



THE CLIMATE GAP AND CAP-AND-TRADE IN CALIFORNIA

March 2, 2017

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USC Program for Environmental & Regional Equity*

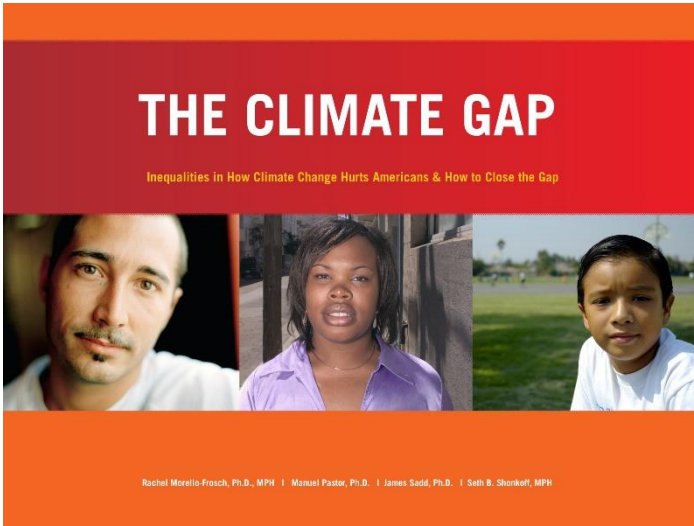
THE CLIMATE GAP



A hidden pattern showing that **people of color and the poor** in the United States **will suffer more** from the economic and health consequences of **climate change** than other Americans.

THE CLIMATE GAP

Because of the **climate gap**, low-income communities of color will:



- Suffer higher **mortality and health impacts**...because of more frequent and intense **heat waves**
- Be exposed to **higher air pollution levels**...because current pattern of pollution **exposure and health inequality** could become even worse
- See the “spending gap” widen...because they pay a greater cost for basic necessities

CAP & TRADE OVERVIEW

CA has a cap on CO₂ emissions that declines each year. It is based on consumption as well as production; electricity importers, for example, are part of the system.

- In **1st phase**, cap covered electricity suppliers and large industrial sources like refineries and cement companies.
- In **2nd phase**, cap covers gas, diesel, and natural gas providers, presenting a different set of research and policy challenges.



Those GHG emitters that meet goals can sell allowances in auctions. Those that don't meet goals can purchase allowances so they can emit more.

CONCERN ABOUT CO-POLLUTANTS

Most greenhouse gases (GHGs) do not directly harm health in communities where they are emitted. But accompanying “**co-pollutants**” like particulate matter can harm the health of nearby residents.



CONCERN ABOUT CO-POLLUTANTS

Power plant near Bakersfield, CA



PM₁₀ emissions: 41.5 metric tons
Population within 6-mi radius: ~1,000

Oil refinery in Torrance, CA



PM emissions: 415.7 metric tons
Population within 6-mi radius: ~802,700

Both facilities emit between 2.5-2.8 million metric tons of GHGs

OUR STUDY

RESEARCH QUESTIONS

What are the **environmental equity implications** of the cap-and-trade program, so far?

- a) What are the demographics surrounding GHG facilities?
- b) What are trends between GHGs and localized co-pollutants?
- c) What equity patterns do we observe?
- d) What are related issues involving in-state emissions trends and use of offsets?



DATA & METHODS

DATA & METHODS

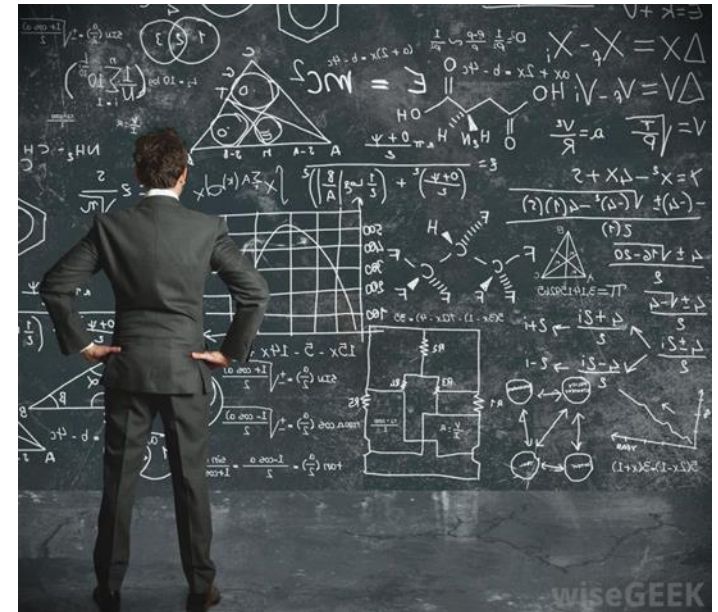
To answer our research questions, we combined:

- **GHG emissions data** from CA's Mandatory Reporting of Greenhouse Gas Emissions (MRR) program, 2011-2014
- **Criteria pollutant data** from the CA Emission Inventory Development and Reporting Systems (CEIDARS), 2011-14
- Data on **neighborhood demographics** from the 2014 5-year American Community Survey estimates
- Cumulative environmental health impacts scores from the Cal-EPA's **CalEnviroScreen 2.0** tool
- Information from the CA Air Resources Board (CARB) about **how regulated companies fulfilled their obligations** under the first compliance period (2013-14) of the cap-and-trade program

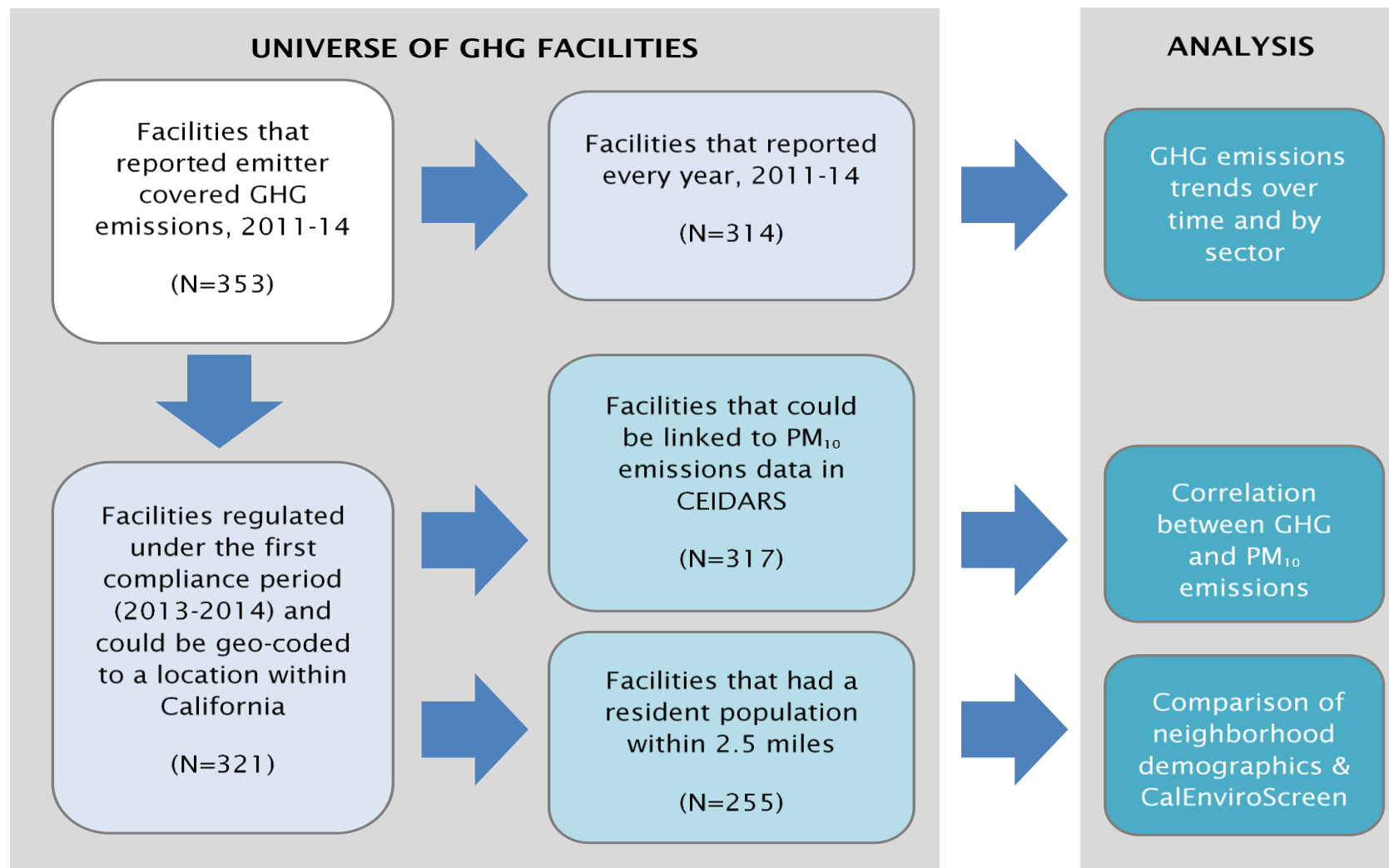
DATA & METHODS

Matching GHG and co-pollutant data was particularly time consuming because there is **no common facility ID** between the databases—so we had to manually match in the data using facility name, city, zip, and, in some instances, address.

We matched 317 of the 321 facilities with emitter covered GHG emissions with co-pollutant data.



DATA & METHODS



FINDINGS

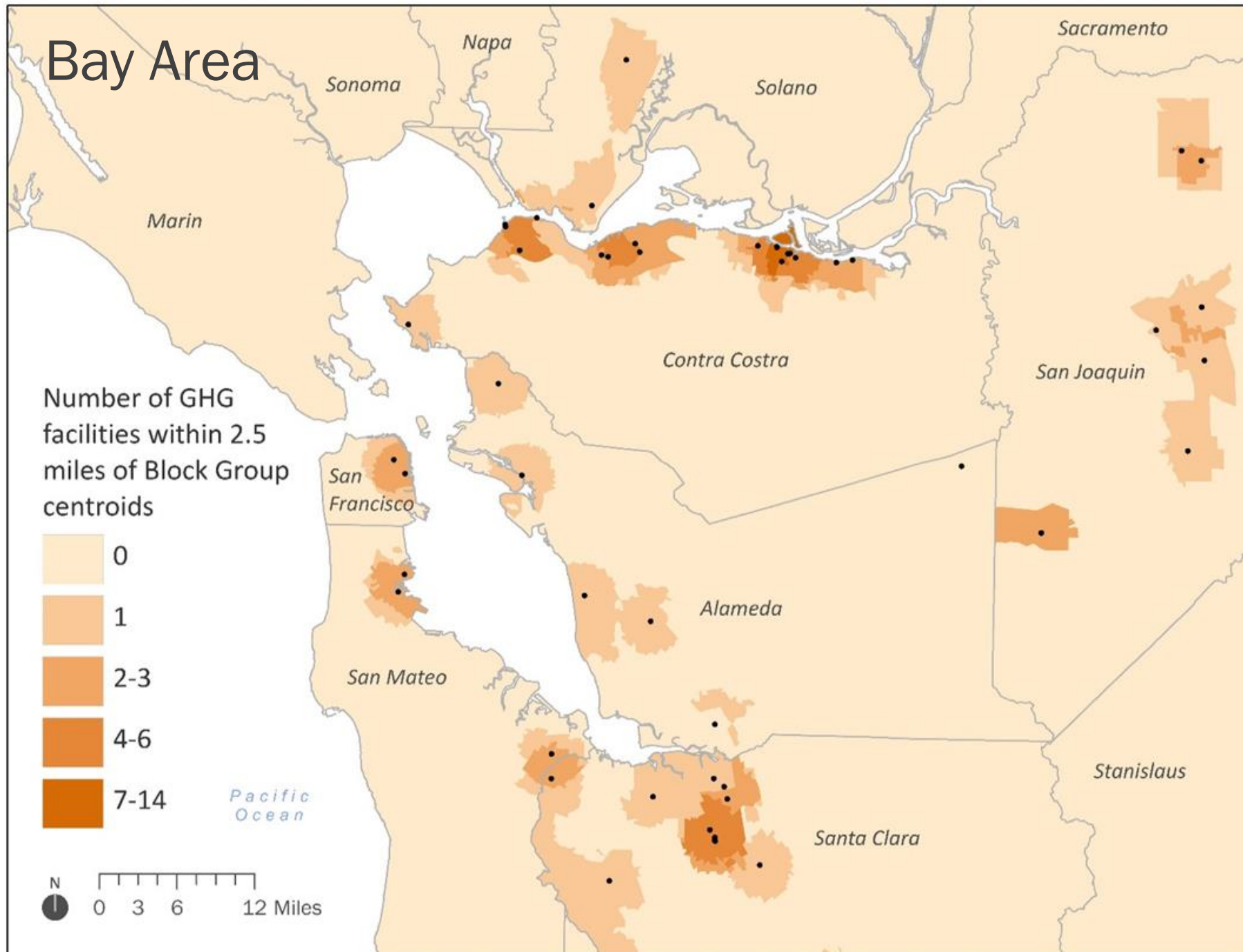
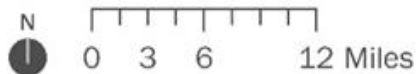
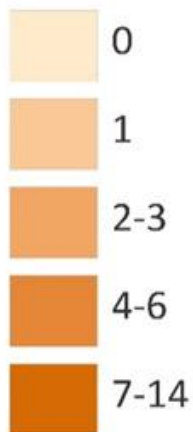
FINDING #1

*Many of California's residential communities are within 2.5 miles of **more than one** GHG-emitting facility.*

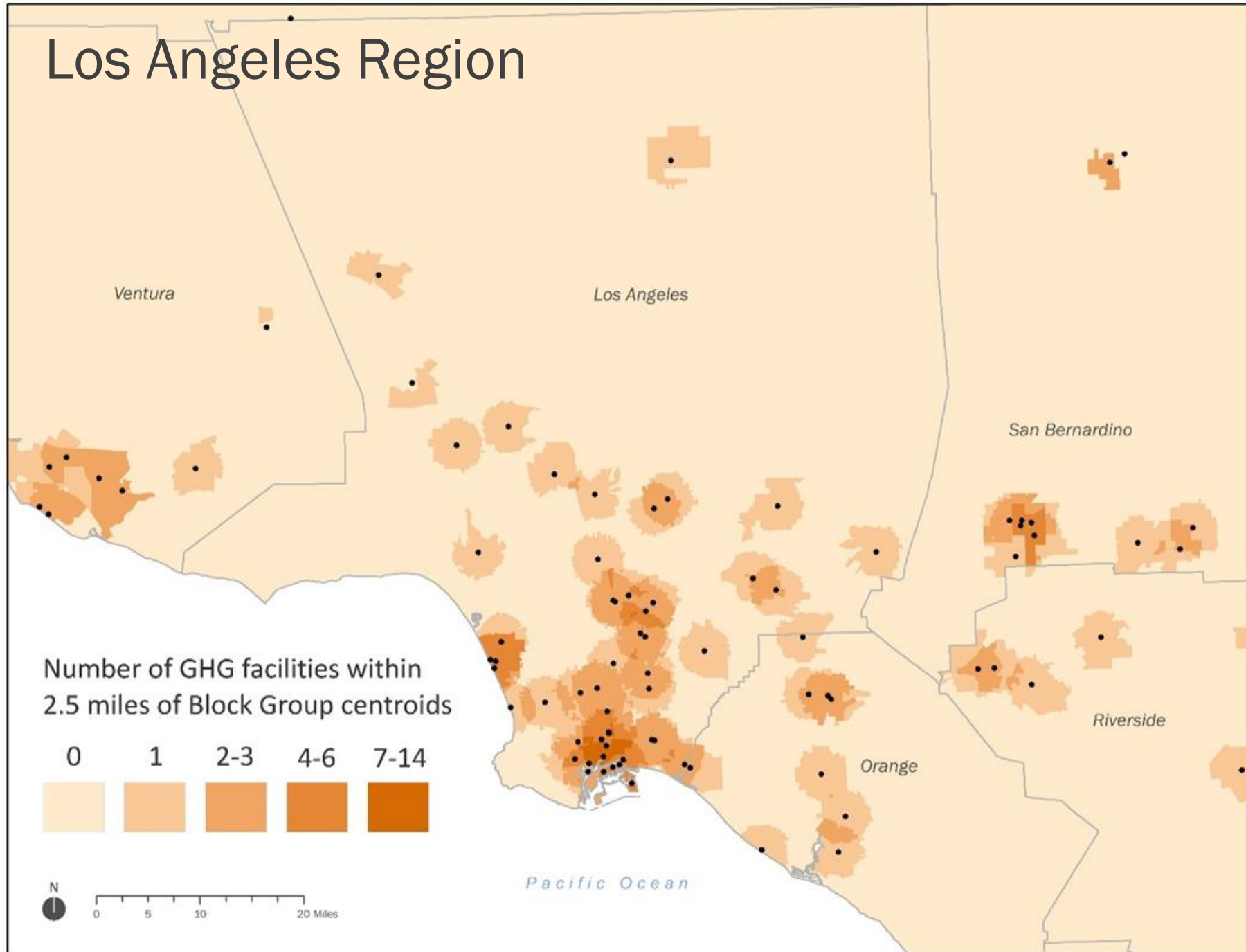


Bay Area

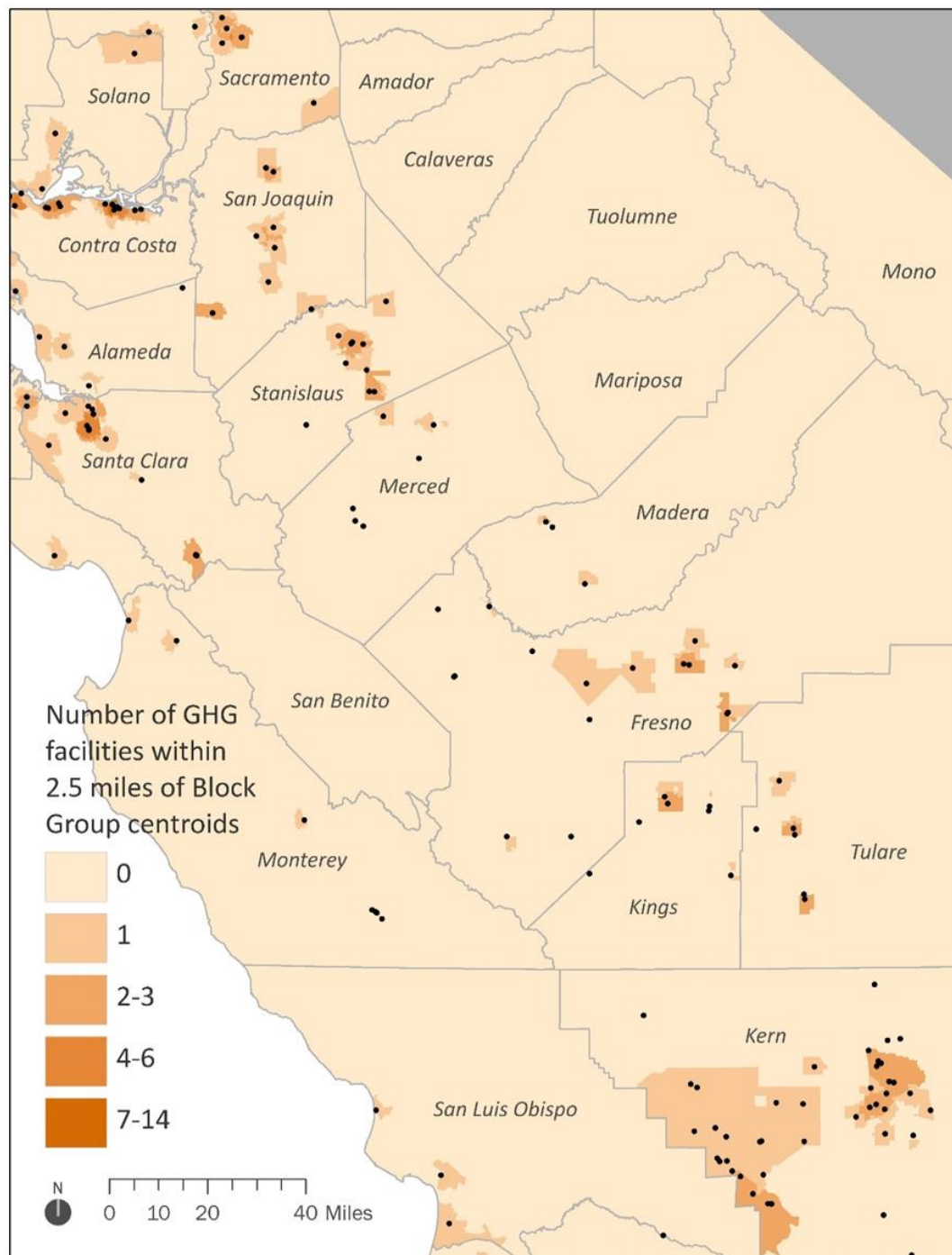
Number of GHG facilities within 2.5 miles of Block Group centroids



Los Angeles Region



Central Valley



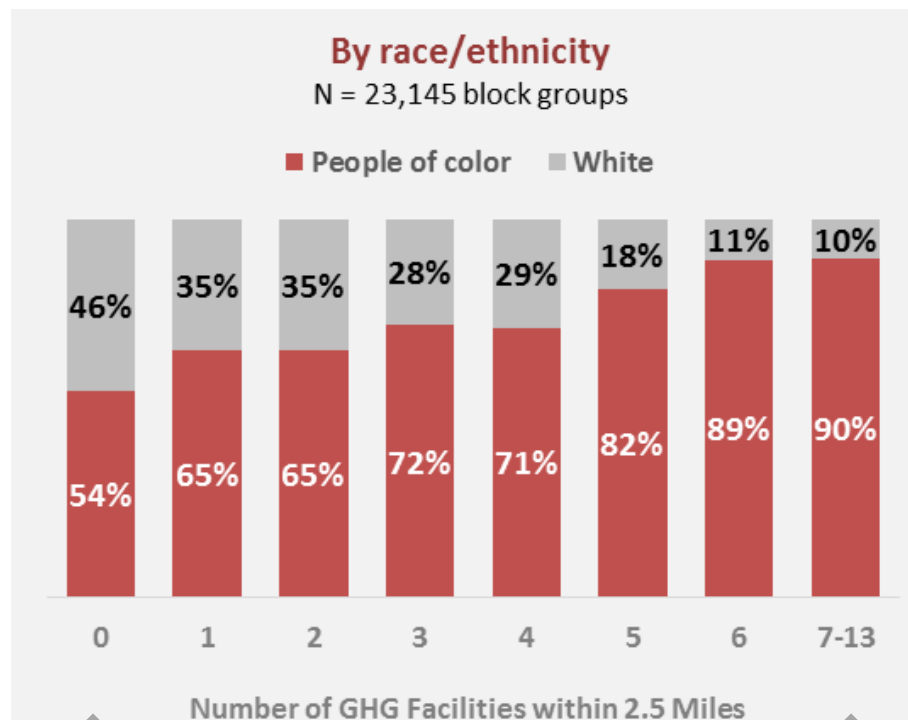
FINDING #2

*Facilities that emit localized GHGs are located in more **disadvantaged communities**.*

	Block groups with <i>at least one facility</i> within 2.5 miles	Block groups with <i>no facilities</i> within 2.5 miles
Mean % People of Color	66%	54%
Mean % People Living Below 2x the Poverty Level	41%	34%
% of Block Groups in a “Top 10%” CalEnviroScreen tract	17%	7%
% of Block Groups in a “Top 20%” CalEnviroScreen tract	31%	15%

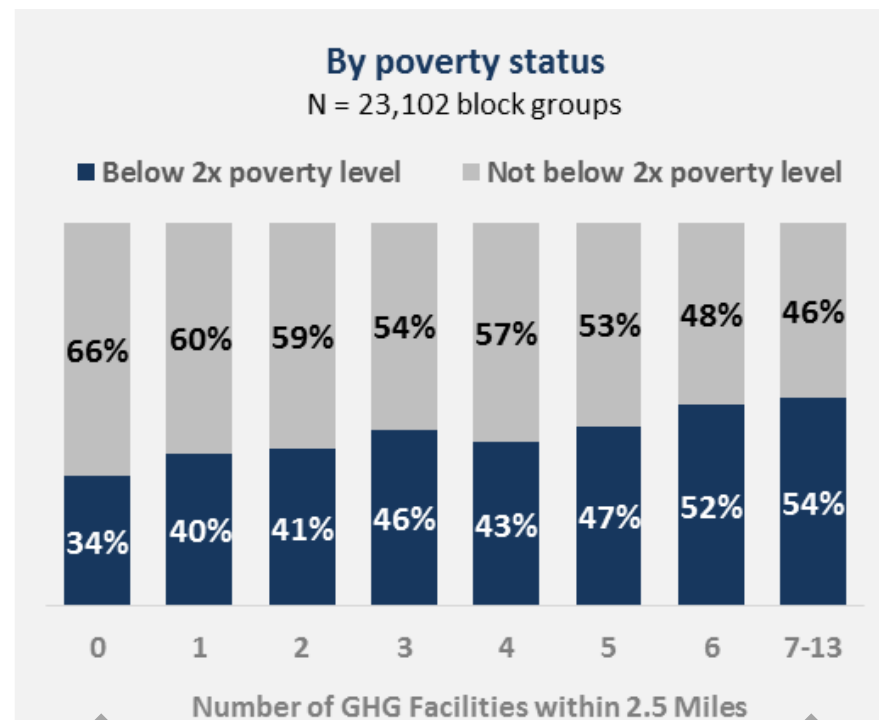
FINDING #2

Number of GHG-emitting facilities in block groups by race/ethnicity and by poverty status



16,729 block groups

55 block groups



16,705 block groups

55 block groups

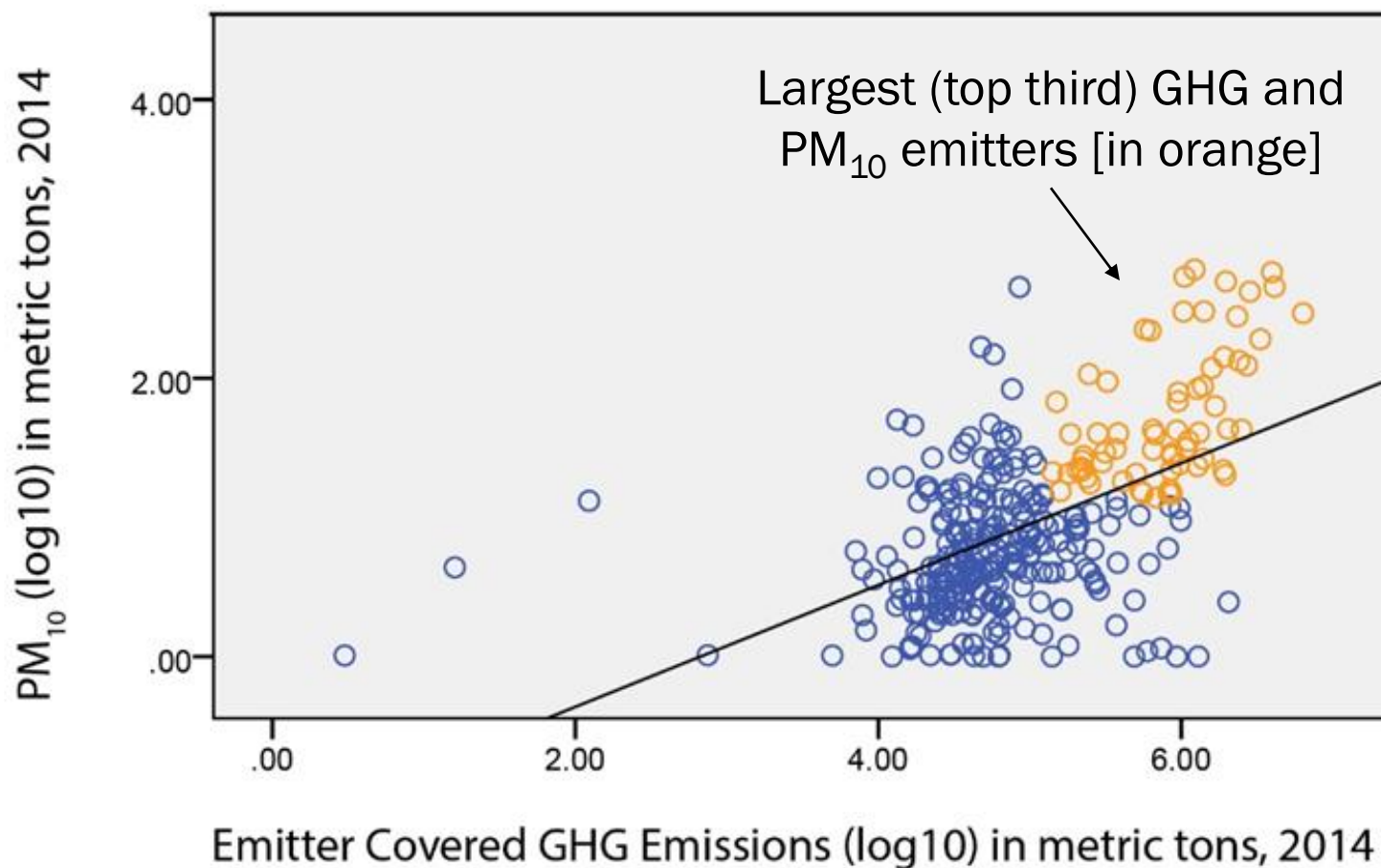
FINDING #3

*While GHG emissions do not generally have direct health impacts, co-pollutants such as particulate matter (PM_{10}) do. Such emissions are **correlated**, with large GHG emitters reporting that they emit more PM_{10} .*

*The **largest emitters** of both GHGs and PM_{10} also tend to be **located near neighborhoods with higher proportions of disadvantaged residents**.*

FINDING #3

Correlation between Emitter Covered GHG Emissions and Particulate Matter (PM₁₀)



FINDING #3

Characteristics of Neighborhoods within 2.5 miles of the Top GHG- and PM₁₀- Emitting Facilities

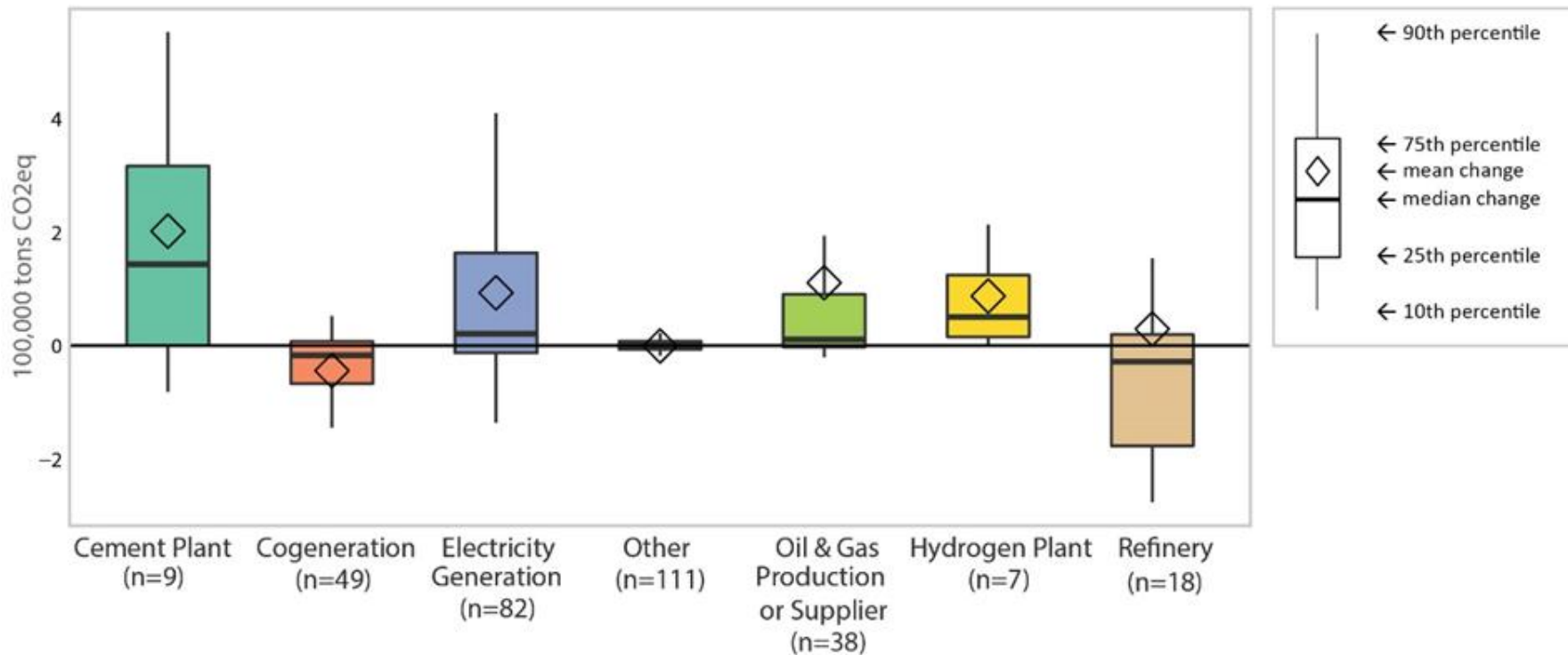
	Block groups within 2.5 miles of the <i>largest GHG and PM₁₀ emitters</i>	All other block groups
Mean % People of Color	66%	57%
Mean % People Living Below 2x the Poverty Level	40%	36%
% of Block Groups in a “Top 10%” CalEnviroScreen tract	18%	9%
% of Block Groups in a “Top 20%” CalEnviroScreen tract	35%	19%

FINDING #4

*While overall GHG emissions in California have continued to drop from a peak in 2001, we find that, on average, many industry sectors covered under cap-and-trade **report increases in localized in-state GHG emissions** since the program came into effect in 2013.*

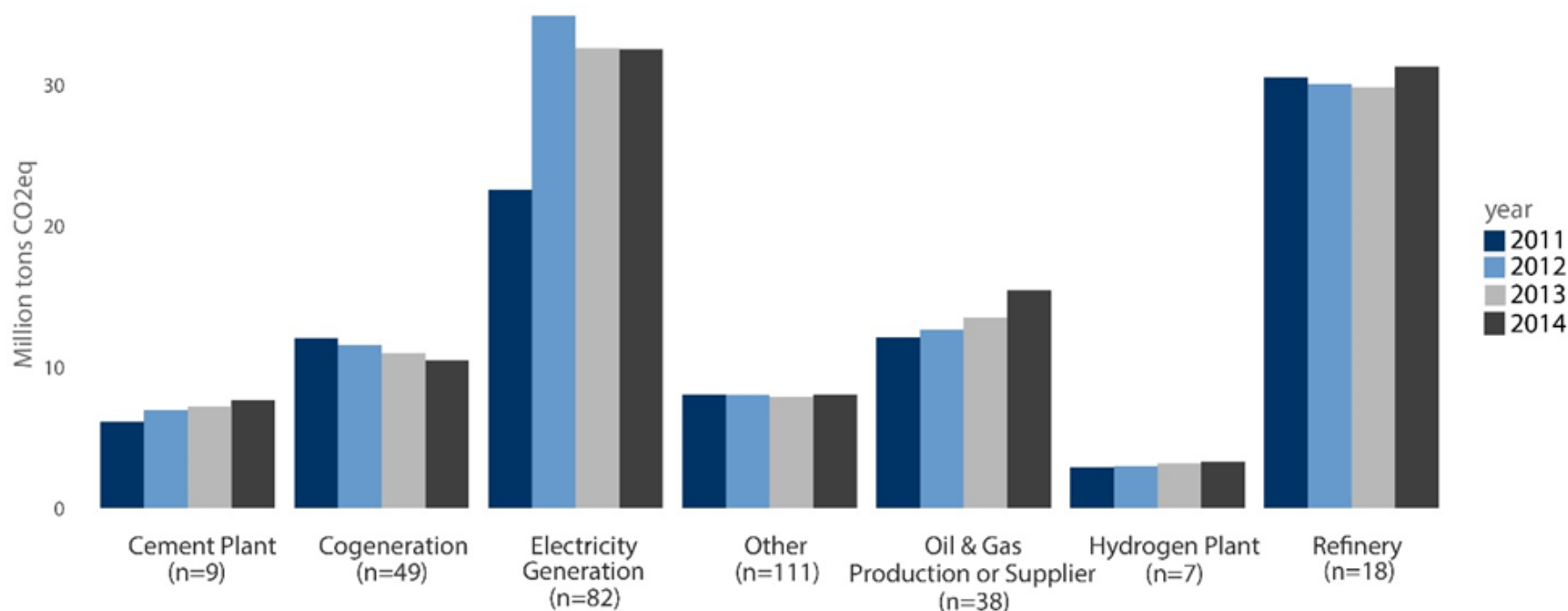
FINDING #4

Change in Emitter Covered GHG Emissions by Industry Sector



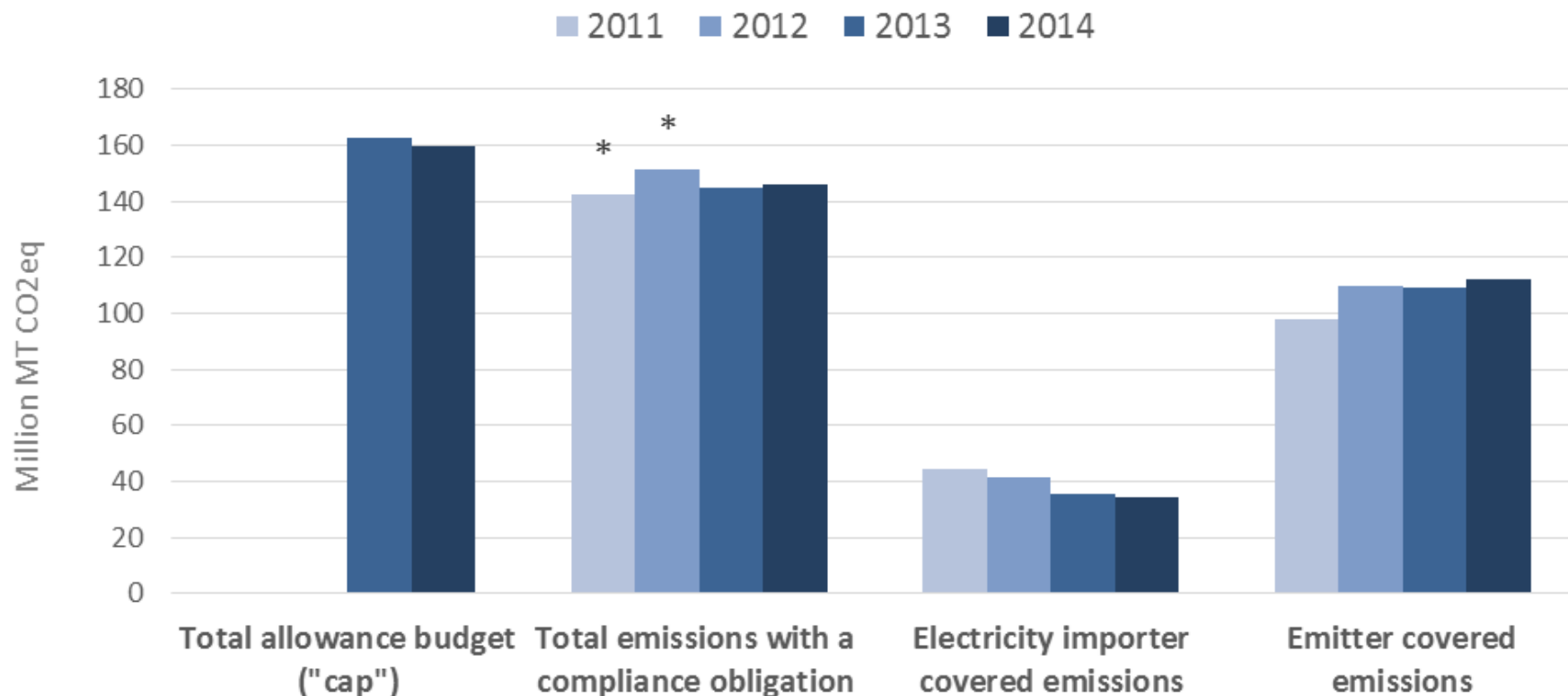
FINDING #4

Temporal Changes in Total Emitter Covered GHG Emissions by Industry Sector



FINDING #4

Total GHG Budget



* Only emissions during 2013 and 2014 were subject to a compliance obligation. Estimates of comparable emissions during 2011 and 2012 were derived by summing the “emitter covered” and “electricity importer covered” emissions reported by regulated facilities for those years.

FINDING #4

Characteristics of Neighborhoods near Top GHG- and PM₁₀-Emitting Facilities that Increased and Decreased GHG Emissions

	Block groups within 2.5 miles of at least one top emitting facility that increased GHG emissions (N=675)	Block groups within 2.5 miles of at least one top emitting facility that decreased GHG emissions (N=669)
Mean % People of Color	74%	58%
Mean % People Living Below Twice the Poverty Level	46%	34%
% of Block Groups in a “Top 10%” CalEnviroScreen tract	25%	14%
% of Block Groups in a “Top 20%” CalEnviroScreen tract	46%	28%

FINDING #5

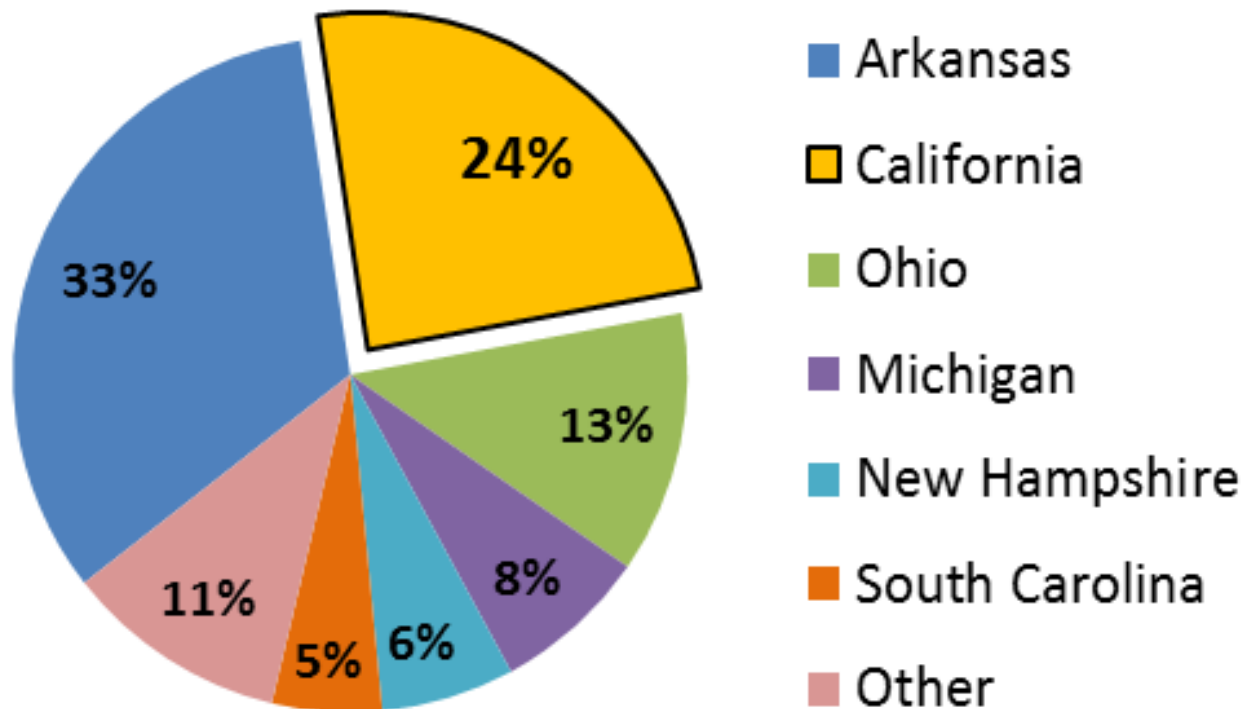
Between 2013 and 2014, more emissions “offset” credits were used than the total reduction in allowable GHG emissions (the “cap”).

These offsets were primarily linked to projects outside of California, and large emitters of GHGs were more likely to use offset credits to meet their obligations under cap-and-trade.



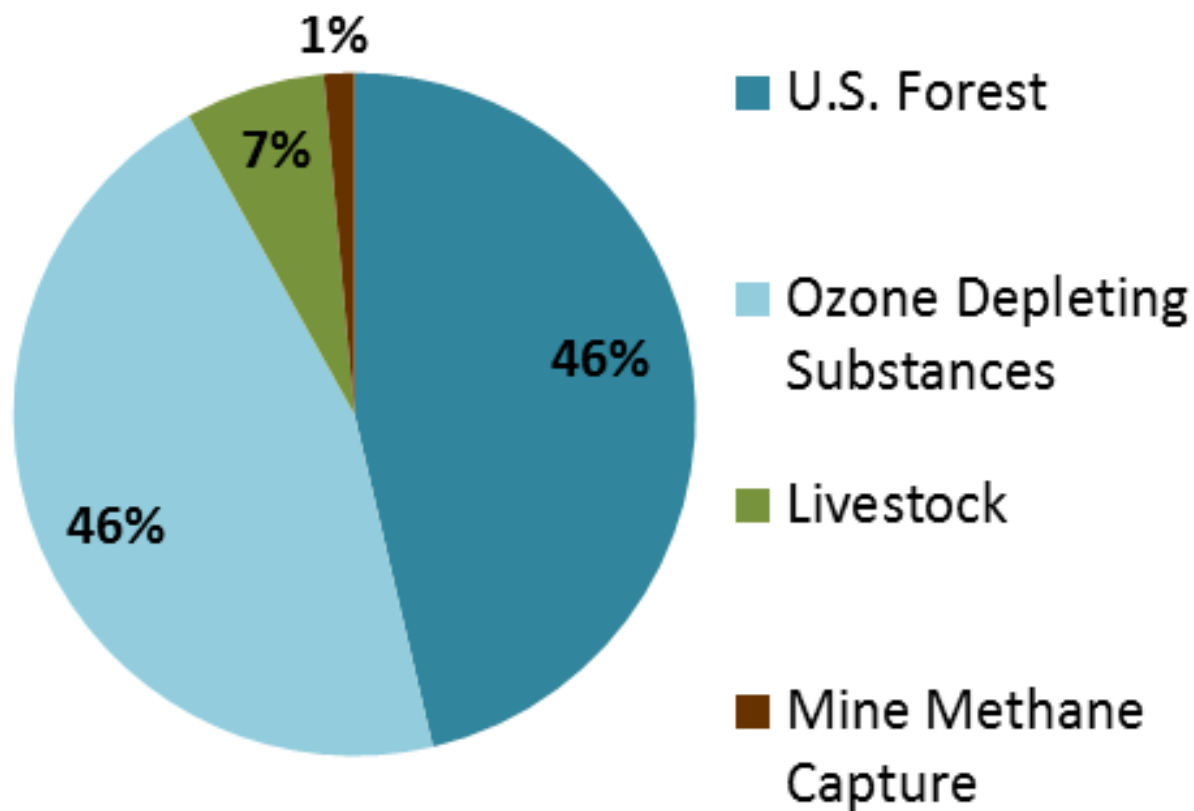
FINDING #5

Origin of Offset Credits



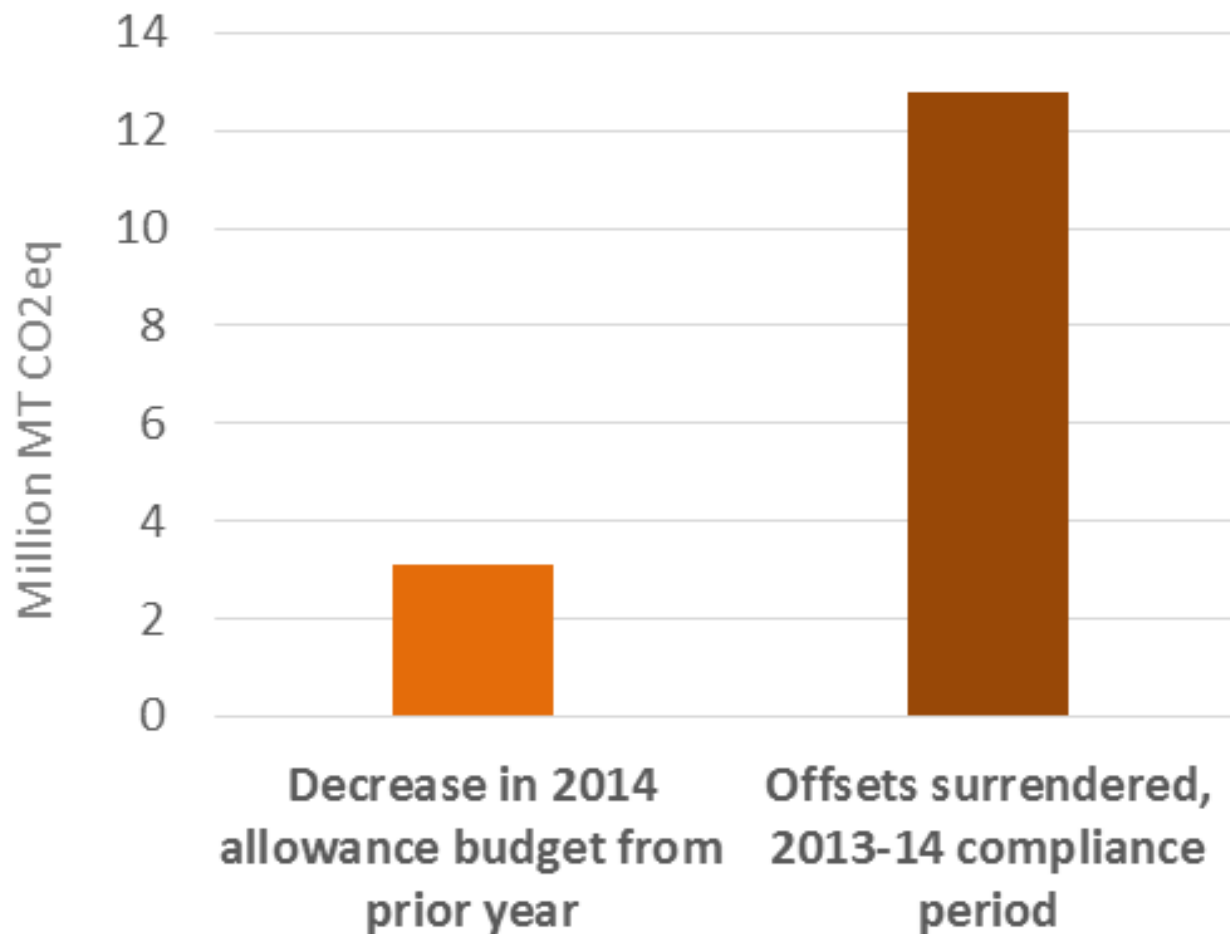
FINDING #5

Offset Credits by Project Type



FINDING #5

Offset Credits vs. Decrease in Allowance Cap



SUMMARY: PRELIMINARY FINDINGS

Regulated GHG-emitting facilities—including those that emit the highest levels of both GHGs and PM₁₀—are located in neighborhoods with **higher proportions of residents of color and residents living in poverty.**



Public health and equity co-benefits of cap-and-trade could be enhanced if there were more **emissions reductions among the larger emitting facilities** that are located in disadvantaged communities.

SUMMARY: PRELIMINARY FINDINGS

In-state **emissions have increased on average** for several industry **sectors** since the advent of the cap-and-trade program, with many high emitting companies using offset projects located outside of California to meet their compliance obligations.

Large GHG emitters that might be of most public health concern were the **more likely to use offset projects** to meet their obligations under the cap-and-trade program.



RECOMMENDATIONS

RECOMMENDATIONS

We need more research! Some things that would help:

- Build **better linkages between state facility-level databases** on GHG and co-pollutant emissions (i.e., harmonize facility ID codes between relevant data sources);
 - This could be built into facility emissions reporting requirements.
- Publicly **release data** on facility- and company-specific allowance allocations.
- Track and make data available on facility- and company-specific **allowance trading patterns**.



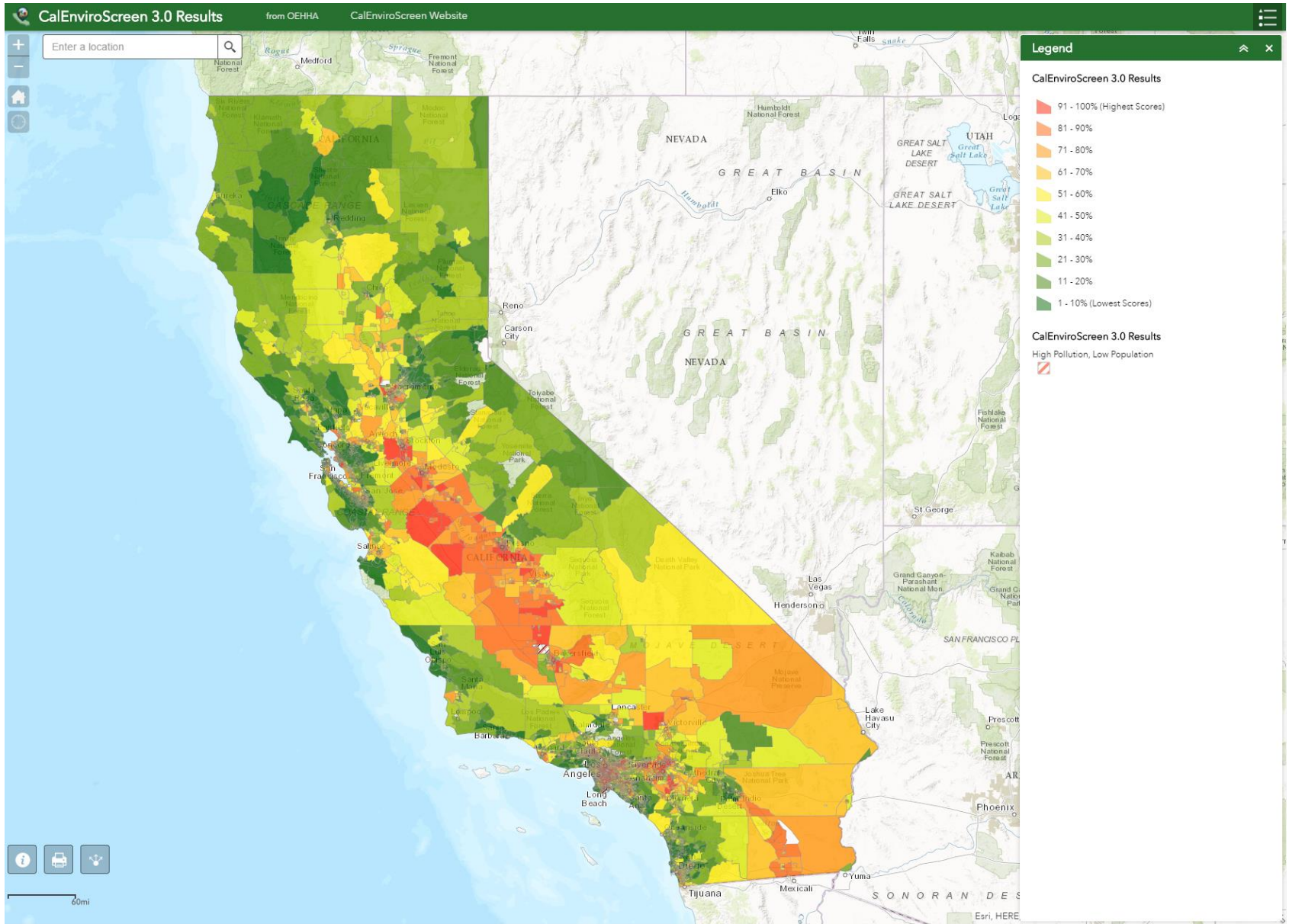
CLOSING THE CLIMATE GAP IN CALIFORNIA

CLOSING THE CLIMATE GAP

- Identify “climate gap” or “disadvantaged” communities
- Invest cap-and-trade revenue in those places
- Focus GHG reductions from sources who also emit toxic pollution
- Target green jobs training

**The good news is:
California’s already
starting to do this.**

CALENVIROSCREEN



CAP-AND-TRADE REVENUE IN DISADVANTAGED COMMS.

SB 535 mandates that at least 25% of cap-and-trade revenue goes directly to “disadvantaged communities” and that at least 10% goes to benefit them.

Revenue is being spent on projects like:

- Affordable housing
- Public transit
- Home weatherization
- Solar
- Urban greening
- And more!



Rolland Curtis, an affordable housing project in South L.A. next to the Expo Line, receiving cap-and-trade funding

THANK YOU!

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AUTHORS & ACKNOWLEDGEMENTS

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ACKNOWLEDGEMENTS

We thank USC PERE Data Manager Justin Scoggins, Graduate Research Assistant Melody Ng, and Communications Specialist Gladys Malibiran for their assistance in the production of this brief and the California Environmental Justice Alliance for helpful feedback on an early version of this brief.

FUNDERS

- Energy Foundation (grant number G-1507-23494),
- Institute for New Economic Thinking (grant number INO1500008)
- Resource Legacy Fund