

WORKSHOP

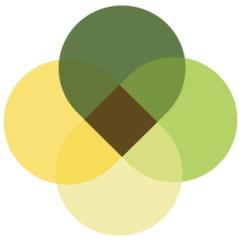
Cumulative Impacts: Building a Scientific Foundation



George Alexeeff
Deputy Director for Scientific Affairs,
OEHHA

Cumulative Impacts &
Precautionary Approaches Project

September 2, 2010



Work Group Timeline

Meeting 1: June 5, 2008

Introduction to project and science of cumulative impacts



Meeting 2: October 30, 2008

Elements of a project report



Meeting 3: December 10, 2008

Tools and methods for assessment of cumulative impacts

Meeting 4: March 4, 2009

Outline of the project report



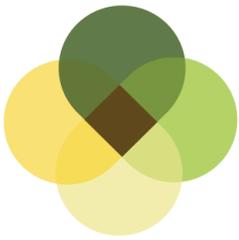
Meeting 5: May 18, 2009

Environmental justice gaps; Key concepts in cumulative impacts



Meeting 6: June 3, 2010

Cal/EPA's proposed screening method for cumulative impacts



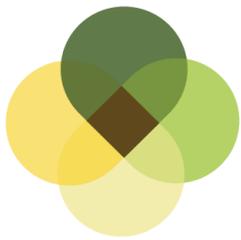
Report Timeline

Public Comment Period

- Comments due by **5pm** on **September 16, 2010**

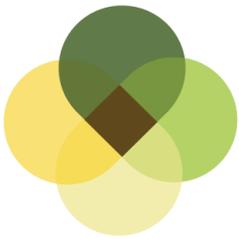
Final Report Release

- The final report will be released by the end of the year



Work Group Members

- **David Arrieta**
DNA Associates
- **Dan Cloak**
Dan Cloak Environmental Consulting
- **Cynthia Cory**
California Farm Bureau Federation
- **Henry Buckwalter (Nasser Dean)**
Western Plant Health Association
- **Sharon Fuller**
Ma'at Youth Academy
- **Joseph Guth**
Science and Environmental Health Network
- **Craig Johns**
California Resource Strategies, Inc.
- **Anne Katten**
California Rural Legal Assistance Foundation
- **Kenneth Kloc**
Golden Gate University School of Law
- **Debbie Lowe Liang**
U.S. Environmental Protection Agency
- **Joseph Lyou**
Coalition for Clean Air
- **Phil Martien**
Bay Area Air Quality Management District
- **Kevin Buchan (Michaeleen Mason)**
Western States Petroleum Association
- **Randall Sawyer**
Contra Costa Health Services
- **Edmund Seto**
University of California, Berkeley
- **Charles White**
Waste Management
- **Janet Whittick**
California Council for Environmental and Economic Balance
- **Joy Williams**
Environmental Health Coalition



Academic Partners

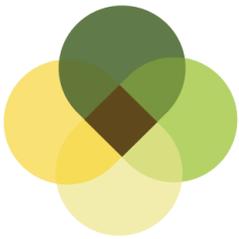
University of California, Berkeley

- **Amy Kyle**
Principal Investigator; School of Public Health
- **Michael Jerrett**
School of Public Health
- **Rachel Morello-Frosch**
Department of Environmental Science, Policy & Management and the School of Public Health
- **Bill Jesdale**
School of Public Health
- **Jason G. Su**
School of Public Health
- **Bhavna Shamasunder**
Department of Environmental Science, Policy & Management

- **Beth Altshuler**
College of Environmental Design, Department of City and Regional Planning
- **Miriam Zuk**
College of Environmental Design, Department of City and Regional Planning
- **Valerie Tran**
Berkeley undergraduate, student assistant

University of California, Riverside

- **Carl Cranor**
Department of Philosophy



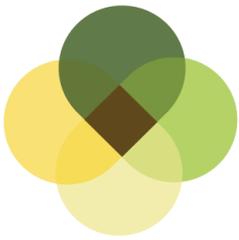
OEHHA Scientific Team

PROJECT TEAM

- **John Faust**
CI/PA Work Group Project Manager
- **George Alexeeff**
- **Lauren Zeise**
- **Carmen Milanes**
- **Karen Randles**
- **Laura Meehan**
- **Mark Miller**
- **Elaine Khan**
- **Nathalie Pham**
- **Carlos Gomez**

EXECUTIVE REVIEW

- **Joan Denton**
Director
- **Allan Hirsch**
Chief Deputy Director
- **Carol Monahan-Cummings**
Chief Counsel



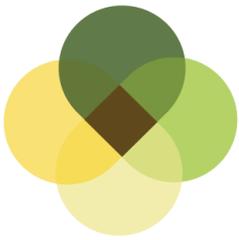
Cal/EPA Representatives

CAL/EPA BOARDS, DEPARTMENTS & OFFICE REPRESENTATIVES

- **Richard Bode/ Mena Shah**
Air Resources Board
- **Barbara Cook**
Department of Toxic Substances
Control
- **Veda Federighi**
Department of Pesticide
Regulation
- **Gita Kapahi**
State Water Resources Control
Board
- **(Rubia Packard)**
Integrated Waste Management
Board

CAL/EPA

- **Linda Adams**
Secretary for Environmental
Protection
- **Cindy Tuck**
Undersecretary
- **Ricardo Martinez**
Deputy Secretary, Environmental
Justice and Border Affairs Unit
- **Malinda Dumisani**
Special Assistant for
Environmental Justice
- **(Cynthia Gomez)**
Assistant Secretary for
Environmental Justice and Tribal
Affairs



Report Outline

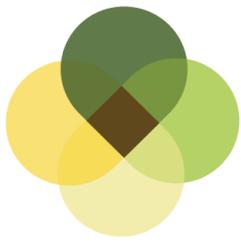
Chapter 1. Scientific Evidence for Disproportionate Cumulative Impacts

Chapter 2. Definitions and Terms

Chapter 3. A Scientific Screening Methodology for Analyzing Cumulative Impacts in Communities

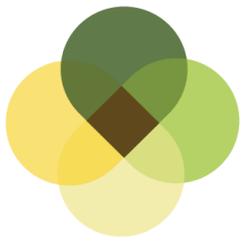
Chapter 4. Cumulative Impacts in Environmental Decision-Making

Chapter 5. Proposed Actions and Next Steps to Address Cumulative Impacts



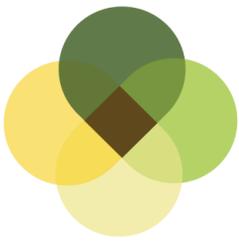
Working Definition

*"Cumulative impacts means **exposures, public health or environmental effects** from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account **sensitive populations and socio-economic factors**, where applicable, and to the extent data are available."*



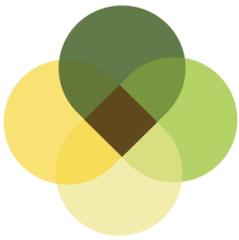
Review of the Science

- ❑ Disparities in exposures and environmental conditions and are prevalent among different:
 - Racial and ethnic groups
 - Socioeconomic strata
- ❑ Scientific evidence suggests a role for pollutant-mediated diseases, particularly for low-income and minority populations.
- ❑ Certain populations may experience greater health effects from environmental pollutants due to population characteristics.

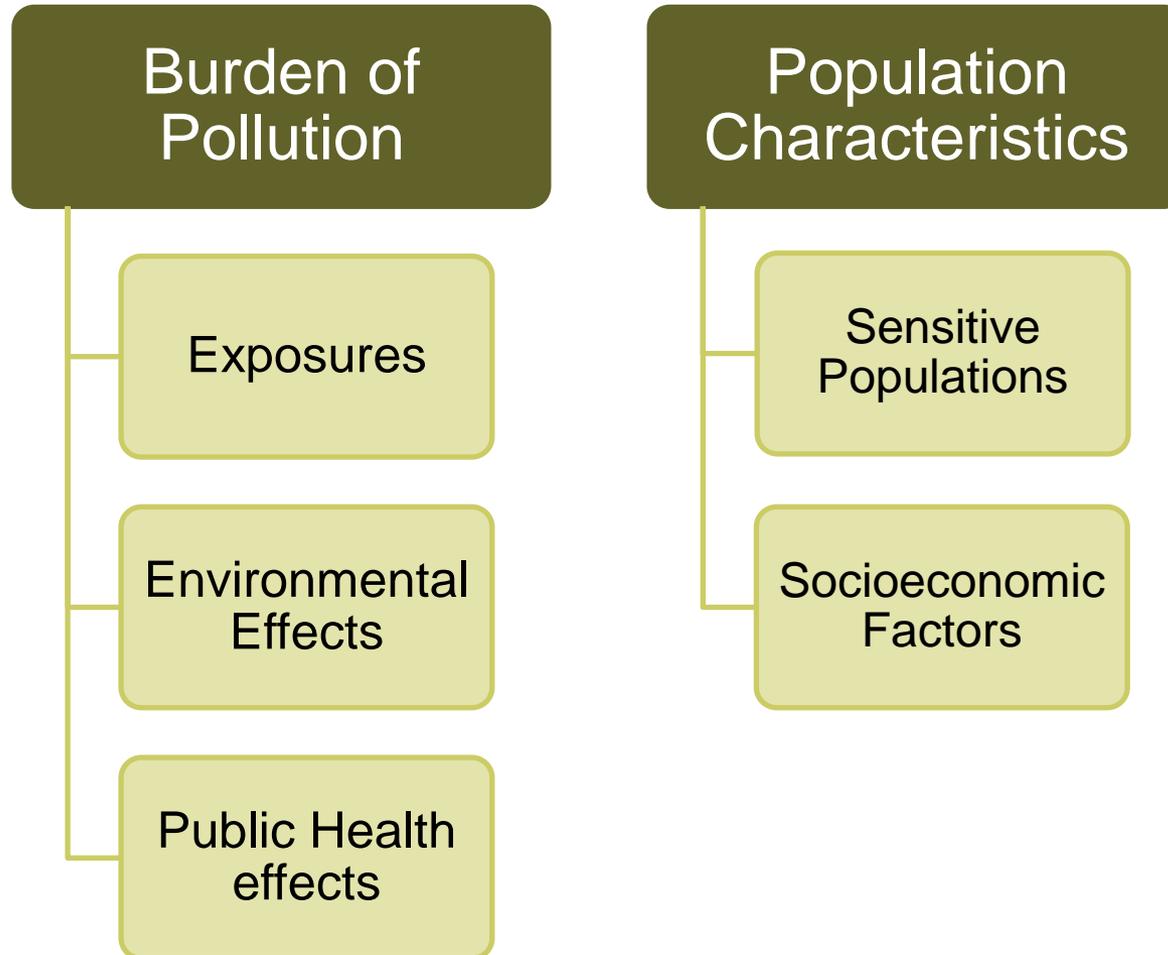


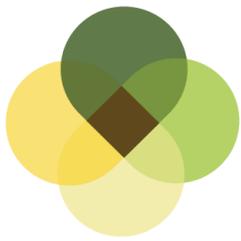
Screening Method

- ❑ Based on Work Group discussions, scientific research, and Agency needs.
- ❑ Identifies differences in cumulative impacts across different geographic areas that is:
 - Based on the cumulative impacts definition
 - Science-based
 - Simple and understandable
 - Multimedia
 - Incorporates population characteristics



Components of Cumulative Impact

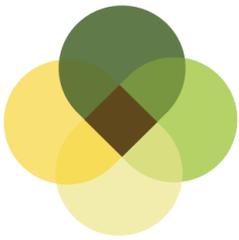




Potential Indicators for Assessing Cumulative Impacts

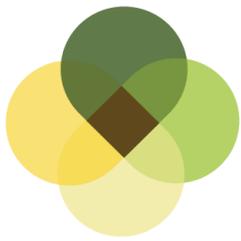
Exposures	Environmental Effects	Public Health Effects	Sensitive Populations	Socio-economic Factors
<ul style="list-style-type: none"> •PM 2.5 concentrations •Ozone concentrations •Toxic releases from industrial facilities •Traffic (vehicles per day) 	<ul style="list-style-type: none"> •Hazardous waste & clean-up sites •Leaking underground fuel tanks 	<ul style="list-style-type: none"> •Low birth weight rate •Heart disease mortality rate •Cancer mortality rate •Asthma hospitalization rate 	<ul style="list-style-type: none"> •Percent under age 5 •Percent over age 65 	<ul style="list-style-type: none"> •Percent non-white residents •Median household income •Percent residents below 2x national poverty level

See Table 2 (p.33) of Report



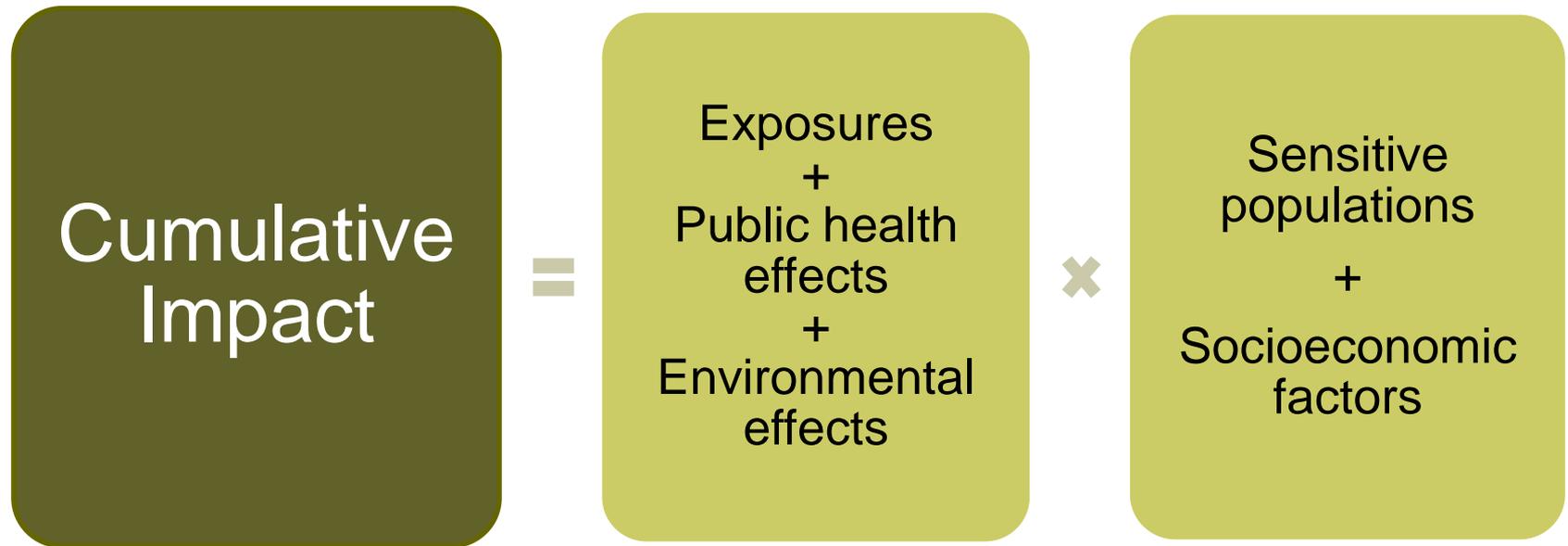
Scores for each Component

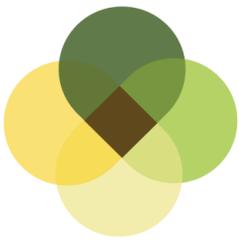
Component	Range of Possible Scores
Exposures	1-10
Environmental effects	1-5
Public health effects	1-5
Sensitive populations	1-3
Socioeconomic status	1-3
Cumulative impact	6-120



Relationship

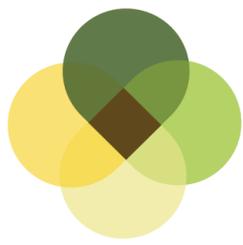
- *Cumulative impacts* need to take into account exposure and health impacts as well as sensitive populations and socioeconomic factors.





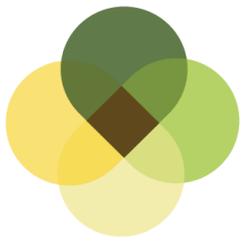
Community Ranking Based on Cumulative Impact Scores

	Community																												
Component	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A A	B B	
Exposures	7	5	8	7	6	4	7	6	8	3	6	6	5	4	6	4	7	7	4	3	3	5	4	4	5	4	5	3	
Public Health Effects	5	5	5	3	4	5	3	5	3	4	3	4	3	3	1	3	3	2	3	2	2	4	3	2	2	1	1	2	
Environmental Effects	3	4	3	3	3	4	4	2	1	5	2	1	5	1	5	2	1	1	3	4	2	2	3	1	1	1	2	1	
Contributors to Burden	15	14	16	13	13	13	14	13	12	12	11	11	13	8	12	9	11	10	10	9	7	11	10	7	8	6	8	6	
Sensitive Populations	3	3	2	3	3	3	2	2	2	2	2	3	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	1	
Socioeconomic Factors	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	2	2	2	2	3	1	1	2	1	2	1	2
Contributors to Sensitivity	6	6	5	6	6	6	5	5	5	5	5	5	4	6	4	5	4	4	4	4	4	5	3	3	4	3	4	3	3
Composite Score	90	84	80	78	78	78	70	65	60	60	55	55	52	48	48	45	44	40	40	36	35	33	30	28	24	24	24	18	



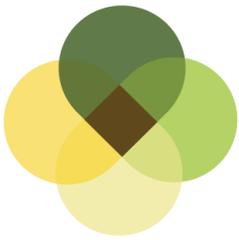
Decision Making Activities at Cal/EPA

- Permitting
- Site Clean-Ups
- Enforcement
- Environmental Monitoring
- Risk Assessment & Standard-Setting
- Financial Assistance
- Education & Outreach



Future Work

- Cumulative impact guidelines
- Methodology for a more comprehensive analysis
- Data



PUBLIC COMMENT

