Establish Working Relationships

Overview of Recent Activity-Based EIs

- Which Ports Are Doing Detailed Activity-based EIs?
 - Houston, New York/New Jersey, Beaumont/Port Arthur (TCEQ), Los Angeles, Long Beach, Seattle, Portland ...
- What Sources are they Looking At & Extent?

	Marine	CHE	Rail	Trucks
PHA	✓NA	✓PB		✓PB
NY/NJ	✓NA	✓PB	✓PB	✓PB
POLA	✓R	✓PB	✓NA	✓NA
POLB		✓PB	✓PB	✓PB
POS	✓	✓	✓	✓
BMT	✓NA			

NA-Nonattainment Area; PB-Port Boundary; R-Regional

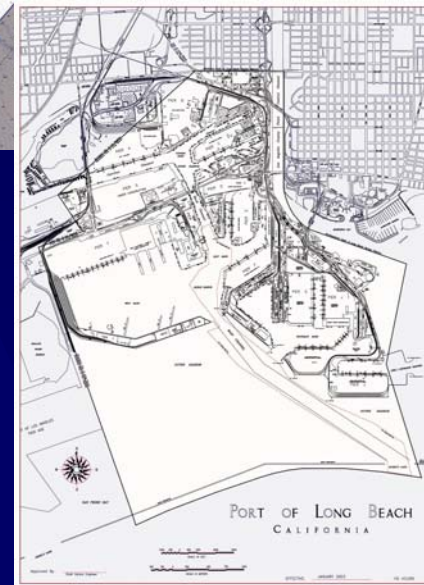
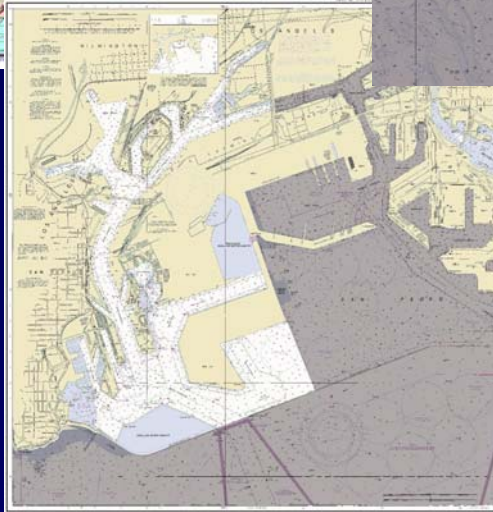
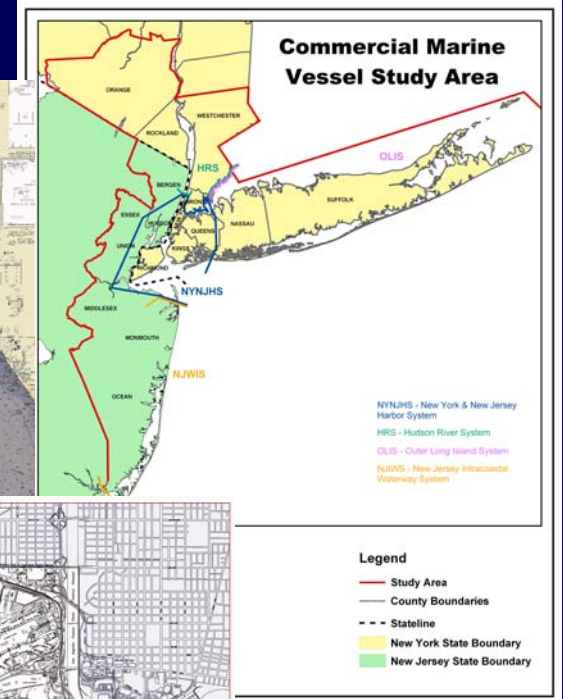
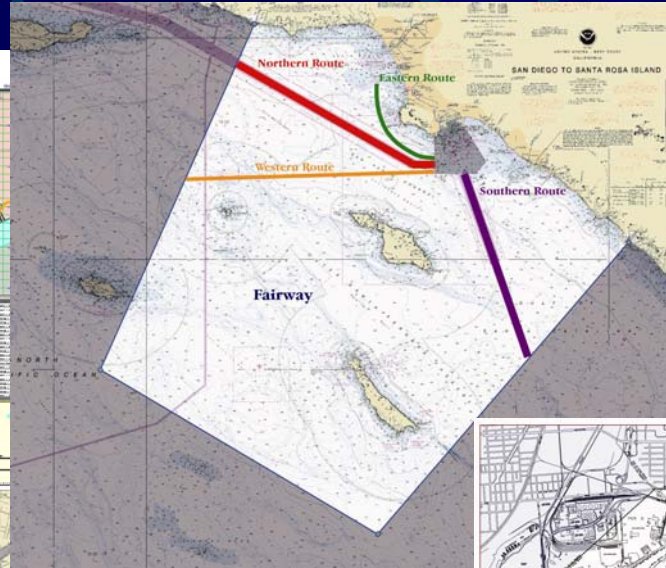
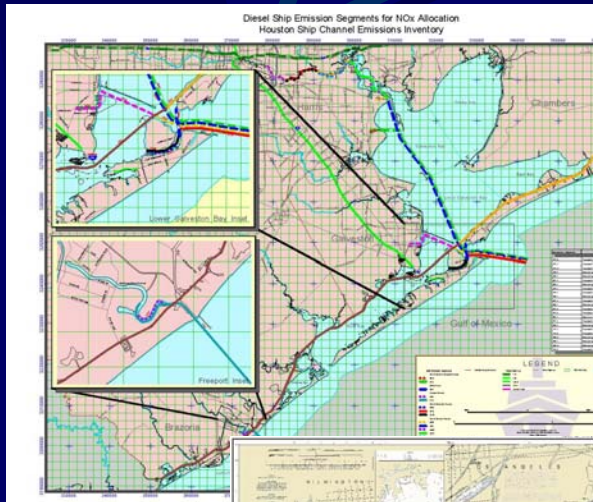
Activity-Based Elements

- Planning is the Key

- Take into Account what you want the EI to be used for Upfront
- Sources to Include & Not Include
- Pollutants to be Considered
- Geographical Extent
- Level of Detail
- Consideration that the Science is Evolving
- Review Prior Studies that have been Completed for your Area
- Coordinate EI w/Local, State, Regional Regulators
- Frequency of Updates
- Spatial Allocation
- Develop Working Groups

Geographical Extent

What is the EI's Purpose or Driver?



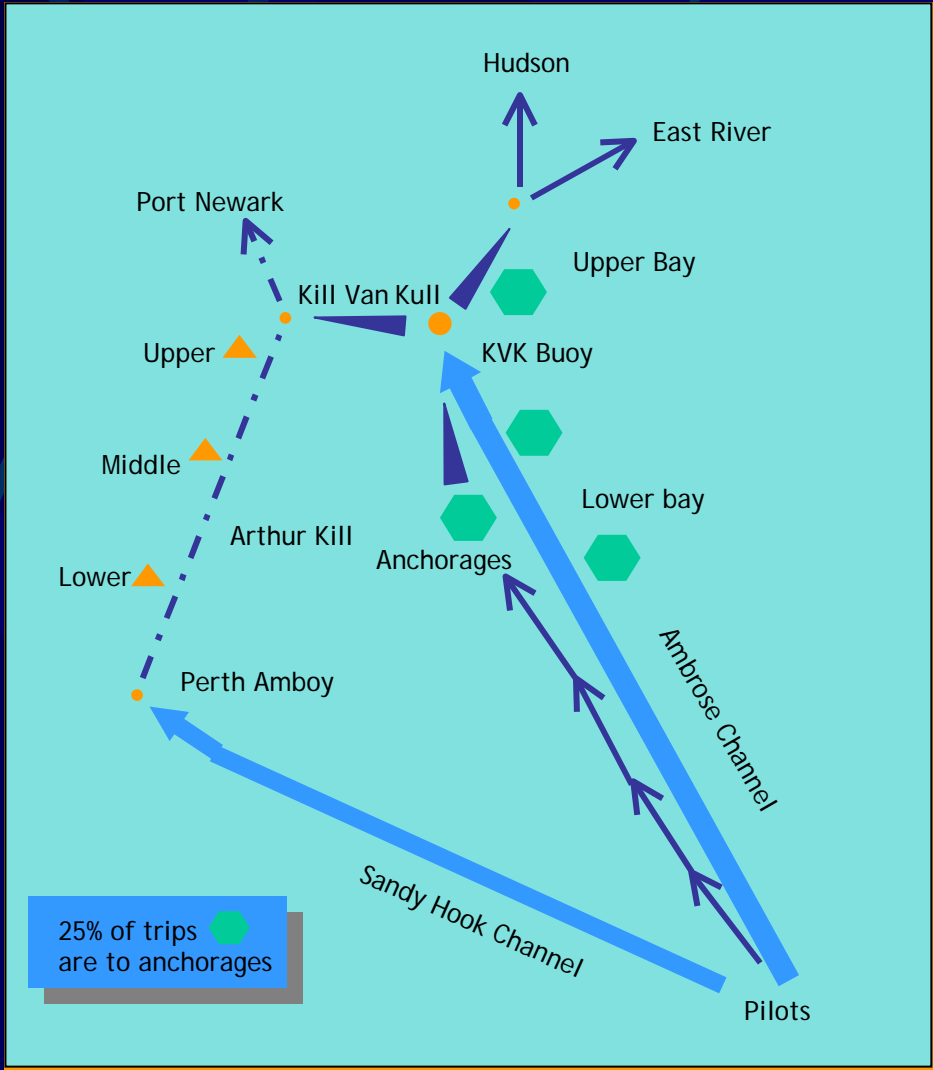
Source Categories - Marine

- Ocean-Going Vessels (OGVs)
 - Tankers
 - Container Ships
 - General Cargo Vessels
 - Bulk Vessels
 - Liquid Petroleum Gas Carriers
 - Cruise Ships
 - Auto Carriers
 - Roll On/Roll Off
 - Military
 - Ocean-Going Tugs
 - Other OGVs
- Towboats
 - Line Haul, Unit Tow, and Fleeting Operations
- Harbor Vessels
 - Assist Tugs, Dredges, Ferries, Government, Excursion Vessels, Recreational, etc.

Source Categories – Land Based

- Cargo Handling Equipment (Nonroad)
 - Yard Hustlers/Hostlers, UTRs, Terminal Tractors
 - Rubber Tired Gantries
 - S
- Rail/Locomotive
 - Line Haul
 - Switching
- Heavy Duty Vehicles (Trucks)
 - Queuing
 - On Terminal
 - Port Boundary/Nonattainment Area
- Small Stationary Sources
 - Painting Operations, Degreasing, Fuel Dispensing/Storage, etc.

OGV Route Modeling



Results

● Houston-Galveston Area Marine

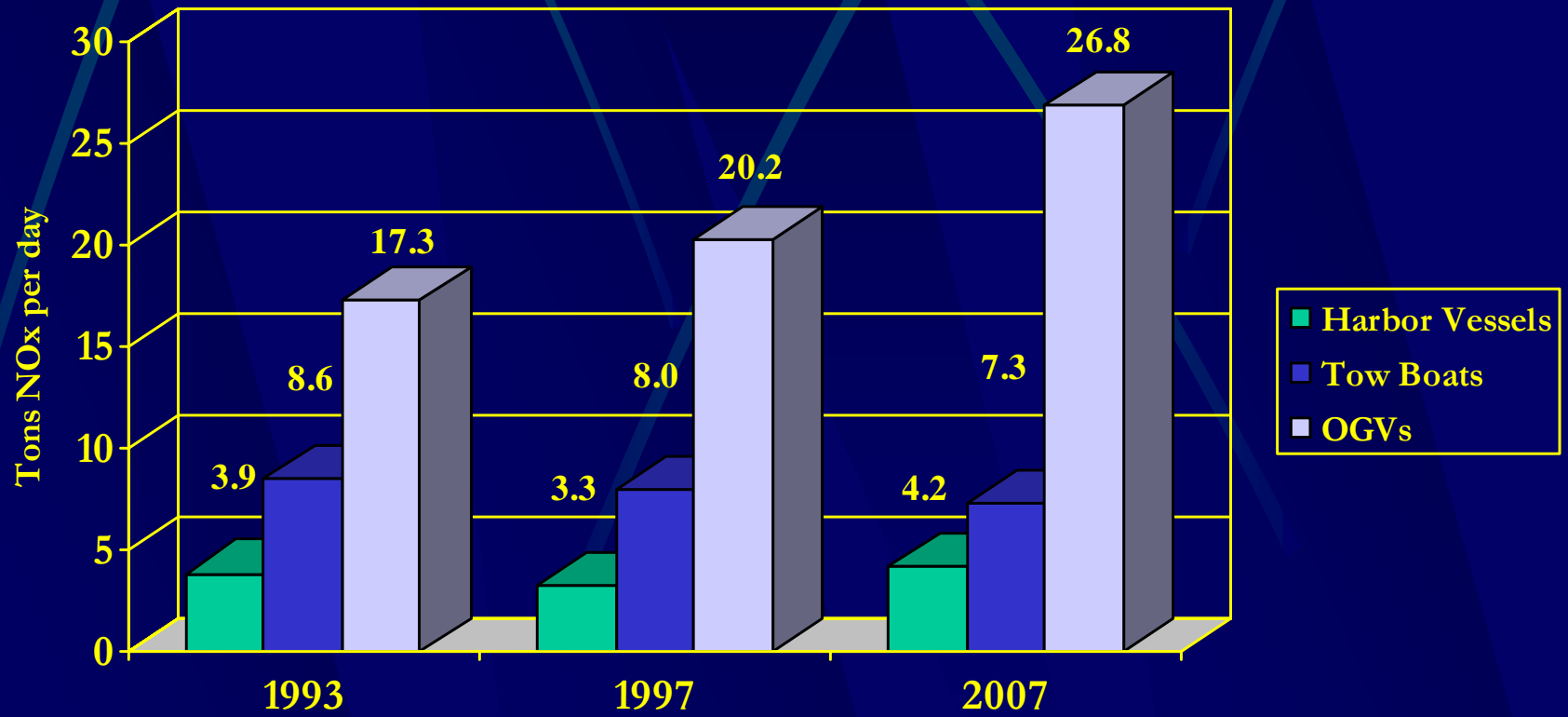
- 1990 HGAVEI: 14.6 tpd VOC 75.3 tpd NOx
- 1991 HGAVEI: 3.8 tpd VOC 40.0 tpd NOx
- 1993 HGAVEI: 4.3 tpd VOC 50.6 tpd NOx
- 2000 HGAVEI: 1.0 tpd VOC 31.5 tpd NOx

● CMVEI Compared with Previous Inventories

- 1990 NYSDEC 2.4 tpd NOx
- NJDEP 26 tpd NOx
- 1996 NYSDEC 7 tpd NOx
- NJDEP 41 tpd NOx
- 2000 CMVEI NY 18 tpd NOx
- CMVEI NJ 15 tpd NOx

Results - Houston

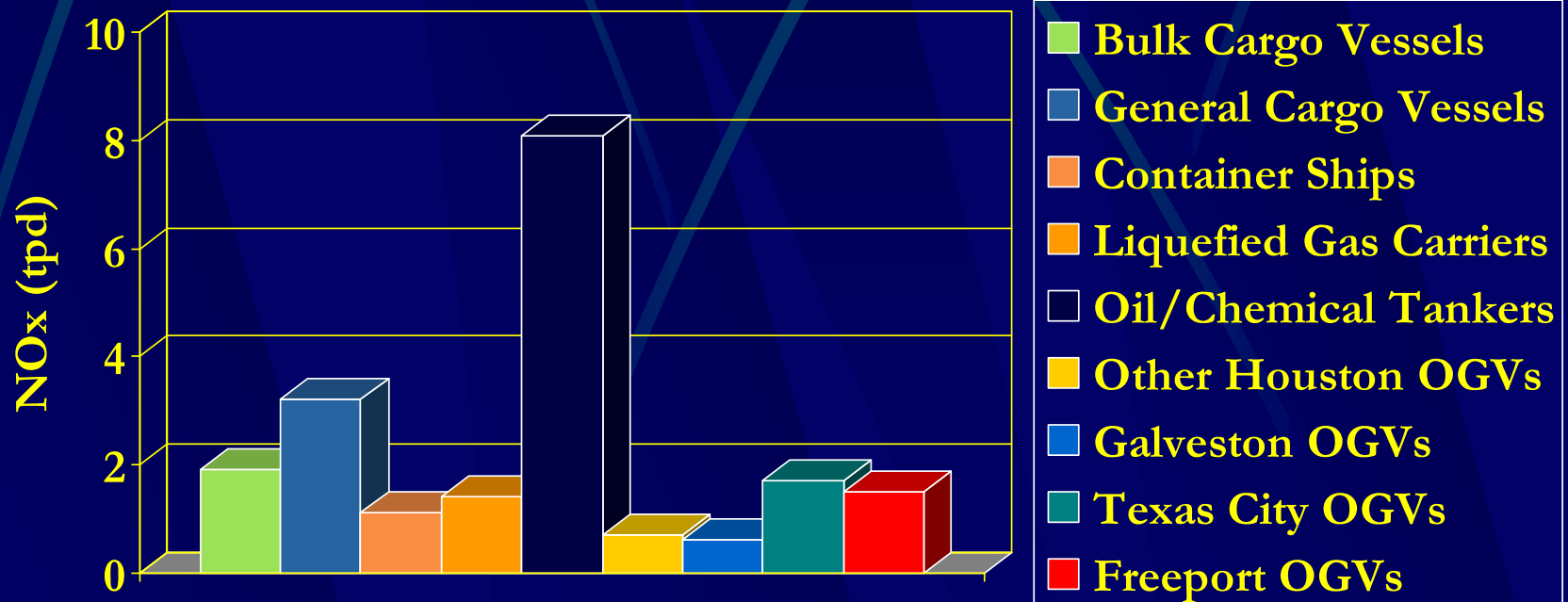
● Emissions by Vessel Type



Results - Houston

● Emissions by OGV Type

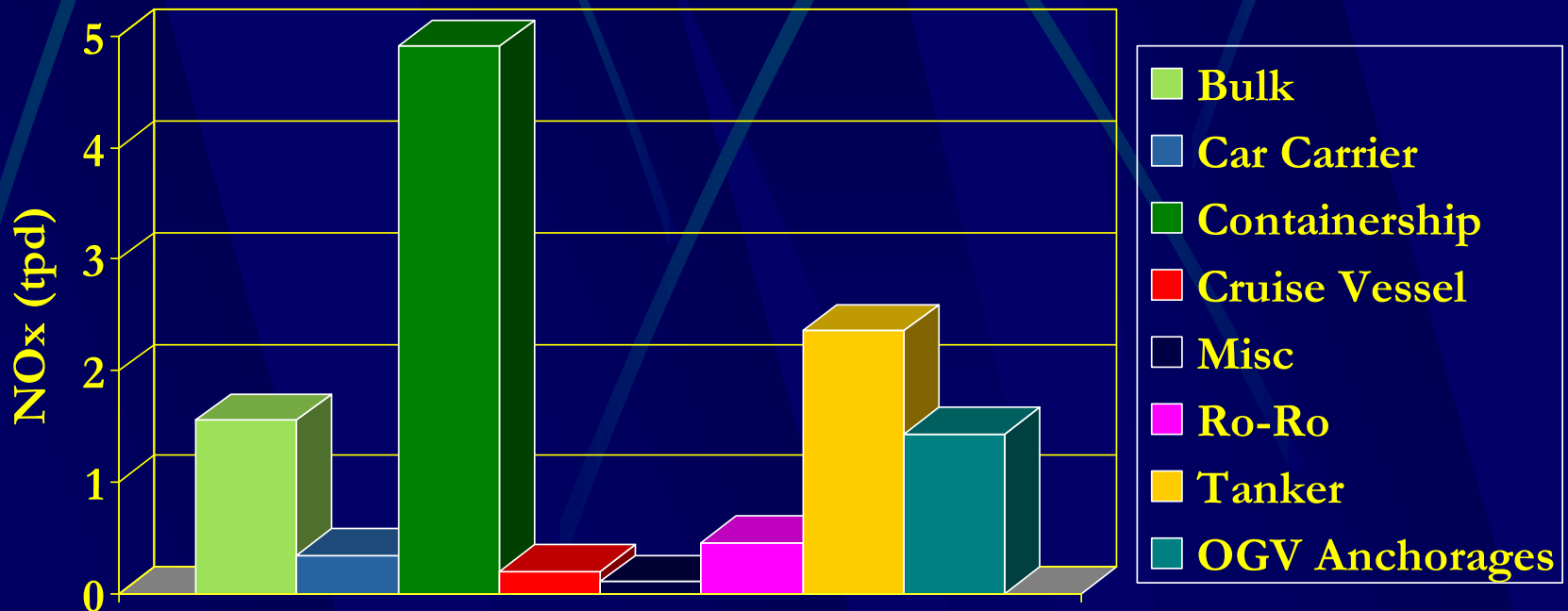
NO_x Emissions by OGV Type



Results – NY/NJ

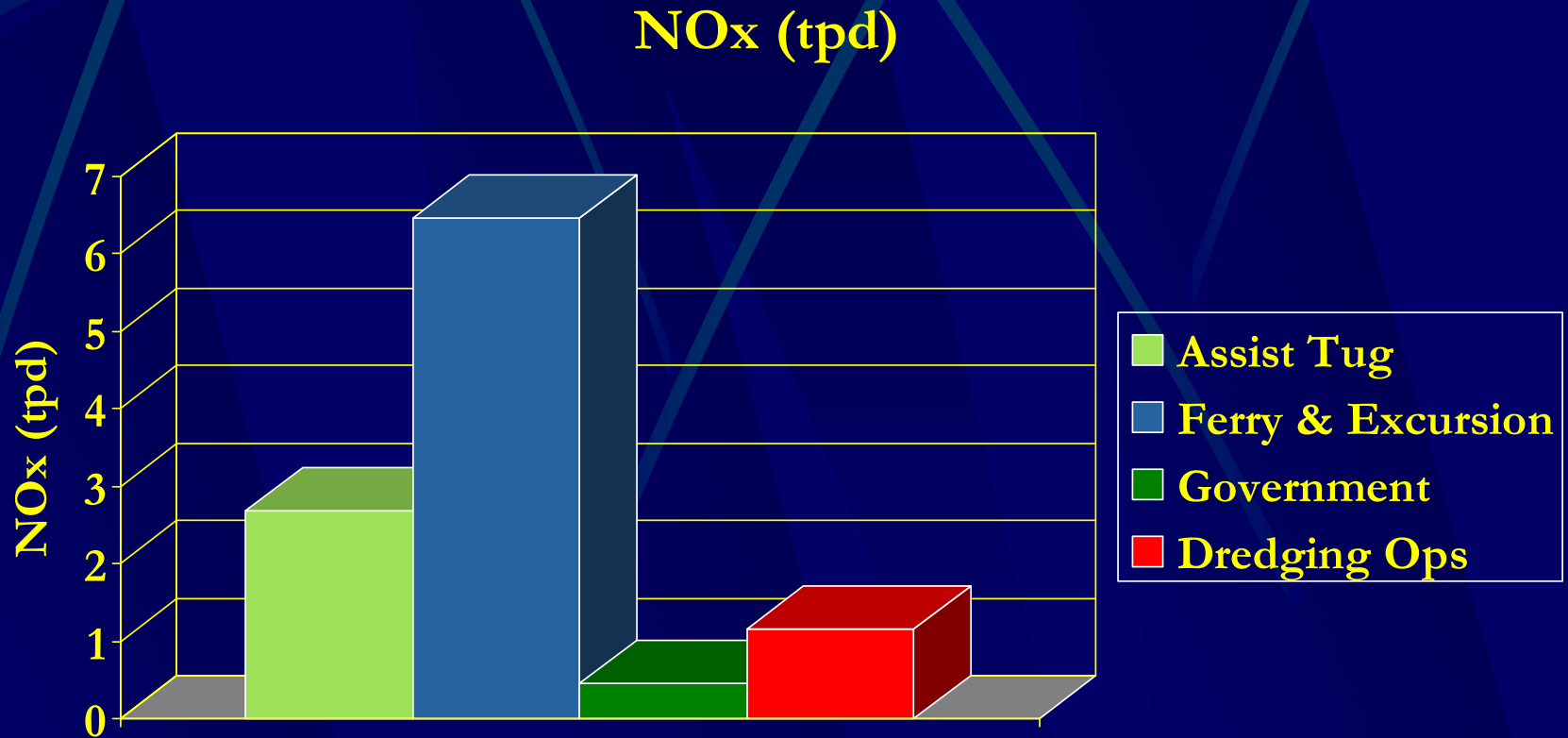
● Emissions by OGV Type

NO_x (tpd)



Results – NY/NJ

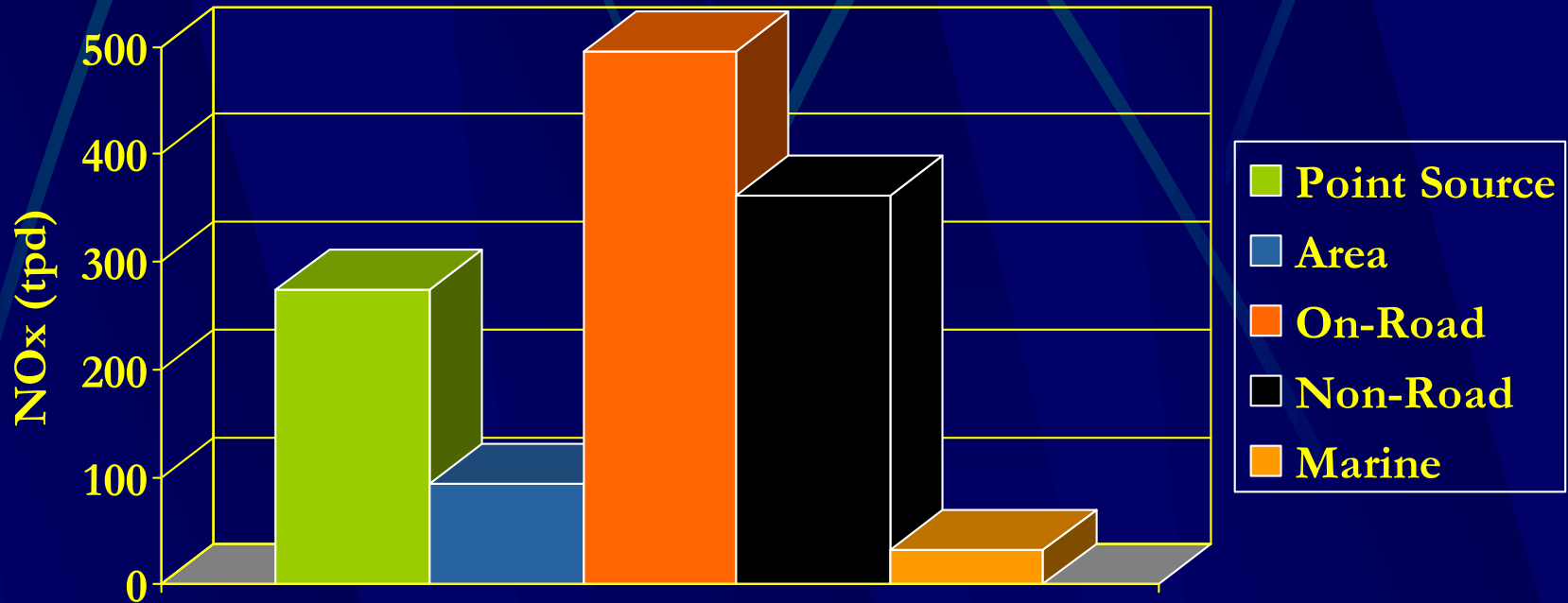
● Emissions by Harbor Vessel Type



Results – NY/NJ

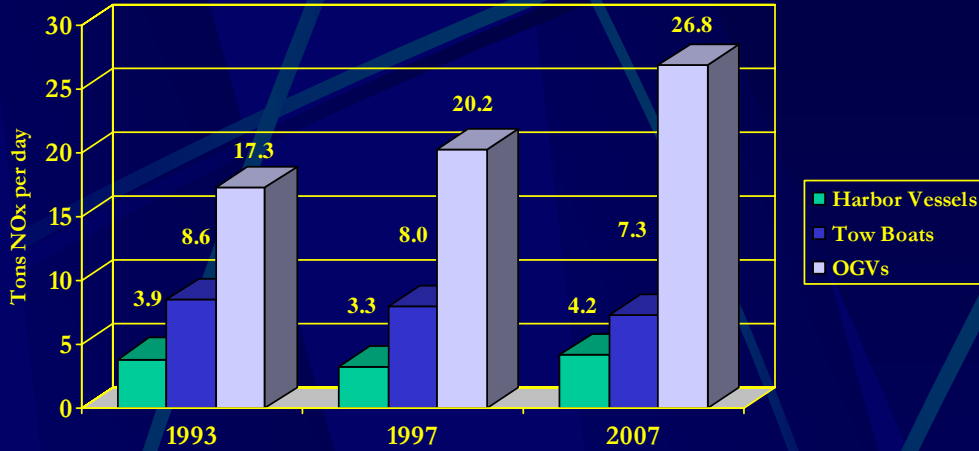
NY & NJ SIP Inventories

NO_x (tpd)

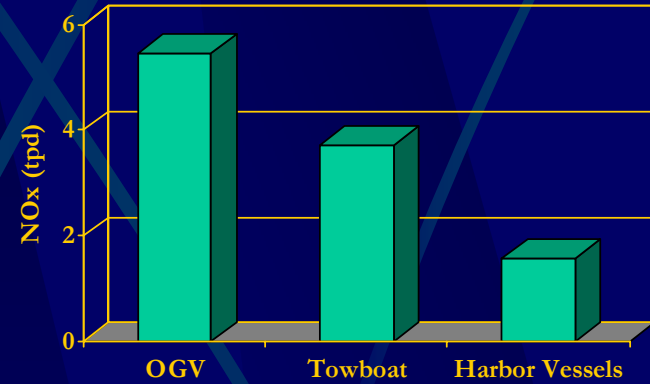


Results – Marine Vessel Mix

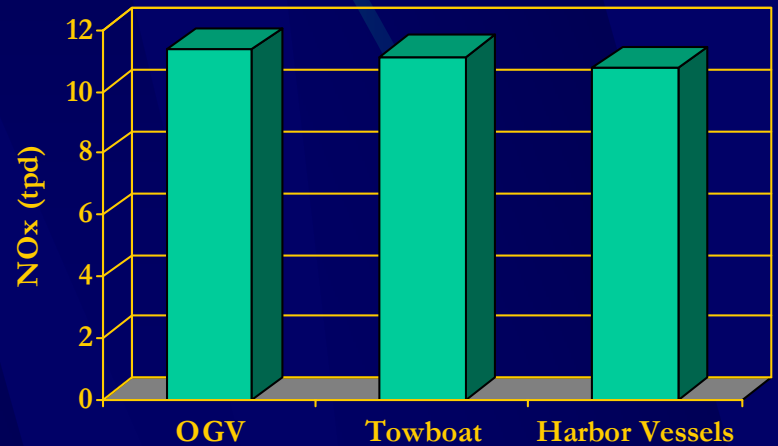
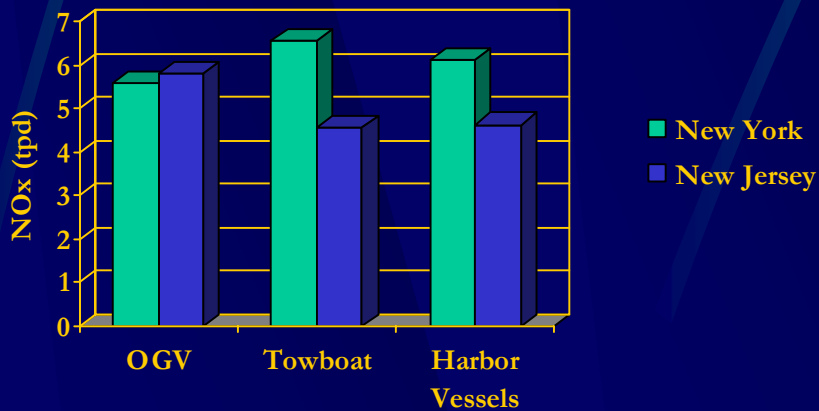
PHA



BPA

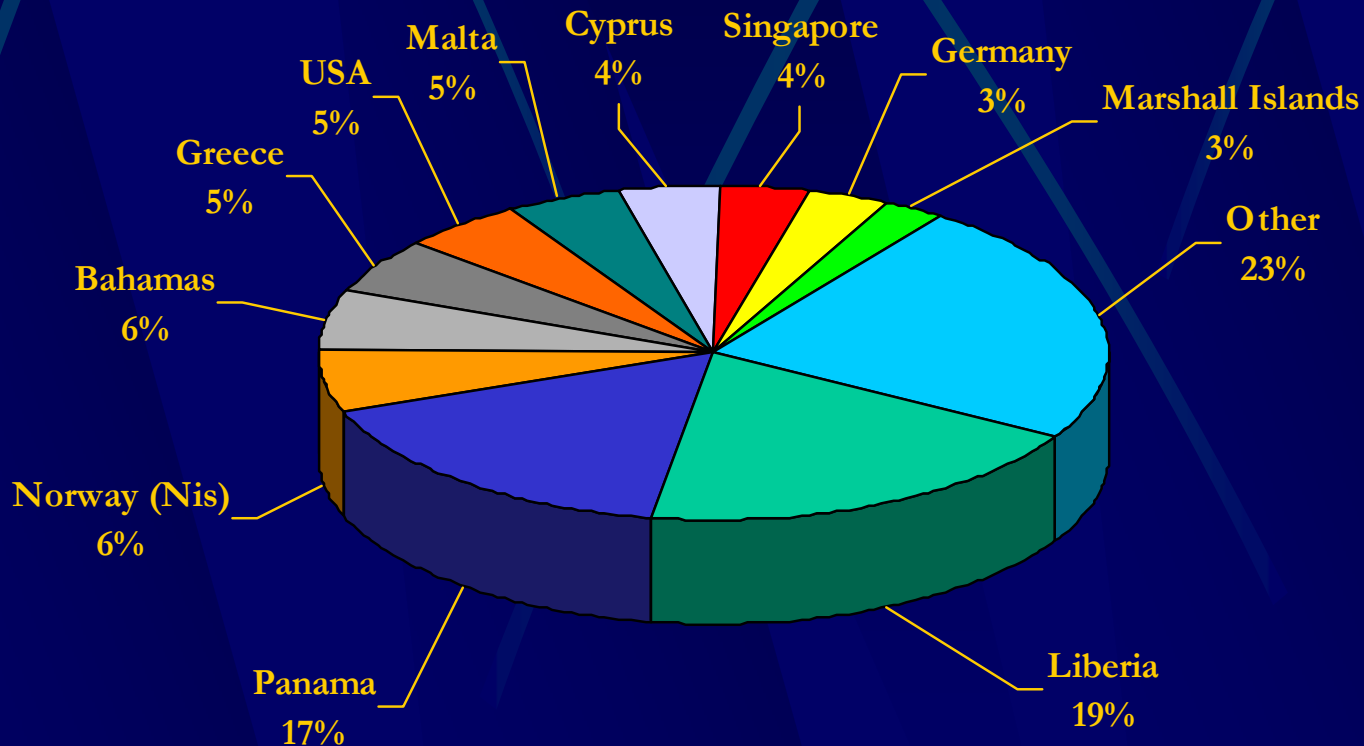


NY/NJ



Results – OGV Registration

● Vessel Registration for OGVs Calling at PANYNJ



Benefits of Activity-Based EIs

- More Accurately Estimates Emissions
- Establishes Consistency when Addressing Emissions Levels, Sources, & Effects
- Provides a Science-Based Foundation by Which Policy can be Developed & Commented On
- Identifies “Low Hanging Fruit”
- Allows for Quantification of Efficiency Improvements
- Future Forecasting & What if Scenarios
- Potential to Establish New Relations w/ Regulators, Ports, Industry, & Owner/Operators
- Evaluating Modal Shifts in Transportation Systems
- Improves Spatial Allocation of Emissions
- Many more...