Air Monitoring in a Southern California Port Community

Update on the Harbor Communities Monitoring Study (HCMS)

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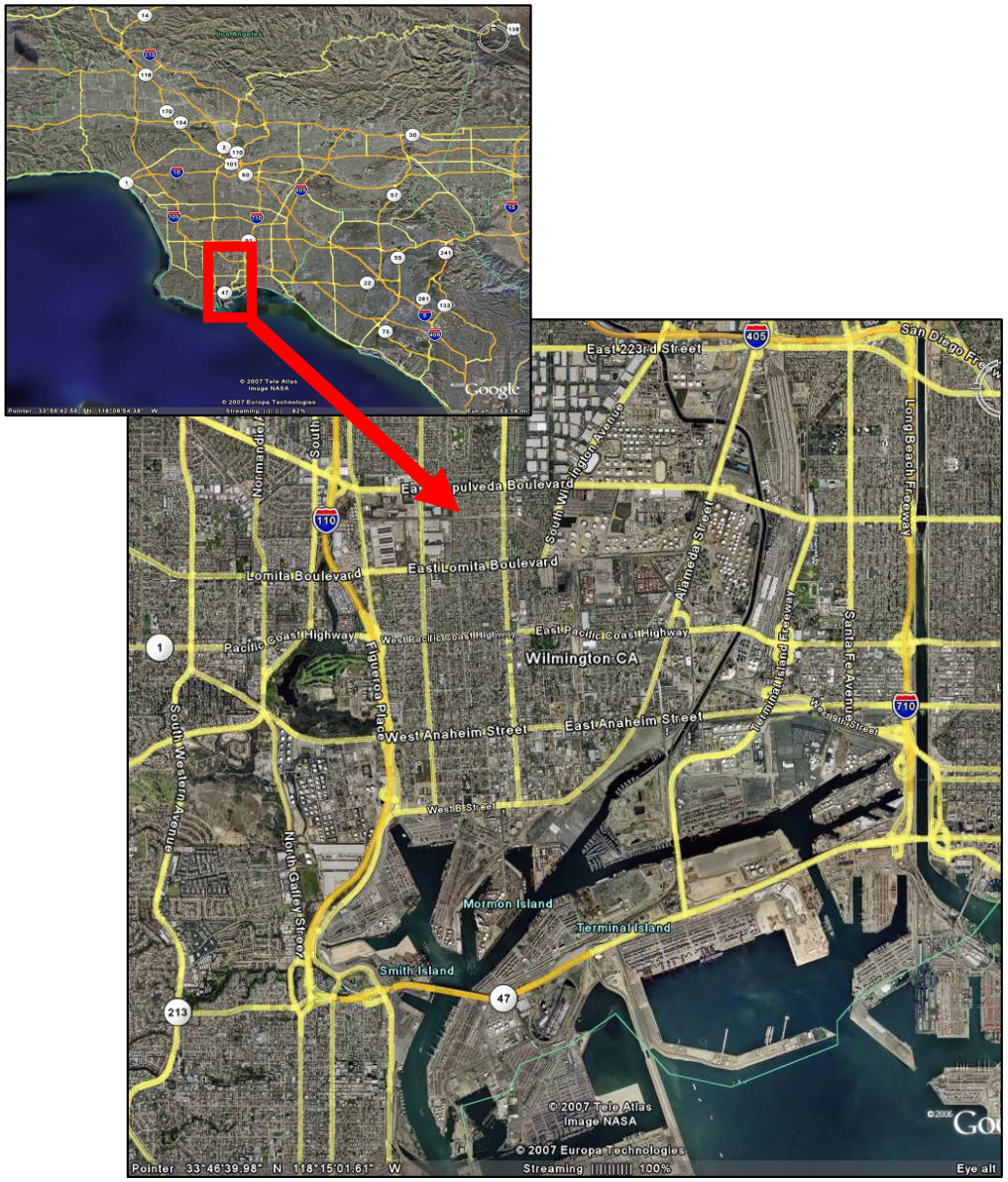
Presentation Outline

- **Background**
- **Results**
- **Next Steps**

Harbor Communities

- Wilmington
- West Long Beach
- South Carson
- San Pedro



Why the Harbor Communities?

HCMS Study Goals

- Use non-traditional methodologies for monitoring pollutants to achieve better spatial resolution
- Determine impacts of local versus regional sources
- Establish baseline to assess emissions reduction programs

HCMS Investigators and Monitoring Equipment

UCLA – instrumented electric vehicle

(NO_X, PM2.5, CO_2, particle counts …)

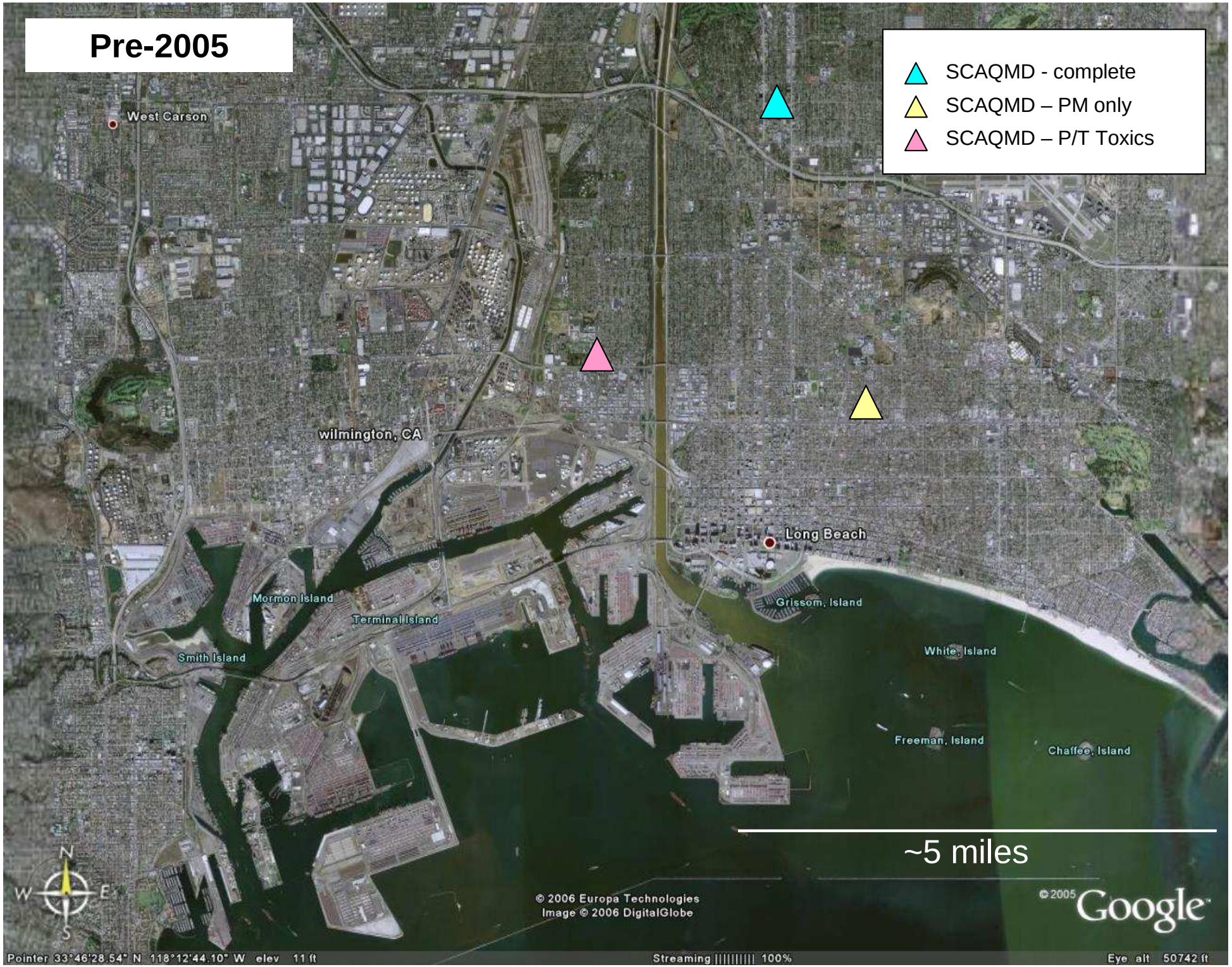
DRI – passive samplers

(NO_X, NO_2, SO_2, H_2S, BTEX, aldehydes)

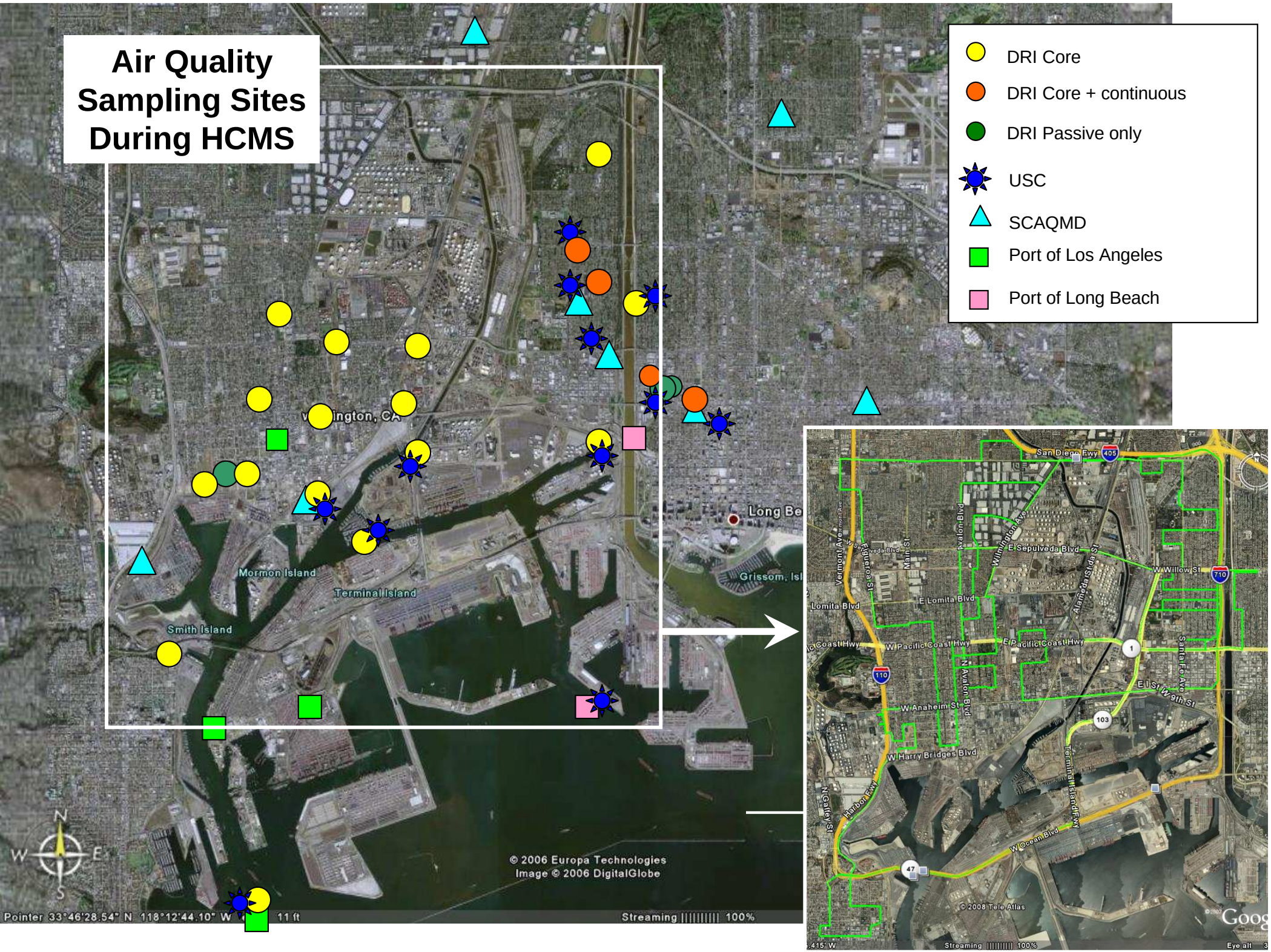
active sampling - PM2.5

USC – particle counter

Evolution of the Air Monitoring Network in the Harbor Communities


Pre-2005
SCAQMD - complete
SCAQMD – PM only
SCAQMD – P/T Toxics
West Carson
wilmington, CA
Long Beach
Mormon Island
Terminal Island
Smith Island
Grissom, Island
White, Island
Freeman, Island
Chaffee, Island
~5 miles
© 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

Air Quality Sampling Sites During HCMS



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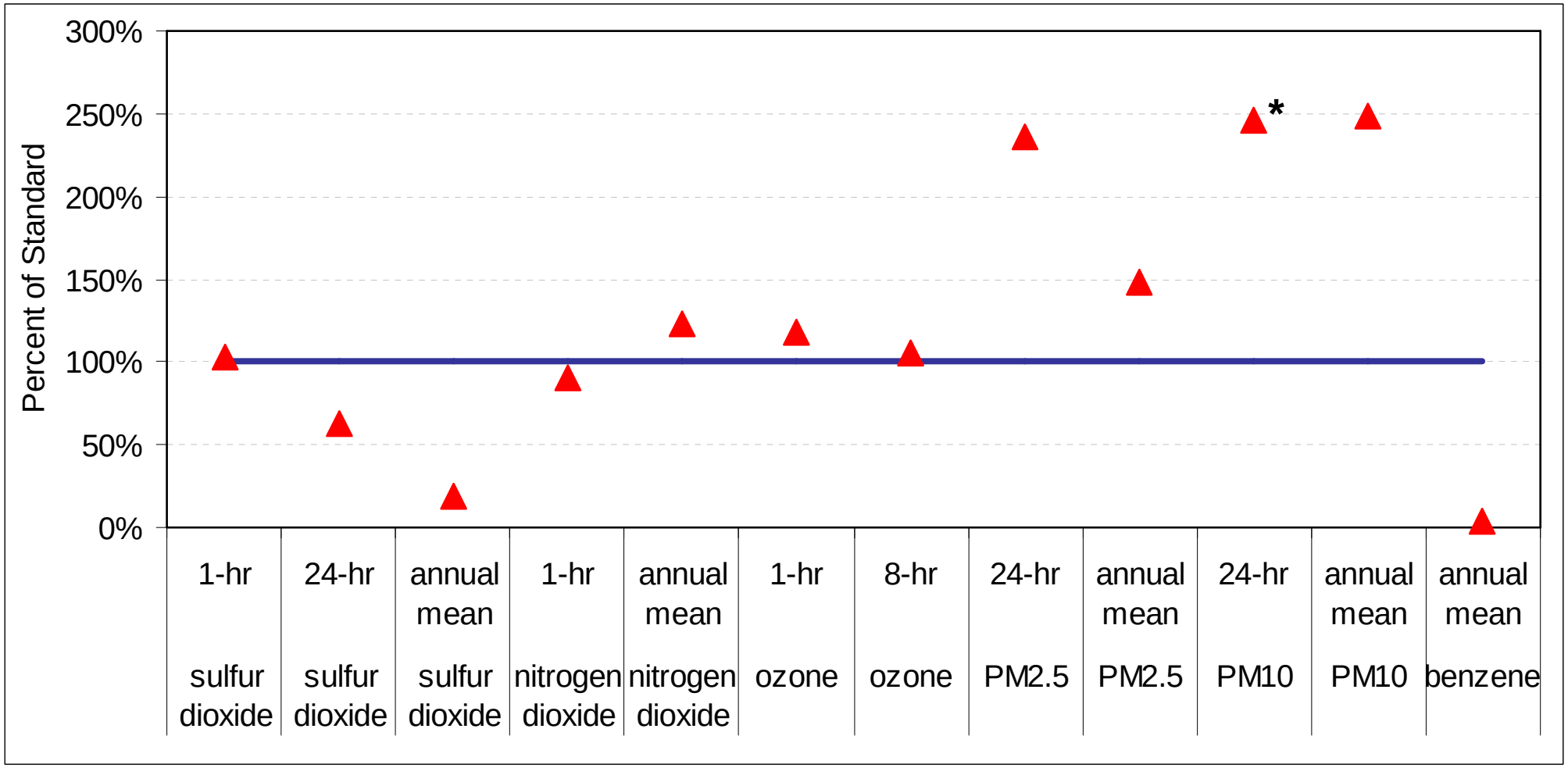
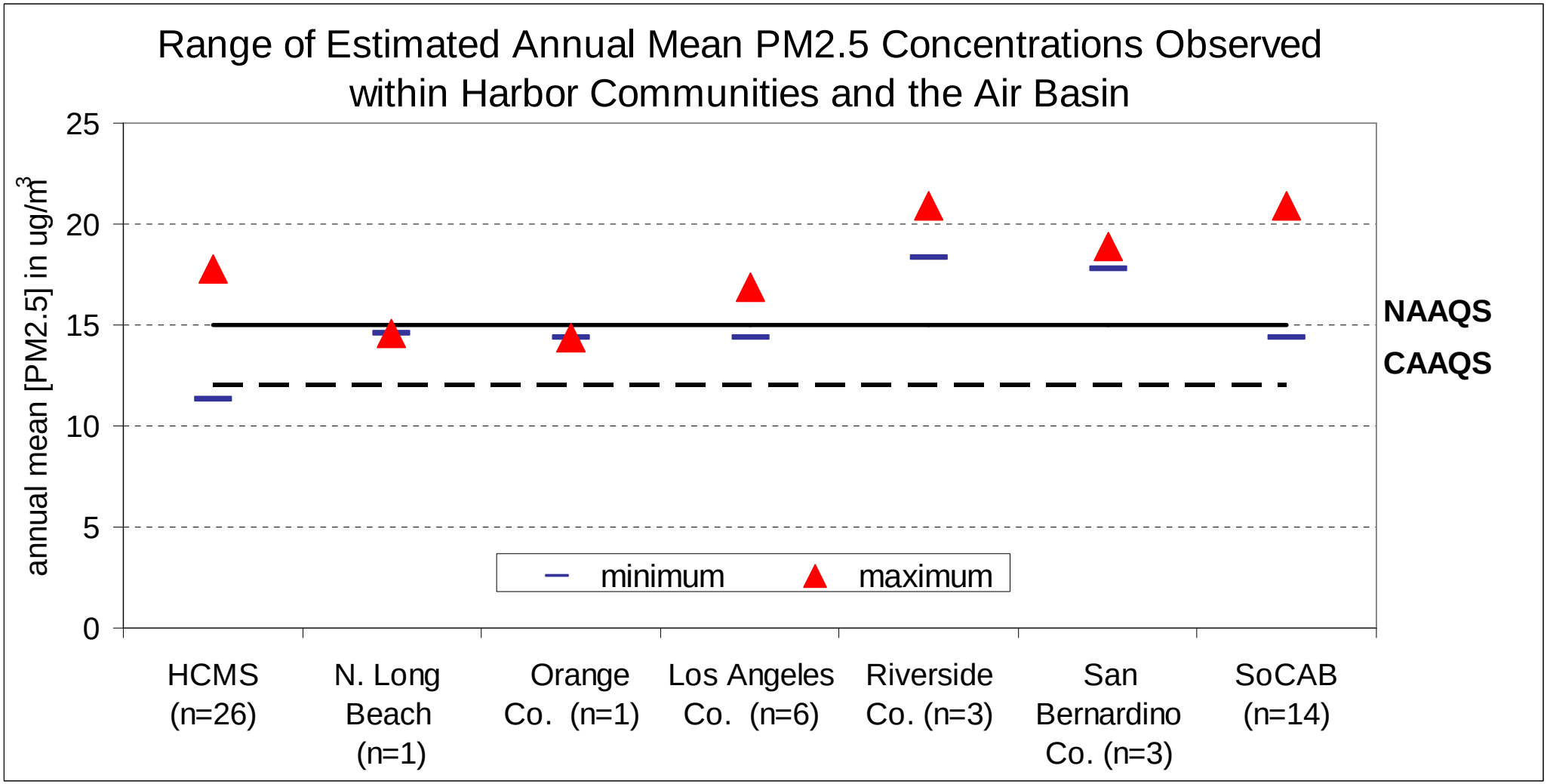
Maximum Concentrations within Harbor Communities during 2007 relative to Ambient Air Quality Standards



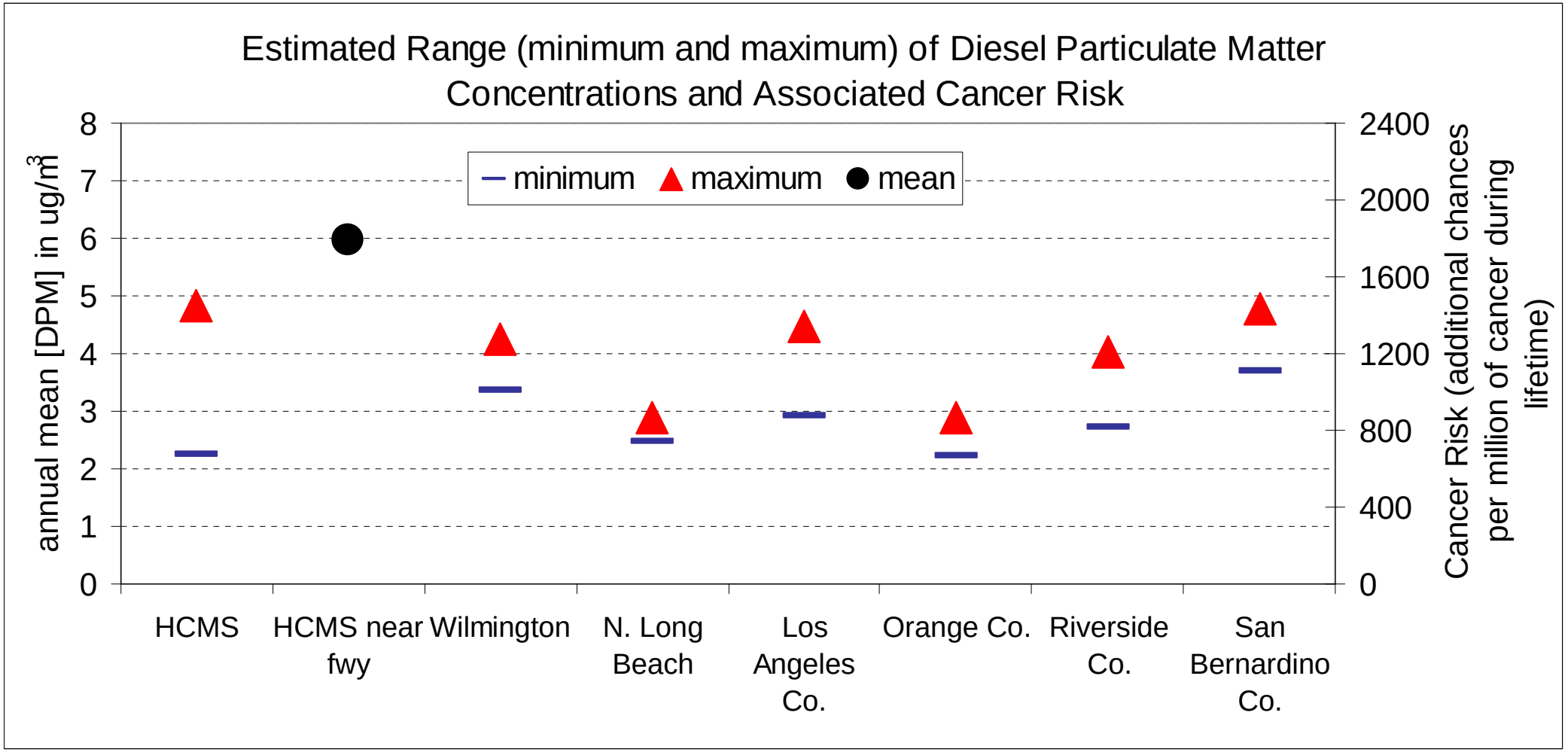
* 24-hr PM10 data are without October data with forest fire impacts; with that fire impact, % exceedance would be 822%.
Note: HCMS passive sampler and mini-vol PM data are not true annual averages, as they are based on seasonal sampling (HCMS PM data within 10% of full data set.); also, HCMS data are not all based on federal reference (or equivalent) method.

Particulate Air Quality in the Harbor Communities is Similar to or Better than the Rest of the Air Basin



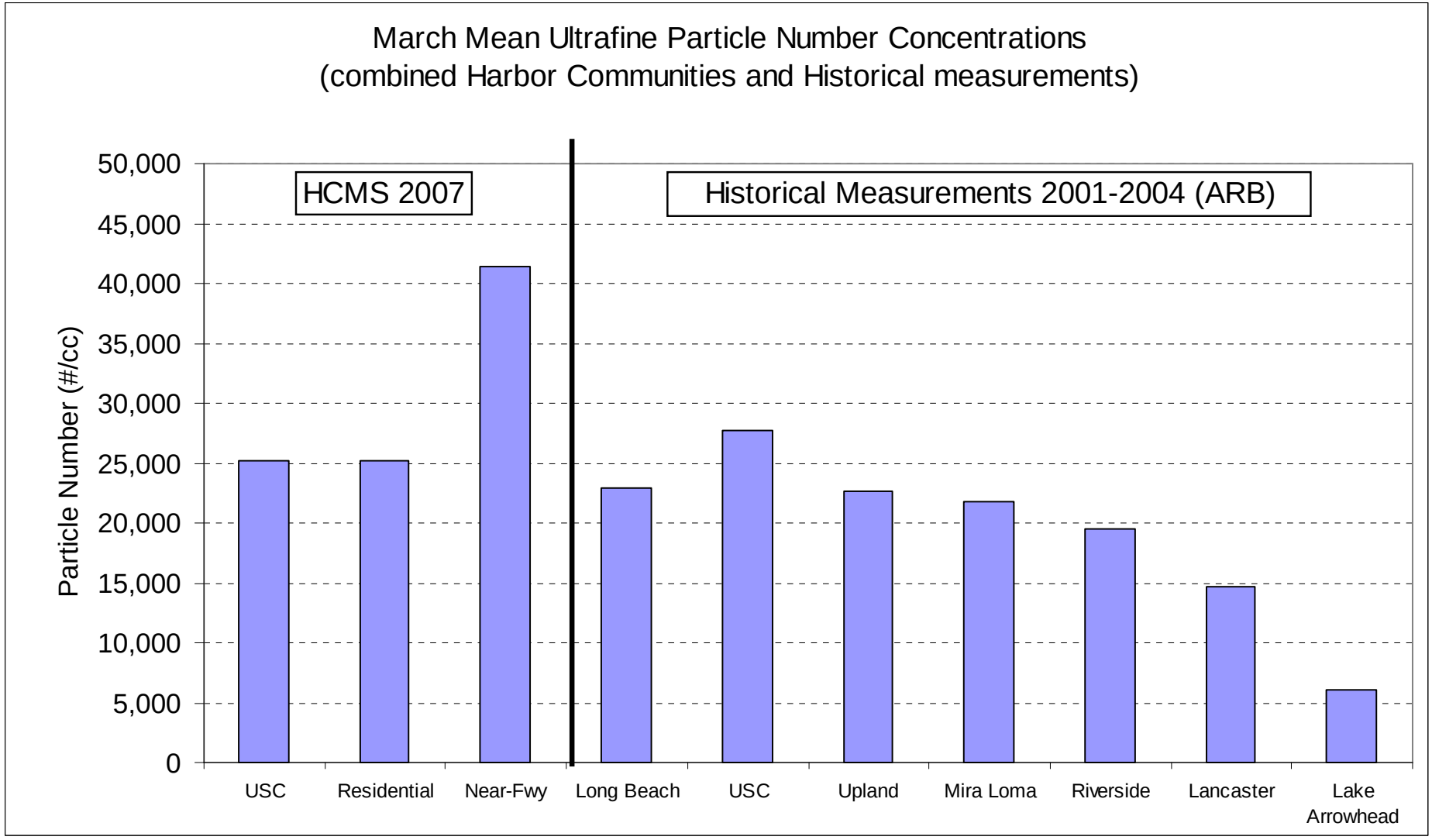
Note #1 NAAQS = National Air Quality Standards, CAAQS = California Air Quality Standards
Note #2: Most of the HCMS annual mean PM2.5 data are estimates based on seasonal sampling.
Note #3: Monitoring by the AQMD represents neighborhood-scale settings as specified by USEPA siting criteria. The HCMS network includes some micro-scale monitoring sites.

Diesel Particulate Matter Concentrations in the Harbor Communities Characterize the Extremes within the Air Basin



Note: HCMS DPM estimates based on seasonal regression slopes of TC as a function of EC. MATES III DPM estimates are based on chemical mass balance modeling.

Ultrafine Particle Counts in the Harbor Communities are Comparable to Rest of Air Basin



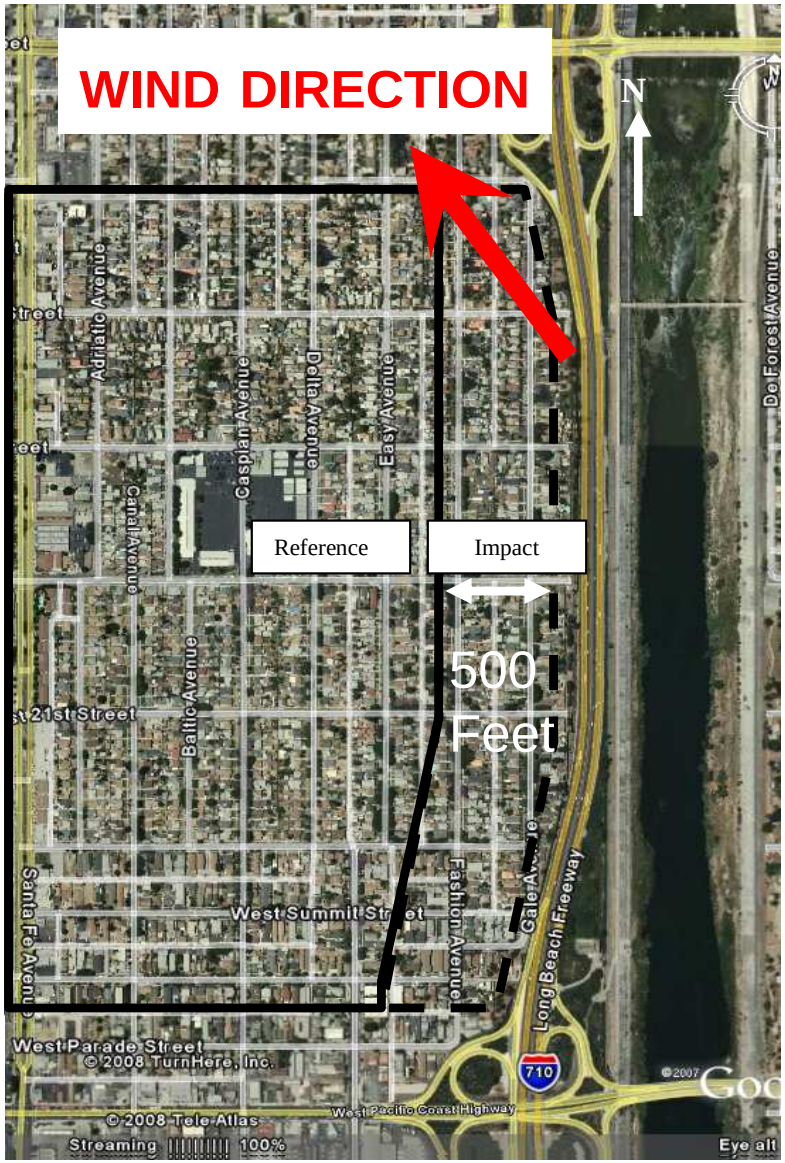
Freeway Results Support ARB Land Use Guidelines

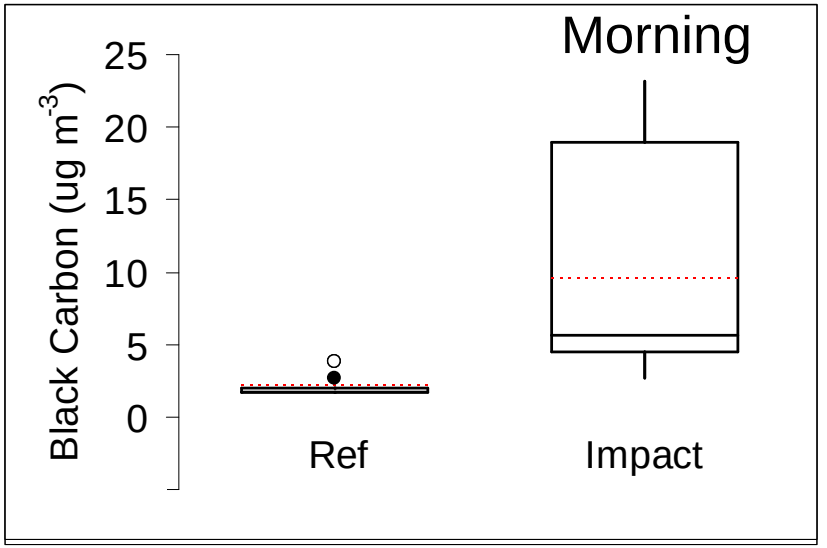
- Passive monitors measure NOx and Benzene concentrations near

  I-710 freeway
- Sharp decreases on BOTH sides of the

  I-710 freeway
  - Benzene reductions > 50% at 500 ft
  - NOx reductions > 50% within 100 ft

Freeway Results Support ARB Land Use Guidelines and Indicate Wind Direction is Important for Determining Near-road Pollution Concentrations





July 17, 2007 Data

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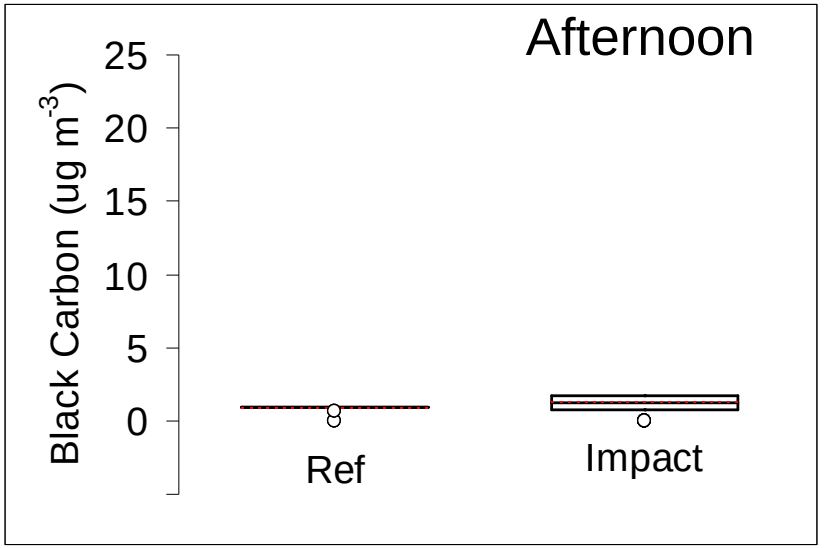
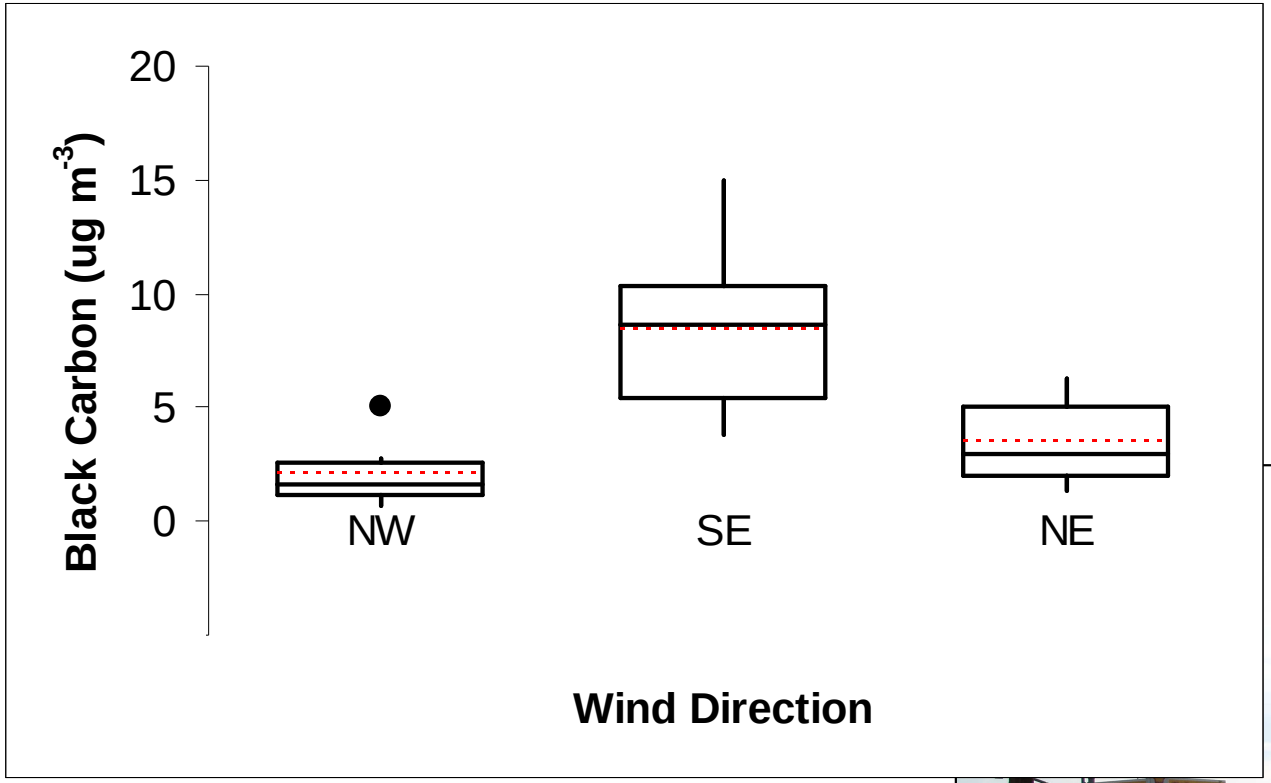


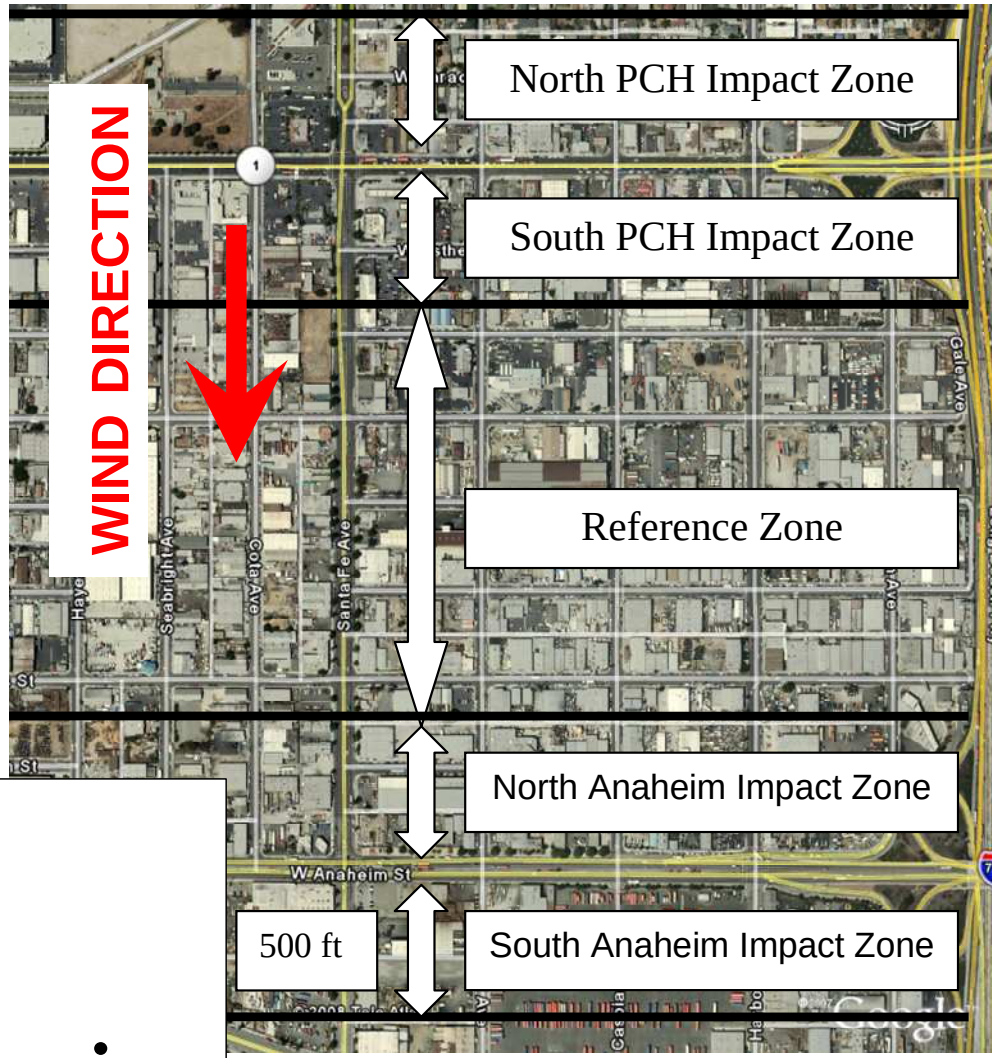
July 17, 2007 Data

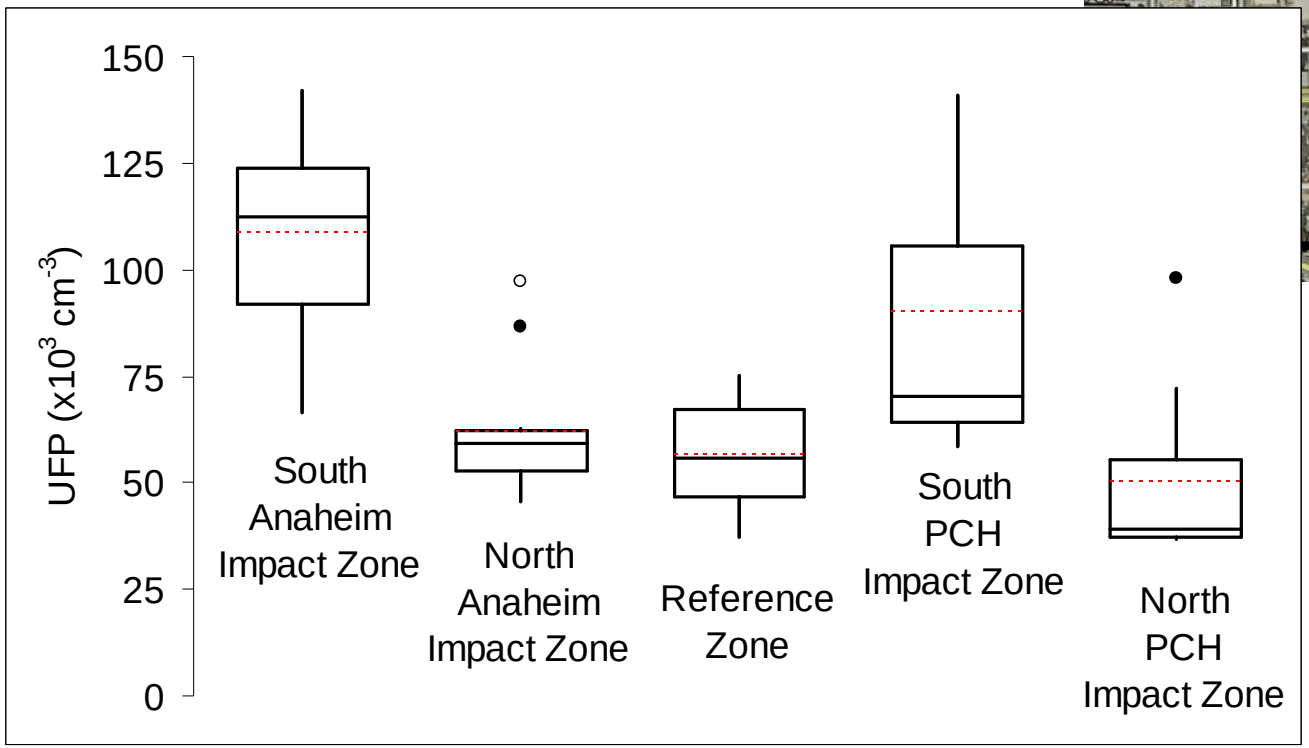
Potential for High Exposures at Intersections with Heavy-Duty Diesel Truck Traffic



Note: No data available for SW wind direction

Potential for High Exposures Near Non-Freeway Roadways





Preliminary Conclusions

- Passive samplers can be a useful screening tool
- Measured pollutants in residential areas in the Harbor Communities are similar to other residential areas of the Los Angeles Basin
- Historical North Long Beach site is representative of pollution concentrations in neighborhoods but not near roadways
- Potential for high exposures to DPM and other related pollutants near- and on-roadways depends on wind direction
- Passive sampler and Mobile Platform results support ARB land use guidelines and detect sharp gradients from line sources

ARB Regulations

- **Drayage Truck Regulation**
- **Ocean-Going Vessels (ship fuel)**
- **At-Berth Ocean-Going Vessels (shorepower)**
- **Cargo Handling Equipment**
- **Prop 1B, year one $98 million**
  - **Port actions**
- **Statewide Regulation for ALL Diesel Trucks**

For more information on rules, plans, funding etc.: www.arb.ca.gov/html/gmpr.htm
Goods movement inquiries: (916) 44-GOODS, gmbond@arb.ca.gov

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Next Steps

- Additional data analysis to better assess air quality impacts of emission sources
- Publish peer-reviewed papers, finalize reports
- Future Board and community updates
- Future monitoring to assess growth of goods movement and diesel emission reduction efforts
  - Mobile monitoring to continue in 2009

Acknowledgements

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  - Long Beach Job Corps
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Acknowledgements

Citizens of the Harbor Communities

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- R.Veyna
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- D. Modha

Questions?