

Cumulative Impacts and Community Vulnerability Symposium

Álvaro Alvarado, Ph.D.

July 27, 2017

Air Resources Board

California Environmental Protection Agency

Environmental Justice Screening Method

- Developed by Manuel Pastor, Rachel Morello-Frosch, Jim Sadd
- Under contract with Air Resources Board
- Research tool to identify hot spots and air quality trends
- Reflects published research on air pollution, environmental justice, and health
- Data transparent, publicly available
- Reviewed by environmental justice groups, academic researchers
- Statewide and regional scoring

Screening Method Categories

- Exposure and Health Risk
 - State and federal data
 - Modeling from emissions inventories
- Hazard Proximity
 - ARB land use guidelines
- Social and Health Vulnerability
 - Based on epidemiological literature
 - EJ literature on community vulnerability
- Climate Vulnerability
 - Heat islands, temperature trend, vulnerability

Hazard Proximity

- Sensitive Receptors
 - Residents, schools, day care centers, playgrounds, urban parks, and health care facilities
- Hazards
 - Hazardous land use: Railroads, airports, ports, petroleum refineries, and intermodal facilities, toxic cleanup sites
 - Large facilities: Green-house gas emissions >25 tons per year; air toxics and criteria pollutants >10 tons per year
 - Small facilities: Chrome plating, auto paint & body shops, gas stations
 - Hazardous waste treatment, storage and disposal facilities
 - Traffic density

Land Use and Hazard Proximity Map

- Measure distance between sensitive receptors and hazards
- Score based upon number of facilities and distance from sensitive receptors
 - 1000 feet = 1
 - 2000 feet = 0.5
 - 3000 feet = 0.1

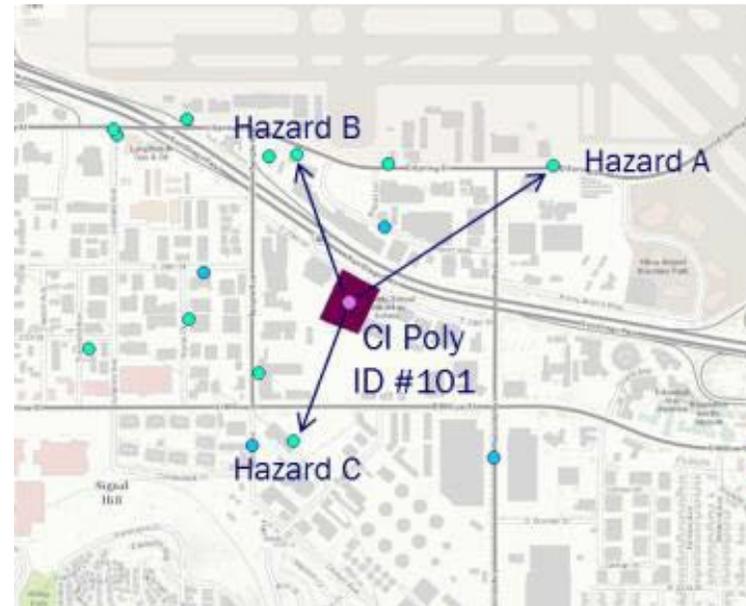


Image credit: Manuel Pastor,
Rachel Morello-Frosch, Jim Sadd

Validating Big Data: Hazard Proximity

Validating Hazard Proximity Locations

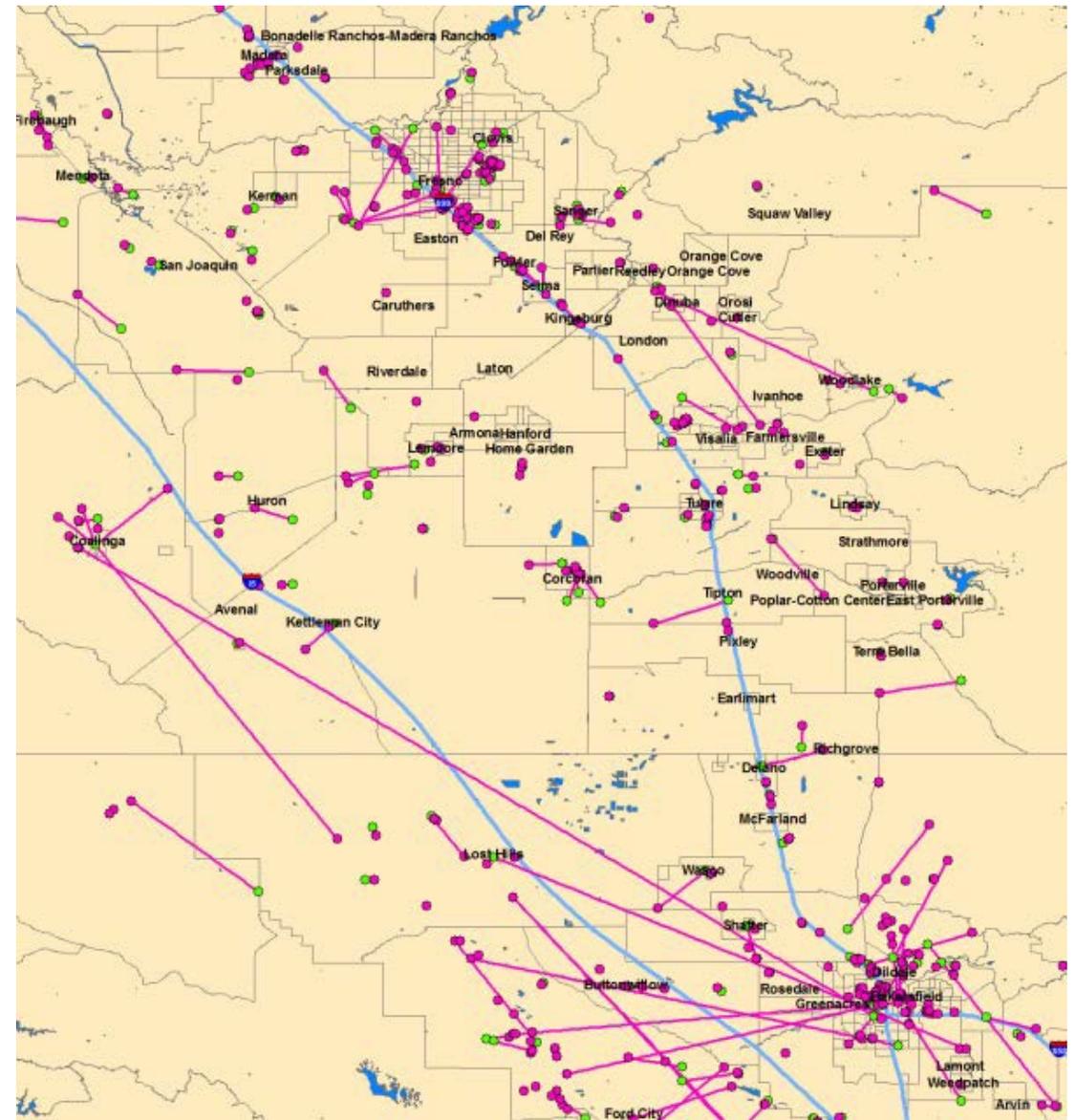


Image credit: Manuel Pastor, Rachel Morello-Frosch, Jim Sadd

Validating Hazard Proximity Locations

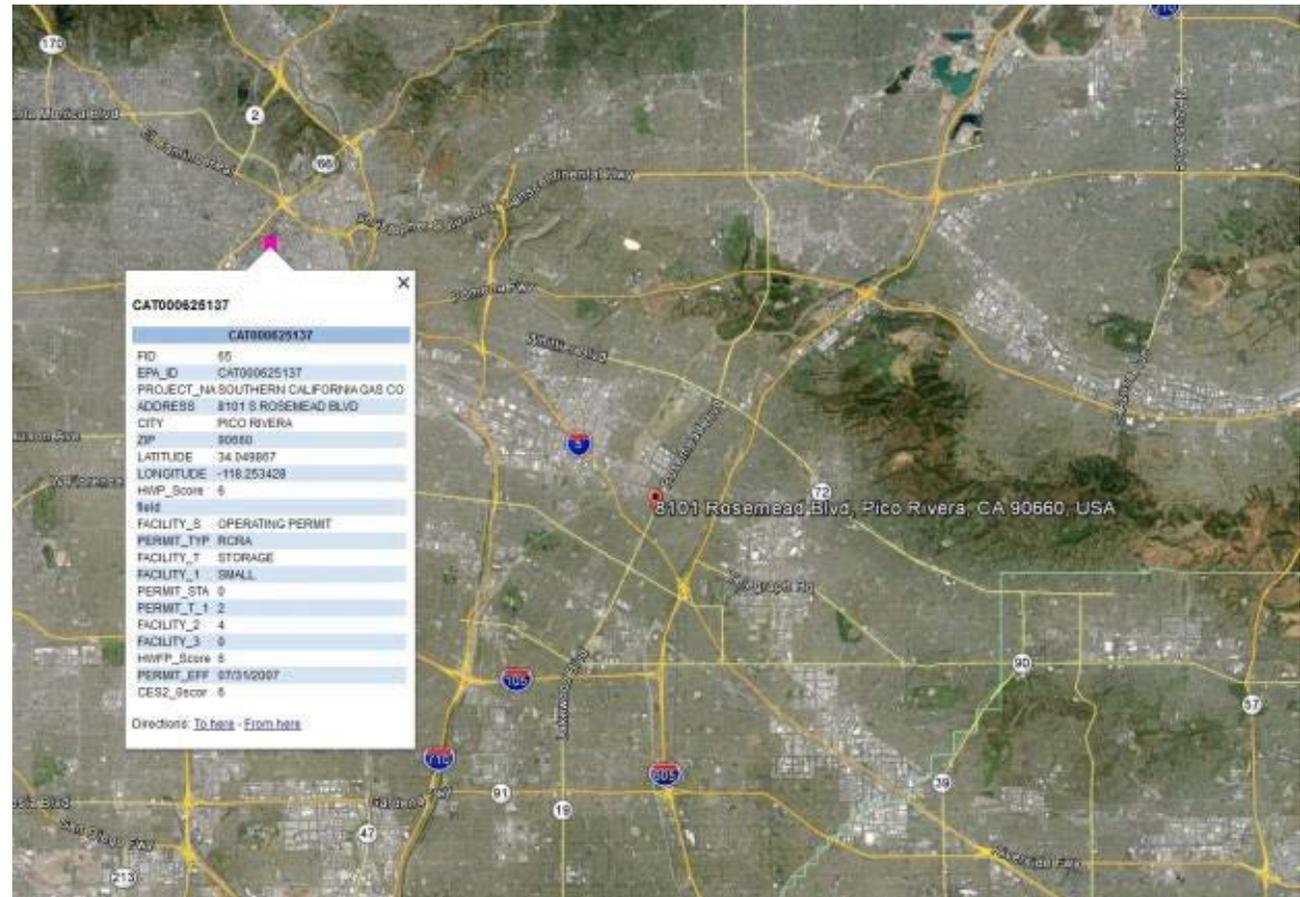


Image credit: Manuel Pastor,
Rachel Morello-Frosch, Jim Sadd

Validating Hazard Proximity Locations

- Near housing
- Changes local hazard proximity score

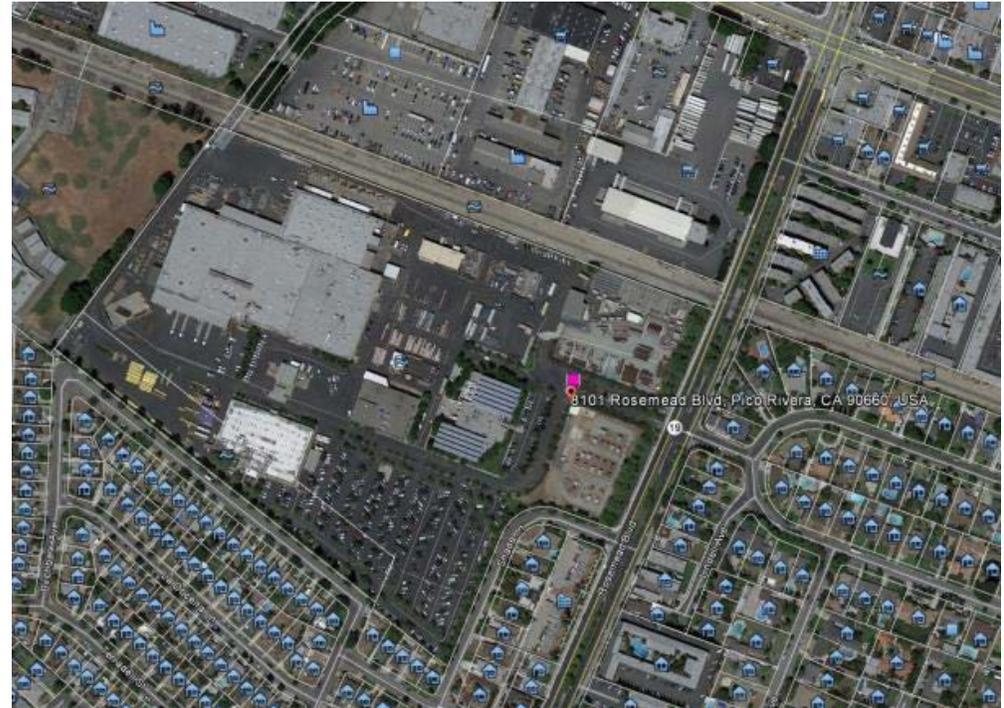


Image credit: Manuel Pastor,
Rachel Morello-Frosch, Jim Sadd

Validating Hazard Proximity Locations

- Large footprint of facility
- Better represented by area

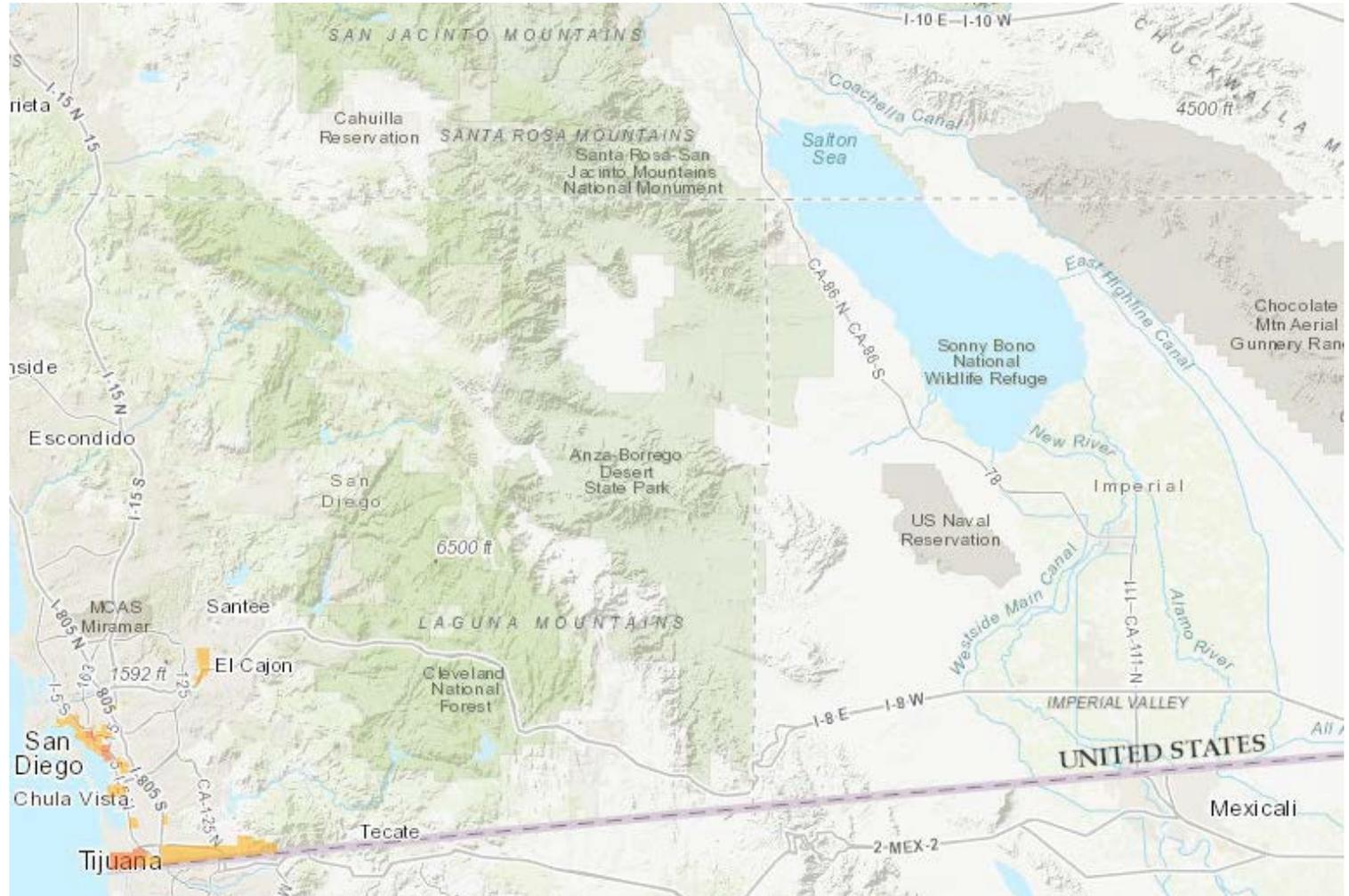


Image credit: Manuel Pastor,
Rachel Morello-Frosch, Jim Sadd

US-Mexico Border

Regional Scoring

- Hazard Proximity and
- Ozone, diesel PM, PM2.5, toxics



US-Mexico Border: Improving Cumulative Impacts Mapping

- Improve accuracy of pollution burden at the US-Mexico border
- Contract with SDSU to create geospatial database of Mexican emission sources
- Low-cost sensor networks in Imperial Valley and San Ysidro

Thank you