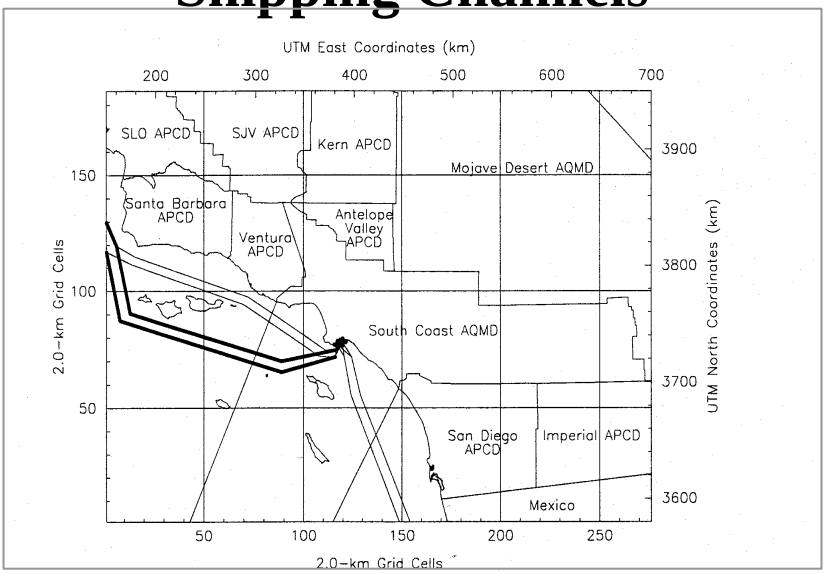
Voluntary Commercial Cargo Ship Speed Reduction Emission Reduction Program

California Air Resources Board
Marine Technical Working Group
December 6, 2001

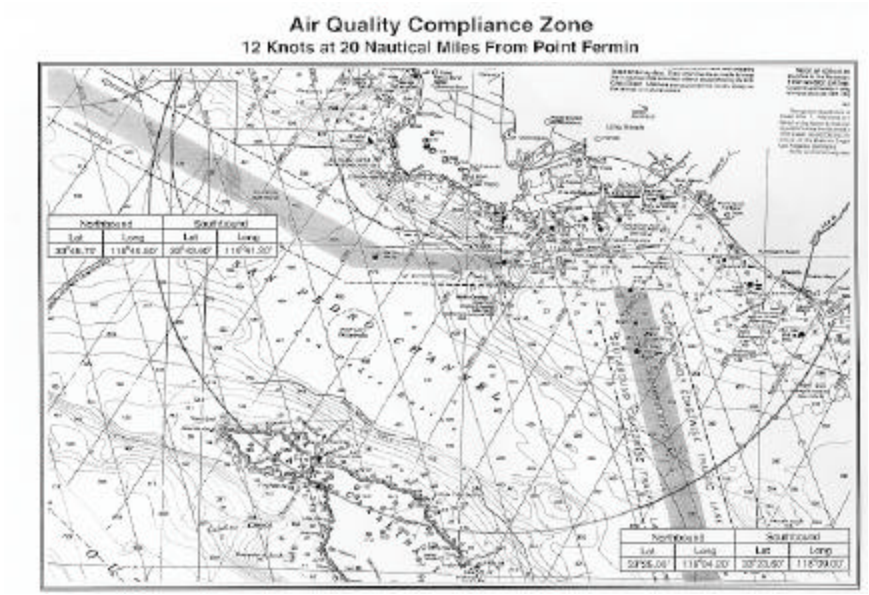
T.L. Garrett

Vessel Operational Controls

Existing and Proposed Shipping Channels

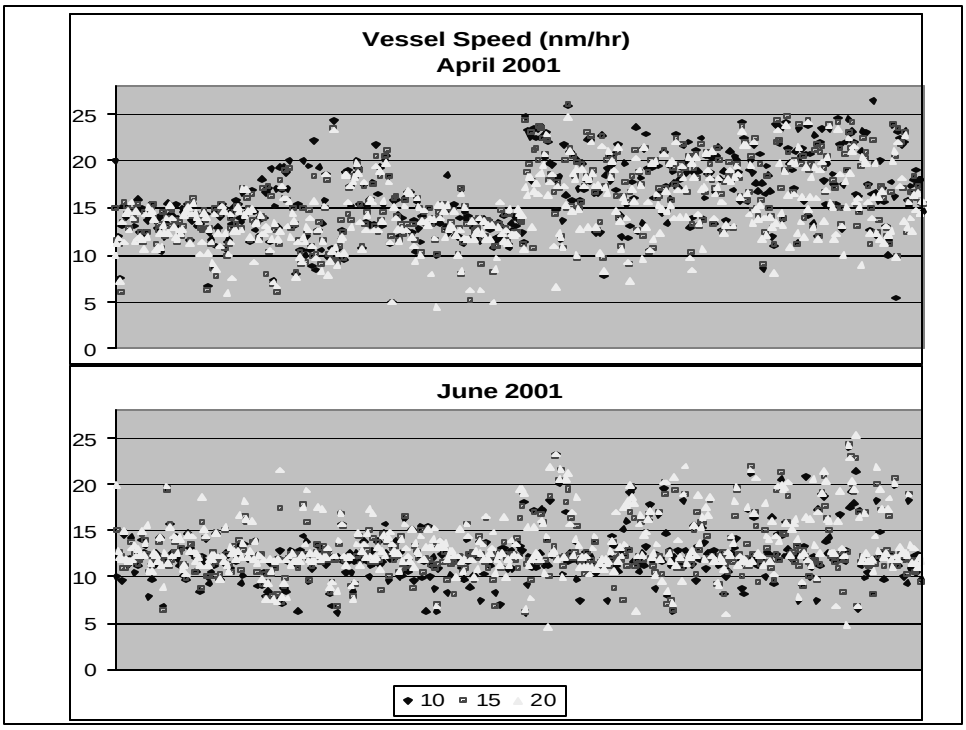


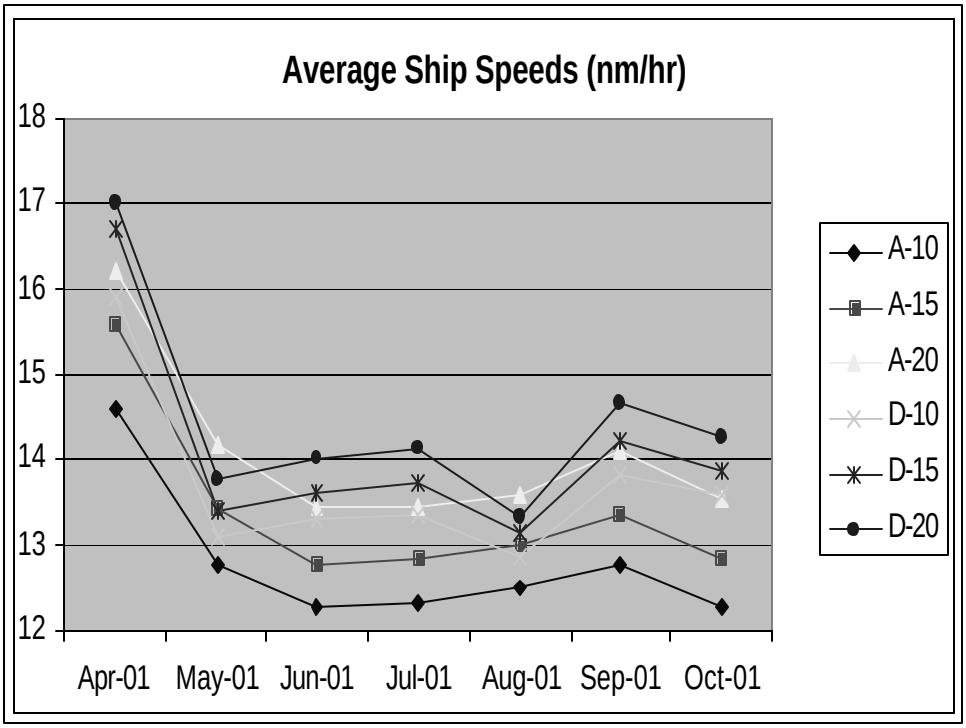
Vessel Speed Reduction

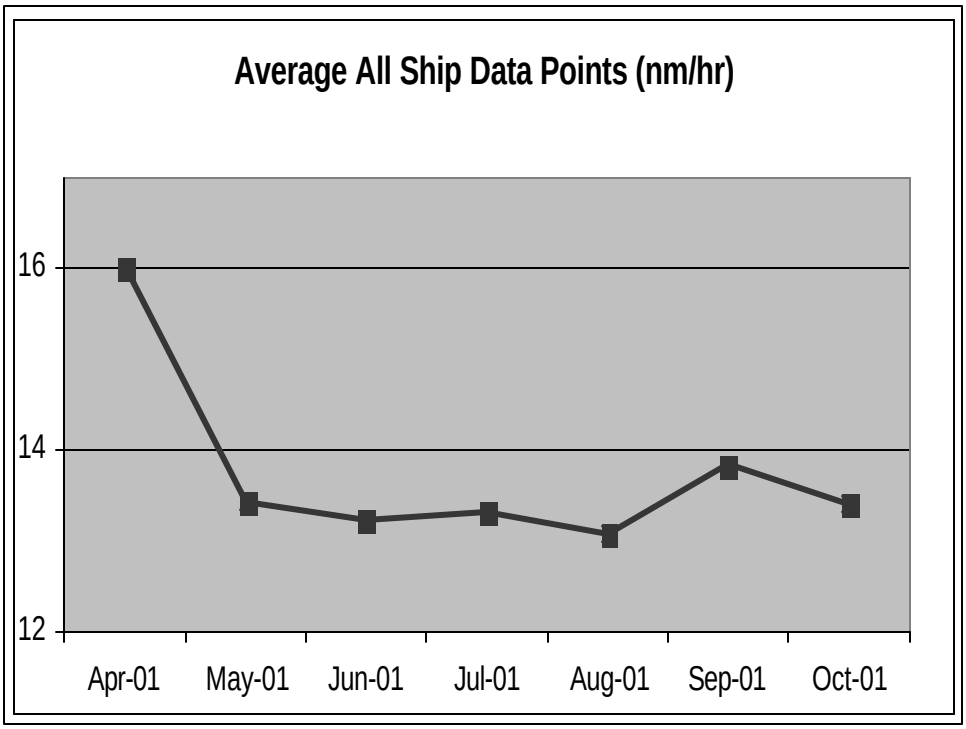


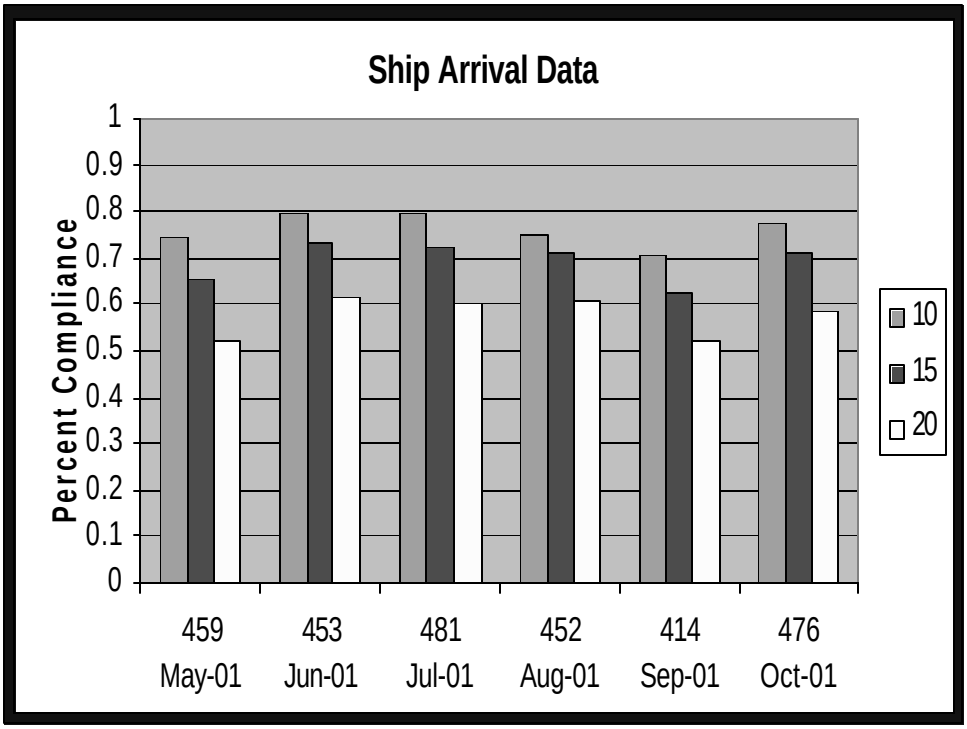
Monitoring of Compliance

- **Six Months of Data**
  - **Appx. 2800 ship calls**
  - **Appx. 460 per month**
- **Container vessels > 50 %**
  - **Appx. 1400 ship calls**
  - **Appx. 240 per month**

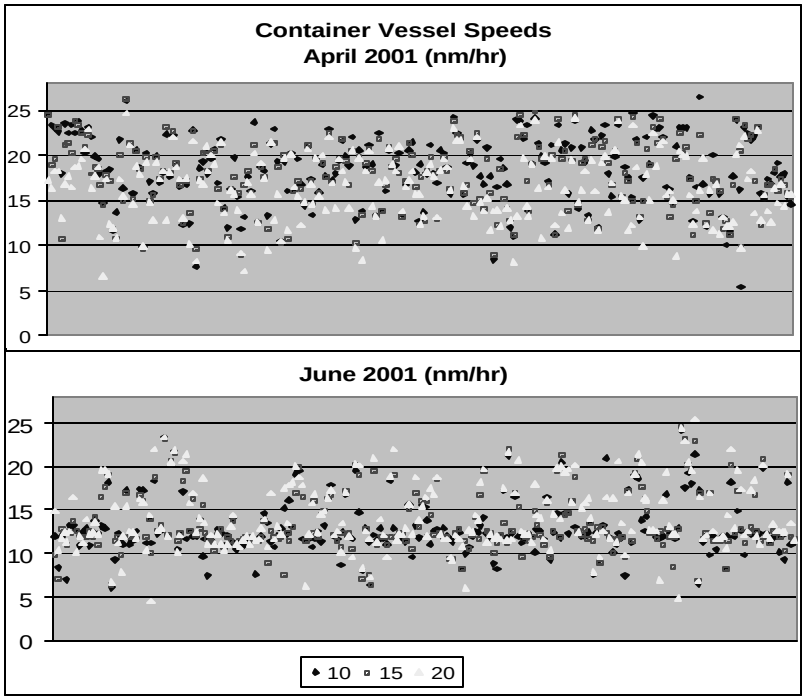

Vessel Speed (nm/hr)
April 2001
25
20
15
10
5
0
June 2001
25
20
15
10
5
0
10
15
20

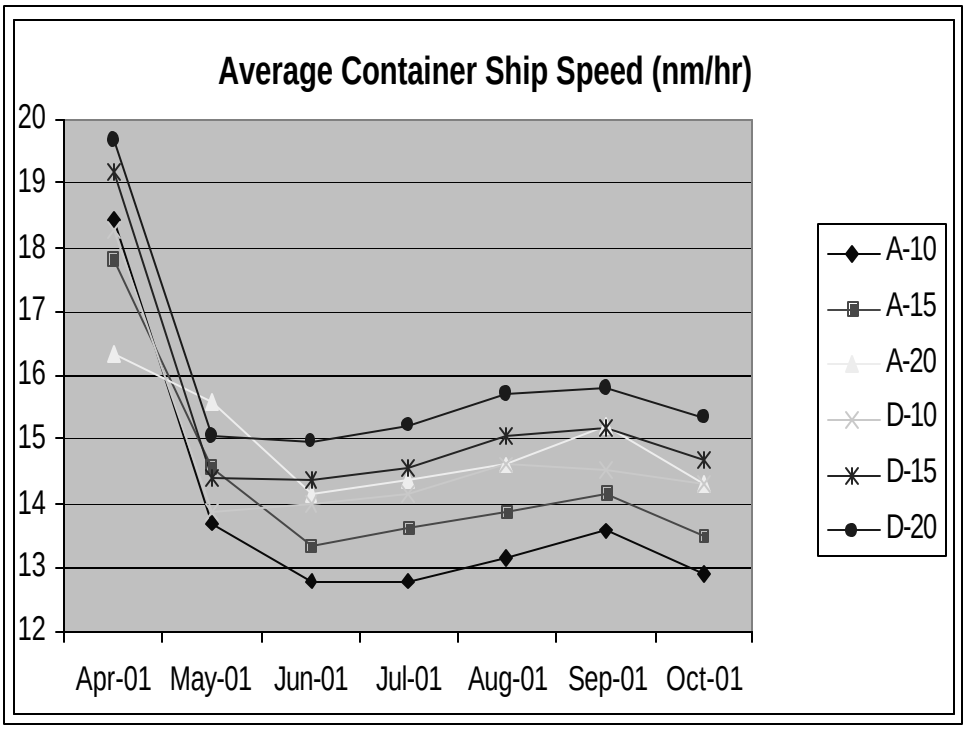

Average Ship Speeds (nm/hr)
18
17
16
15
14
13
12
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
A-10
A-15
A-20
D-10
D-15
D-20

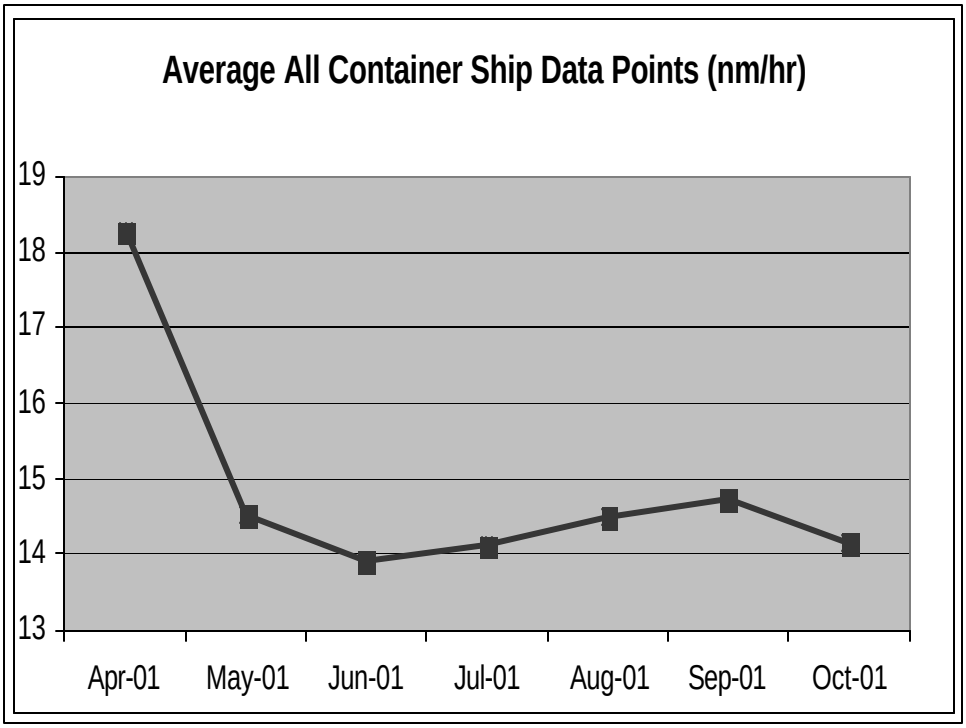

Average All Ship Data Points (nm/hr)
16
14
12
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01


Ship Arrival Data
Percent Compliance
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
459
May-01
453
Jun-01
481
Jul-01
452
Aug-01
414
Sep-01
476
Oct-01
10
15
20

Container Vessels




Average Container Ship Speed (nm/hr)
20
19
18
17
16
15
14
13
12
Apr-01
May-01
Jun-01
Jul-01
Aug-01
Sep-01
Oct-01
A-10
A-15
A-20
D-10
D-15
D-20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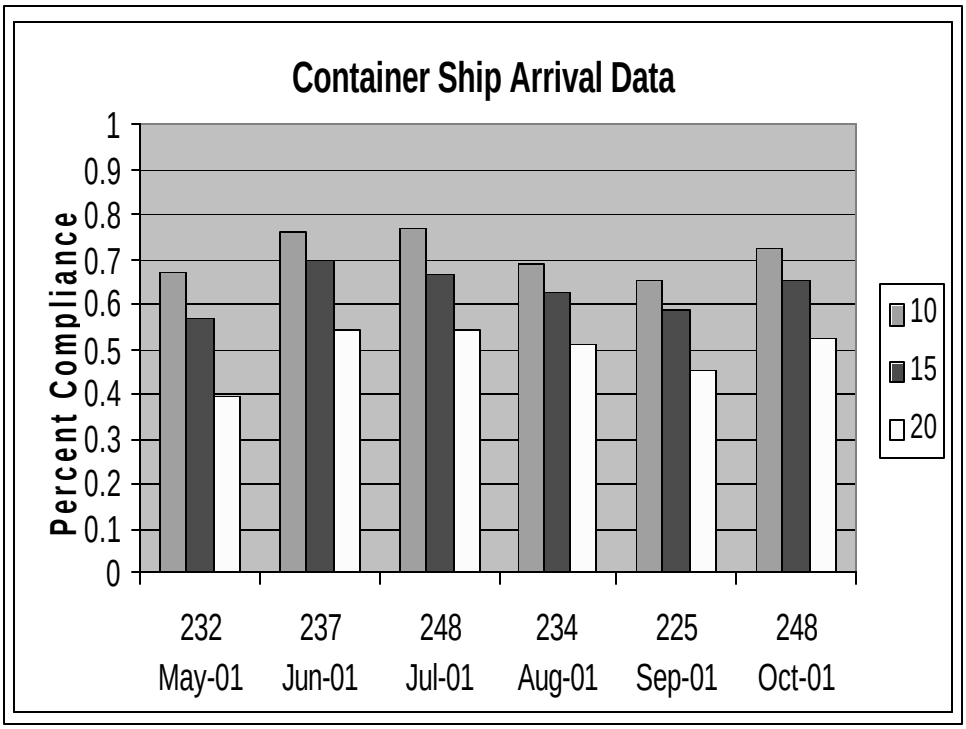
Sep-01
Oct-01



Summary

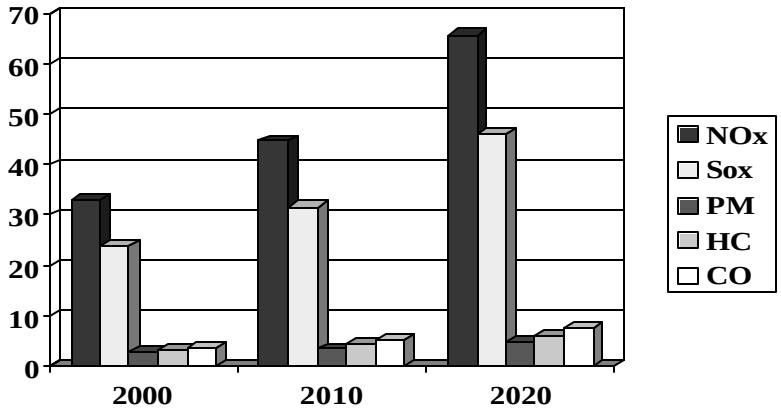
- **VSR Measure is Working but Could/ Should be Better**
- **Need to Improve Education and Provide Incentives to Responsive Shippers**
- **Calculation of Emissions Benefits will require SIGNIFICANT EFFORT**

Next Steps

- **Develop Vessel Specific Engine Data Base**
- **Update Vessel Emission Factors**
- **Reevaluate Power vs. Fuel Consumption**
- **Calculate Emissions Benefits of VSR**

Marine Vessel Emissions

(ton/day)



Marine Vessel Control Measure M13

- **IMO Standards - 1998**
- **EPA National Standards - 1999**
- **Operational Controls (Voluntary)**
  - **Relocated Shipping Channel**
  - **Vessel Speed Reductions**

Next Steps cont.

- **Account for Marine Vessel Emission Improvements**
- **Revise the Baseline or Reduce the Burden**
- **Develop and Implement New Controls**

Special Thanks!