San Pedro Harbor Communities Monitoring Study

California Air Resources Board

Overview Presentation

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to the

West Coast Collaborative

Marine Vessels and Ports Sector

June 4, 2008

HCMS Design

- **Harbor Communities**
  - Wide variety of pollution sources
  - Complex meteorology
  - Residential neighborhoods impacted
  - Active community groups

- **Non-traditional Monitoring to Assess Intra-Community Pollutant Variations**
  - DRI - primarily passive samplers
  - USC - particle counters
  - UCLA - mobile monitoring platform

Objectives & Questions
to be addressed by the HCMS

❑ Characterize Spatial Air Quality Variations

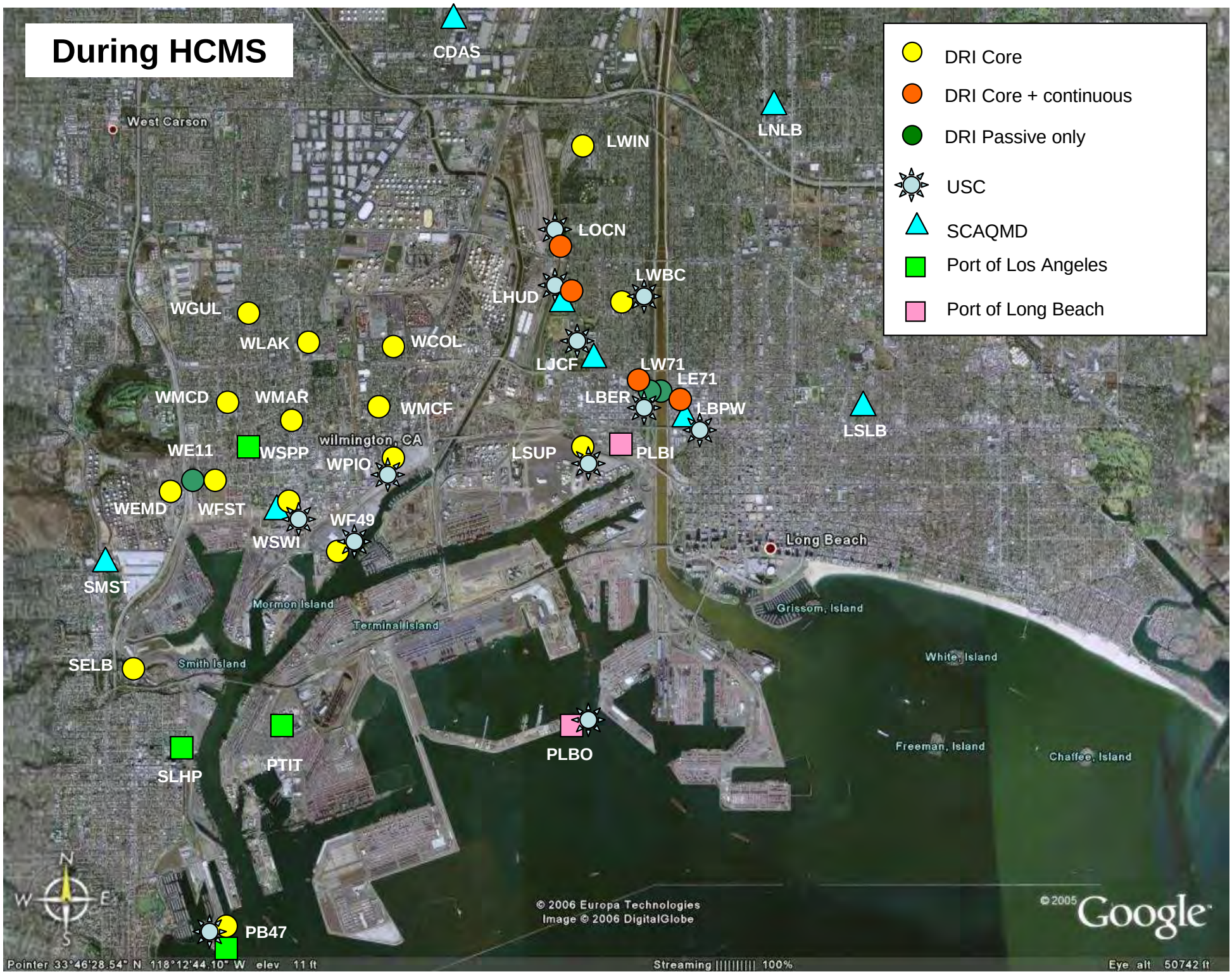
- Does the long-term monitoring network adequately characterize pollution in the HC?
- Do pollutant concentrations in the HC exceed AQ standards?
- Is air pollution greater in the HC than in other areas of SoCAB?

❑ Characterize Impacts of Pollution Sources

- Can the AQ measurements be deconstructed to characterize the relative contributions of regional and local pollution sources?
- Were previous modeling assessments accurate in predicting the distribution of pollutants in the HC?

❑ Assess Measurement Methods

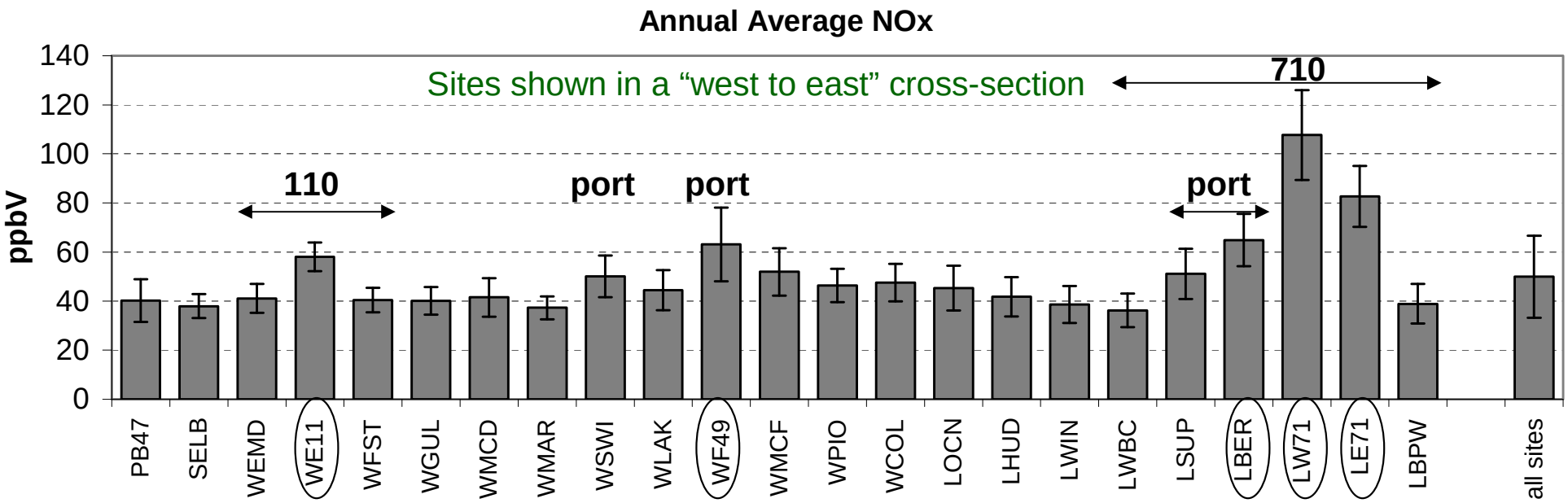
- Can lower-cost passive sampling characterize concentrations?

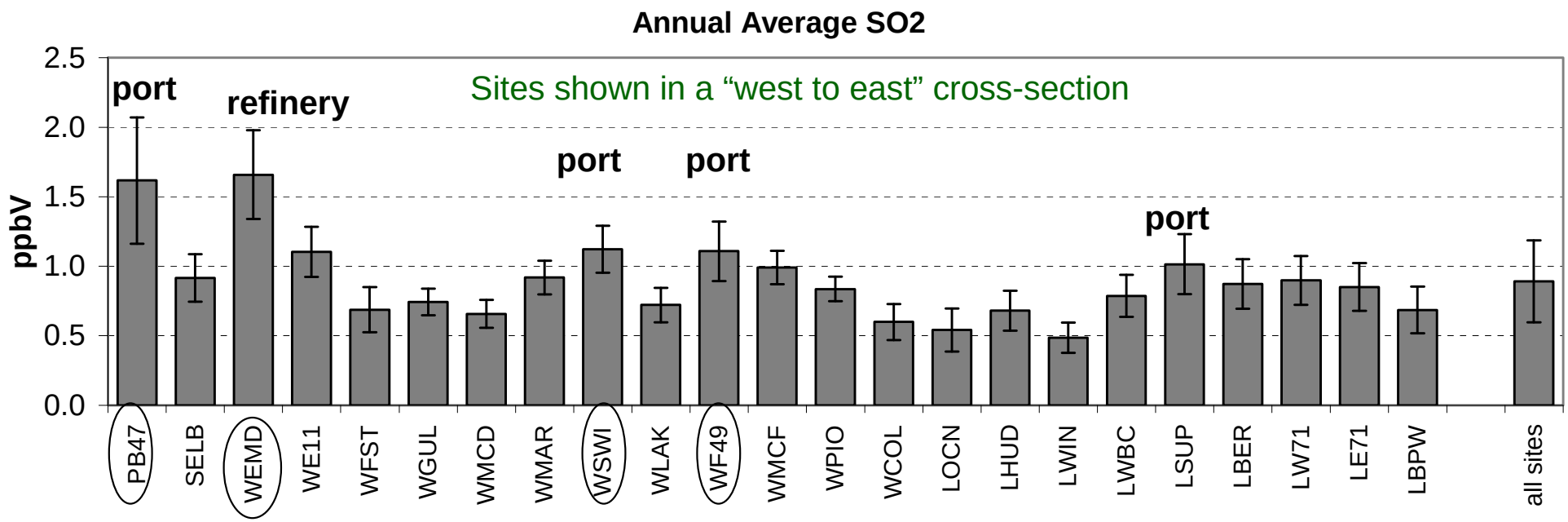

During HCMS
DRI Core
DRI Core + continuous
DRI Passive only
USC
SCAQMD
Port of Los Angeles
Port of Long Beach
CDAS
LNLB
LWIN
LOCN
LWBC
LHUD
WGUL
WLAK
WCOL
LJCF
LW71
LE71
LBER
LBPW
WMCD
WMAR
WMCF
LSLB
WE11
WSPP
wilmington, CA
WPIO
LSUP
PLBI
WEMD
WFST
WSWI
WF49
Long Beach
SMST
Mormon Island
Terminal Island
Grissom, Island
SELB
Smith Island
White, Island
PLBO
Freeman, Island
Chaffee, Island
SLHP
PTIT
PB47
© 2006 Europa Technologies
Image © 2006 DigitalGlobe
©2005 Google
Pointer 33°46'28.54" N 118°12'44.10" W elev 11 ft
Streaming 100%
Eye alt 50742 ft

Preliminary Results from DRI

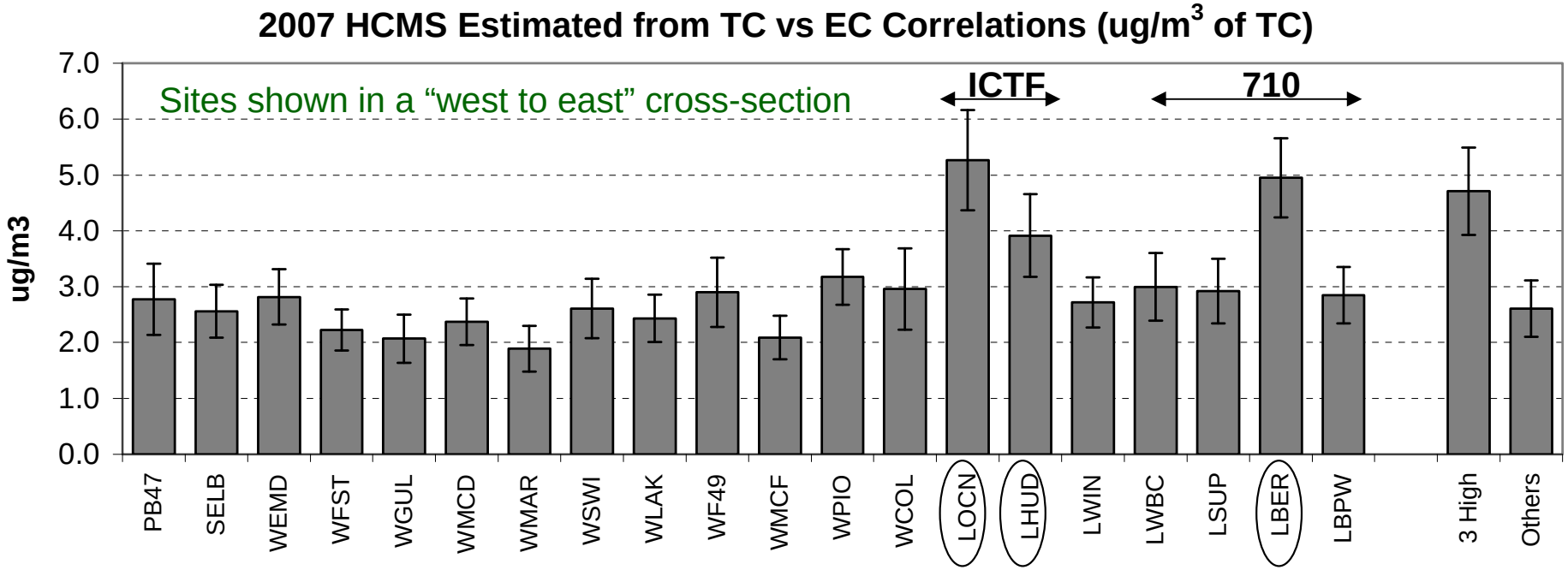
- **23 passive sites (NO_X, SO_2, BTEX, aldehydes)**
  - 3 sites supplemented with passive NO_2 and H_2S
  - 20 sites supplemented with PM2.5
  - 4 sites supplemented with continuous BC, CO, VOC, PM2.5
- **1-week samples, 4 weeks/season, 4 seasons**
- **Monitoring Periods**
  - 2/13/07 to 3/13/07 (winter)
  - 5/15/07 to 6/12/07 (spring)
  - 7/31/07 to 8/28/07 (summer)
  - 11/13/07 to 12/11/07 (fall)

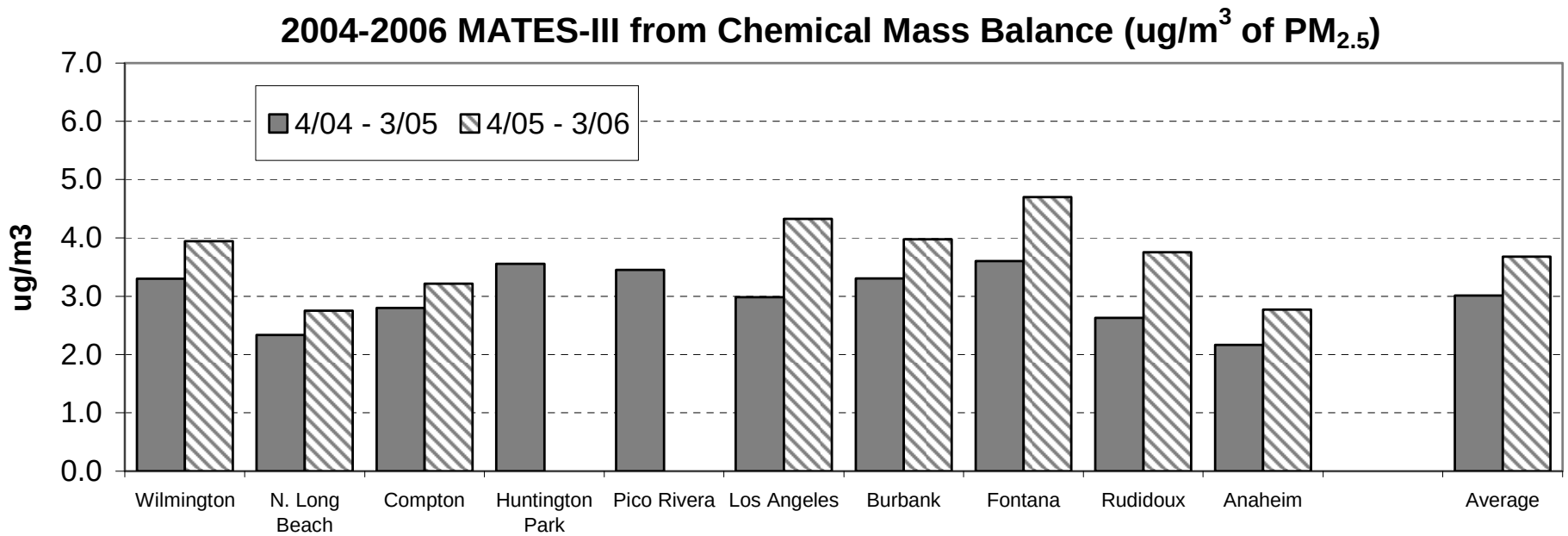
Variation of NOx and SO_2 Concentrations within Harbor Communities





Estimated Annual Average Diesel PM Concentrations





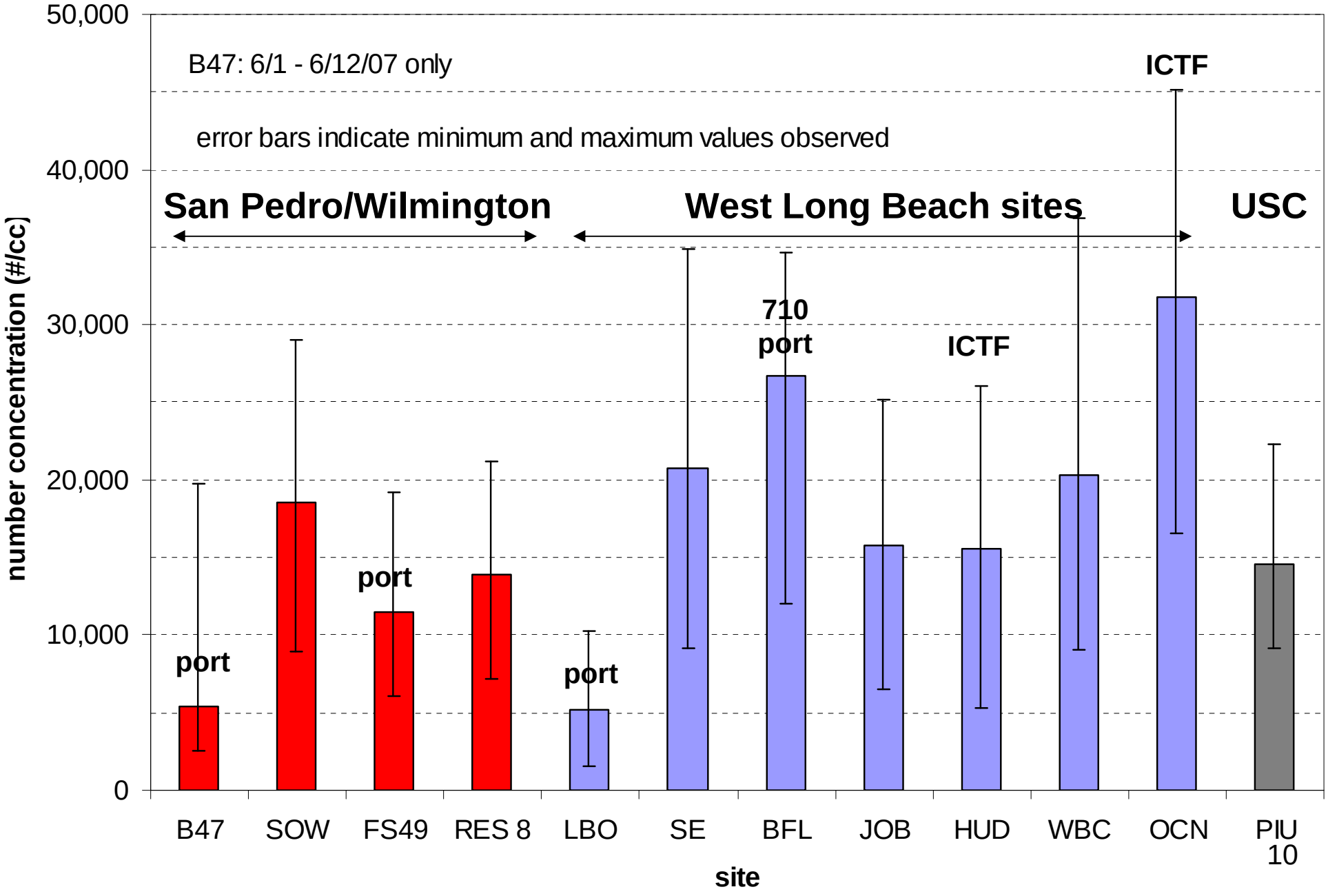
DRI Saturation Sampling Summary

- Pollutant concentrations are higher near roadways. Estimated annual average concentrations of diesel particulate matter (DPM) were higher near diesel truck routes.
- Annual average DPM concentrations were comparable to the rest of the basin at locations 300 m or more from traffic.
- DPM results are consistent with earlier ARB modeling.
- Higher than average SO_2 levels were measured at the east boundary of the Conoco-Phillips Refinery and in the port area.

Preliminary Results from USC

- Condensation particle counter (d<0.2µm)
- Counts dominated by ultrafine particles (d<0.1µm)
- Continuous counts mid-Feb thru mid-Dec 2007
- 12 sites in Harbor Communities; 1 at USC
- Minute by minute particle counts and meteorology

Mean 24-hour Particle Number Concentrations
Spring study period



USC Particle Count Summary

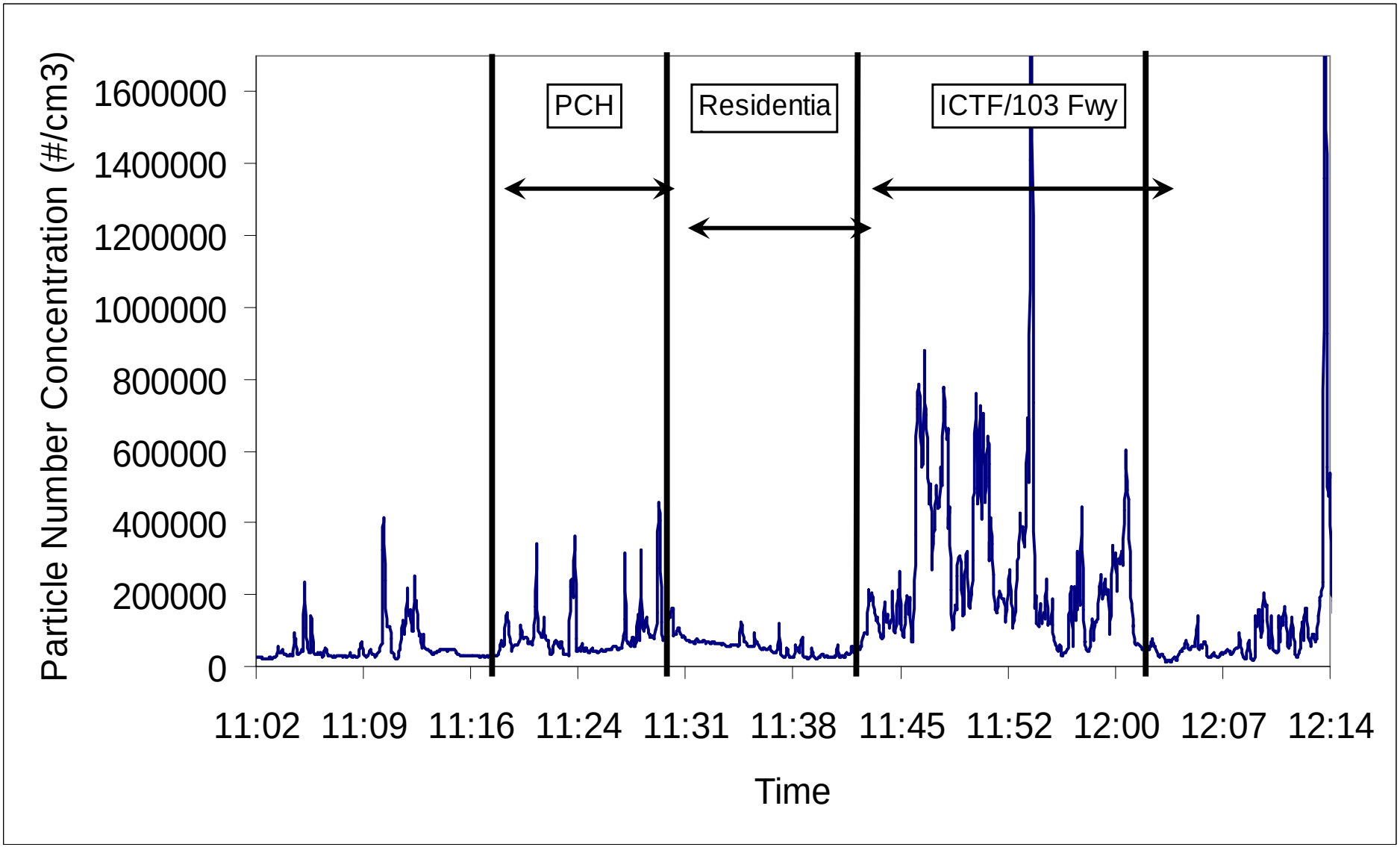
Ultrafine particle concentrations vary with:

- Proximity to combustion sources
- Source emission patterns (spatial and temporal variations tend to have a goods movement signature)
- Meteorological patterns

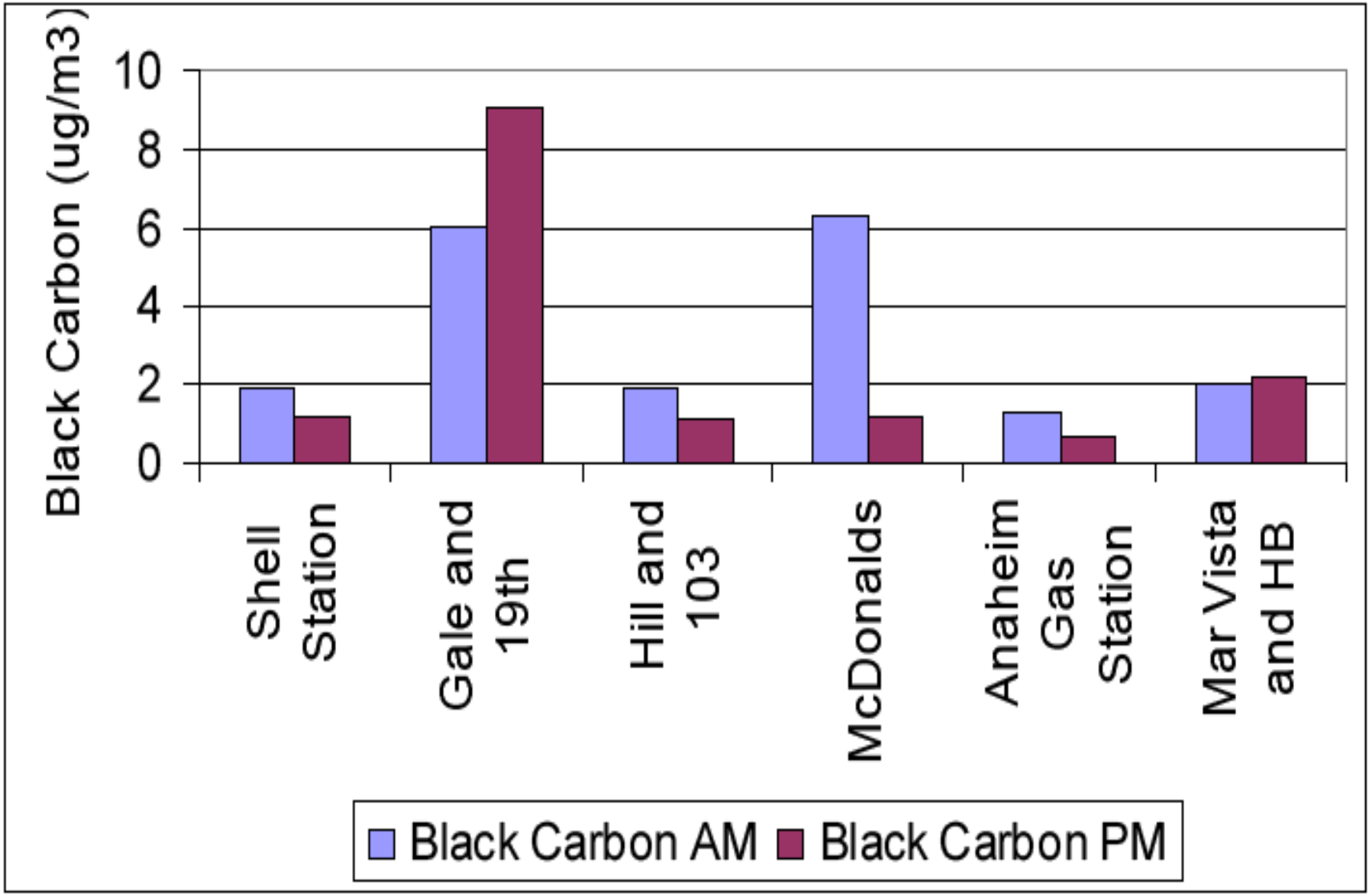
Preliminary Results from UCLA

- Repeated sampling runs over fixed routes
  - Port/Freeway/Truck
  - Residential
- CO, CO_2, NO_X, VOC, H_2S, PAH, PM2.5, particle number
- 12-15 days (am/pm)/season
- winter/summer/+ supplemental runs

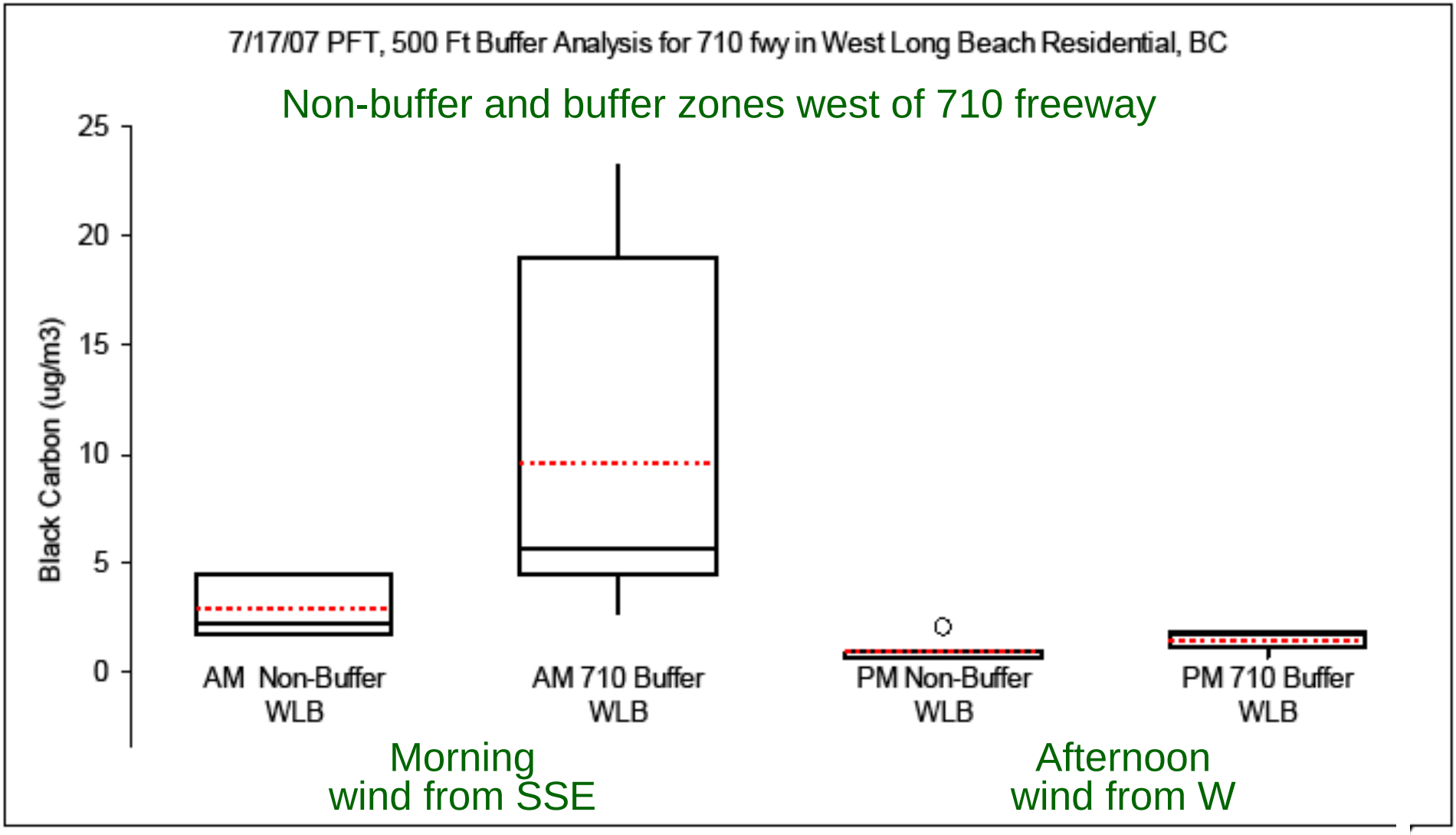
Concentrations During a Run



DRAFT Near-Roadway Results
Winter



710 Freeway Buffer Analysis
Black Carbon



Summary and Implications

- Concentrations of black carbon, NO, and particle number can be elevated in buffer zones near heavily-traveled roadways
- The presence of heavy-duty diesel trucks and meteorology are important factors determining when and where the highest pollutant impacts occur
- Depending on meteorology, near-roadway exposures can be significant for persons living, working, shopping, or recreating in buffer areas close to heavily-trafficked roadways

What's Next?

CARB HCMS - field work complete

1) August - finish data validation & analysis
2) September – Community & Board briefings
3) October – populate database & publish papers
4) December - final reports & community briefing

Ports of LA and LB

1) Collect ≥3 years of data

South Coast AQMD Clean Ports Initiative

1) Collect ≥1 year of data

Resources

HCMS Website:

http://www.arb.ca.gov/research/mobile/hcm/hcm.htm

Ports Data Website:

http://caap.airsis.com/MapView.aspx