

Planned Air Pollution Research

Fiscal Year 2009-2010

September 24, 2009

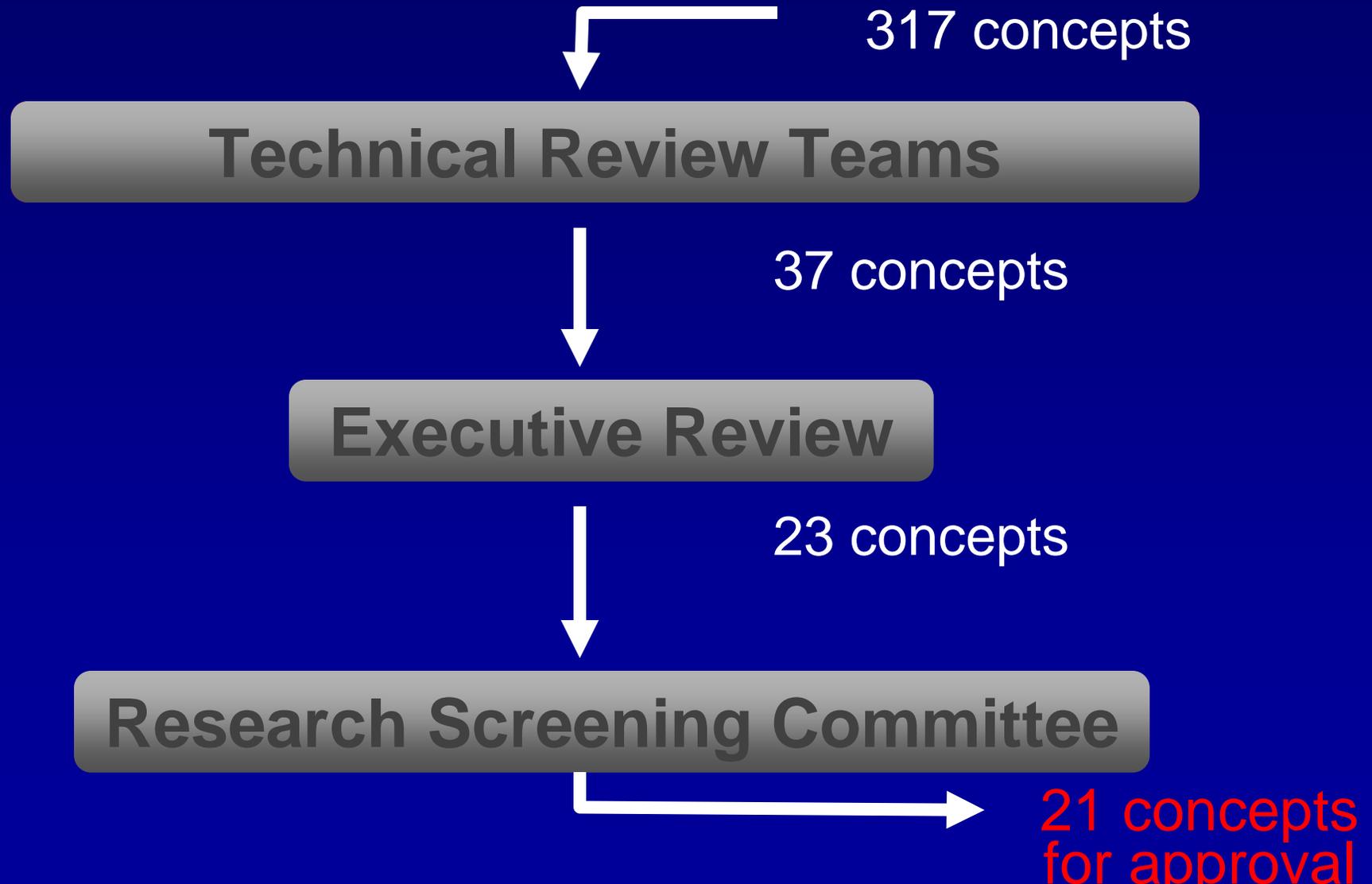
California Environmental Protection Agency

 **Air Resources Board**

ARB's Research Program

- Addresses causes, effects, and solutions to California's air quality and climate change issues
- Provides scientific information to support ambient air quality standards, planning, and climate change
- Supports ARB's **regulatory and policy priorities**

Research Planning Process



Technical Review Teams

- Identify major research gaps
- Identify niche areas for ARB to target funds
- Review concepts for technical merit and responsiveness to gaps
- Avoid duplicative research
- Identify collaboration and co-funding opportunities

Technical Review Teams: Interagency Coordination

External Reviewers and Collaborators

Bay Area Air Quality Management District

California Department of Transportation

California Energy Commission

California Integrated Waste Management Board

California Public Utilities Commission

Coordinating Research Council

Health Effects Institute

National Oceanic and Atmospheric Administration

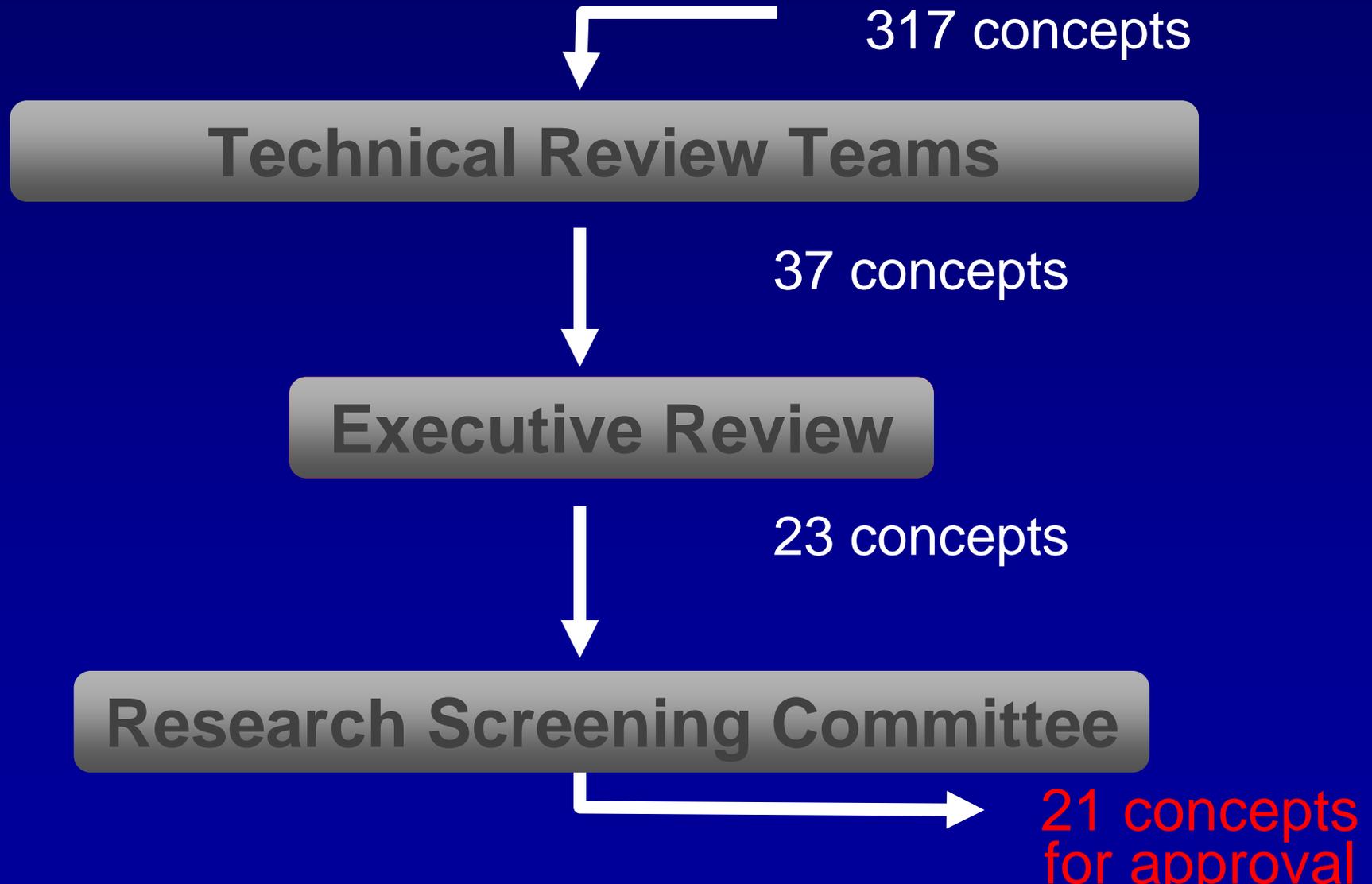
New York State Energy Research and Development Authority

Office of Environmental Health Hazard Assessment

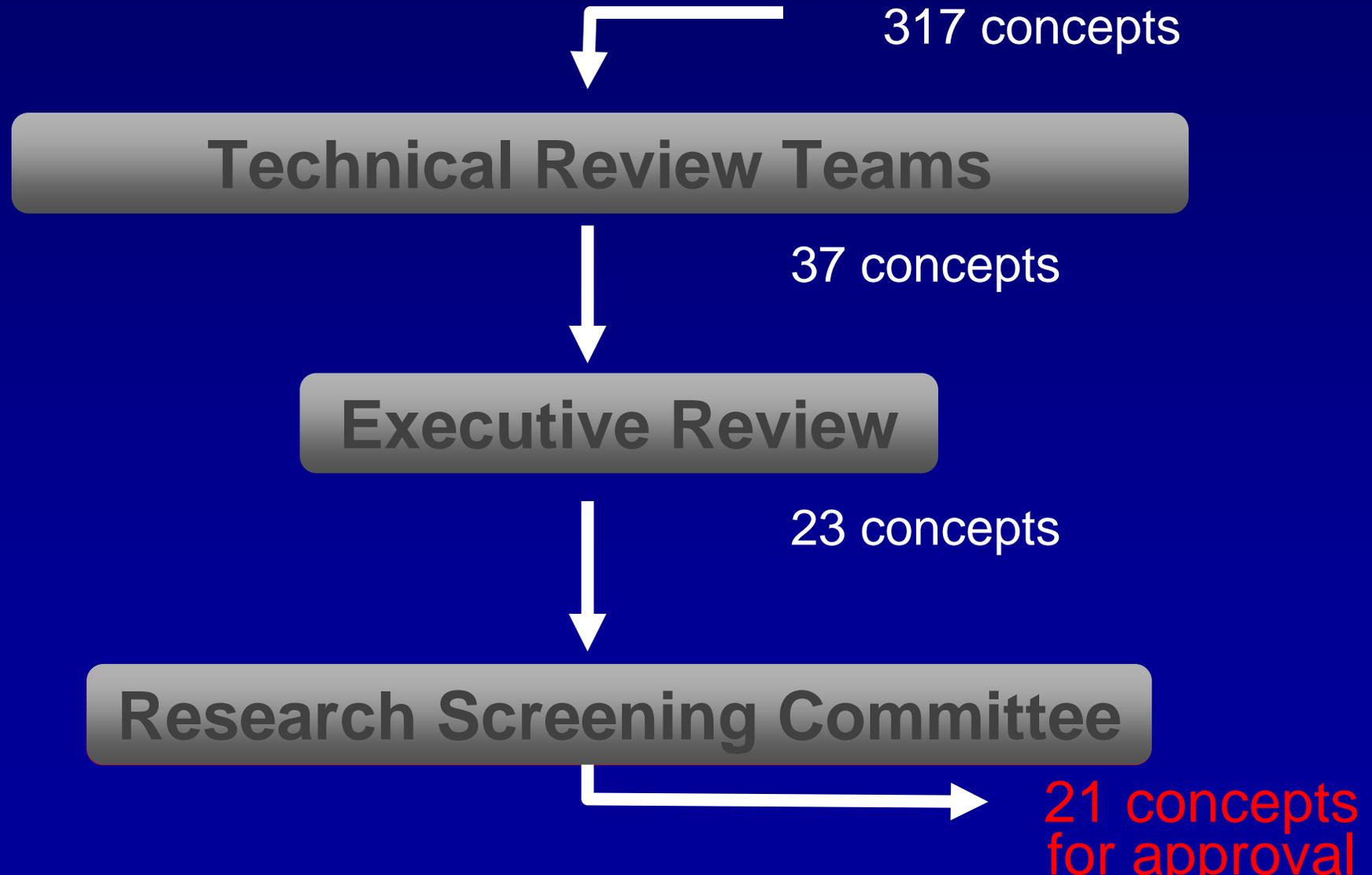
South Coast Air Quality Management District

United States Environmental Protection Agency

Research Planning Process



Research Planning Process



Research Screening Committee

Harold Cota, Ph.D. (Chairman), Cal Poly SLO

Dan Costa, Ph.D., US EPA

Irva Hertz-Picciotto, Ph.D., UCD

Steven Japar, Ph.D., Ford Motor Company, Retired

Matthew Kahn, Ph.D., UCLA

Charles Kolstad, Ph.D., UCSB

Chung Liu, D.Env., SCAQMD

Rachel Morello-Frosch, Ph.D., M.P.H., UCB

Suzanne Paulson, Ph.D., UCLA

Tracy Thatcher, Ph.D., Cal Poly SLO

Forman Williams, Ph.D., UCSD

CAT Research Subgroup: Interagency Coordination

- Research Chapter included in latest Climate Action Team Report
- CAT Research Subgroup reached consensus on priorities:
 - periodic, comprehensive interagency exchange and coordination on climate-related projects
 - continue development of climate change research catalog
 - initiate development of a State strategic plan for climate change research

ARB Air Pollution Research: Financial Stewardship

- Coordinates with other funding agencies to avoid duplicative research
- Significant co-funding/leveraging secured annually
 - 2009 plan: builds on previous years' partnerships
 - 2008: over \$13 million leveraged, with large field study
 - 2007: \$1.6 million
 - 2006: \$ 2 million
- Requires lowest overhead rates available
 - 10% from UCs
 - 25% from CSUs

Research Program Areas

- Health Effects and Exposures
- State Implementation Plan (SIP) Support
- Climate Change
- Climate/Air Quality Nexus

Funding Allocations

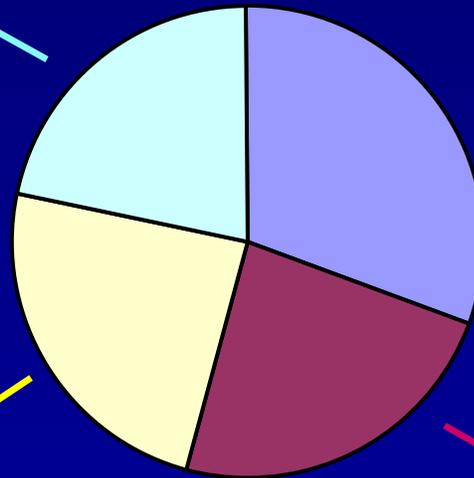
\$5,310,500

**Climate/Air Quality
Nexus: \$1,150,000**

**Health Effects and
Exposures: \$1,630,000**

**Climate Change:
\$1,292,000**

**State Implementation
Plan (SIP) Support:
\$1,238,500**



Health Effects & Exposures

\$1,630,000

5 projects

Health Effects & Exposures

HEALTH EFFECTS AND AIR QUALITY STANDARDS

- PM2.5 health effects in the Central Valley
- PM2.5, inflammation and coronary artery disease

INDOOR AIR QUALITY REGULATIONS

- Evaluation of in-duct air cleaning devices that generate ozone

DIESEL, PORTS, AND COMMUNITY EXPOSURES

- On-road emissions from heavy-duty diesel trucks: impacts of fleet turnover and ARB's truck & bus rule
- Near-freeway pollution and air quality improvements from new regulations in the port area

Investigation of pollution gradients near freeways and air quality improvements from new regulations in the port area



How does pollution from freeway traffic and port activities effect Californians' exposures to particular matter?

source: <http://www.palmspringsphotoblog.com/heavy-freeway-traffic.html>

State Implementation Plan (SIP) Support

\$1,238,500

4 projects

SIP Support

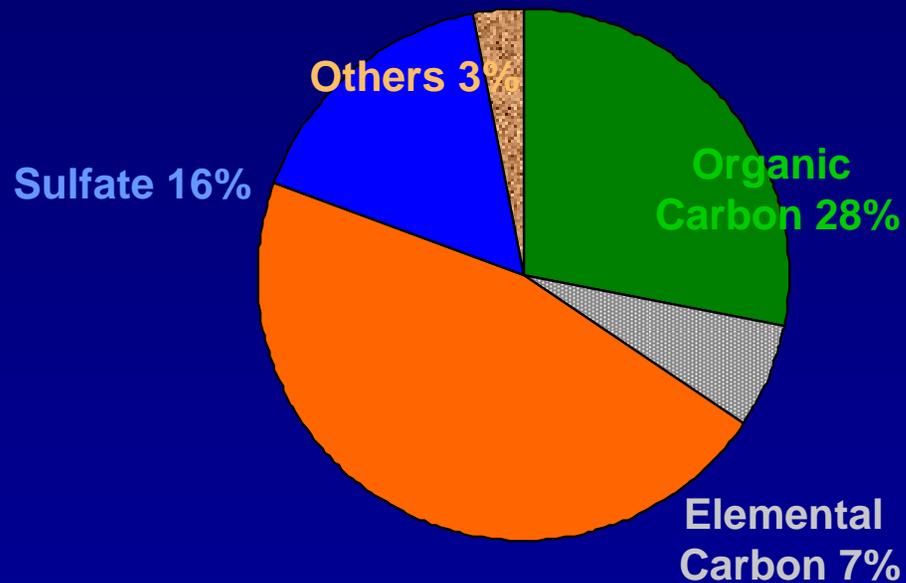
BIOGENIC EMISSIONS

- Determining nitric oxide emissions from soil in California cropping systems to improve ozone modeling
- Validation of ARB's statewide biogenic emissions inventory

PM EMISSIONS AND SOURCES

- Characterization of organic PM emissions from motor vehicles
- Improved characterization of primary and secondary particles

Improved characterization of primary and secondary particles



What sources contribute to carbon-containing PM2.5 in rural and urban areas?

Nitrate 46%

Average PM2.5 Mass = $20.3 \mu\text{g}/\text{m}^3$

PM2.5 annual average concentrations in Riverside, California

note: relative & absolute concentrations vary on a daily basis & seasonally

Climate Change

\$1,292,000

9 projects

Climate Change

ECONOMIC PLANNING

- Assessment of models for economic analysis of regulatory and non-regulatory GHG emission control strategies

BEHAVIORAL CHANGE

- Strategies for low household energy consumption in California
- Bridging the gap between potential and actual energy savings in commercial buildings

Climate Change

EMISSIONS INVENTORY AND MITIGATION

- Greenhouse gas and ozone precursor concentrations and emissions in the L.A. basin
- Indirect effects of black carbon controls and the global warming benefits of diesel emissions reductions
- Quantifying effects of local government actions to reduce VMT
- Measuring the climate impact of green residential buildings
- Validation of California's greenhouse gas inventory for CH₄
- Assessment of N₂O emissions from California's dairies

Assessment of nitrous oxide (N₂O) emissions from California's Dairies



Support AB 32 Early Action by clarifying baseline emissions from California's dairies

source: <http://www.flickr.com/photos/jkilmer2659/749468239/>

Climate/Air Quality Nexus

\$1,150,000

3 projects

Climate/Air Quality Nexus

CalNEX 2010: Research for improved understanding of air quality, climate change, and emissions inventories

- Vertically resolved observations of air pollution and key chemical species in California
- Time-resolved measurements of PM_{2.5}
- Source apportionment as a function of altitude of particulate matter



Recommendation

**Approval of the
Planned Air Pollution Research
Fiscal Year 2009-10**

AIR POLLUTION RESEARCH

California Environmental Protection Agency

 Air Resources Board