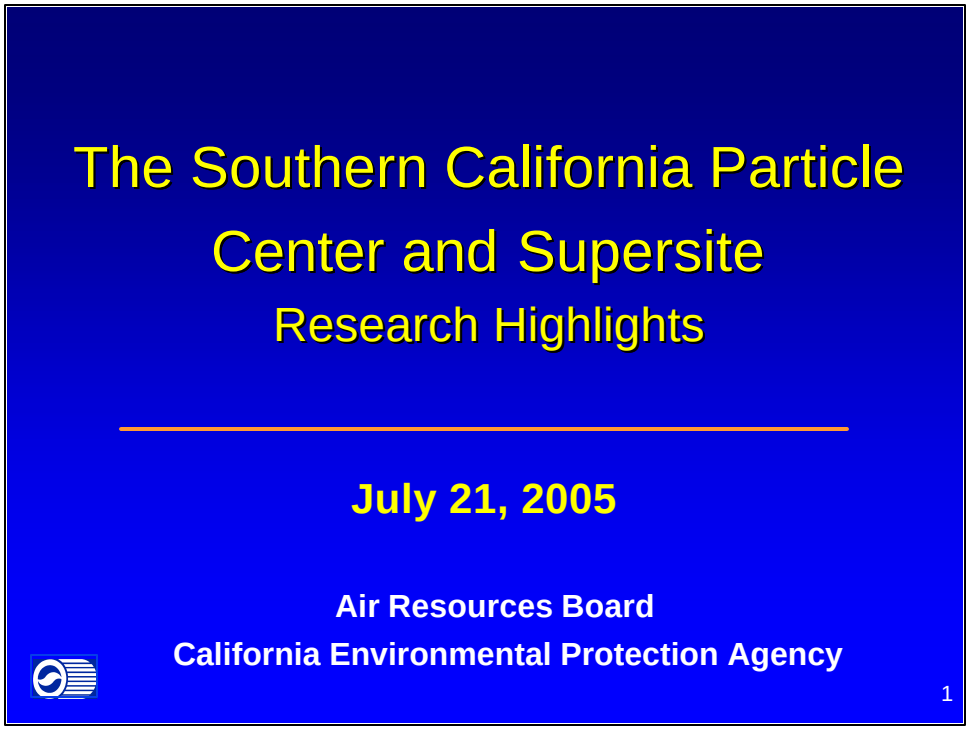
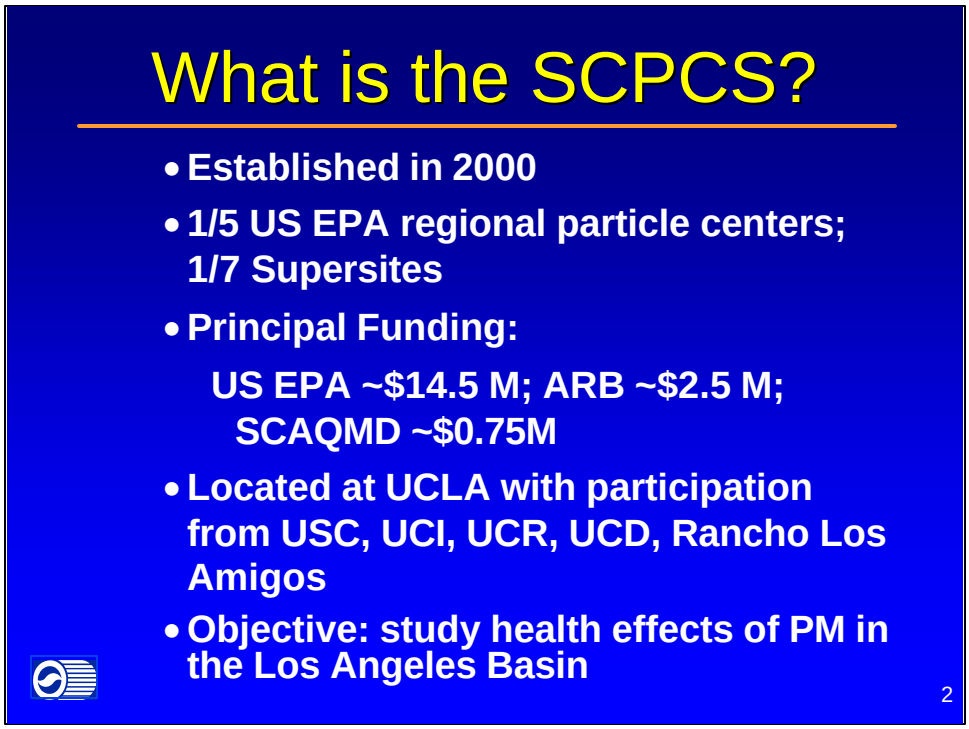


Thank you, Ms. Witherspoon. Good morning, Chairwoman Tuck and members of the Board.

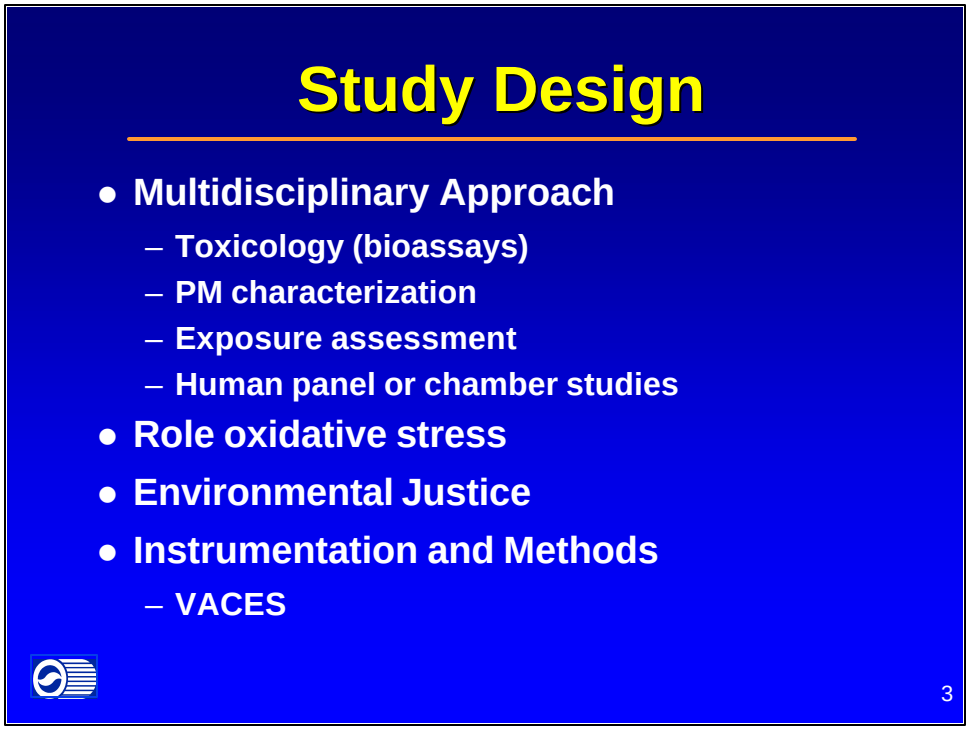
In this morning's health update I will review the research program areas and highlight the experimental findings of studies being conducted at one of the nation's premier air pollution research centers—the Southern California Particle Center and Supersite.



In the year 2000, the Air Resources Board initiated funding for an exposure facility at UCLA to study the inhalation effects of ambient aerosols. The Center's funding was augmented by US EPA when it was named as 1 of 5 regional Particle Centers and 1 of 7 Supersites in the nation. This is the only Center in the nation to be funded by EPA as both a Particle Center and a Supersite.

Although the Center is located at the University of California, Los Angeles, research programs are conducted with participating investigators from the University of Southern California, UC Irvine, UC Riverside, UC Davis and Rancho Los Amigos, among many others.

The main objective of the Center is to conduct high quality multi-disciplinary research on airborne particulate matter to ensure public health. Research is linked to key policy-related scientific uncertainties based on the National Research Council's 10 Research Priorities for Airborne Particulate Matter.



The Center has been successful in completing a large number of studies and contributing to a great many others by maintaining a multi-disciplinary approach integrating information obtained from toxicology, PM characterization, exposure assessment and human panel studies. To-date the Center's publications in peer-reviewed journals have exceeded the 100 mark.

A particular emphasis for research at the center is placed on the role of oxidative stress and the ability of PM to induce pro-inflammatory responses thought to be responsible for the health effects observed in epidemiologic studies of asthma and cardiovascular disease.

Studies conducted at the Center helped justify a new State law that affects communities impacted by traffic pollution, which are often economically disadvantaged. This law restricts the siting of new schools within 500 feet of a freeway or a heavily traveled roadway. (Section 17213 of the California Education Code and section 21151.8 of the California Public Resources Code.)

The Center's research on exposure assessment and toxicology depends on the use of sophisticated instrumentation and methodology. The Center has made enormous contributions in this area as well; with development and evaluation of a concentrator: the Versatile Aerosol Concentration Enrichment System or VACES.

Health Studies

- **Animal Model**
  - **CAPs exposure**
  - **allergic responses and inflammation greater at 50 m vs 150 m** ***(Kleinman et al., 2005 in-press)***
- **Human Panel Study**
  - **Exposed to CAPS and NO_2**
  - **Healthy and with COPD**
  - **respiratory effects in healthy volunteers**
  - **Older adults may experience acute small airways dysfunction with impaired gas exchange** ***(Gong et al., 2005)***

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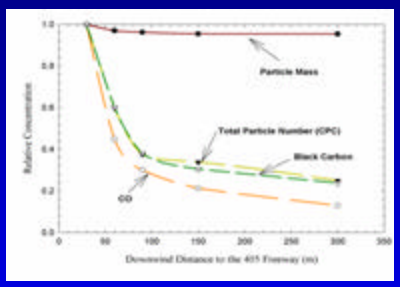
VACES makes it possible to expose laboratory animals or human volunteers to Concentrated Ambient Particles or CAPS in field conditions or chambers. CAPs can also be utilized for cellular bio-assays to quantitatively understand the chemical and toxicological properties of PM.

An example of an animal study using this approach was conducted by Kleinman and colleagues (Kleinman, MT, Sioutas, C Stram, D., et al., 2005, in-press), who were able to show that mice exposed to CAPS collected 50 meters downwind of a roadway had greater allergic responses and had greater indications of inflammation than did mice exposed to CAPS 150 meters downwind of the roadway.

The human panel studies undertaken at the Center have all shown cardiovascular effects for coarse, fine and ultrafine particles; particularly changes in heart rate variability. In one example of a human panel study conducted at the Center, researchers examined the respiratory responses of elderly subjects with and without chronic obstructive pulmonary disease, or COPD. In this study, volunteers were exposed to particulates and nitrogen dioxide in a single person exposure chamber shown here. The results found small, but statistically significant decrements in respiratory responses associated with CAPs that were greater in healthy volunteers--indicating that the respiratory effects may be related to efficient penetration and deposition of inhaled toxic particles in small airways.

Exposure Assessment

- **Physical and chemical characterization near source (heavy and light-duty vehicles)**
- **Atmospheric transformation**
- **Impact of mobile sources on indoor environments** ***(Kuhn et al., 2005)***



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Exposure assessment studies at the Center focus on the physical and chemical characterization of PM near sources: freeways with heavy and light-duty vehicle traffic. Research in this category has shown that ultrafine PM and co-pollutants decrease exponentially as distance increases from the roadway. Size distributions, chemical characteristics and volatility have also been shown to be impacted as distance increases from the roadway.

Center researchers also seek to understand how PM toxicity varies between “source” and “receptor” sites, and how PM composition may have been modified by atmospheric chemistry. Concentrators and inhalation exposure systems housed in a trailer are important for conducting these studies.

A recently published study by the Center on the differences between indoor and outdoor ultrafine particle matter volatility found that outdoor particles are more volatile than indoor particles—these changes are likely to affect the pollutant’s toxicity (Kuhn, T., Krudysz, Zhu, Y., et al., Volatility of indoor and outdoor ultrafine particulate matter near a freeway. Aerosol Science 36(291-302) 2005.)

Next Steps

- **Compare toxicity of emissions sources**
  - **gasoline vs diesel**
  - **fine PM vs ultrafine PM**
- **Guide ARB in targeting PM sources and constituents for control**

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The PM Center funding has been recently extended by the EPA and the UCLA PM Center plans to continue its focus on the understanding of PM toxicity with emphasis on gasoline versus diesel emissions, and comparisons of fine versus ultrafine PM.

One such study involves a Center researcher, as the Principal Investigator, and is a joint effort with ARB and the South Coast Air Quality Management District. This investigation will compare PM emissions from gasoline and diesel engines with varying levels of emissions control technology. Bioassays will evaluate the health effects of the CAPS from these sources.

The studies highlighted today and future studies conducted at the Center will guide ARB in targeting the appropriate PM sources and constituents for regulation and control.

Thank you for your attention and I would be happy to take questions.