



Presents

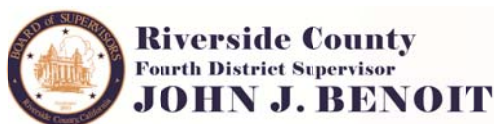
**Sustainable Goods Movement
Maintaining the Environment, Economy and Equity**

A Two-Day Symposium Emphasizing the Issues and Solutions Associated
with the Movement of Goods in Southern California

**November 21-22, 2013
8:30 AM – 4:00 PM**

Location
**CSUSB Palm Desert Campus
Palm Desert, California**

Sponsored by:



**Palm Springs Institute
for Environmental Sustainability**



Sustainable Goods Movement
Maintaining the Environment, Economy and Equity

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Sustainable Goods Movement

Maintaining the Environment, Economy and Equity

A Two-Day Symposium Emphasizing the Issues and Solutions Associated with the
Movement of Goods in Southern California

Statement of Purpose

We live in a global economy, where goods are imported, exported and transported across the United States. Southern California is a major hub for goods movement for the rest of the country, which supports our economy and jobs. However, there are rising concerns regarding diesel emissions and the proximity of some residents to major transportation corridors. The challenge we face is to resist making rash decisions based on only one piece of the puzzle, when all are important for the long-term sustainability of our economy, communities, and the environment we live in. This two-day symposium will address these issues by bringing together specialists from diverse disciplines. The purpose is to advance and broaden our understanding of the scientific, social and economic aspects of goods movement, with a central focus of addressing concerns and proposing solutions for long-term sustainability. Major funding is provided by the Southern California Association of Governments.

Symposium Committee:

Chair: Dr. Robert N. Phalen, California State University San Bernardino

Active Members:

Sylvia Betancourt, Center for Community Action and Environmental Justice

Lee Brown, California Construction Trucking Association

Dr. Kimberly Collins, California State University San Bernardino

Eldon Heaston, Mojave Desert AQMD

Dr. Bob Leo, California State University San Bernardino

Dr. Dale Lund, Center for the Promotion of Health Disparities Research and Training

Ken Lund, Allen Lund Company

Dr. Jenna LeComte-Hinley, Health Assessment Resource Center

Joe Rajkovic, California Construction Trucking Association & Western Trucking Alliance

Dr. Samuel Soret, Loma Linda University

Gaylon Thornton, Leonard Transportation Center

Schedule

Day 1: November 21, 2013

7:30-8:30 **Registration (Coffee and Danish) – Indian Wells Theater**

Session 1 – Welcome and Introduction (Economy and Equity)

Time	Presenters	Topic
8:30-8:45	Supervisor John Benoit (Riverside County) Hassan Ikhata (SCAG)	Welcome and opening remarks
8:45-9:05	Kimberly Collins (CSUSB)	Economic growth and security

Session 2 – Toxicology and epidemiology of air pollution (Environment)

Time	Presenter	Topic
9:10-9:30	Robert F. Phalen (UCI)	Deposition and fate of inhaled transportation-related particulates
9:30-9:50	James Enstrom (UCLA)	Air pollution and total mortality
9:50-10:10	Stanley Young (NISS)	Acute air pollution deaths and air pollution in southern California
10:10-10:30	Panel	Open discussion

Session 3 – Transportation-related exposures near major roadways (Equity)

Time	Presenter	Topic
10:40-11:00	Jenny Quintana (SDSU)	Traffic-related exposures at US-Mexico ports of entry
11:00-11:20	Samuel Soret (LLU)	Respiratory health risks near a major transportation center
11:20-11:40	Nicole Gatto (LLU)	Air pollution and cognitive function
11:40-12:00	Teresa Dodd-Butera (CSUSB)	Traffic-related exposures and maternal/child health
12:00-12:30	Panel	Open discussion

12:30-1:30 Lunch (IW-120)

Session 4 – Local communities and businesses (Equity)

Time	Presenter	Topic
1:30-1:50	Penny Newman (CCA EJ)	Community exposures near transportation corridors
1:50-2:10	Ken Lund and Joseph Rajkovicz (Trucking Representatives)	Goods movement and small businesses
2:10-2:30	Matt Malkan (UCLA)	Regulation and environmental/social justice
2:30-3:00	Panel	Open discussion

3:00-3:15 Break

Session 5 – Future directions (Open discussion)

Time	Presenter	Topic
3:15-4:00	Panel	Future directions for sustaining the environment, economy and social equity

Day 2: November 22, 2013

7:30-8:30 Registration (Coffee and Danish) – Indian Wells Theater

Session 6 – Sustainable strategies (Economy)

Time	Presenter	Topic
8:30-8:40	Session Chair	Day 2 – Welcome and introductions
8:40-9:00	Jo Klinski (Magna Force)	Economical transport solutions for high density corridors
9:00-9:20	Renee Moilanen (POLB)	Sustainable shipping and reduced emissions
9:20-9:40	Eldon Heaston (MDAQMD)	High desert inland port
9:40-10:00	Robert N. Phalen (CSUSB)	Alternative strategies for reducing near-road exposures
10:00-10:30	Panel	Open discussion

Session 7 – Measuring and evaluating transportation emissions (Environment)

Time	Presenter	Topic
10:40-11:00	Guoyuan Wu (UCR)	Improved truck emission estimates using truck weight and activity data
11:00-11:20	Yang Li (UCR)	Determination of suspended exhaust PM
11:20-11:40	Liem Pham (UCR)	Variations in particulate emissions near major highways
11:40-12:00	Panel	Open discussion

12:00-1:00 Lunch (IW-120)

Session 8 – The impacts of unemployment on health (Economy)

Time	Presenter	Topic
1:00-1:20	Robert N. Phalen (CSUSB)	Introduction: Why should we include employment when discussing the health and well-being of our communities?
1:20-1:40	Jenna LeCompte-Hinely (HARC)	Unemployment and health in Coachella Valley
1:40-2:00	Janet Koh (LLU)	Unemployment and child maltreatment
2:00-2:30	Panel	Open discussion

2:30-3:30 Rooms available for breakout sessions and networking

Institutions and Organizations

CCA EJ	Center for Community Action and Environmental Justice
CSUSB	California State University San Bernardino
HARC	Health Assessment Resource Center
LLU	Loma Linda University
MDAQMD	Mojave Desert Air Quality Management District
NISS	National Institute for Statistical Sciences
POLB	Port of Long Beach
SCAG	Southern California Association of Governments – Additional Support from Supervisor John Benoit, Riverside County
SDSU	San Diego State University
UCI	University of California Irvine
UCLA	University of California Los Angeles
UCR	University of California Riverside

Biographies – Opening Remarks

Supervisor John J. Benoit

Fourth District, Riverside County Board of Supervisors

Supervisor John J. Benoit is the Chairman of the Riverside County Board of Supervisors, representing the eastern two-thirds of Riverside County as the 4th District Supervisor. Incorporating nearly 5,000 square miles, the 4th District stretches from Palm Springs and Desert Hot Springs, south to the Salton Sea and east to Blythe and the Colorado River.



John has a life story of exceptional service to the public. John is a veteran of 31 years in law enforcement, starting with the Corona Police Department. He attended the FBI National Academy and served as a volunteer fire captain with the Sunset-Whitney Fire Department. His 29 years with the California Highway Patrol took him up and down the state, working patrols in Los Angeles, in Sacramento and in Bakersfield. In 1988, he made the Coachella Valley his home when he was promoted to commander of the California Highway Patrol's Indio Station.

Long active in community service organizations as past president of both the United Way of the Desert and Indio Rotary, John served on the Desert Sands School Board. Having retired from the Highway Patrol in 2001 and driven to make a positive impact and serve his community, he ran for the State Assembly in 2002. John served three full terms in the California State Assembly, representing the 64th District from 2002-08 and then representing the 37th District in the California State Senate in 2008-09.

As a state lawmaker, John was successful in having 40 pieces of legislation signed into law, including the landmark "Aryanna's Law" to protect children in daycare centers. He was known for his ability to reach across the aisle to improve public safety, transportation and education. He was awarded Legislator of the Year honors by the California School Boards Association, the School Transportation Coalition, the California Narcotics Officers' Association and the Chief Probation Officers of California.

Following the death of his friend and mentor, Supervisor Roy Wilson, John was appointed to the Board of Supervisors in 2009. He was elected to a full, four-year term on June 8, 2010.

A graduate of Riverside's Notre Dame High School and Riverside City College, John holds a bachelor's of science degree in public safety at Cal State Los Angeles and a master's degree in public administration at Cal State San Bernardino. Having participated in language immersion programs in Mexico and Costa Rica, his bilingual skills are invaluable to his work in Riverside County's largest and most diverse district.

Hasan Ikhata

Executive Director, Southern California Association of Governments

Considered one of the preeminent transportation planning experts in the nation, Hasan Ikhata is the Executive Director of the Southern California Association of Governments (SCAG), the largest metropolitan planning organization in the United States. Appointed in January 2008, Mr. Ikhata has over 25 years of public and private sector experience in Transportation Planning in Southern California. At SCAG Mr. Ikhata implements the policies of an 83-member Regional Council and directs day-to-day operations of the agency. He is credited with being a transformational and unifying leader who has enhanced SCAG's value to member agencies and fostered unprecedented levels of public input and participation in the development of regional transportation plans.



Prior to joining SCAG in 1994, Mr. Ikhata worked for the Los Angeles County Metropolitan Transportation Authority (MTA), the South Coast Air Quality Management District (SCAQMD); and Mr. Ikhata also worked abroad for the USSR government, Moscow Metro Corporation.

Mr. Ikhata has received several awards and honors from various organizations and agencies including MOVE LA, for Outstanding Leadership as Executive Director of SCAG in preparation of the 2012 Regional Transportation Plan/Sustainable Communities Strategy. He has also been recognized by the American Society of Public Administration (ASPA), Southern California Leadership Council (SCLC), Orange County Transportation Authority (OCTA), Orange County Council of Governments (OCCOG), Orange County Business Council, Orange County Division, League of California Cities, California Legislature 49th District Assembly Resolution by Hon. Mike Eng, City of Los Angeles, State of California Certificate of Recognition, Association of the San Bernardino County Special Districts, Four Corners Transportation Summit, City of Big Bear Lake and numerous others.

Mr. Ikhata holds a Bachelor's and a Master's degree in Civil and Industrial Engineering from Zaporozhye University in the former Soviet Union; a Master's degree in Civil Engineering from UCLA and a PhD Candidacy in Urban Planning and Transportation from USC.

Biographies – Session Presenters

Kimberly Collins, California State University San Bernardino

Kimberly Collins is on the faculty of the Public Administration Department at California State University-San Bernardino. The focus of her work is on quality of life, democracy, public policy and management in comparative border regions. She has extensive experience working with data to explore these topics in both the United States and Mexico.

From 1999 to 2009, she was the founding director of the California Center for Border and Regional Economic Studies (CCBRES), located on the Imperial Valley Campus of San Diego State University and taught SDSU-Imperial Valley in the public administration department. As director of CCBRES, Kimberly developed a monthly indicator bulletin and an annual indicator report for the Imperial-Mexicali valleys, which was presented at an annual economic development conference, organized by Kimberly and the Center.

Teresa Dodd-Butera, California State University San Bernardino

Dr. Teresa Dodd-Butera is an Associate Professor of Nursing at CSU San Bernardino, and the Coordinator of the Graduate Nursing Program. She is a registered nurse and a Diplomate of the American Board of Applied Toxicology. Her research focuses on exposures to the maternal-fetal environment, global health, health promotion and prevention strategies, and issues of environmental justice and public health.

James Enstrom, University of California, Los Angeles

In 1970 Dr. Enstrom obtained his Ph.D. in elementary particle physics at Stanford University from Nobel Laureate Melvin Schwartz. During 1971-1973 he worked as a physicist at the Lawrence Berkeley Laboratory in the research group of Nobel Laureate Luis Alvarez. In 1976 he received an M.P.H. and postdoctoral certificate in epidemiology at UCLA from renowned public health epidemiologist Lester Breslow, M.D.

In July 1976 he joined the UCLA School of Public Health faculty as a Research Professor / Researcher focusing on lifestyle and environmental epidemiology. He held that position until June 2012 and now continues at UCLA in a similar position. Since 1981 he has been a Fellow of the American College of Epidemiology and since 2005 he has been President of the Scientific Integrity Institute, which focuses on scientific integrity in epidemiology.

In December 2005 he published major findings that fine particulate matter does not cause premature death in California. His findings have now been overwhelmingly confirmed and he is working diligently to get EPA, CARB, and SCAQMD to recognize these null findings. Currently he is assisting the US House Science Committee in its efforts to get EPA to publicly release the data it uses to set air pollution regulations.

Nichole Gatto, Loma Linda University

Dr. Nicole Gatto is currently an Associate Professor in the Department of Epidemiology, Biostatistics and Population Medicine in the School of Public Health at Loma Linda University. Dr. Gatto earned her Master's in Public Health from the Fielding School of Public Health at UCLA and her PhD in Epidemiology from the Department of Preventive Medicine at USC's Keck School of Medicine. Dr. Gatto also holds certifications in Public Health (CPH), SAS and Geographical Information Science (GIS).



Dr. Gatto's 19 years of experience in health science research have focused on environmental, occupational and genetic risk factors for cardiovascular and neurological diseases. Dr. Gatto's specific research interests include Parkinson's disease and dementias/cognitive dysfunction.

Dr. Gatto has taught at the undergraduate and graduate level for ten years, and has guest lectured in numerous academic and community settings. Dr. Gatto completed a one-year internship in communicable disease control and prevention at the Los Angeles County Department of Public Health in 2012.

In 2009, Dr. Gatto co-founded the Milagro Allegro Community Garden, a vibrant and thriving community space that integrates urban, farming, art and education in Northeast Los Angeles. In 2010, inspired by Michelle Obama's "Let's Move" campaign, with colleagues Dr. Gatto developed LA Sprouts, a nutrition and gardening intervention aimed at reducing the risk of childhood obesity.

Currently, Dr. Gatto teaches EPDM 588 "Environmental and Occupational Epidemiology". Dr. Gatto is a native Angeleno who is inspired by the work of Wangari Maathai who founded the Green Belt movement in Kenya, and Alice Waters who created the Edible Schoolyard in Berkeley, CA.

Eldon Heaston, Mojave Desert AQMD

Eldon Heaston was appointed Executive Director of the Mojave Desert Air Quality Management District in March 2006. During his twenty-one years with the District, Heaston has worked to build and uphold its reputation as one of the most progressive and accessible air districts in the state.

Prior to his appointment as Executive Director, Heaston served as the Deputy Air Pollution Control Officer for eleven years. In that capacity he managed the day-to-day operations of both air districts, including compliance, regulatory development, engineering, air monitoring and the small business assistance program. Prior to that, he was the Environmental Services Manager, whereby he was responsible for the development and implementation of the District's AB2588 Toxic "Hot Spots" Program, rule development, health risk assessment/modeling, and Federal and State Implementation Plan (SIP) development.

Before joining the District, Heaston spent over eleven years in the aerospace and petrochemical industry where he held various positions in industrial hygiene and environmental management.

Heaston recently served six years as a Governor's appointee to the state's Inspection and Maintenance Review Committee, which evaluated the effectiveness of California's Smog Check Program and recommended program improvements.

Heaston is a founding member of the Mojave Desert Chapter of the Air & Waste Management Association, and a Past Chair of the West Coast Section of A&WMA. Heaston has also served as an adjunct faculty member for California State University, San Bernardino.

Jo Klinski, Magna Force

Jo Klinski is the Chief Operating Officer and Chief Intellectual Property Officer at Magna Force, Inc., a 20 year old company dedicated to creating innovative, ecologically sustainable and resource efficient technologies for industry and transportation. Jo oversees all aspects of Magna Force's international business development as well as the company's expanding patent portfolio. Jo also manages the company's contracts and oversees its marketing program. She has been involved with company operations since 1997.

Prior to her work at Magna Force, Jo was a manager at a boutique building supply company specializing in custom ordering, loading and shipping of sea going containerized freight to Hawaii and the Pacific Rim providing first-hand experience with the issues surrounding freight shipments.

Janet H. Koh, Loma Linda University

Janet H. Koh, MPH, DrPH(c) is a doctoral student at Loma Linda University School of Public Health. She is currently Principal Trainer with the electronic medical record software implementation at Loma Linda University Health. Previously, she was the program specialist with the division of Forensic Pediatrics at Loma Linda University Children's Hospital. Upon completion of her Master of Public Health degree, she created a child abuse prevention program focusing on abusive head trauma (AHT) prevention and worked with numerous community organizations to provide education and offer services to improve community health outcomes. She maintained record keeping and prepared statistical data for the program. Ms. Koh is currently A.B.D., finalizing her dissertation, Environmental Stability, Intimate Partner Violence, and Associated Disparities in Child Maltreatment.

Jenna LeComte-Hinely, Health Assessment Resource Center

Dr. Jenna LeComte-Hinely holds a BS in Business Administration from the University of Redlands, and an MS and PhD in Applied Industrial-Organizational Psychology from Portland State University. Dr. LeComte-Hinely's research is in the field of Occupational Health Psychology, and much of her past research has centered on the impact of work-life balance on health and wellness. Currently, Dr. LeComte-Hinely is the Director of Research and Evaluation at Health Assessment Resource Center (HARC, Inc.), a Palm-Desert based nonprofit dedicated to providing objective, reliable research in order to facilitate better decision-making regarding health and quality of life. At HARC, Dr. LeComte-Hinely oversees the triennial survey of the health of the Coachella Valley community. This survey provides an unbiased, statistically reliable snapshot of the health of adults and children living in the Coachella Valley. In her role as Director of Research and Evaluation, Dr. LeComte-Hinely also designs and conducts customized research and evaluation for a variety of other local organizations.

Yang Li, University of California Riverside

Yang Li is now a graduate student in Mechanical Engineering Department of University of California, Riverside. He attended Thermal Science and Energy Engineering department from University of Science and Technology of China for his bachelor degree in engineering. He also worked as Advanced Placement teacher for Physics. He is group member in the aerosol science group of Professor Heejung Jung at the Bourns College of Engineering Center for Environmental Research and Technology (CE-CERT). His research areas are online measurement of particular matter and fire synthesis of battery materials.

Kenny Lund, Allen Lund Company

A graduate of Loyola Marymount with a degree in Business Administration, Kenny Lund came to the Allen Lund Company in 1989 after three years of teaching and coaching at St. Francis High School in La Cañada, California.

Kenny managed the Refrigerated Transportation Division in Los Angeles for eight years, handling loads mostly to the southeastern United States before shifting full time into being the manager of the newly formed Information and Technology Department in 1997.



In November of 2002 Kenny became Vice President of Information and Technology and 2 ½ years later in July of 2005 was promoted to Vice President – Support Operations that includes the Information and Technology, Marketing and Carrier Resources Departments.

In 2011 Kenny became a CTB (Certified Transportation Broker).

He currently serves on the following:

- Board of Directors – Transportation Intermediaries Associations
- Chairman, Supply Chain Logistics Council – United Fresh Produce Association
- Board of Directors Executive Committee – United Fresh Produce Association
- North American Produce Transportation Working Group – Worked on Produce Transportation Guidelines

Kenny lives in Pasadena, California with his wife Mary and five children.

Renee Moilanen, Port of Long Beach

Renee Moilanen is an Environmental Specialist at the Port of Long Beach, one of the nation's largest seaports. As a key member of the Port's Air Quality team, she helps oversee the Port's Green Ship Incentive Program, which rewards ship operators for deploying lower-polluting ships to Long Beach, and she manages the Port's efforts to demonstrate emission reduction technologies for ships. Ms. Moilanen assists with the San Pedro Bay Ports Technology Advancement Program, helping to manage technology projects designed to reduce or eliminate tailpipe diesel emissions, and with the Port's shore power program. She holds a Bachelor of Arts degree from the University of Florida and a Master's degree in Public Policy with a concentration in health policy from the University of California, Los Angeles.

Penny Newman, Center for Community Action and Environmental Justice

Penny Newman is executive director and founder of the Center for Community Action and Environmental Justice (CCA EJ), which serves Riverside and San Bernardino counties. She began her fight for environmental justice with the battle of the Stringfellow Acid Pits, California's worst toxic waste site. This 25-year battle of a small town against the pollution from the Stringfellow site is recounted in her book, "Remembering Stringfellow." Ms. Newman has received numerous awards during her 27 years as an environmental activist, including Jurupa's "Citizen of the Year." She was nominated as a 2005 California Senate "Woman of the Year" by Sen. Nell Soto, D-Pomona. Newman has also appeared on numerous television shows such as the "Remembering Your Spirit" segment of the Oprah Winfrey show. She was the subject of an HBO documentary, "Toxic Time Bomb."

Robert F. Phalen, University of California Irvine

Robert F. Phalen, Ph.D., co-directs the Air Pollution Health Effects Laboratory at the University of California, Irvine (UCI). He is a Professor in the Department of Medicine, Center for Occupational and Environmental Health. He graduated in 1964 from San Diego State University with a B.S. in physics, and obtained in 1966 an M.S. degree in physics. In 1971, he obtained a Ph.D. in radiation biology and biophysics, with specialization in inhalation toxicology, from the University of Rochester (in NY). His postdoctoral research was conducted at the Inhalation Toxicology Research Institute in Albuquerque, NM. In 1972, Dr. Phalen joined the College of Medicine at UCI to establish the Air Pollution Health Effects Laboratory, which still conducts studies relating to the toxicology of air pollutants. These studies have been supported by a variety of federal agencies, California state agencies, and numerous private agencies. He has published over 140 scientific papers, authored or co-authored books entitled *Inhalation Studies: Foundations and Techniques, 1st and 2nd editions* (1984, 2009), *Methods in Inhalation Toxicology* (1996), *The Particulate Air Pollution Controversy* (2002) and *Introduction to Air Pollution Science* (2011).

Robert N. Phalen, California State University San Bernardino

Robert N. Phalen, PhD, CIH, is an Associate Professor of Environmental Health Sciences in the Health Science and Human Ecology Department at California State University San Bernardino. Dr. Phalen received his doctoral degree in Environmental Health Sciences from University of California, Los Angeles. He is a Certified Industrial Hygienist (CIH), a specialist dedicated to protecting the health and well-being of people at work and in their community. Dr. Phalen teaches environmental and occupational health to undergraduate and graduate students. His primary areas of research include air quality, environmental monitoring (air and water), pesticides, personal protective equipment, and ergonomics. He is currently conducting research on air and water pollution issues within the Southern California region. Dr. Phalen is also a co-author of the textbook *Air Pollution Science: A Public Health Perspective*, which was designed for use with academic programs in environmental and public health. The textbook is published by Jones and Bartlett and the American Public Health Association.

Liem T. Pham, University of California Riverside

Liem T. Pham is currently a mechanical engineering graduate student at University of California Riverside (UCR) working under the supervision of Dr. Heejung Jung at the Bourns College of Engineering Center for Environmental Research and Technology (CE-CERT). He previously attended University of California Irvine (UCI) and received his Master of Science and Bachelor of Science in Mechanical and Aerospace Engineering focusing in the area of alternative energy and technology. After completing his master degree, he joined One-Cycle Control Inc. and worked as Senior Mechanical Engineer for three years in the Research and Development Division and also Production Division. His main research at UCR is in the area of vehicle emissions and characterizing diesel engine exhaust using environmental chamber.

Penelope J.E. Quintana, San Diego State University

Dr. Penelope JE Quintana is an Associate Professor of Public Health at San Diego State University (SDSU) Graduate School of Public Health. She received a BS in Genetics from UC Davis, an MPH in Occupational Health at SDSU, and a PhD in Environmental Health Sciences from UC Berkeley. She has a research focus on exposures to children and vulnerable populations at the US-Mexico border. She has assessed children's exposure to thirdhand smoke (residual tobacco toxicants remaining after smoking has occurred) through surface wipe and house dust, and demonstrated the persistence of toxicants in these environments. In conjunction with researchers at Universidad Autónoma de Baja California, Tijuana, she has studied exposure to toxic traffic pollutants inside vehicles waiting in lines to cross the US-Mexico border and exposures to nearby communities. With the University of Washington, she has measured absorption of diesel pollutants through urinary analysis in pedestrians waiting in long lines northbound at the San Ysidro Port of Entry next to idling diesel buses. She is the author of a recent report drawing attention to the long northbound wait times and lines of idling vehicles at US-Mexico Ports of Entry as an environmental justice issue for border crossers and surrounding communities.

Joe Rajkovacz, California Construction Trucking Association and Western Trucking Alliance

Joe Rajkovacz serves as Director of Governmental Affairs & Communications for the California Construction Trucking Association and Western Trucking Alliance. The association is the oldest independent non-profit trucking trade association in the U.S.



Mr. Rajkovacz has been employed in the trucking industry for over 35 years working various capacities from company driver, owner-operator, small-fleet owner (employer), and ultimately associational representative for two non-profit trade associations. Ironically, his trucking career began while attending Marquette University in pursuit of a law enforcement degree; he drove beer trucks out of Milwaukee's breweries to pay for his college education. While he did serve as a police officer, his interest in trucking never faded and he decided to shift career fields and resume a trucking career. During his active trucking years, Mr. Rajkovacz logged over 3.8 million miles without a preventable accident.

Few industries are as highly regulated as the trucking industry. Since 2006, the industry entered what can only be called a "hyper-regulatory" environment unlike anything seen in the industry since deregulation in 1980. Mr. Rajkovacz has been involved in many of the major state and federal regulatory hurdles faced by the trucking industry from federal hours-of-service regulations to the promulgation of the California Air Resources Board regulations on diesel powered trucks. One constant through all of the hyper-regulatory activity was Mr. Rajkovacz passion in representing the views of small-business truckers from Sacramento to Capitol Hill in Washington D.C.

Mr. Rajkovacz has testified numerous times before congressional committees in Washington D.C. on trucking issues, he has done extensive work with the U.S Department of Homeland Security helping develop the First Observer Transportation Security Awareness Program, he is frequently an invited guest on various national radio programs offering commentary specific to trucking issues. He has written for national trade publications. He participates actively in the Commercial Vehicle Safety Alliance and other industry-government highway safety oriented coalitions. In 2007 Mr. Rajkovacz was appointed to the Commercial Driver's License task force by then U.S. Secretary of Transportation Mary Peters.

Mr. Rajkovacz and his wife live in Rancho Cucamonga, California.

Samuel Soret, Loma Linda University

Samuel Soret, PhD, MPH, is currently Associate Dean for Public Health Practice and Associate Professor of Environmental Health at Loma Linda University School of Public Health, Loma Linda, CA. He received a BS in Biological Sciences from the University of Valencia, Spain, an MPH from the University of California Berkeley's School of Public Health, and a PhD in Biology from Loma Linda University. His main research interests focus on air pollution epidemiology and medical geography. He is currently a co-investigator of the Adventist Health and Smog (AHSMOG) Study, a longstanding investigation on the chronic health effects of air pollution. He is also Principal Investigator of the Environmental Railyard Research Impacting Community Health (ENRRICH) Study, which focuses on the assessment of health effects associated with residential proximity to goods movement facilities in inland Southern California. He is also pursuing research on the potential enhanced susceptibility of kidney transplant recipients to community air pollution.

Guoyuan Wu, University of California Riverside

College of Engineering – Center for Environmental Research and Technology (CE-CERT) University of California, Riverside

Dr. Guoyuan Wu received his B.S. degree in Energy Engineering in 2001 from Zhejiang University, P. R. China, and completed his M.S. degree in Thermal Engineering at Tsinghua University, P. R. China, in 2004. Then, he earned Ph.D. degree in Mechanical Engineering from the University of California, Berkeley in 2010. During the pursuit of his Ph.D., Dr. Wu had been employed as a graduate student researcher at the California Partners for Advanced Transportation Technology (PATH) for about five years. Upon graduation, Dr. Wu joined the Transportation Systems Research (TSR) group at CE-CERT as a Postdoctoral Researcher. Since July 2012, he has been working as an Assistant Research Engineer and conducting research on evaluation and development of intelligent and sustainable transportation systems, optimization and control of transportation systems, and traffic simulation. Dr. Wu is a member of the Institute of Transportation Engineers (ITE), Institute of Electrical and Electronics Engineers (IEEE), and Chinese Overseas Transportation Association (COTA). He is also a friend of several standing committees of Transportation Research Board (TRB), including the Traffic Signal Systems (AHB25), Managed Lanes (AHB35), and Transportation and Air Quality (ADC20).

Stanley Young, National Institute of Statistical Sciences

Dr. S. Stanley Young is the Assistant Director for Bioinformatics at the National Institute of Statistical Sciences (NISS) in Research Triangle Park, North Carolina. NISS' mission is to identify, catalyze and foster high impact, cross- disciplinary research involving the statistical sciences. He is also the CEO of Omicsoft Corporation.

Dr. Young graduated from North Carolina State University, BS, MES and a PhD in Statistics and Genetics. He worked in the pharmaceutical industry on all phases of pre-clinical research, first at Eli Lilly and then at GlaxoSmithKline. He has authored or co-authored over 50 papers including six "best paper" awards, and a highly cited book, Resampling-Based Multiple Testing. He has two issued patents.

He is interested in all aspects of applied statistics, with special interest in chemical and biological informatics. He conducts research in the area of data mining.

Dr. Young is a Fellow of the American Statistical Association and the American Association for the Advancement of Science. He is an adjunct professor of statistics at North Carolina State University, the University of Waterloo and the University of British Columbia where he co directs thesis work.



Abstracts

Session 1 – Welcome and Introduction (Economy and Equity)

Kimberly Collins, PhD

Department of Public Administration, CSUSB

Quality of Life Indicators for the Inland Empire: Insight to a More Sustainable Future

International trade is an important part of any nation's economic growth and security. The United States has developed one of the strongest, global trade regimes in the world, leading to the system of globalization known in the world today. The impacts of this trade have been very important to the U.S. and to local regions that experience the movement of goods on an everyday basis. While at the national level, the overall impacts to the nation are generally seen as positive, the local experience can be very different. There is a cost and some benefits to a region's quality of life. These are best displayed through indicators that provide insight to the region's realities and allow for an understanding of sustainable economic growth. In the Inland Empire, a large and diverse area, there are two very important transportation corridors, the NAFTA and Alameda Corridors. Rail and truck traffic pass through the area on a constant basis. This presentation will provide an overview of the region through quality of life indicators that highlight the impacts of international trade, focusing on specific communities in crisis and the region as a whole. It is hoped that by looking at the objective indicators better policies and allocation of resources can occur to mitigate the impacts of trade and improve the local quality of life.

Session 2 – Toxicology and epidemiology of air pollution (Environment)

Robert F. Phalen, Ph.D.

Center for Occupational and Environmental Health, Department of Medicine
University of California, Irvine

The Deposition and Fates of Inhaled Transport-Related Particulate Material

In order to accurately predict the potential adverse health effects of inhaled transportation-related particles, their initial deposition doses, and fates in the body must be examined. All substances can be harmful, and all can be safe depending on the dose, i.e., "the dose makes the poison." Particle size, airway anatomy, and breathing parameters are the major factors that determine initial deposition doses in the respiratory tract. Transport-related particles are in the fine (under 2.5 μm aerodynamic diameter) and ultrafine (physical dimensions under 0.1 μm) modes of environmental particles. Particles in this size range will deposit throughout the entire respiratory tract when they depart airstreams and contact airway surfaces. From an inhalation toxicology viewpoint the respiratory tract has three main anatomical regions: (1) upper (nose, mouth, and larynx); (2) tracheobronchial; and (3) alveolar. Each region has its characteristic anatomy, biological functions, diseases, and mechanisms that lead to particle capture. The main mechanisms that cause inhaled particles to deposit are: (1) sedimentation due to gravity; (2) inertial impaction (for large particles); (3) diffusion (for small particles); (4) interception (e.g., for fibers); and (5) electrostatic attraction (for highly charged particles). A person's age, disease states, level of exertion and other factors also influence inhaled particle deposition and clearance. Because "the dose makes the poison", it is important to examine the deposition doses of air pollution particles over a lifetime. Even at the highest current permitted EPA air standards, the deposition over 70 years is less than 0.5 grams for PM_{2.5}. One can identify

subpopulations that may get larger doses, or be susceptible to adverse health effects, such as young children, those with existing or predisposition to disease states, and those exposed near strong particle emission sources. The bottom line is that the doses from modern transportation-related sources are very small, and it is difficult to justify more-strict regulation on a dose basis.

James E. Enstrom, Ph.D., M.P.H.

UCLA School of Public Health

Air Pollution and Total Mortality in California

There is overwhelming epidemiologic evidence that air pollution, specifically particulate matter (PM), both fine particulate matter (PM_{2.5}) and coarse particulate matter (PM₁₀), and ozone, are not related to total mortality in California. I will summarize all the long-term PM and ozone epidemiologic cohort studies in California, including my own recent analysis of a major national cohort. I will discuss the limitations of these studies: lack of access to several key databases; the ecological fallacy; failure to consider other pollutants; failure to satisfy causality criteria; and failure to consider other competing health risks. Also, ethical issues underlying much of air pollution epidemiology will be discussed. I will make a strong case that air pollution at current ambient levels is not harming Californians and that there is not a scientific or public health basis for the regulations designed to further reduce air pollution levels. In particular, costly California goods movement regulations designed to reduce diesel PM from trucks are not justified. While claims have been made that these diesel regulations will prevent a couple hundred “premature deaths” per year in California, the actual California-specific evidence shows that PM (diesel and otherwise) does not cause any “premature deaths” in California. Finally, I will make the case that air pollution health effects and regulations must be put into proper perspective with other factors that influence health in California, especially given the low age-adjusted total death rate in this state and the relatively good health of Californians.

S. Stanley Young

National Institute of Statistical Sciences

Is there evidence for acute air pollution deaths in southern California?

The Great Smog of London, 1952, is estimated to have killed thousands of people and alerted all to the hazards of high levels of air pollution. There has been great progress in reducing air pollution and current literature is mixed on if current levels of air pollution are associated with acute deaths. There is a need to assess possible mortality effects of current levels of air pollution in specific regions as it is well-known that there is geographic heterogeneity. Daily deaths and air pollution levels as measured by PM_{2.5} and ozone were obtained for the years 2007-2010 for eight California air basins. Here we report on findings for southern California air basins. Spikes in the levels of PM_{2.5} and ozone, so called natural experiments, can be used to test for the acute effects of air pollution. People 65 and older were taken to be most sensitive to air pollution. Lung and cardiovascular deaths were taken to be most relevant to air pollution. Seasonal effects were removed using 21-day moving medians to give time-local estimates of deaths and air pollution. Death lags of 0, 1, and 2 days were examined. Analyses were computed for two measures of air pollution, four years, and three lags, looking for a consistent, acute effect of air pollution on mortality. A number of data visualization and supporting statistical analysis support the statement that there were no consistent statistical effects of PM_{2.5} or ozone on acute deaths. We concluded that there is no evidence of an increase in acute deaths due to PM_{2.5} or ozone in southern California for the years 2007-2010.

Session 3 – Transportation-related exposures near major roadways (Equity)

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Exposures to traffic pollutants at US-Mexico Ports of Entry (POEs), an environmental justice issue: case studies at the San Ysidro POE

The US-Mexico border crossings at Land Ports of Entry (POEs) are vital for trade, transport and movement of people between closely linked-regions. However, delays at these crossings are long for both drivers and pedestrians, and have increased since 9-11. Being in close proximity to traffic pollutants is associated with a host of adverse health effects, including respiratory and cardiovascular effects, adverse birth outcomes and even Type II diabetes. Here we present data on exposures to pedestrians, drivers and community members in relation to the San Ysidro POE that links San Ysidro, CA and Tijuana, Mexico. Results indicate consistently higher daytime black carbon (BC) and ultrafine particles (UFP) concentrations at the measurement sites in San Ysidro near the POE. BC pollution was significantly positively associated with the POE northbound wait times when the wind direction was from the POE towards San Ysidro, but not when the wind direction was from the west/northwest towards the POE. We also quantified northbound pedestrian commuter exposure to traffic-related air pollutants at the San Ysidro POE. Subjects who crossed the border in pedestrian lanes had up to 6-fold increases in exposure to traffic pollutants as compared to non-border commuters. Drivers were exposure to high levels of UFP during the border wait. Disparities in traffic exposures are an environmental justice issue and this should be taken into account during planning and operation of POEs.

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¹Loma Linda University School of Public Health

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Exploring Respiratory Health Risks of Living near a Major Goods Movement Rail Yard: The ENRRICH Study

Background: Residents near transportation hubs and corridors are likely to be exposed to high levels of airborne pollutants and experience increased adverse health outcomes. One such exposure setting is represented by the communities neighboring the Los Angeles-Long Beach port complex and its associated inland trade centers. Community groups and the air quality agencies have identified the BNSF San Bernardino Railyard (SBR) as a public health concern and an environmental justice issue affecting the adjacent low-income, minority populations. The Environmental Railyard Research Impacting Community Health (ENRRICH) Project is a collaborative established by researchers and local residents in response to the lack of objective data about this regional issue. Using community-based-participatory-research, ENRRICH explored health risks of living in close proximity to the SBR and supported the development of a community response plan to help mitigate exposure. Assessing the relationship between pollution density near and further away from the railyard and adverse respiratory health effects among

nearby school children was a primary goal. **Methods:** Respiratory health screening was offered to all children with parental consent at a school located 550 yards from the SBR and at a second school 5 miles west. Screening included: airway inflammation using fractional exhaled nitric oxide (FeNO), Peak Expiratory Flow (PEF), and health-history questionnaires. Regression analyses assessed the association between school proximity to the railyard and adverse respiratory health endpoints. **Results:** Over 1,000 children were screened. School children near the SBR exhibited significantly elevated airway inflammation (Prevalence Ratio=1.44, 95%CI: 1.02-2.02) and reduced expiratory flow compared to those attending the comparison school. **Conclusion:** Our findings suggest that close proximity to major rail yards can further negatively impact respiratory health in children even in areas already negatively impacted by poor air quality. There is the need for policy development and mitigation plans aimed at reducing exposure near schools.

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Components of Air Pollution and Cognitive Function in Middle-aged and Older Adults in Los Angeles

While experiments in animals demonstrate neurotoxic effects of particulate matter (PM) and ozone (O₃), epidemiologic evidence is sparse regarding the relationship between different constituencies of air pollution mixtures and cognitive function in adults. We examined cross-sectional associations between various ambient air pollutants [O₃, PM_{2.5} and nitrogen dioxide (NO₂)] and six measures of cognitive function and global cognition among healthy, cognitively intact individuals (n=1,496, mean age 60.5 years) residing in the Los Angeles Basin. Air pollution exposures were assigned to each residential address in 2000-06 using a geographic information system that included monitoring data. A neuropsychological battery was used to assess cognitive function; a principal components analysis defined six domain-specific functions and a measure of global cognitive function was created. Regression models estimated effects of air pollutants on cognitive function, adjusting for age, gender, race, education, income, study and mood. Increasing exposure to PM_{2.5} was associated with lower verbal learning (H = -0.32 per 10 ug/m³ PM_{2.5}, 95% CI = -0.63, 0.00; p = 0.05). Ambient exposure to NO₂ >20 ppb tended to be associated with lower logical memory. Compared to the lowest level of exposure to ambient O₃, exposure above 49 ppb was associated with lower executive function. Including carotid artery intima-media thickness, a measure of subclinical atherosclerosis, in models as a possible mediator did not attenuate effect estimates. This study provides support for cross-sectional associations between increasing levels of ambient O₃, PM_{2.5} and NO₂ and measures of domain-specific cognitive abilities.

Teresa Dodd-Butera, PhD; RN/DABAT
California State University San Bernardino

Traffic-Related Toxic Exposures: Implications for Maternal - Child Health

The *in utero* environment is uniquely susceptible to toxicity from exposures due to critical periods of development during pregnancy. Components of traffic contributing to toxicity include: carbon monoxide and carbon dioxide; polyaromatic hydrocarbons (PAHs); particulate matter; and diesel exhaust, which present a potential threat to maternal – fetal health and well-being. In this presentation, evidence of adverse birth outcomes and conditions of pregnancy related to proximity to traffic and subsequent toxic exposures will be examined. A review of the scientific evidence indicates an association between traffic – related exposure and preeclampsia, pre-term birth, decreased birth weight, congenital birth defects, asthma, and autism. Further, mechanisms of placental transfer and developmental toxicity will be presented which address the vulnerability of the maternal – fetal environment. Implications for policy decisions will be presented using a logic model which provides an illustration of an underlying conceptual framework and the logical connection within and between systems. An underlying assumption is the value of effective, efficient and equitable strategies for decreasing traffic-related exposures before, during, and after pregnancy. Inputs include community stakeholders and resources which are impacted by decisions which regulate traffic-related toxic exposures. An integration of principles of public health and policy will be discussed as essential for mitigating exposures and preventing short and long term adverse health outcomes from traffic-related toxic exposures in this vulnerable environment.

Session 4 – Local communities and businesses (Equity)

Penny J. Newman, Executive Director
Center for Community Action and Environmental Justice

The View from Our Window: The Critical Intersection between Freight Transport and Communities

With globalization and the expansion of international trade, corporate and consumer demand for imported goods is continuously increasing. These imports, the majority of which arrive by ship, are transported to millions of destinations all over the country by an expanding logistics industry otherwise known as the goods movement industry. The goods movement industry includes ports, trucking companies, rail yards and rail lines, intermodal facilities, warehouses, and distribution centers—each relying upon diesel fuel to power their operations. While this system benefits industry, it does not take into account externalized health costs caused by the goods movement industry in California. That cost, an estimated \$21.5 billion, is paid instead by taxpayers each year. In the South Coast Air Basin, health impacts such as premature death, chronic bronchitis, and hospitalization are estimated to cost \$10.2 billion per year. The expansion and maintenance of public freeways and roads, on which heavy trucks create the greatest wear and tear, further subsidizes the goods movement industry. But mere numbers do not capture the impacts upon communities in southern California. Our paper will explore the impacts on primarily low income communities of color that are smothered in the layers of diesel pollution. Results are seen in a recent health study that found at one elementary school near the railyard in San Bernardino has an asthma rate at a startling 47%. CCAEJ will outline in a paper and presentation alternatives to addressing these impacts.

Ken Lund

Vice President – Allen Lund Company

Joe Rajkovacz

Director of Governmental Affairs & Communications

California Construction Trucking Association/Western Trucking Alliance

Sustainable Goods Movement – A Small Business Perspective

A discussion of the environmental and economic impacts of how goods are shipped is often defined by the largest participants within the supply-chain. Often misunderstood are the overwhelming dominance and impact on the marketplace of small-business motor carriers and owner-operators.

Everybody is familiar with JB Hunt, Swift, Schneider, and UPS. They are large multinational motor carriers with a very specific business model followed. It's easy to believe these large motor carriers dominate the trucking industry – they don't. Federal databases contain records on over 500,000 active motor carriers – nearly half are one-truck operations. In fact, 97 percent of all registered motor carriers in the U.S. operate 20 or fewer trucks. Not understanding how diverse and dynamic the presence of owner-operators and small-businesses are on goods movement can lead to misguided and ineffective public policy intended to mitigate the environmental effects from transportation (e.g. banning certain trucks in California only leads to their sale to other jurisdictions effectively migrating emissions reductions and alleged health effects elsewhere).

Successful strategies to mitigate air quality concerns associated with goods movement needs to give more consideration to the economic challenges faced by the majority small-business community and incorporate their concerns into mitigation efforts. Government funding opportunities to upgrade equipment is not means tested and often is nothing more than a transfer from one government entity to another. Our presentation will delve into all these intersecting complexities with the intention to broaden everyone's understanding of the "real world of trucking" and also offer up alternative strategies that would aid economic growth in our industry in an equitable manner.

Dr. Matthew Malkan,

UCLA Department of Physics & Astronomy

Environmental Regulation Which Reduces Social Justice

A goal of environmental regulatory agencies is environmental justice. If some regulatory decisions are favored because they reduce social inequities, then it also follows logically that other policies which would increase social inequity must be disfavored. Most environmental justice advocates focused on negative health effects that fall more heavily on underprivileged communities. I focus on two other impacts of environmental decisions—living costs and unemployment, which are inextricably linked with health outcomes, since studies show that unemployment and lower standard-of-living correlate with poorer health. Environmental justice requires that the impacts of tighter environmental restrictions must not fall disproportionately on lower-income families.

The California Air Resources Board mandated phasing out many diesel engines used in the state for goods movement and construction. Other policies require replacing cheaper but dirtier power sources with cleaner but costlier sources, ie., renewables. The economic analysis of these stricter regulations states that their increased costs will be passed on to consumers. Affluent consumers may hardly worry about their reduced standard of living. However, contrary to the goals of environmental justice, these increased costs are NOT shared equally among

individuals of different socio-economic status. Lower-income individuals must expend a larger fraction of their budgets on essentials (e.g. food, power, housing and cheaper consumer durables). Simple economic analysis indicates that transportation costs (largely trucking) account for a larger fraction of the consumer prices of cheaper necessities, and that these make up a disproportionately large fraction of the expenditures of those near the poverty line. Similarly, poorer individuals spend a higher percentage of their incomes on housing and utilities. Regulations that preferentially raise these costs therefore function as new regressive taxes. Because consumption patterns are a strong function of income, the costs of these environmental rules are even more regressive than the general sales tax, which is widely criticized for its regressivity. These regulations have the perverse effect of widening—not narrowing—the wealth and health gap between poor and affluent.

An additional environmental justice consideration arises when regulations reduce employment. The impact of CARB diesel regulations on workers in the transportation industry is again regressive—ie., harm falls disproportionately on the lower-income workers. I discuss ways in which environmental regulators can advance—rather than impede—the cause of environmental justice.

Session 6 – Sustainable strategies (Economy)

Jo Klinski, Chief Operating Officer/Chief Intellectual Property Officer
Magna Force, Inc. (Developers of the LEVX® technologies)

LEVX®: Environmentally and Economically Sustainable Transport for High Density Freight Corridors

The evolution of transport technology has taken a leap into the future with the development and demonstration of full scale LEVX® freight transport systems that possess unmatched operating efficiencies and provide low cost infrastructure options in zero and near zero emission configurations.

LEVX® technologies point the way to an economically and environmentally sustainable future where transport energy requirements and related emissions can be reduced by up to 95%. The proprietary LEVX® technologies provide the keys to overall system efficiency by eliminating the static drag and impact loads associated with weight bearing wheels and the magnetic drag developed in electromagnetic systems. Light weight, simplified LEVX® guideway structures provide additional cost advantages as they require no third rails, overhead wires, copper coils or wayside power conditioning equipment for operation.

Moving freight swiftly, cleanly, and quietly along LEVX® a dedicated fixed guideway would also dramatically reduce the impact of freight transport on communities currently burdened with congested surface streets and the environmental consequences of truck traffic.

What does all of this mean to the guy on the street? It means that heavy loads can be mobilized with a fraction of the energy needed by today's transportation options, conserving energy resources, slashing pollution and lowering the costs and impacts of moving freight. It also means fewer trucks on shared streets, improving safety and reducing road maintenance requirements while improving freight delivery times to support a growing economy.

Renee Moilanen
Port of Long Beach

Charting the Course: Reducing Ship Emissions in a Sustainable Way

Ships are the single largest source of air pollution in San Pedro Bay, and they are the toughest source category to regulate. At the ports of Long Beach and Los Angeles, ships account for nearly 60% of the air emissions, and they pose a significant health risk to local communities, which already suffer from high rates of asthma and other illnesses. Additionally, because ships are often flagged in foreign countries, deployed worldwide based on global market conditions, and regulated internationally, local jurisdictions such as the Port of Long Beach (Port) find it particularly difficult to effectively address these emissions. There are few tools available to clean up the ships, and even fewer tools that balance environmental benefits with economic realities.

Despite these challenges, the Port has made substantial progress in reducing ship pollution over the past decade, seeing declines of up to 75% since 2005. This accomplishment reflects the Port's commitment to adopting innovative strategies that focus on long-term environmental and economic sustainability. These strategies have involved (1) developing voluntary emission-reduction programs that use financial incentives and public accolades to extract compliance, and (2) collaborating closely with the shipping industry.

This paper will describe the Port's major ship-related initiatives, including the Vessel Speed Reduction program, which discounts dockage fees for operators that voluntarily slow their ships near the port; the Green Ship Incentive Program, which rewards shipping lines financially for deploying their newest, lowest-emitting ships; and the Technology Advancement Program, which funds emission-reduction technology demonstration projects. Additionally, the paper will highlight the direct and indirect community benefits, from reduced health risk to the industry's growing involvement in community causes, such as funding new playgrounds and school programs.

By balancing environmental, community, and economic considerations, the Port has demonstrated that even the most intractable environmental issues can be addressed with sustainable, collaborative strategies.

Robert N. Phalen, Ph.D.
California State University San Bernardino

Alternative Technologies and Solutions to Reducing Near Road Exposures from Heavy-Duty Diesel Vehicles

In the grand scheme of goods movement, heavy-duty trucking is one of the more costly modes of transportation and it is estimated that about 28% of shipping costs can occur in the "last mile" of transit. Due to regional air pollution concerns, these essential services are often under substantial regulatory control, which serves to increase transportation costs and the affordability of fresh produce, foods and other goods. This can have a negative impact on low and middle-income families. However, it has also been shown that those who live closer to major transportation corridors have higher exposures to heavy-duty diesel emissions. As with any scenario where there are trade-offs, risks and benefits, it is important to evaluate those solutions that can minimize risks and maximize benefits—In this case, we need cost-effective solutions that reduce transportation costs, support the local economy and reduce human exposures. The purpose of this paper is to review those factors that most affect near road exposures to heavy-duty diesel vehicle exhaust and propose efficient alternatives to costly fuel modifications and exhaust aftertreatments. The major factors reviewed include vehicle speed, truck cycle (e.g., delays, idle time, stops and accelerations), vehicle class and weight, vehicle age, fuel injection and timing (with investigation of the NO_x-particulate matter trade-off), terrain, distance from roadway, and wind speed. Additional solutions, such as use of smaller and cleaner vehicles in high density urban environments, are presented.

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Fusion of Truck Weight and Activity Data for Improved Estimation of Emissions Due to Goods Movement

Among several factors affecting vehicle emissions is vehicle weight, which is particularly critical when modeling emissions from heavy-duty trucks (HDTs). The Motor Vehicle Emission Simulator (MOVES) model provides a framework to account for weight information when constructing the vehicle emission inventory. To date, this has not received much attention although reliable vehicle weight data has become increasingly available in the last several years thanks to the deployment of weigh-in-motion (WIM) technology.

This paper presents a method for fusing vehicle weight data from WIM stations and traffic data from vehicle detector stations (VDS) to result in better HDT activity data input for MOVES in terms of vehicle operating mode distribution. The main idea is to identify trucks recorded by a nearside WIM station that are likely to travel over a VDS during a time period. Then, the measured weight data of these trucks can be associated with the second-by-second speed and acceleration values from synthesized vehicle trajectories that are created from strategically selected MOVES driving cycles.

Using freeways in Los Angeles County, California, as a case study, it is shown that the distributions of vehicle operating mode are quite different between the proposed method and the existing method, which assumes an average weight value for all HDTs in the same class. The proposed method results in 78% higher oxides of nitrogen emissions and 30% higher particulate matter emissions than the existing method.

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Determination of suspended exhaust PM mass for light duty vehicles

In line with stricter PM emission standards for heavy-duty vehicles (HDV), the United States Environmental Protection Agency (US EPA) and the California Air Resources Board (CARB) will implement stricter PM standards on light-duty vehicles (LDV). California's new PM emission standard will be reduced to 1 mg/mile, posing a challenge to current gravimetric measurement method. The European Union (EU) will implement particle number (PN) emission standard and proposed to use the Particle Measurement Programme's (PMP) PN measurement protocol as a complementary measurement to the PM mass standard. The current EU PN standard excludes sub 23 nm particles which are mostly volatile but may be responsible for significant adverse health effects. There is limited information regarding associations between human health effects and PN emissions. Also PN and PM do not necessarily correlate with each other over a variety of test conditions, which poses questions to regulators

regarding whether particle number is an appropriate metric to replace current particle mass-based measurement protocols.

This study presents determination of suspended exhaust PM mass as opposed to filter captured PM mass as a possible alternative metric to complement current gravimetric method. One example is the integrated particle size distribution (IPSD) method (Liu et al., 2009) which combines particle size distribution with size dependent particle effective density. The method allows for simultaneous determination of particle mass, particle surface area, and particle number. An initial work by Liu et al. (2009) showed good agreement with 1065 compliant gravimetric measurement at low emission levels. As IPSD can simultaneously obtain PM as well as PN, it has the potential to explain discrepancies between current gravimetric method and particle number method. The paper presents comparison of suspended PM mass determined by the IPSD method with gravimetric PM mass. Final goal of this project is to assess repeatability and accuracy of alternative methods to determine suspended PM mass to examine appropriateness as future regulatory measurement methods.

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Temporal and spatial variations of particulate emissions on major highways: Lagrangian approach using mobile monitoring system

Ultrafine particles (UFP) with diameter < 0.1 μm and nanoparticles with diameter < 50 nm comprise major fractions of total particle number from vehicle exhaust. They are linked to series of adverse health effects, including asthma and cancer. Although there are infrastructures for stationary monitoring sites of particulate matter (PM) throughout Southern California, they are built at locations away from the main sources such as highways and power generation sites. The data from monitoring sites do not have good indications how people are exposed to PM level because particle concentration downwind of the source can reach background level with just 300 m away. In this study, a mobile platform was used to monitor UFP and nanoparticles during peak traffic time during daily commute on the 91 freeway and the 710 freeway using Lagrangian approach. Long Beach Port is directly connected to the 710 freeway where there is a higher concentration of diesel exhaust. This enables a direct comparison between diesel engine and gasoline engine traffic. Particle concentration, particle size distribution, total particle surface area, and average particle diameter were measured. A GPS was used to record vehicle speed, location, and road grade during the measurement run. Temporal and spatial variations in concentration were reported to indicate hot spots of particle nucleation on highways. The peak concentrations are $150 \times 10^3 / \text{cm}^3$ and $6.4 \times 10^3 / \text{cm}^3$ on the 91 and 710 freeway respectively. Meanwhile, the average particle diameter is 2.4 nm/cm^3 and 1.5 nm/cm^3 on the 91 and 710 freeway respectively. Our preliminary results indicates that the average PM concentration is approximately 4 times higher on the 91 freeway and 2 times higher on the 710 freeway compared to average daily exposure.

Jenna Risa LeComte-Hinely, PhD

Health Assessment Resource Center (HARC, Inc.)

Unemployment and Health in the Coachella Valley

Between 2007 and 2010, unemployment in the Coachella Valley more than doubled, increasing from 4.5% to 10.1%. This paper explores the relationship between unemployment and health in the Coachella Valley. Data are from HARC's triennial random-digit dial telephone survey, which provides a representative sample of the Coachella Valley community for 2007 and 2010. Unemployed adults in Coachella Valley are typically males with a high-school level education and very low household income. Results show that unemployed adults have significantly worse health than employed adults. More than half of unemployed adults lack any type of healthcare coverage, a rate that is more than double that of employed adults. For those unemployed adults that *do* have healthcare coverage, their healthcare plans are less likely to cover important services, such as dental, vision, or mental health services. Unemployed adults are less likely to have visited a doctor or dentist in the past year, indicating they are likely not receiving important preventive care. Unemployed adults engage in significantly less exercise than their employed counterparts, putting themselves at risk for obesity and serious health problems. Unemployed adults also exhibit significantly more negative health behaviors, including smoking cigarettes and binge drinking. Overall, results exhibit strong evidence that unemployment is associated with very serious negative health effects. Given the high rate of unemployment in the Coachella Valley, this presents a serious public health problem for the community.

Janet H. Koh, MPH, DrPH, Loma Linda University; Asma Taha, RN, PhD, California State University San Bernardino

Employment, Environmental Stability and Associated Disparities in Child Maltreatment

Child maltreatment is a prominent public health problem that can lead to serious injury and suffering, an increase in health care costs, and demands on valuable community resources. The National Data Analysis System reflected that 2.07 per 100,000 children, an estimated 1,560 children nationally, died as a result of maltreatment in 2010. San Bernardino County (SB County) prosecutors charged 1,550 people with child abuse in 2012, a year when five children died at the hands of an adult. In 2012, in the state of California, there were 94,379 cases of documented physical abuse. In SB County, there were 6,644 cases. SB County is the fifth largest country in the United States with population of over 2 million. The estimated annual cost of child maltreatment was higher than \$103 billion in 2007. Employment status can lead to several factors including instability of residence, familial stress, and a lack of resources or social support that have an effect on the severity of child maltreatment. There is a gap in the literature regarding whether or not employment status with the decline in the economy has been linked to cases of child maltreatment. While a national news study indicates that the recession has been linked to cases of Shaken Baby Syndrome, there are few, if any, scholarly articles confirming such an association. Millett, Lanier, and Drake (2011) report that while there has been a decline in national rates of child maltreatment, it is of concern that the recent economic recession will reduce or reverse this decline. Although rates of unemployment are on the decline, 110,000 San Bernardino residents report being unemployed in June 2012. Whether there is a link between unemployment and child abuse in our local area is not definite. A local investigation is underway to examine the demographics of documented child abuse cases seen at a level 1 trauma center in SB County.

Information for Attendees

Registration

Registration is \$50 per person for the two days, to cover the uncontrolled costs of food, refreshments, parking and printed materials. A check or money order can be received by November 18, 2013. The registration form is available on the PSIES website (see link below). If you plan to pay on the day of the symposium please e-mail Robert Phalen at phalen@csusb.edu to ensure we order you lunch.

<http://psies.csusb.edu/SustainableGoodsMovementSymposium2013.html>

Parking

No parking permits are required on the days of the symposium. The parking costs are included in the registration.

Directions

The CSUSB Palm Desert Campus is located at 37500 Cook Street, Palm Desert, CA 92211.

Directions from LA/San Bernardino:

Take the I-10 Freeway east toward Indio
Take the Cook Street exit
Turn right onto Cook Street
Go south on Cook St. past Gerald Ford Ave.
Turn Left onto Berger Drive West

Directions from Indio/Arizona:

Take the I-10 Freeway west toward Los Angeles
Take the Cook Street exit
Turn left onto Cook Street
Go south on Cook St. past Gerald Ford Ave.
Turn Left onto Berger Drive West

Internet and Workrooms

We have a large open room available with Wi-Fi, IW-120, which is directly across from the main theater. The room will also be used for lunch and breaks. Wi-Fi can be accessed using the below username and password:

- Username: **conference**
- Password: **guest@pdc**

The Deposition and Fates of Inhaled Transport Related Particulate Material

by

**Robert F. Phalen, Ph.D., Professor
Department of Medicine, Center for
Occupational and Environmental Medicine
Co-Director: Air Pollution Health Effects Laboratory,
University of California, Irvine**

**Sustainable Goods Movement: Maintaining
the Environment, Economy and Equity**

**CSUSB Palm Desert Campus, Palm Desert, CA
November 21-22, 2013**

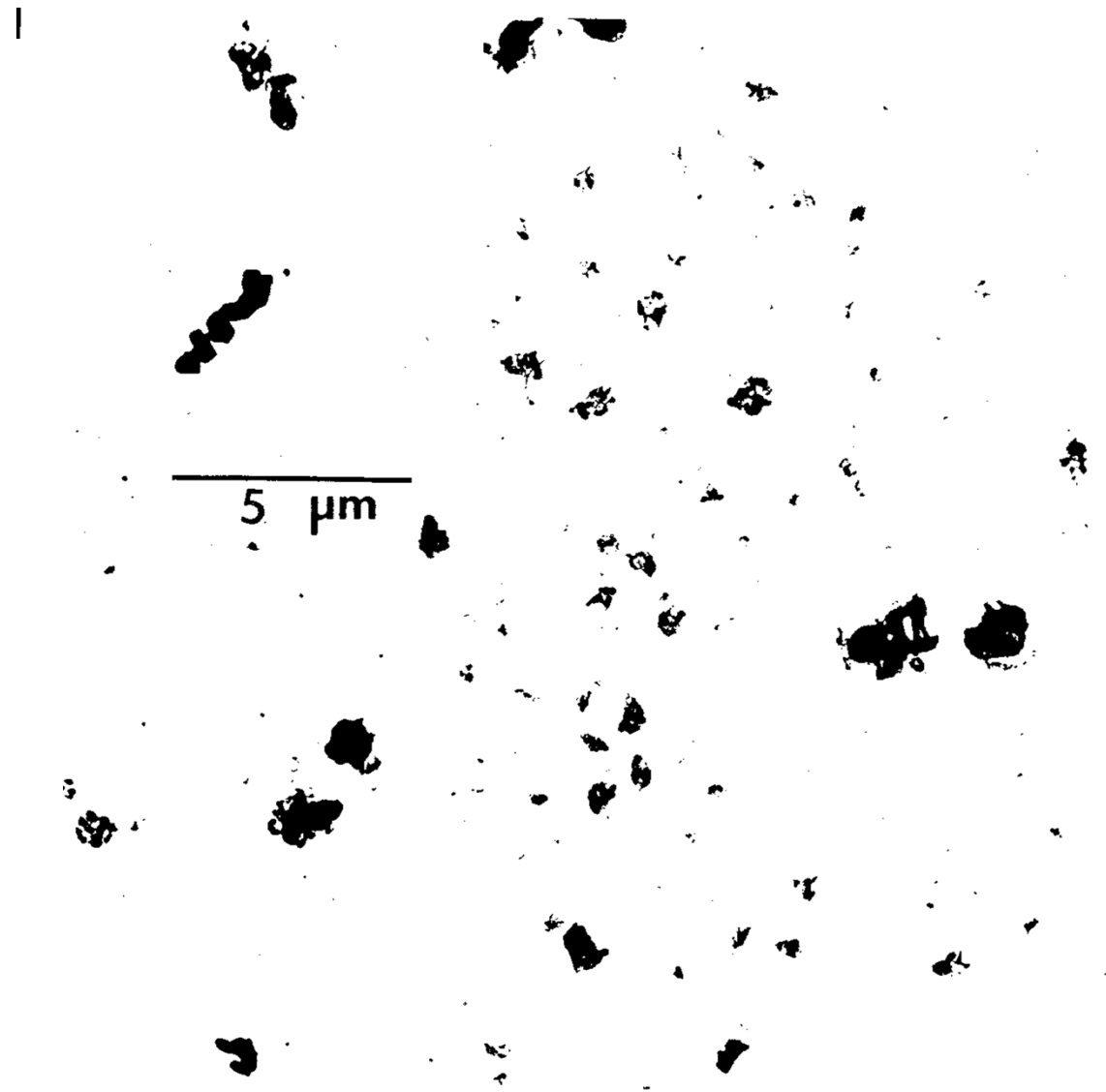
“All substances are poisons; There is none which is not a poison.
The right dose differentiates a poison from a remedy.”



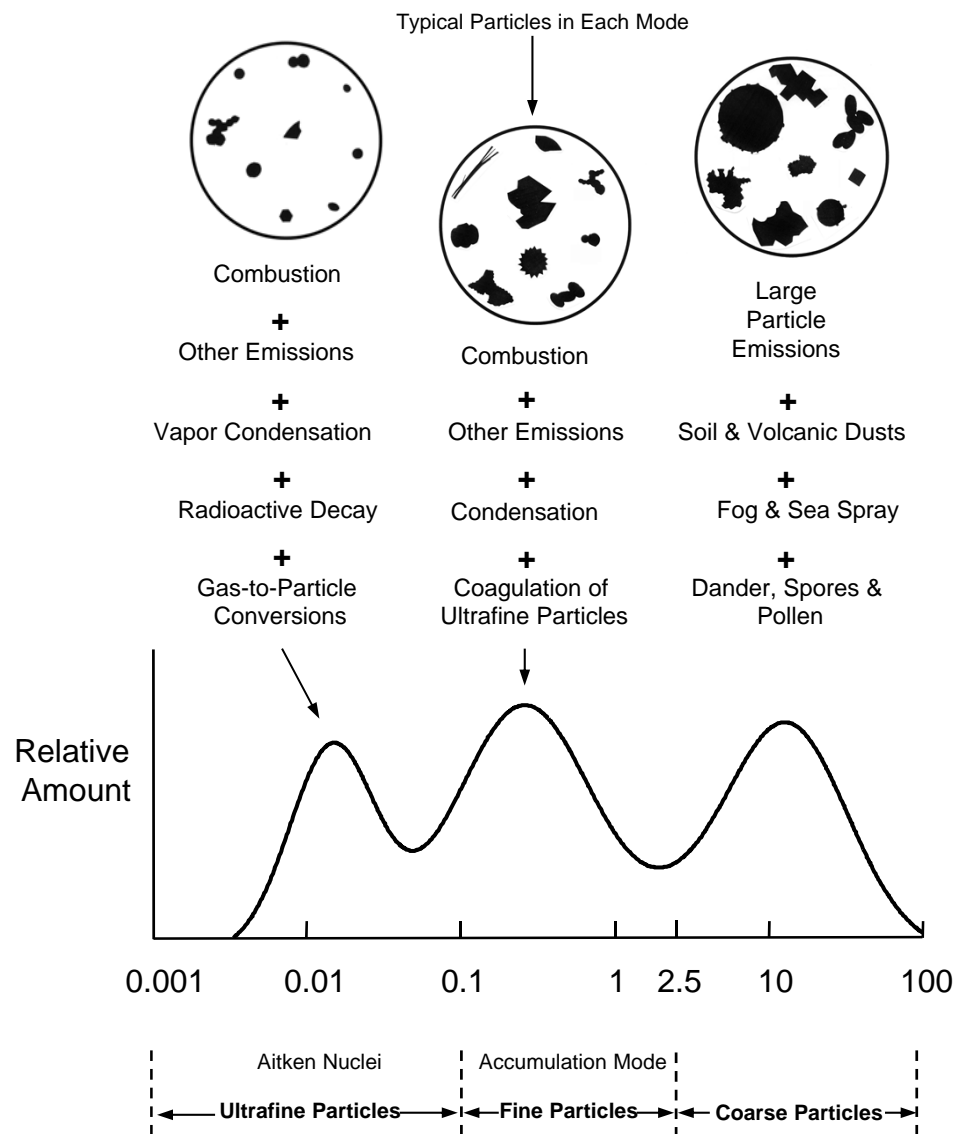
OUTLINE

- * ENVIRONMENTAL PARTICLES**
- * THE HUMAN RESPIRATORY TRACT**
- * DEPOSITION OF INHALED PARTICLES**
- * U.S. EPA CRITERIA AIR POLLUTANTS**
- * CALIFORNIA DIESEL EXHAUST DOSES**
- * CALIFORNIA PM ISSUES**
- * CONCLUDING REMARKS**
- * REFERENCES**

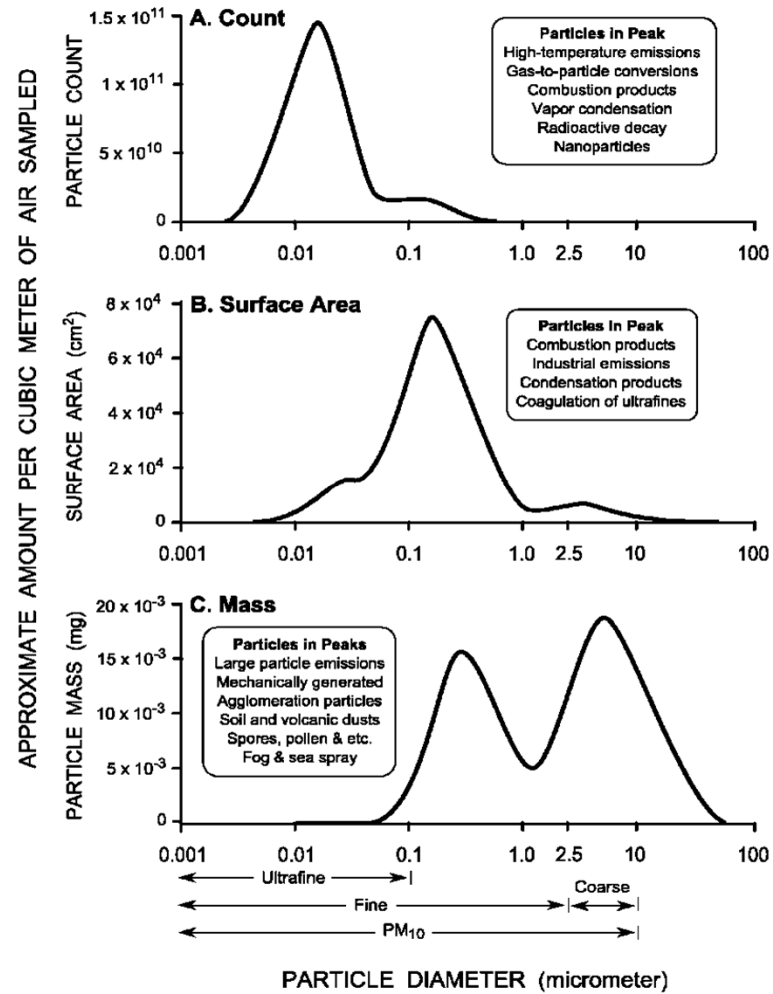
EM PHOTO OF PARTICLES IN IRVINE AIR



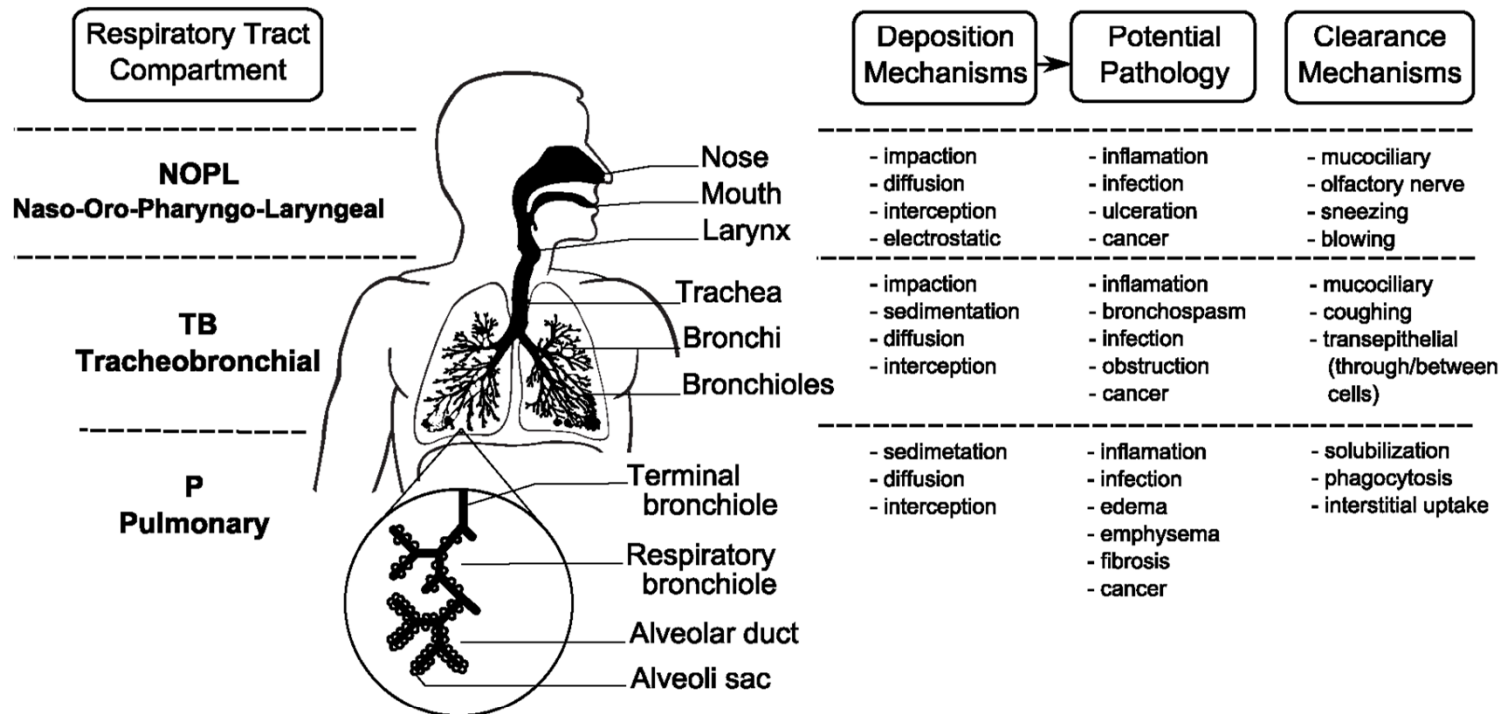
TROPOSPHERIC PARTICLES - SIMPLIFIED



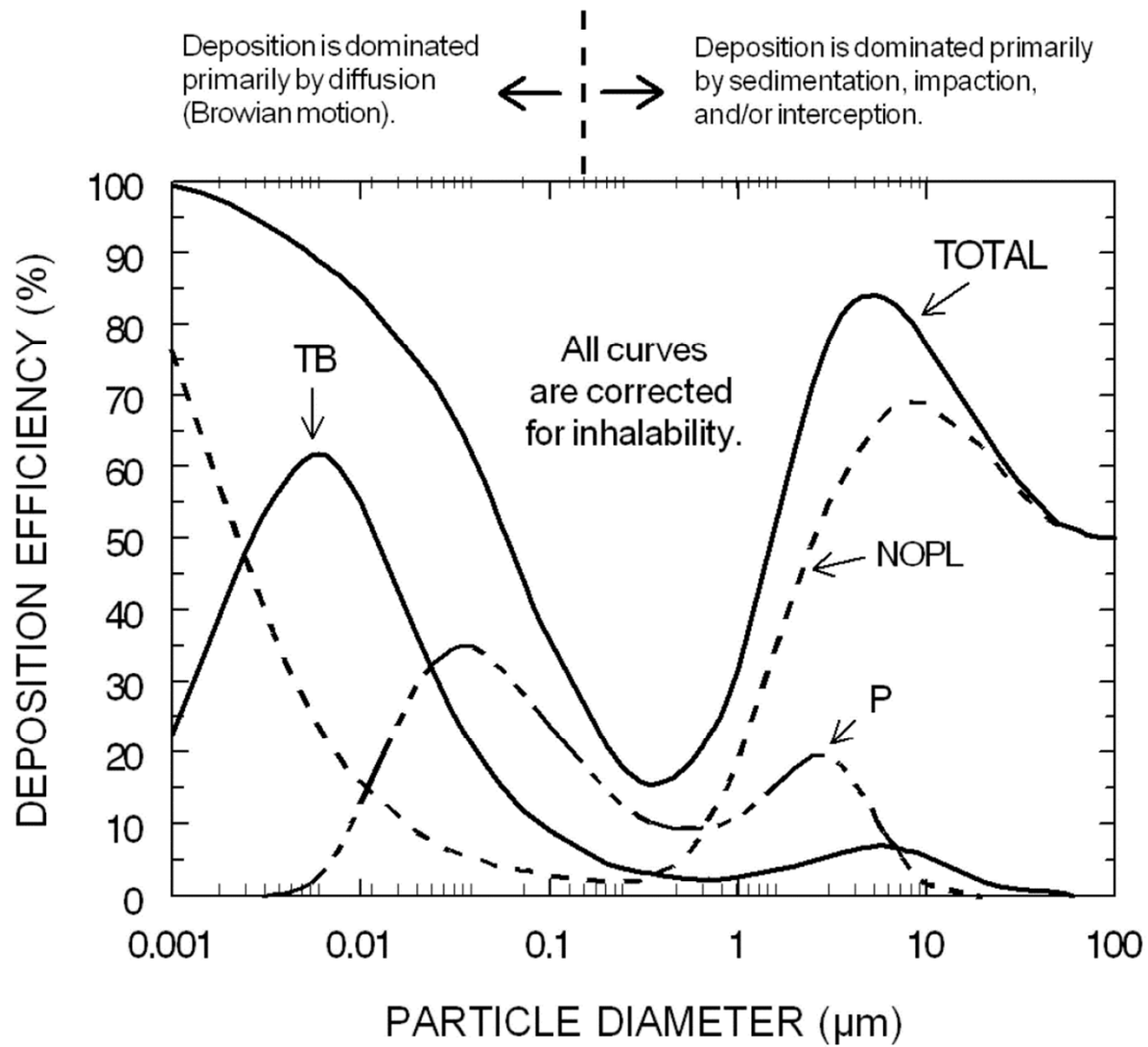
TROPOSPHERIC AEROSOL USING THREE METRICS



THE RESPIRATORY TRACT



INHALED PARTICLE DEPOSITION



NAAQS – NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Type*	Standard	Averaging Time
<i>Sulfur Dioxide</i>	Primary	0.075 ppm	1 h
	Secondary	0.5 ppm	3 h
<i>Nitrogen Dioxide</i>	Primary	0.053 ppm	Annual
	Primary	0.1 ppm	1 h
<i>Ozone</i>	Primary	0.075 ppm	8 h
<i>Carbon Monoxide</i>	Primary	9 ppm	8 h
	Primary	35 ppm	1 h
<i>Lead</i>	Primary	0.15 µg/m ³	3 mo (rolling avg).
<i>PM₁₀</i>	Primary	150 µg/m ³	24 h
<i>PM_{2.5}</i>	Primary	35 µg/m ³	24 h
	Primary	15 µg/m ³	annual

* Primary standards are intended to protect public health, and Secondary standards are set to protect public welfare (e.g. impacts on vegetation, crops, man-made materials, ecosystems, visibility, climate, etc). When the Secondary standard is the same as the Primary standard the Secondary standard is not listed. Source: <http://epa.gov/air/criteria.html>, (accessed 11/15/2013).

PM 2.5 DOSE CALCULATIONS - 1

- * Assume 24 hours of breathing at a low exertion level for 70 years at maximum EPA NAAQS ($15\mu\text{g}/\text{m}^3$)
- * Estimate total inhaled dose to the Pulmonary Airways.
- * Total 70 year outdoor 24 hour/day dose = 1.8 grams
- * Total 70 year indoor & outdoor dose = 0.65 grams

PM 2.5 DOSE CALCULATIONS - 2

- * Total 70 year diesel dose in CA = 0.026 grams
- * Smoking 1 cigarette dose = 0.04 grams
- * CA diesel dose in 70 years = 0.65 cigarettes; i.e., 0.01 cigarettes/year.
- * The TWA for soot is 3 mg/m^3 giving 0.026 grams in 2 days.
- * No non-infection related substance could be toxic at the average level of diesel PM exposure in CA.
- * The single lethal dose of strychnine sulfate = 0.14 grams

CALIFORNIA PM ISSUES - 1

- * U.S. EPA sets National Ambient Air Quality Standards (NAAQS).
- * CA has a dry climate, so soil dust PM 2.5 is about 1.7 to 3.5 $\mu\text{g}/\text{m}^3$.
- * PM is the only regulated air pollutant without chemical specification; mass is regulated.
- * PM 2.5 is mass (natural & anthropogenic) in particles under 2.5 μm diameter.
- * In CA total PM 2.5 is about 10 $\mu\text{g}/\text{m}^3$ of air. Diesel combustion contributes about 0.4 to 0.6 $\mu\text{g}/\text{m}^3$ (Mahmud, et al., 2012)
- * Epidemiology studies of PM 2.5 in CA are largely negative, as opposed to some Eastern U.S. cities.

CALIFORNIA PM ISSUES - 2

- * Further restrictions on diesels could have only negligible impacts on PM 2.5 in CA.
- * CA has serious economic problems, which also have adverse health impacts.
- * Any risk assessment should be done on the risks of a decision (e.g., regulation), not a chemical (or substance).
- * CA should consider seeking a waiver to exempt the state from PM 2.5 NAAQS.

CONCLUSIONS

- * PM 2.5 in CA air is quite low.
- * Diesel exhaust is a small portion of PM 2.5 in CA.
- * Doses from inhaled diesel exhaust particles in CA are very small.
- * PM 2.5 in CA is less toxic than that in some Eastern U.S. cities.
- * Is it logical for CA to impose additional restrictions on diesel exhaust?

REFERENCES

Jenkins, R.A., Guerin, M.R., and Tomkins, B.A., *The Chemistry of Environmental Tobacco Smoke, 2nd Edn.*, Lewis Publishers, Boca Raton, FL, 2000.

Mahmud, A., Hixson, M., and Kleeman, M.J., Quantifying population exposure to airborne particulate matter during extreme events in California due to climate change, *Atmos. Chem. Phys. Discuss.*, 12: 5881-5901, 2012.

Phalen, R.F., and Phalen, R.N., *Introduction to Air Pollution Science: A Public Health Perspective*, Jones & Bartlett, Burlington, MA, 2011.

Phalen, R.F., *The Particulate Air Pollution Controversy*, Kluwer Academic Press, Boston, MA, 2002.

Schictel, B.A., Pichford, M.L., and White, W.H., Comments on “Impact of California’s Air Pollution Laws on Black Carbon and their Implications for Direct Radiative Forcing”, by Bahadur et al., *Atmos. Environ.* 45:4116-4118, 2011.

Air Pollution and Total Mortality In California

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CSUSB Sustainable Goods Movement Symposium

Palm Desert, CA

November 21, 2013

Fine Particulate Matter (PM_{2.5}) & Total Mortality Relationship Since 1993

Based on Prospective Epidemiologic Cohorts

Dockery, Pope, et al. NEJM 1993 “An association between air pollution and mortality in six U.S. cities” (H6CS)

Pope, Thun, et al. AJRCCM 1995 “Particulate air pollution as predictor of mortality in prospective study of U.S. adults” (CPS II)

Wall Street Journal April 7, 1997

“Pollution study sparks debate over secret data”

SCIENCE July 25, 1997 “Showdown Over Clean Air Science”
& “Researchers and Lawmakers Clash Over Access to Data”

Robert F. Phalen “The Particulate Air Pollution Controversy”
2002 Book and 2004 Paper

Fine Particulate Matter (PM_{2.5})

PM_{2.5} is defined by particle size ($\leq 2.5 \mu\text{m}$ in diameter) and not by chemical composition. PM_{2.5} is generated mainly by combustion processes. The major sources of PM_{2.5} in California are forest fires, agricultural dust, industrial combustion, China, and diesel engines (about 10%)

PM_{2.5} epidemiology has been used to establish the following scientifically contested regulations that have had and still have multi-billion dollar economic impacts in California and the US:

- 1) 1997 & 2012 US EPA Annual National Ambient Air Quality Standard (NAAQS) for PM_{2.5} : $15 \mu\text{g}/\text{m}^3$ and now $12 \mu\text{g}/\text{m}^3$
- 2) 2008 CARB Truck and Bus Regulation for Diesel Vehicles
- 3) 2003-2007-2012 SCAQMD Air Quality Management Plans₃

“Premature Deaths” Attributed to PM_{2.5}

A relative risk greater than 1.0 [RR > 1.00] for the relationship between PM_{2.5} and total (all cause) mortality is interpreted by US EPA and CARB as evidence that PM_{2.5} “causes” “premature deaths.”

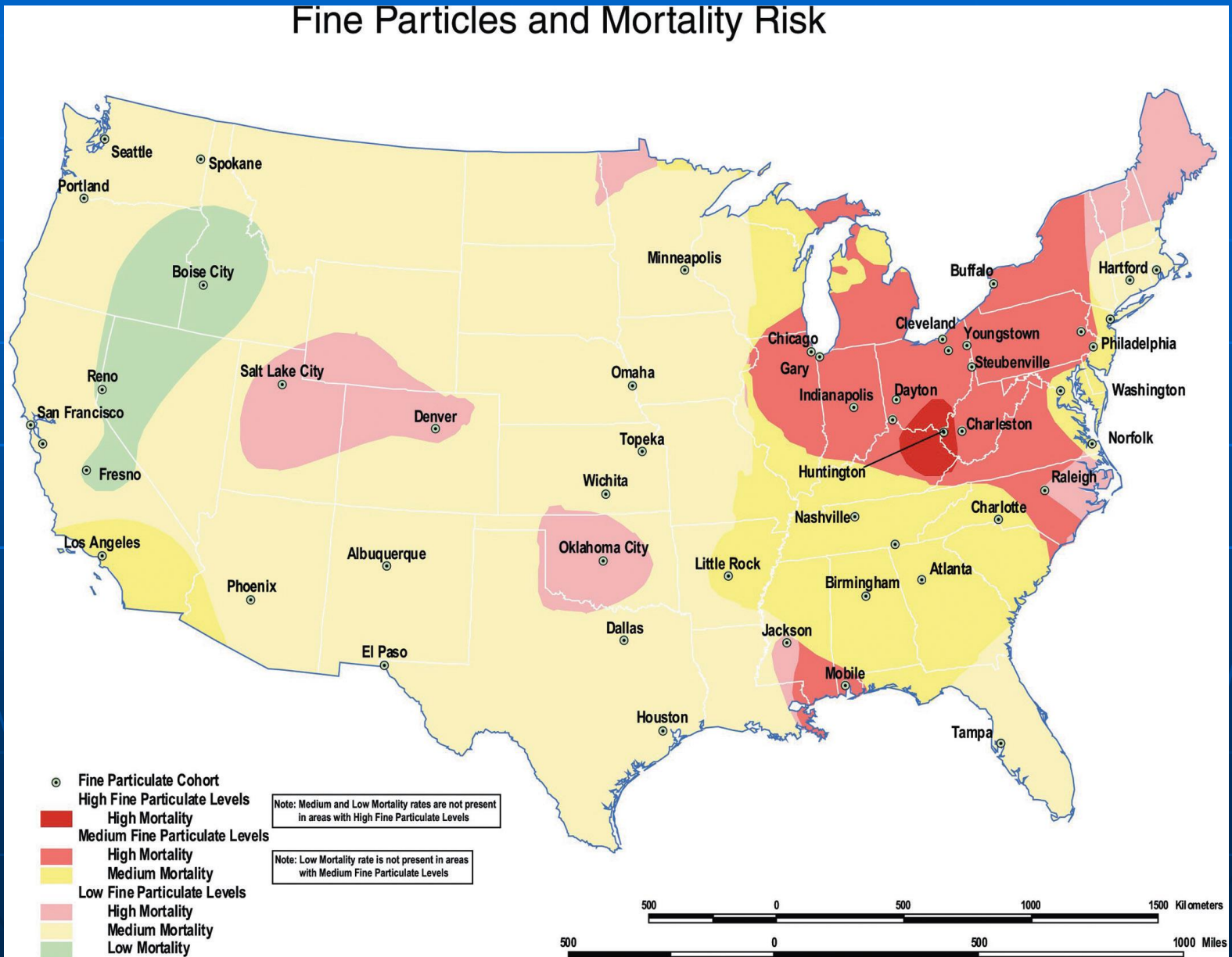
Because EPA assigns a lifetime monetary value of about \$9 million to each “death,” the health benefits of preventing these “deaths” are assumed to exceed the compliance costs of the EPA and CARB regulations that are designed to reduce PM_{2.5} levels and PM_{2.5}-related deaths.

Without PM_{2.5}-related “premature deaths” the EPA and CARB regulations are not justified on a socioeconomic cost-benefit basis.

2000 Krewski Jerrett HEI Report Figure 21

1982-1989 CPS II PM_{2.5} Mortality Risk <1.0 in CA

Fine Particles and Mortality Risk



August 31, 2010 Letter from Krewski to HEI President Greenbaum

(http://www.arb.ca.gov/research/health/pm-mort/HEI_Correspondence.pdf)

**Special Analysis of California Subjects
in Krewski 2009 HEI Research Report 140
(direct result of repeated requests to HEI
by Ad Hoc Trucking Group during 2010)**

RR = 0.872 (0.805 – 0.944) during 1982-1989

RR = 0.960 (0.920 – 1.002) during 1982-2000

Based on 40,408 CPS II subjects in 4 CA Metro Areas (MSAs)

PM_{2.5} & Total Mortality in California: RR (95% CI)

(<http://www.scientificintegrityinstitute.org/ASAS092812.pdf>)

McDonnell 2000 (9 air sheds)	AHSMOG	RR ~ 1.03 (0.95-1.12)	1976-1992
Krewski 2000 (4 MSAs, reported in 2010)	CA CPS II	RR = 0.87 (0.81-0.94)	1982-1989
Enstrom 2005 (11 cos & 25 cos)	CA CPS I	RR = 1.00 (0.98-1.02)	1983-2002
Zeger 2008 (CA + OR + WA)	MCAPS "West"	RR = 0.99 (0.97-1.01)	2000-2005
Krewski 2010 (4 MSAs)	CA CPS II	RR = 0.96 (0.92-1.00)	1982-2000
Jerrett 2010-11 (Nine Model Average)	CA CPS II	RR = 1.00 (0.99-1.01)	1982-2000
Lipsett 2011	CA Teachers	RR = 1.01 (0.95-1.09)	2000-2005
Jerrett 2013 (Conurbation LUR Model Only)	CA CPS II	RR = 1.06 (1.00-1.12)	1982-2000
Enstrom Unpub	NIH	RR ~ 1.00	1995-2006

PM₁₀ & Total Mortality in California: RR (95% CI)

Abbey 1999 AHSMOG RR = 1.00 (0.97-1.04) 1977-1992
(N=6,338; SC&SD&SF Air Basins; all natural causes)

Chen 2010 AHSMOG RR = 1.01 (0.98-1.04) 1977-2006
(N=4,830; SC&SD&SF Air Basins; all natural causes)

Jerrett 2011 CA CPS II RR = 1.00 (0.99-1.02) 1982-2000
(N=76,135;KRG Zip Model; 20 ind cov+7 eco var; Table 37)

Lipsett 2011 CA Teachers RR = 1.01 (0.95-1.09) 2000-2005
(N=73,489 F; California)

Enstrom Unpub CA CPS I RR ~ 1.00 1983-2002
(N~80,000; California)

Enstrom Unpub NIH RR ~ 1.00 1995-2006
(N~150,000; California)

Ozone & Total Mortality in California: RR (95% CI)

Abbey 1991 AHSMOG RR ~ 1.00 (0.89-1.12) 1977-1986
(N=6,303; SC&SD&SF Air Basins; all natural causes)

Abbey 1999 AHSMOG RR ~ 1.00 (0.92-1.09) 1977-1992
(N=5,893; SC&SD&SF Air Basins; all natural causes)

Chen 2010 AHSMOG RR = 0.95 (0.89-1.01) 1977-2006
(N=4,830; SC&SD&SF Air Basins; all natural causes)

Lipsett 2011 CA Teachers RR = 0.97 (0.94-1.01) 1997-2005
(N=107,784 F; California)

Jerrett 2011,2013 CA CPS II RR = 1.00 (0.98-1.02) 1982-2000
(N=73,711; IWD Model; California)

Enstrom Unpub CA CPS I RR ~ 1.00 1983-2002
(N~80,000; California)

Enstrom Unpub NIH RR ~ 1.00 1996-2006
(N~150,000; California)

October 28, 2011 Jerrett Final Report

(<http://www.arb.ca.gov/research/apr/past/06-332.pdf>)

Figure 22: PM_{2.5} and Total Mortality in CA during 1982-2000
RR = 1.08 (1.00-1.15) New “Conurbation” LUR Model
RR = 1.002 (0.992-1.012) Nine Model Average

September 1, 2013 Jerrett AJRCCM Paper

(<http://www.atsjournals.org/doi/abs/10.1164/rccm.201303-0609OC>)

Figure 6: PM_{2.5} and Total Mortality in CA during 1982-2000
RR = 1.06 (1.00-1.12) “Conurbation” LUR Model

“NO₂ (a marker for traffic pollution) and fine particulate matter were also associated with mortality from all causes combined”
“confirm that air pollution is a significant risk factor for mortality”

NO Mention of NULL Jerrett Report Results (Nine Model Average)

NO Mention of Other Major NULL CA PM_{2.5} Mortality Results

NO Mention That These Findings Do Not Support CA Regulations

Summary of “Premature Deaths” in California

235,000 Annual Deaths in California

1) Based on H6CS & CPS II US Results Used by EPA

~18,000 Annual Premature Deaths Due to All PM_{2.5}

~3,500 Annual Premature Deaths Due to Diesel PM

~250 Annual Premature Deaths Prevented by CARB

2) Based on CA-specific Results (see Enstrom 2012)

~0 Annual Premature Deaths Due to All PM_{2.5}

~0 Annual Premature Deaths Due to Diesel PM

~0 Annual Premature Deaths Prevented by CARB

August 1, 2013 US House Science Committee Subpoena of “Secret Science” Data Used by EPA for Deaths Related to PM_{2.5} & Ozone

Original Two Papers

- 1993 Dockery Pope NEJM PM2.5 Paper (H6CS Data)
- 1995 Pope Thun AJRCCM PM2.5 Paper (ACS CPS II Data)

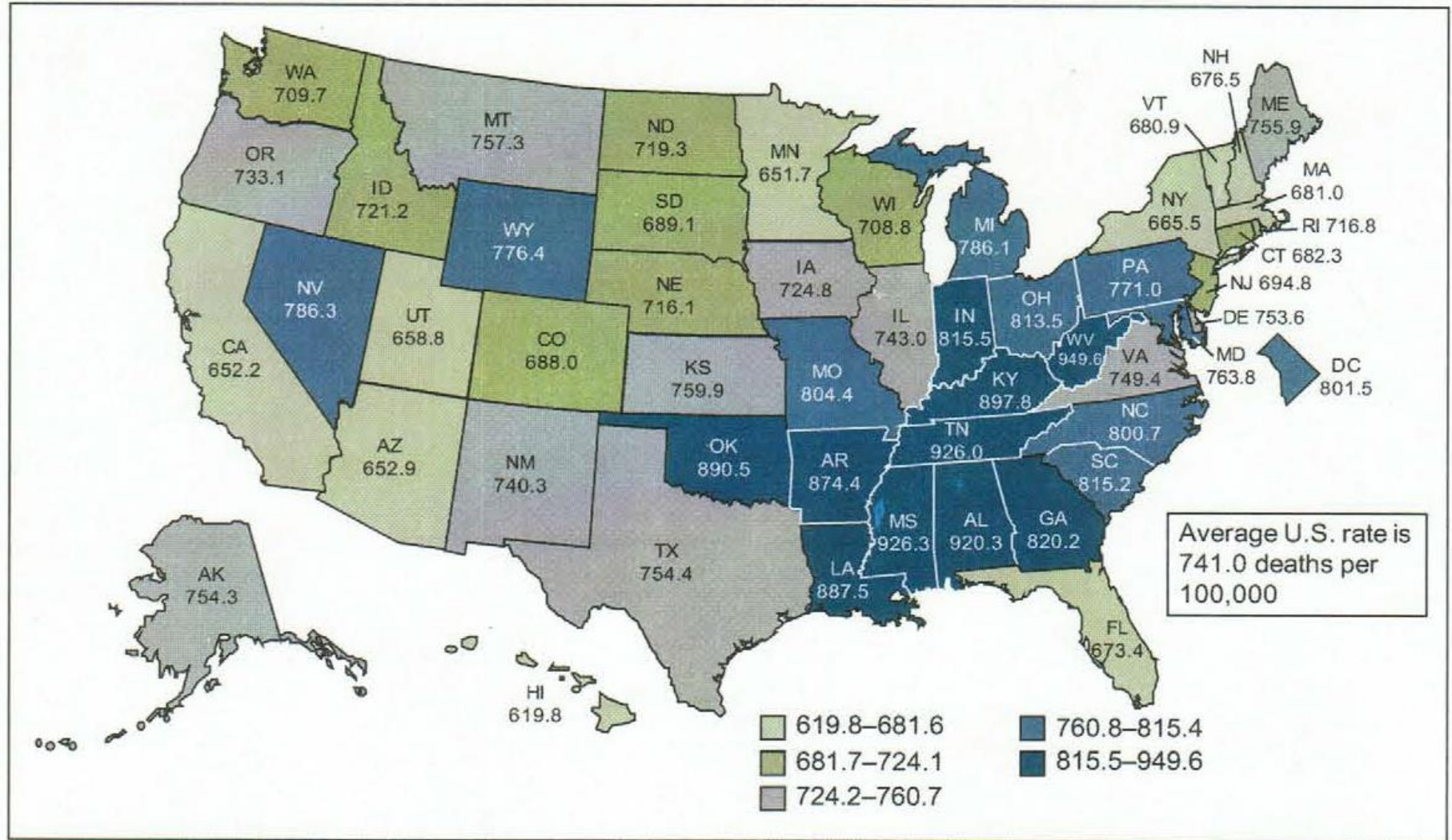
Seven Subpoened Follow-up Papers

- 2000 Krewski Burnett Jerrett HEI PM2.5 Reanalysis Report
- 2002 Pope Burnett Thun Krewski JAMA PM2.5 Paper
- 2006 Laden Dockery AJRCCM PM2.5 Paper
- 2009 Krewski Jerrett Burnett Pope Thun HEI PM2.5 Report
- 2009 Jerrett Krewski Pope Thun NEJM Ozone Paper
- 2009 Pope Dockery NEJM PM2.5 Paper
- 2012 Lepeule Dockery EHP Paper

2009 Age-Adjusted Total Death Rates by State

NCHS (<http://www.cdc.gov/nchs/data/databriefs/db64.pdf>)

Figure 4. Age-adjusted death rates, by state and the District of Columbia: United States, preliminary 2009



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

Ratio of 2009 Age-Adjusted Total Death Rates in California Compared with US (Annual Deaths/100,000) CDC NCHS Wonder Database (<http://wonder.cdc.gov/ucd-icd10.html>)

California / U.S.	$652.2 / 741.1 = 0.880 = 88.0\%$
'South Coast Air Basin' / U.S.	$650.8 / 741.1 = 0.878 = 87.8\%$
Los Angeles County / U.S.	$637.3 / 741.1 = 0.860 = 86.0\%$
Orange County / U.S.	$570.9 / 741.1 = 0.770 = 77.0\%$

California PM_{2.5} and Ozone from China

December 1, 2010

California Pollution: Made in China?

<http://blogs.wsj.com/chinarealtime/2010/12/01/california-pollution-made-in-china/>

January 17, 2013

US cities suffer impact of downwind Chinese air pollution

<https://www.chinadialogue.net/article/show/single/en/5615-US-cities-suffer-impact-of-downwind-Chinese-air-pollution>

January 19, 2013

How China's air pollution disaster is coming to America

<http://www.examiner.com/article/how-china-s-air-pollution-disaster-is-coming-to-america>¹⁵

Conclusions About Air Pollution and Total Mortality in California Based on Prospective Epidemiologic Studies

- 1) Overwhelming Evidence in CA that Premature Death is NOT Related to PM_{2.5}, PM₁₀, and Ozone**
- 2) Harvard & ACS Must Comply with August 2013 Subpoena of “Secret Science” Data Used by EPA**
- 3) EPA and CARB PM_{2.5} & Ozone Regulations in CA Should be Frozen Pending Outcome of Subpoena**
- 4) Air Pollution in CA and South Coast Air Basin Must Be Put Into SES Context Given Low Total Death Rates & More PM_{2.5} from China than Diesel**

Is there evidence for acute air pollution deaths in Southern California?
S. Stanley Young, National Institute of Statistical Sciences
Young@niss.org, 919 685 9328

The Great Smog of London, 1952, is estimated to have killed thousands of people and alerted all to the hazards of high levels of air pollution. There has been great progress in reducing air pollution and current literature is mixed on if current levels of air pollution are associated with acute deaths. There is a need to assess possible mortality effects of current levels of air pollution in specific regions as it is well-known that there is geographic heterogeneity. Daily deaths and air pollution levels as measured by PM_{2.5} and ozone were obtained for the years 2007-2010 for eight California air basins. Here we report on findings for a Southern California air basin. Spikes in the levels of PM_{2.5} and ozone, so called natural experiments, can be use to test for the acute effects of air pollution. People 65 and older were taken to be most sensitive to air pollution. Lung and cardiovascular deaths were taken to be most relevant to air pollution. Seasonal effects were removed using 21-day moving medians to give time-local estimates of deaths and air pollution. Death lags of 0, 1, and 2 days were examined. Analyses were computed for two measures of air pollution, four years, and three lags, looking for a consistent, acute effect of air pollution on mortality. A number of data visualization and statistical analyses support the statement that there were no consistent statistical effects of PM_{2.5} or ozone on acute deaths. We concluded that there is no evidence of an increase in acute deaths due to PM_{2.5} or ozone in Southern California for the years 2007-2010.

Is there evidence for acute air pollution deaths in Southern California?

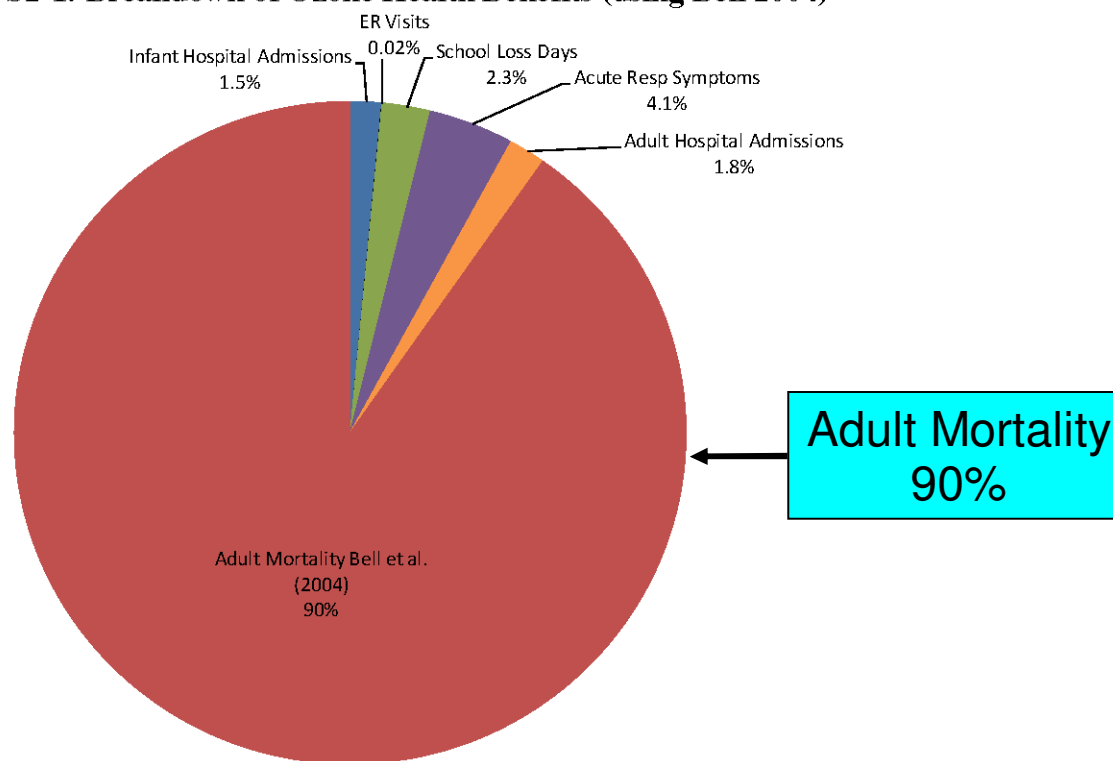
S. Stanley Young
young@niss.org

Steve Milloy
junkscience.com

Mortality Claim Vital to EPA/CARB

- Revised Ozone NAAQS
- Alleged benefits depend heavily on assumed relationships between ozone, PM2.5 & mortality

Figure S2-1: Breakdown of Ozone Health Benefits (using Bell 2004)*



Secret Science

1. EPA has refused to provide health data used in air quality studies since 1994 (trust me science)
2. Efforts to criticize methodology have failed
3. Problem solved in 2013 by obtaining California death certificate data
 - a. All deaths 1998-2010 (2007-2010 analyzed)
 - b. Age at death, cause of death, zip code at death

California Data Is the Best Data

1. Most current – even 2011 is available
2. No cherry picking – all deaths from entire state with the ‘worst’ air in U.S.
3. Will be made publicly available
4. Level playing field for air quality science
5. Opens up EPA/CARB epidemiology to scrutiny

Question/Data/Methods

Do increases in ozone or PM2.5 increase acute mortality?

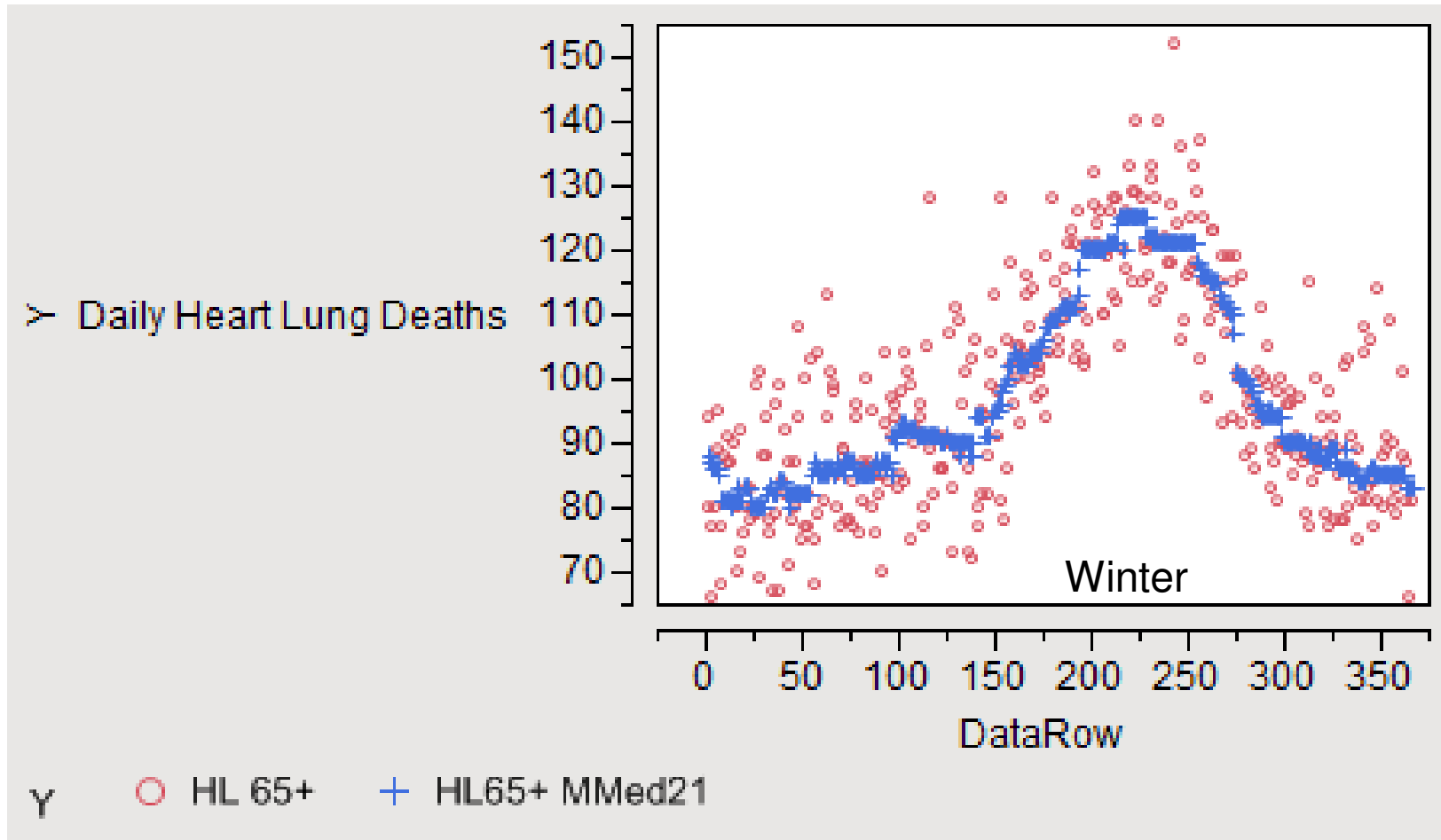
Data: Mortality for eight air basins in California
Heart/Lung for 65 and older
Years, 2007-2010

Methods: Visualizations: (p-values, volcano plots)
Time series, 21-day moving medians
Deviations of daily values from moving medians
Regression: HL 65+ deaths
versus ozone and PM2.5

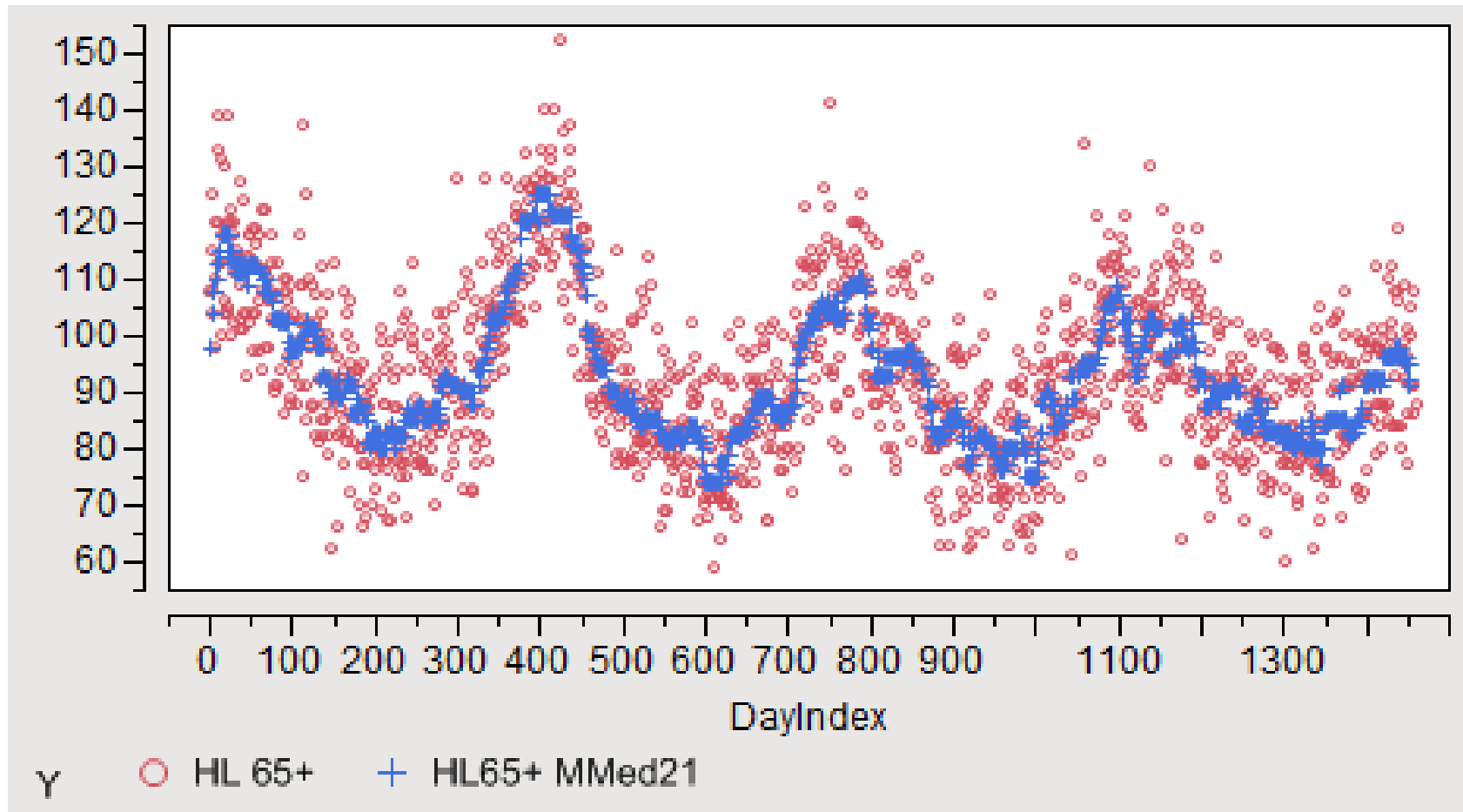
Moving Median

1. Median: $\frac{1}{2}$ values below and $\frac{1}{2}$ values above.
2. 21-day moving median for time series.
 - a. Take 21 consecutive values and compute median.
 - b. Remove 1st value and add 1 value at end.
 - c. Compute new median.
3. The moving 21-day median tracks the time series.

South Coast (LA), 2007-2008



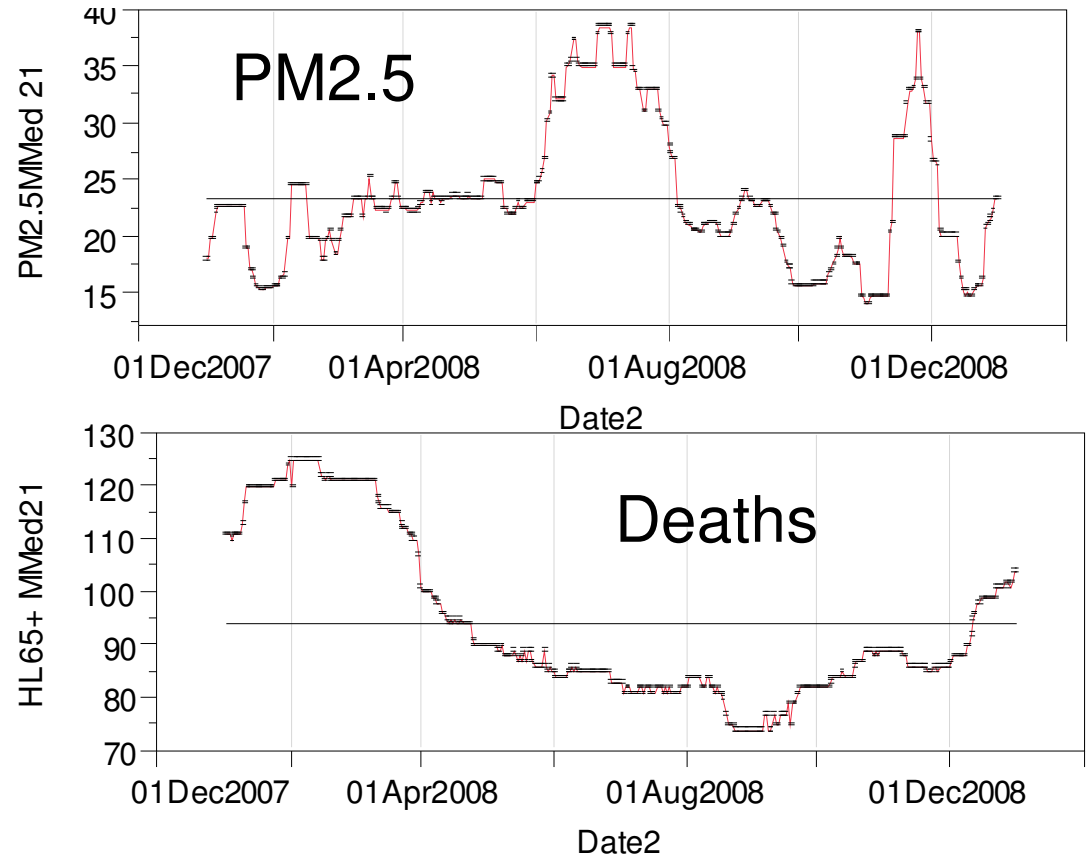
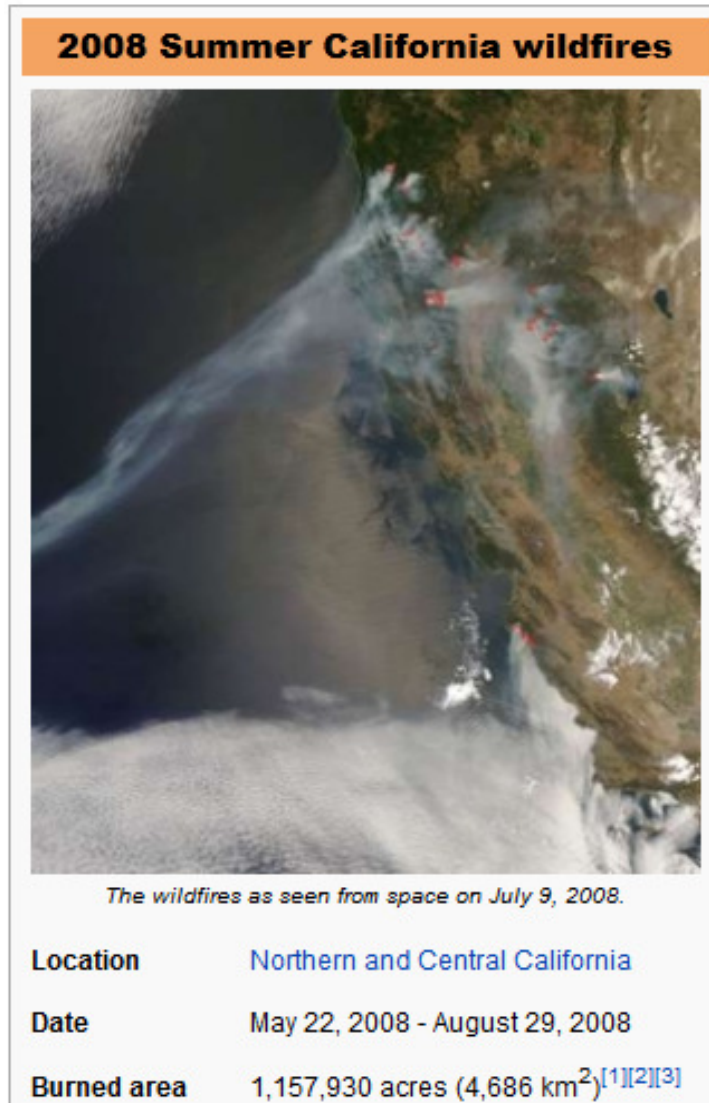
South Coast Deaths, 4 years



Natural Experiments

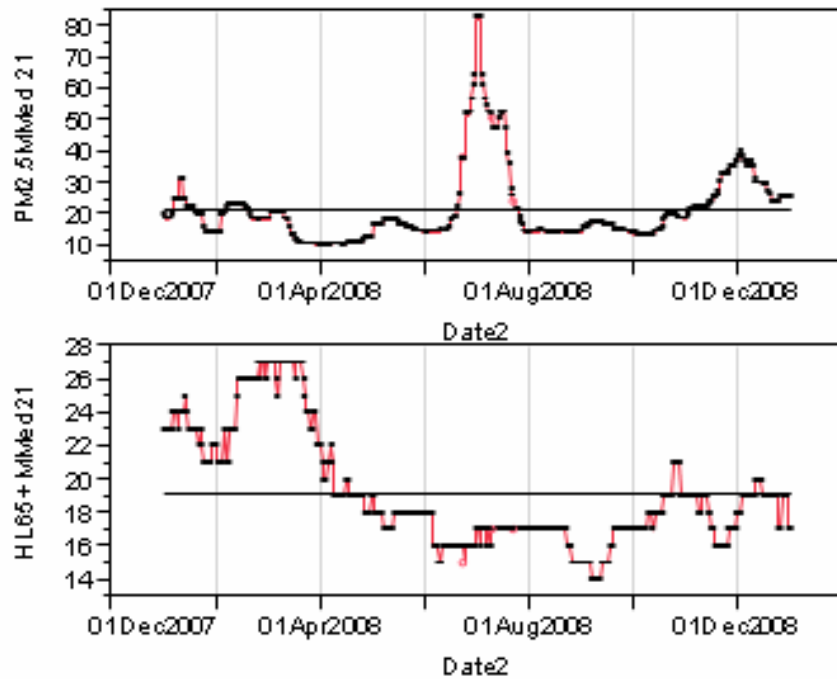
Wildfires

South Coast, 2008

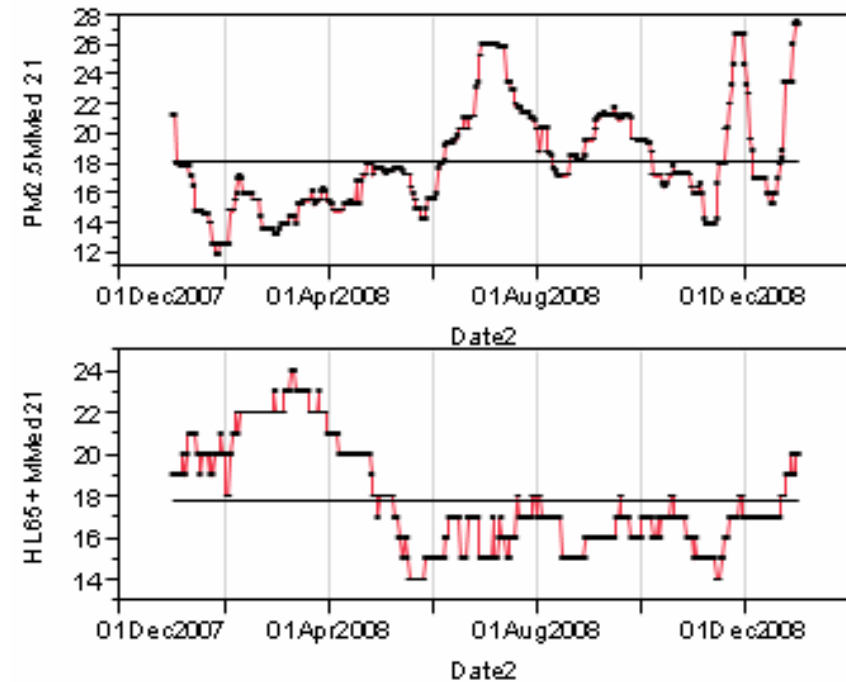


Natural Experiments (2)

Sacramento Valley



San Diego County

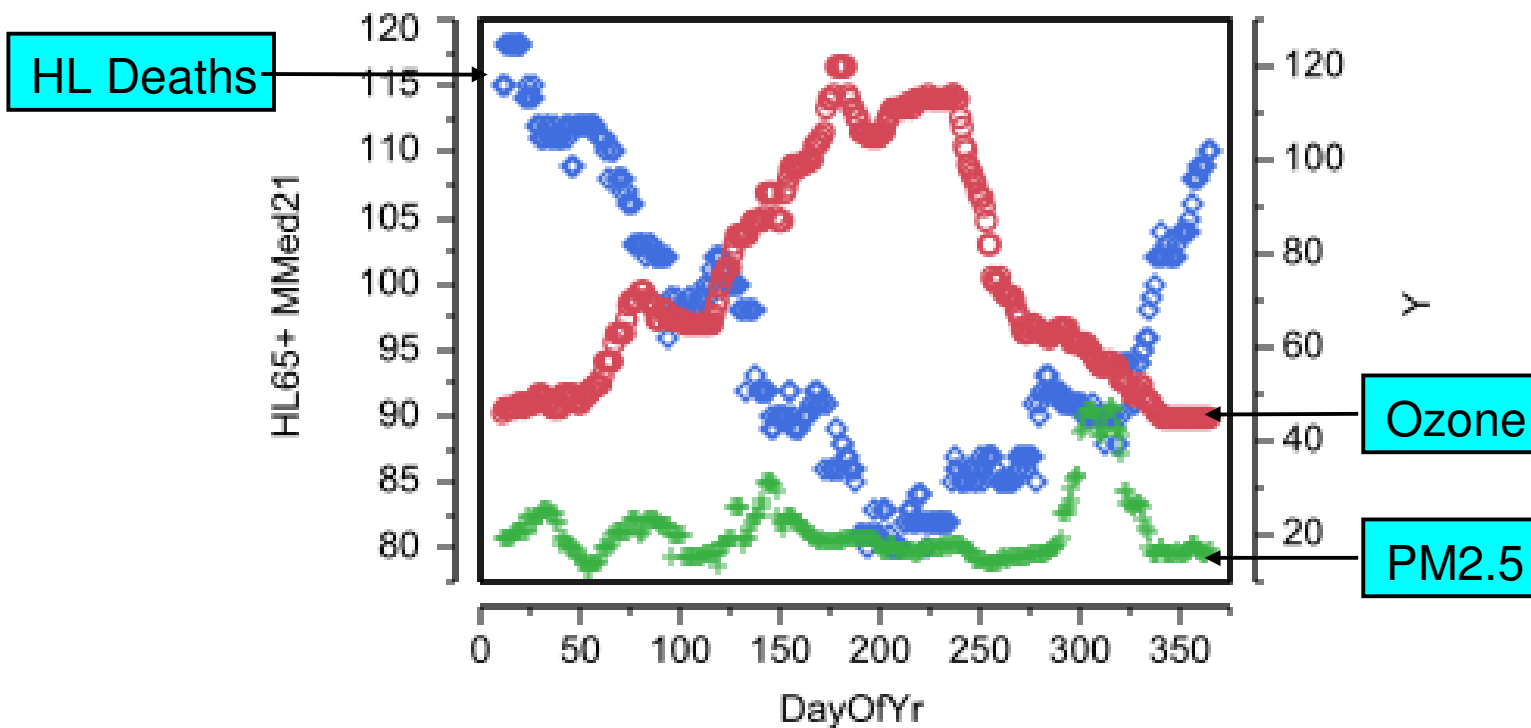


Similar lack of effect for all 8 air basins.

Moving 21-day medians

00b South Coast 2001 - 2010 data set - Overlay Plot

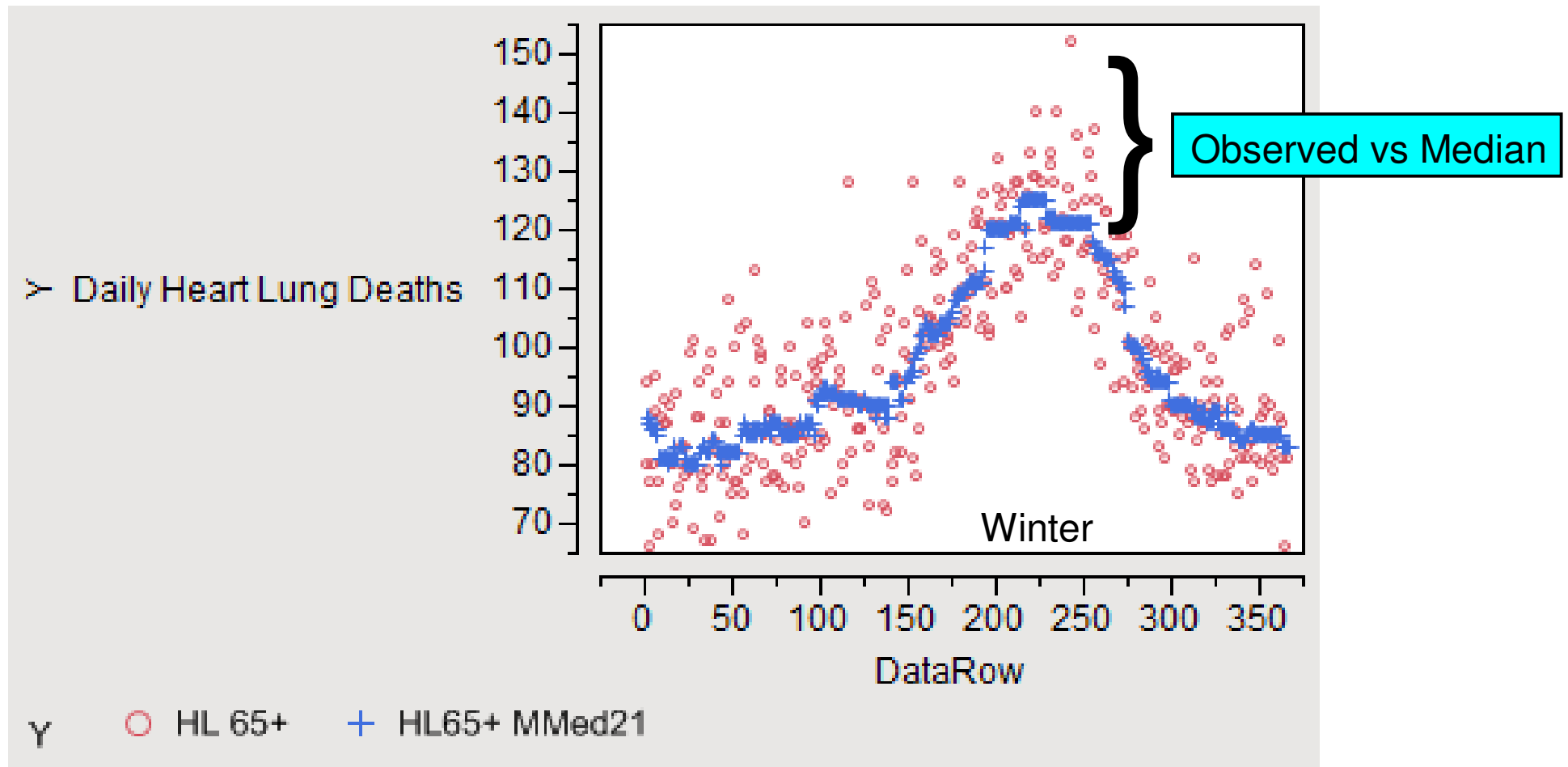
Overlay Plot Yr=2007



Left Scale: ◇ HL65+ MMed21
Right Scale: ○ Oz ppb MM + PM2.5 MM21

Compute "local effect"

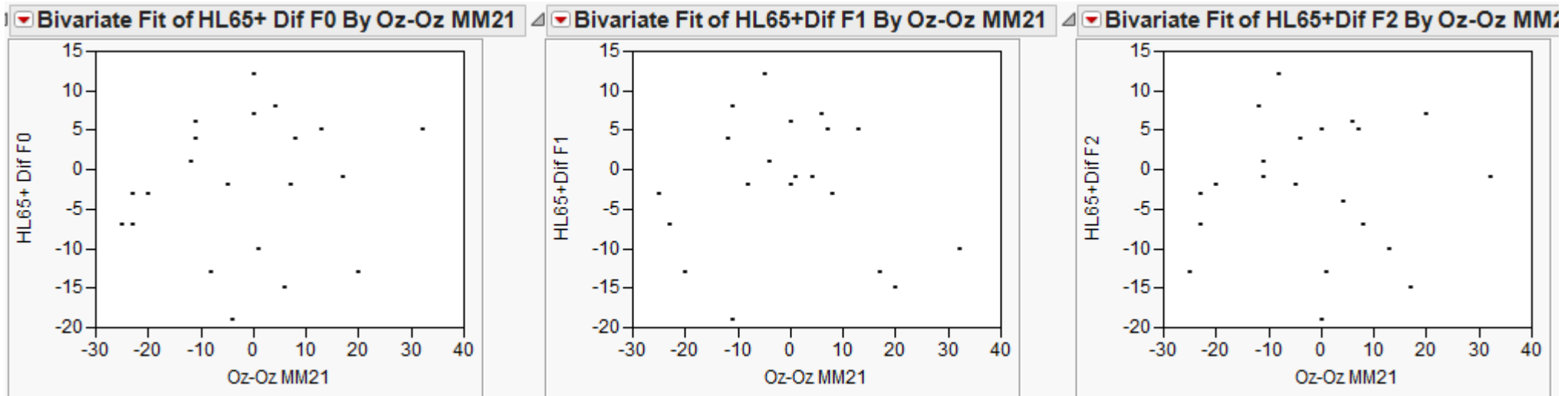
South Coast (LA), 2007-2008



For each day compute the observed value minus the 21-day moving median.

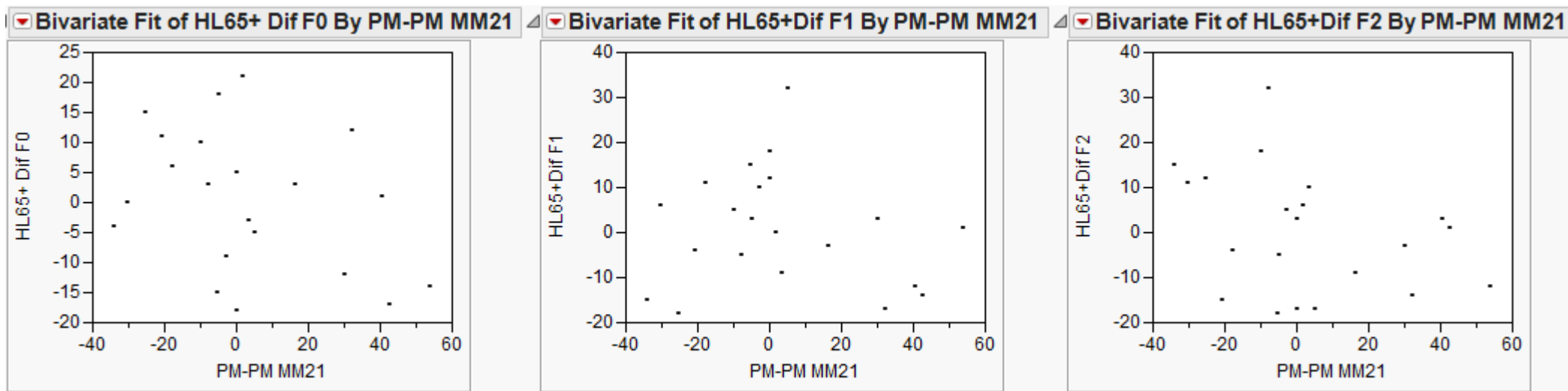
HL 65+ deaths versus Ozone

Local effect of HL 65+ deaths, lags of 0, 1, 2 days, versus local effect of ozone.



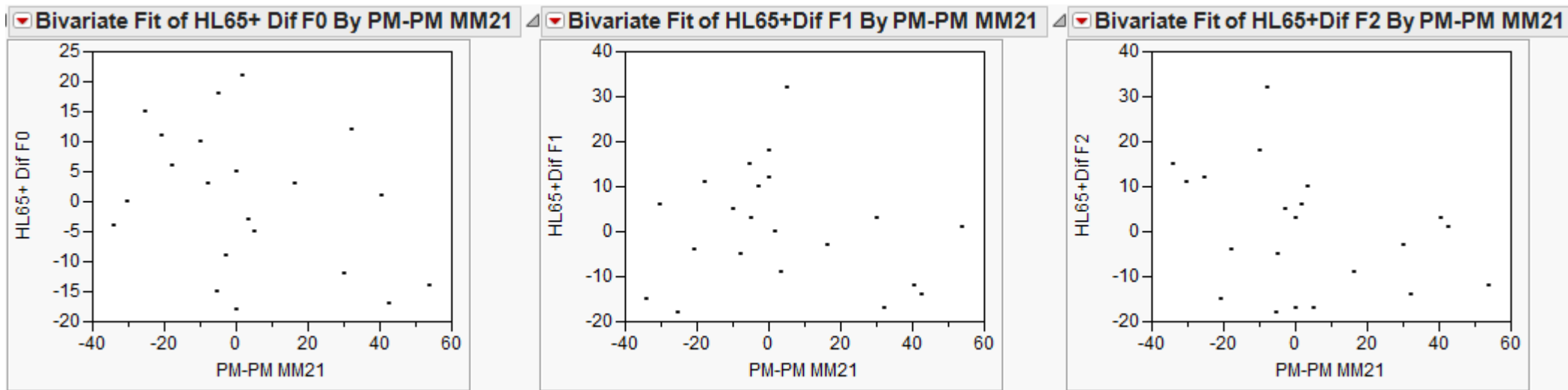
HL 65+ deaths versus PM2.5

Local effect of HL 65+ deaths, lags of 0, 1, 2 days, versus local effect of PM2.5.

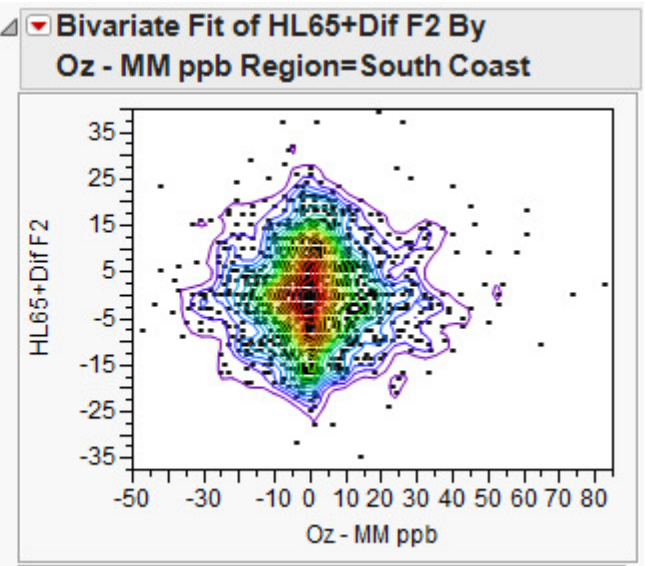
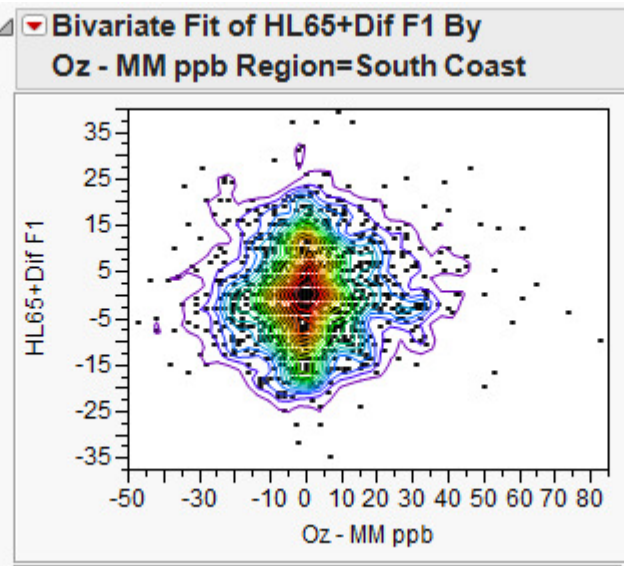
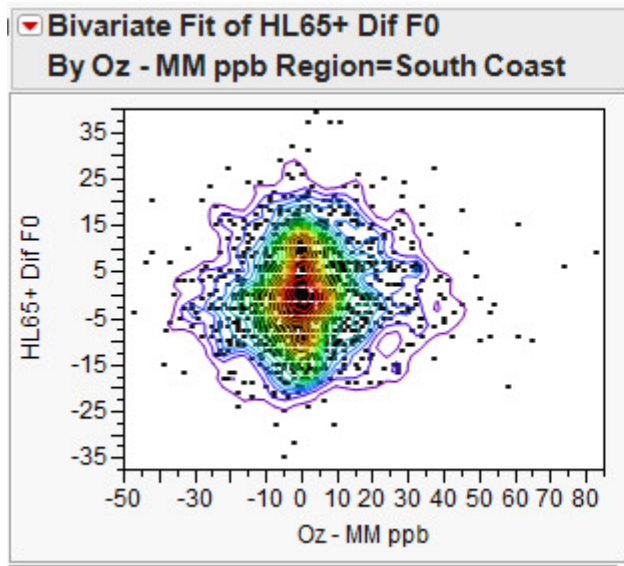


HL 65+ deaths versus PM2.5

Local effect of HL 65+ deaths, lags of 0, 1, 2 days, versus local effect of PM2.5.



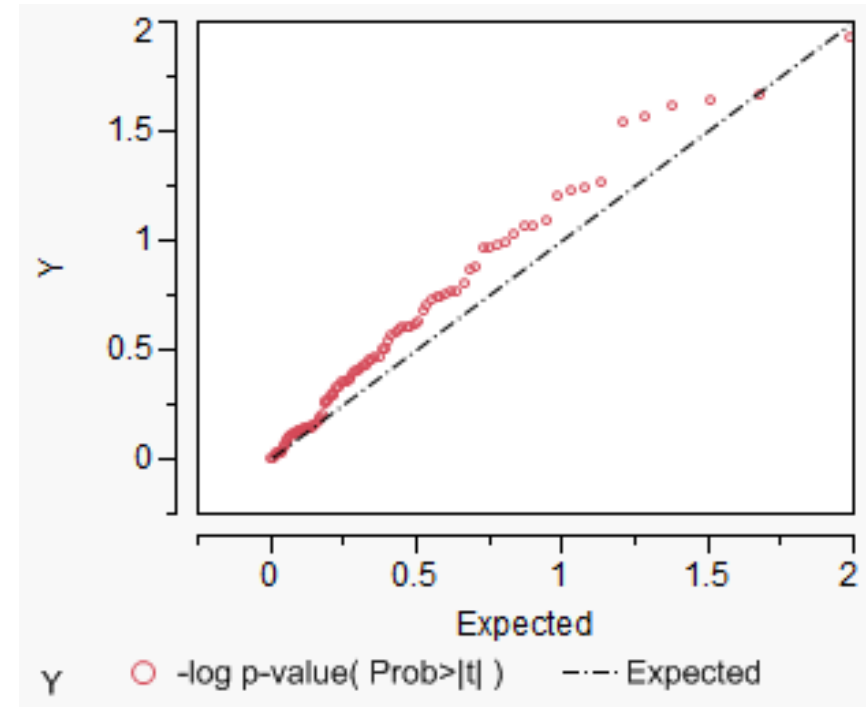
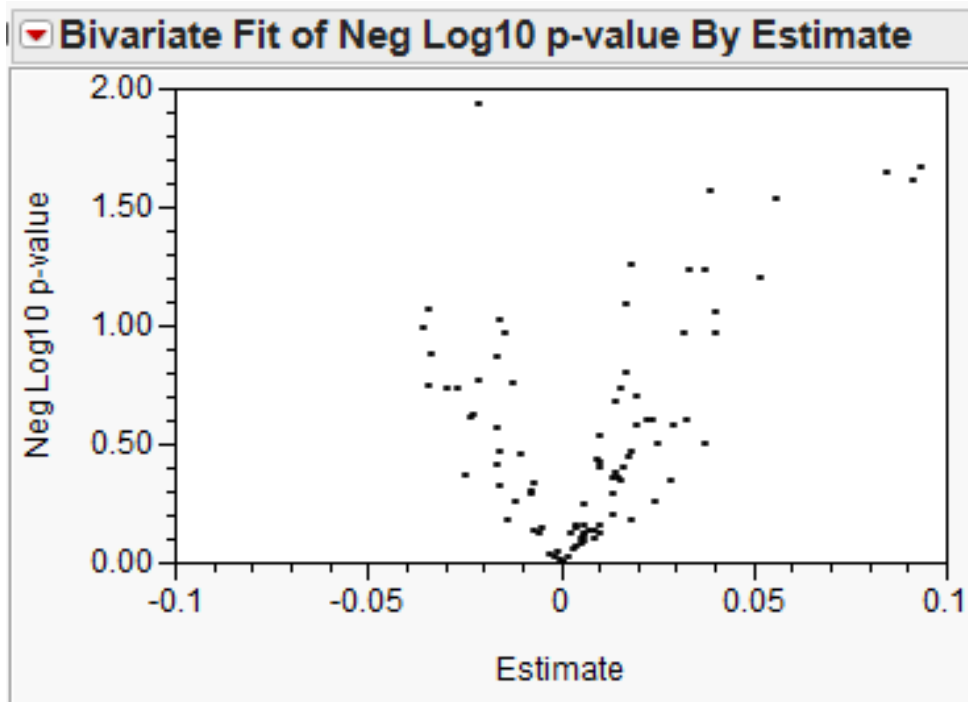
Density plots South Coast



Comments
South Coast
Three lags

Ozone regression analysis results

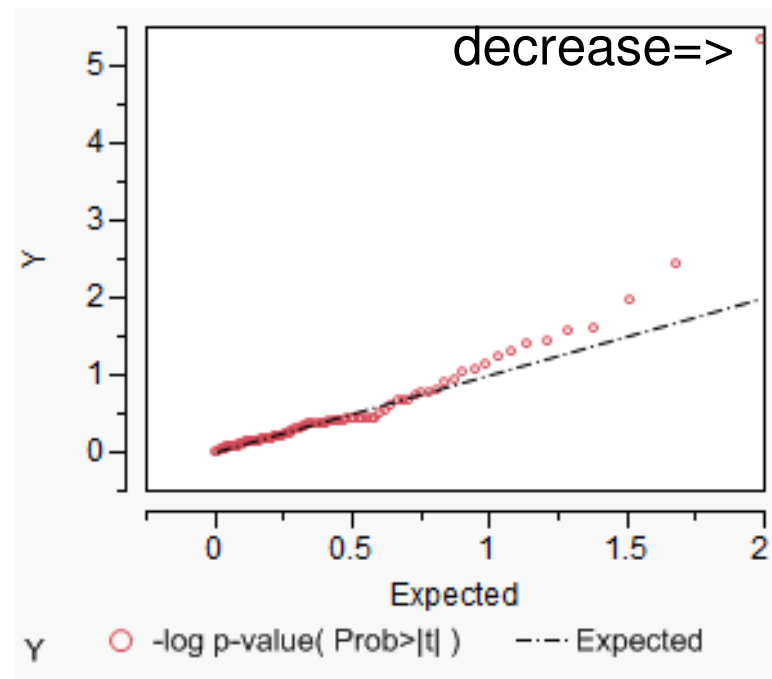
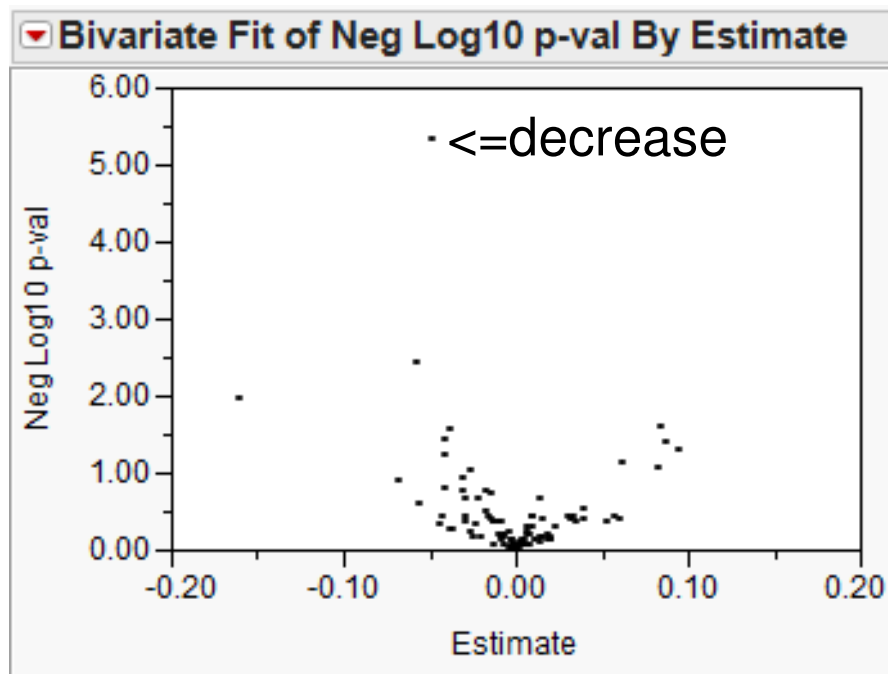
1. 96 regressions were computed, local HL deaths vs local ozone.
2. Regression slope of 0 implies no effect.
3. Larger neg Log10 p-values are more significant.



1. The regression coefficients center at 0 implying no overall effect.
2. The p-values are close to 45 degree line implying no effect.

PM2.5 regression analysis results

1. 96 regressions were computed, local HL deaths vs local ozone.
2. Regression slope of 0 implies no effect.
3. Larger neg Log10 p-values are more significant.



1. The regression coefficients center at 0 implying no overall effect.
2. The very small p-values is for a decrease in HL deaths.
3. The p-values are close to 45 degree line for most coefficients implying no effect.

Summary

- A large California data set was assembled
- Natural experiments were examine.
- Local effects for HL 65+ deaths, ozone and PM2.5 were computed.
- Lags of 0, 1, and 2 days were examined.
- There is no indication that ozone or PM2.5 are associated with acute deaths.

Bottom Line

Young/Milloy analysis finds no effects of ozone or PM2.5.

EPA/CARB should make data sets publicly available.

California Legislature should require CARB to

- a. Name papers used in support of legislation
- b. Make data used in papers public

Environmental Regulation Which Reduces Social Justice
(Paper and Presentation)

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A goal of environmental regulatory agencies is environmental justice. If some regulatory decisions are favored because they reduce social inequities, then it also follows logically that other policies which would increase social inequity must be disfavored. Most environmental justice advocates focused on negative health effects that fall more heavily on underprivileged communities. I focus on two other impacts of environmental decisions—living costs and unemployment, which are inextricably linked with health outcomes, since studies show that unemployment and lower standard-of-living correlate with poorer health. Environmental justice requires that the impacts of tighter environmental restrictions must not fall disproportionately on lower-income families.

The California Air Resources Board mandated phasing out many diesel engines used in the state for goods movement and construction. Other policies require replacing cheaper but dirtier power sources with cleaner but costlier sources, ie. renewables. The economic analysis of these stricter regulations states that their increased costs will be passed on to consumers. Affluent consumers may hardly worry about their reduced standard of living. However, contrary to the goals of environmental justice, these increased costs are NOT shared equally among individuals of different socio-economic status. Lower-income individuals must expend a larger fraction of their budgets on essentials (e.g. food, power, housing and cheaper consumer durables). Simple economic analysis indicates that transportation costs (largely trucking) account for a larger fraction of the consumer prices of cheaper necessities, and that these make up a disproportionately large fraction of the expenditures of those near the poverty line. Similarly, poorer individuals spend a higher percentage of their incomes on housing and utilities. Regulations that preferentially raise these costs therefore function as new regressive taxes. Because consumption patterns are a strong function of income, the costs of these environmental rules are even more regressive than the general sales tax, which is widely criticized for its regressivity. These regulations have the perverse effect of widening—not narrowing—the wealth and health gap between poor and affluent.

An additional environmental justice consideration arises when regulations reduce employment. The impact of CARB diesel regulations on workers in the transportation industry is again regressive—ie., harm falls disproportionately on the lower-income workers. I discuss practical ways in which environmental regulators can advance—rather than impede—the cause of environmental justice.

Executive Order 12898: 2/11/1994

- “Each Federal agency shall make achieving ***Environmental Justice*** part of its mission by identifying and addressing, as appropriate, *disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations* in the United States.”
- ...when its rules have "disparate" and "disproportionate" impacts on minority communities, with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

[Inside EPA, 6/21/2013]

Growing Importance of EJ for Environmental Policy

- 900 Nexis articles on “Environmental Justice” in last decade; 90 in all previous years combined, starting with Pres. Clinton’s Executive Order 12898
- In a January 2010 memo to EPA staff, the EPA Administrator cited **environmental justice** as one of the agency’s top priorities.
- “EPA Administrator Gina McCarthy is vowing to greatly expand the agency's environmental justice work” (Inside Cal/EPA, 9/13/2013)

It's not only Federal.

Ex.: San Diego's "Sustainable Communities Strategy" is Flawed

- The California Attorney General became involved in September 2011 by sending a comment letter on the draft EIR. The Attorney General suggested that the draft EIR was inadequate because CEQA requires **environmental-justice**-specific analysis...

EJ Imperative is not only Federal.

CARB Onboard? Check, since 2001

- [from CARB 2007 Diesel Regulations document] “As a matter of policy, ARB is committed to *integrating environmental justice in all of its activities*. On December 13, 2001, the Board approved Environmental Justice Policies and Actions, which formally established a framework for incorporating environmental justice into the ARB’s programs, consistent with the directives of State law. Environmental justice is defined as the fair treatment of people of all races, cultures, and incomes *with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies (ARB, 2001)*. These policies apply to all communities in California, but recognize that *environmental justice issues have been raised more in the context of **low-income and minority** communities.*”

What Environmental Justice Means

- Regulatory policies which *reduce* social inequities must be favored, so...
- Logically this requires that Regulatory policies which *increase* social inequities must be **avoided** (even if they are otherwise OK).
- Most previous EJ advocates consider negative health effects only by *regulated* emitters. But EJ says we must also consider the *regulators*.
- *There are virtually no real-world policies with 100% positive or 100% negative consequences: EJ is only meaningful if it accounts for both positives and negatives*
- **For consistency, EJ must ALSO weigh negative health effects resulting from the *costs of environmental regulations***

Key Determinants of Public Health

1. Socio-Economics	40%
2. Population's Health Behaviors	30%
3. Access to Medical Care	20%
4. Environmental	10%--with PM2.5
levels already approaching ambient, this could actually be 0%	

4. is doubtful. We must look at 1., which is more certain.

Source: Different Perspectives For Assigning Weights To Determinants of Health, University of Wisconsin, Public Health Institute, 2010

1. *Income* is a Fundamental Inverse Predictor of Illness and Premature Mortality:

Age-adjusted Death rate proportional to $(\text{Income})^{-2/3}$
(e.g. 50% income drop raises mortality rate 33%)
[Brenner 2005, Intl J of Epidemiology 34, 1214]

For working-age persons, Increasing (1990's) Income
from 0 to \$10K to 20K to 30K:

Reduces mortality by 1.5, 2.5, 3.5 times

(but only minor benefits seen for further income gains)

[Backlund et al. 1996, Ann. Epidem. 6: 12]

Same thing is found at a county-wide level [Cheng&Kindig 2012]

2. *Unemployment* is a well-established risk factor for illness and premature mortality (since the '80s, “the science is settled”, same as 1.)

- Studies in multiple industrialized countries show that fully adjusted mortality rates are at least *doubled* by being unemployed

[eg. Lancet 348:909, BMJ 308:1135]

- 50% rise in unemployment rate produces 257,000 annual deaths /40 countries [Brenner 2011]

CARB goes 'All In' to eliminate PM2.5 from Diesels. Predicted Economic Costs of their Truck Regulations

- Almost 1.0 Million California trucks must be 'fixed' or replaced now (minus 20,000 exempted agricultural vehicles)
- CARB estimates >\$40K (2008) cost per diesel, since they hope some trucks can be retrofitted (\$20-40K cost, plus annual maintenance)
- CARB's "Clean Trucks Program" loans require payments of \$10,000 per year for 7 years with a balloon at the end (not surprising that the Daimler Financing organization predicted 40% of loanees may default--[*"Foreclosure on Wheels"* 2008, NAACP/LULAC])
- CARB predicts annual costs of \$0.57--0.97 Billion (2013, continuing for 5 yrs), mostly borne by Goods Movement, then Construction, then Wholesale/Retail
- Who exactly is going to pay??

PM2.5 Diesel Regulations-- CARB Predicted Economic Costs

- CARB: "For the 20 to 40% of fleets for which the regulatory costs exceed a 10 percent change in ROE, these fleets will have to pass through at least some of the costs to their customers in the form of higher prices for their services to maintain their profitability." [i.e., avoid bankruptcy]

- But cut-throat competition makes it unlikely that much of this cost could be 'passed on to shippers': truckers either eat the cost or lose the job:

"Because of the weak negotiating power of the port drayage sector, prices will only likely go up when a crisis occurs due to the inability of the LMCs to afford moving the freight. This analysis shows that by the time the transition in prices is over, many of the LMCs will no longer exist."

- [Husing, Brightbill, Crosby, "San Pedro Bay Ports Clean Air Action Plan", 2007]

• CARB Regulation Scenario 1 [Appendix J]: Assuming most costs are 'passed on' to rest of California, state output drops by \$1.3 Billion /year, and **13,600 jobs** in the rest of the state are lost [typo understated this by factor of 1000]

PM2.5 Regulation-caused Premature Deaths

What are the health effects of those “*negligible*” economic costs, if some of them fall on diesel workers (e.g. truckers, construction)?

Suppose incomes of 30,000 workers drop \$10K/year, this results in
 $0.3\% \times 30,000 =$

90 additional premature deaths annually

- Unemployment: If 14,000 lose jobs, their mortality rates double, ie. $1\% \times 14,000 =$

140 additional premature deaths annually

*As we'll see, these lost lives could be **larger** than the claimed reduction in (statistical) premature deaths from the diesel regulations. And their numbers are much more 'solid' than the guesstimated saved lives.*

CARB estimates of health benefits of its Clean Truck Program

- Rather than waiting for retired trucks to be naturally replaced with new cleaner ones, CARB decided to accelerate the reduction in PM2.5 by ~5 years. At their estimated cost of \$3.0--3.4 Billion, what health gains do they predict?
- Reduced premature deaths from PM2.5 is nearly all of the purported benefit
- Based on extremely thin epidemiological evidence, CARB claims the reduced PM2.5 emissions will 'save' 200 premature deaths annually [CARB-funded, and other research shows that this number could actually be Zero],

Which CARB values at ~\$5--9 Million each (depending on Discount Rate)

--->

“ARB staff estimates that the benefits to California of currently adopted air pollution control measures exceed their costs by about 3 to 1.”

mainly because they left out the economic-induced premature deaths

CARB estimates of health benefits of its Clean Truck Program

- Since the two big health COSTS of the Clean Truck regulations (due to reduced income and increased unemployment) were ignored by CARB, this looks like a Cost / Benefit Catastrophe:
- Cost/Benefit ratio could actually be larger than 1.0

But for now, let's suppose for the sake of argument that the CARB PM2.5 regulations actually *do* save (a few) more lives than they end up costing.

We still must ask:

How is this working out for Environmental Justice?

Negative Effects Heavily Concentrated Among Lower-Income and Minority Workers

- Consider one case study on the front line, diesel trucks at San Pedro ports
[Husing,Brightbill,Crosby, “San Pedro Bay Ports *Clean Air Action Plan*”,2007]
(which AQMD says produce 10% of the ports’ PM2.5 emission, 800--1800 tons, saving 13--80 premature deaths/year)
- In 2006 Truck Drivers’ Average Annual Income was \$29,000 (it has not risen since). A different survey found average wages \$12/hour. 86% of drivers netted less than \$40K/year. [Husing et al., 2007]
- Ports of LA/LB served by 1400 trucking companies with 17,000 drivers, 89% are foreign born, *93% are Latino*
- These workers--who will definitely bear a disproportionate share of the PM2.5 regulatory costs--should satisfy EPA’s EJ definition of an ‘overburdened community’*

*(although it has not yet been defined--GAO 2011: “EPA has yet to establish a strategy for how it will provide standard and consistent definitions for key **environmental justice** terms, such as ‘minority’ and ‘low-income communities,’ as called for by the EPA IG in 2004.)

Even just *slowing growth* costs lives

- Ex: San Pedro ports over-regulation scenarios could cost 150,000--300,000 jobs of lost growth by 2030

[Husing, Brightbill, Crosby 2007]

- That amount of Unemployment would cause ***thousands of annual premature deaths***

Who Pays the Higher Costs of Living?

Robert Husing: “Public health research groups like the Robert Wood Johnson Foundation find that socioeconomic difficulties, not environmental issues, are the principal causes of public health risks. In areas where large numbers of people are poor, marginally educated, unemployed or underemployed, researchers find life expectancies are shortened. In effect, *by cutting off job growth in the very sectors that can allow the state's most vulnerable people to move out of poverty, California's privileged classes are ensuring that they remain subjected to serious health risks.*”

Similar violations of fundamental principle of Environmental Justice are likely to be found throughout all of environmental regulation in California,

because *Transportation* and *Energy* costs are major components of cost-of-living essentials, which eat up most of the budgets of low-income people

\$32K Income:	Food	15%
[www.bls.gov/cex]2012	Housing/Utils	37%
	Transportation	17%
	Clothing	3.5%

Costs of Environmental Regulations are Extremely Regressive--this is not new.

1
Keeney and Green (RPPI Policy Study #225, June 1997)
estimated *income-loss induced fatalities* from
\$9 Billion expenditure to meet EPA's (then) PM2.5
(and Ozone) Air Quality Standards
(assuming every California household shares equally):

1632 Deaths,
of which 252 are Black;
989 are lowest-income (household <\$15K 1994)

And, most of all, costs of *energy*.

For low-income people, this is similar to cost of living

- “Laws and policies that restrict access to America’s abundant energy resources drive up the price of energy and consumer goods,” **Congress of Racial Equality Chairman Roy Innis** points out. “They cause layoffs and leave workers and families struggling to survive. *They roll back the progress for which civil rights revolutionaries like Dr. Martin Luther King struggled and died.*”
- “**Robert Bullard** [the founder of EJ movement] addressed “energy apartheid” and who gets the benefits of clean energy[...and who pays]”

The above criticisms are consistent with GAO's 11/2011 Critique of EPA's pursuit of Environmental Justice:

- “Finally, EPA does not have performance measures for eight of its Plan EJ 2014 implementation plans. Without performance measures that align with EPA's Plan EJ 2014 goals, the agency will *lack the information* it needs for EPA managers to effectively *assess how the agency is performing* relative to its environmental justice goals and the *effect of its overall environmental justice efforts on intended communities.*”

Fairness and Equity are huge goals of government policy, and not easy to achieve. But at the least, we must avoid government policies which actually produce UNfairness and INequity.

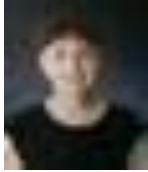
- I believe it is time for EJ advocates to ‘get real’ about what they are trying to do.

Or else...support policies which maximize growth of jobs and incomes (and find another way to transfer cash to favored interest groups).

The Desert Sun November 23, 2013

Two sides emerge in emissions argument at CSUSB

Nov. 23, 2013



Written by

[K Kaufmann](#)

The Desert Sun

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PALM DESERT — Slapping tighter regulations on emissions from diesel-burning trucks might not help the Coachella Valley or other regions across Southern California create economically and environmentally sustainable communities, but keeping schools away from major sources of emissions, such as highways or railroad yards might.

Two very different schools of thought emerged early at the Sustainable Goods Movement Symposium, held Thursday and Friday at California State University, San Bernardino’s Palm Desert campus. On the one hand, some researchers at the two-day event argued that emissions from diesel, such as the microscopic particles called PM-2.5, are overregulated, and their health impacts — particularly death rates — are distorted, resulting in potentially negative impacts on the economy.

“PM-2.5 is the only regulated pollutant that doesn’t have chemistry attached to it,” said Robert F. Phalen, co-director of the Air Pollution Health Effects Laboratory at UC Irvine. “Further restrictions on diesel could have only negligible impacts on PM-2.5; I’m not sure there are any. California has serious economic problems. If you regulate transportation, you regulate the cost of milk.”

But focusing exclusively on mortality rates is equally distorted, countered Penelope Quintana, a professor of public health at San Diego State University, who has studied the high levels of pollution people may be exposed to while waiting in long lines to cross the border from Mexico.

She and other researchers pointed to the chronic health impacts of diesel and other transportation emissions on low-income communities located close to highways, warehouse districts or railroad yards.

Samuel Soret, associate dean for public health practice at Loma Linda University, found children at a school located near the San Bernardino rail yard were 59 percent more likely to score below normal levels on lung function tests than children at a control location not near the yard.

Both sides of the debate have strong resonance for the Coachella Valley, where air quality is affected by the fleets of diesel trucks moving goods east and west on Interstate 10 and where business leaders want to draw more of that traffic to diversify the economy and grow jobs by developing the area as a distribution and warehouse hub.

“In environmental groups, there is a focus that doesn’t adequately address socioeconomics,” said Riverside County Supervisor John J. Benoit, who opened the conference with an overview of air quality issues in the South Coast air basin. “We’ve made such strides in air quality. We have to balance socioeconomics.”

The American Lung Association regularly rates Riverside County as having some of the worst air pollution in the nation.

A possible midpoint between the two opposing views is a concept of sustainability that encompasses environmental, economic and social concerns, said Robert N. Phalen, an associate professor of public health at Cal State San Bernardino and son of Robert F. Phalen.

“We need to consider more than one factor,” said the younger Phalen, who also served as the conference organizer. “Risk assessment is done on a case-by-case basis, yet public health does not occur on a case-by-case basis. We have to push something that’s multifactorial, that’s going to improve public health instead of tackling 5 percent or 10 percent of the issue.”

The pitfalls of finding that middle ground were played out in conference sessions where advocates for low-income communities and representatives from industry groups each laid claim to the banner of environmental justice.

Penny Newman, executive director of the Center for Community Action and Environmental Justice, recalled the challenges faced by the small Riverside County community of Mira Loma, which in a period of about four years went from a quiet enclave of dairy farms to a distribution hub completely hemmed in by large warehouses.

“We worked with developers so there is room for trucks to park instead of being out on the street and designing projects so there is somewhere (for truckers) to eat,” she said. “A lot of things, it comes down to planning. No one is thinking it through.”

Joe Rajkovic, director of governmental affairs of the California Construction Trucking Association, spoke of the pending economic impacts of regulations requiring truckers to install expensive pollution filters by Jan. 1, 2014 — costs that will fall heaviest on owner-operators who only have one to three trucks.

“They’re using environmental regulations to eliminate small competitors. Small guys are the ones who bring you products,” he said. “You can’t regulate with a broad rule. There are all these micro-industries. Diesel engines for mining are different from refrigerated trucks.”

The California Air Resources Board is launching the regulations as part of a larger statewide program to cut diesel emissions. Agency representatives were invited to speak at the conference, but did not attend, Robert N. Phalen said.

Beth White, a manager for the agency, said in a phone interview Friday that more options are being developed to help owner-operators with small fleets, including extensions and extra funding. A series of community meetings will be held across the state next month.

Echoing Phalen, Soret said the way forward must be one that can acknowledge the conflicts and pull in a broad range of voices and views.

“What we still need to reckon with, there are specific places, certain communities and other collective organizations receiving a negative impact. That’s where the rubber meets the pavement. How do we reconcile the fact that goods movement is good overall but there will be times that there will be acute effects for certain places or certain people. and how can we resolve that? We need to bring people around the table people who may not have thought of themselves as players.”

Energy reporter K Kaufmann can be reached at (760) 778-4622



The American Lung Association regularly rates Riverside County as having some of the worst air pollution in the nation. / Richard Lui The Desert Sun



Dr. Samuel Soret, Associate Dean for Public Health Practice and Associate Professor of Environmental Health at Loma Linda University School of Public Health speaks at the Sustainable Goods Movement symposium held at the California State University San Bernardino Palm Desert Campus on November 21, 2013. / Omar Ornelas, The Desert Sun