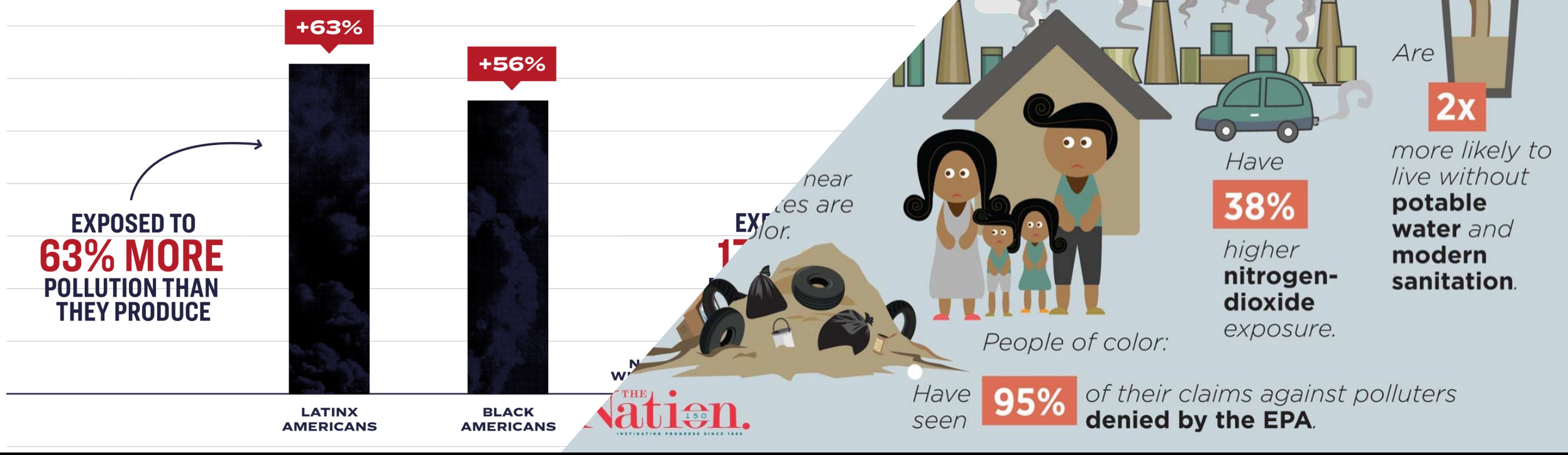
AIR POLLUTION AND DEMOGRAPHICS (2010-2015)

Aiden Wood



THE SCIENTIFIC PROBLEM

Hypothesis: There is a correlation between demographics and exposure to air pollution

Data

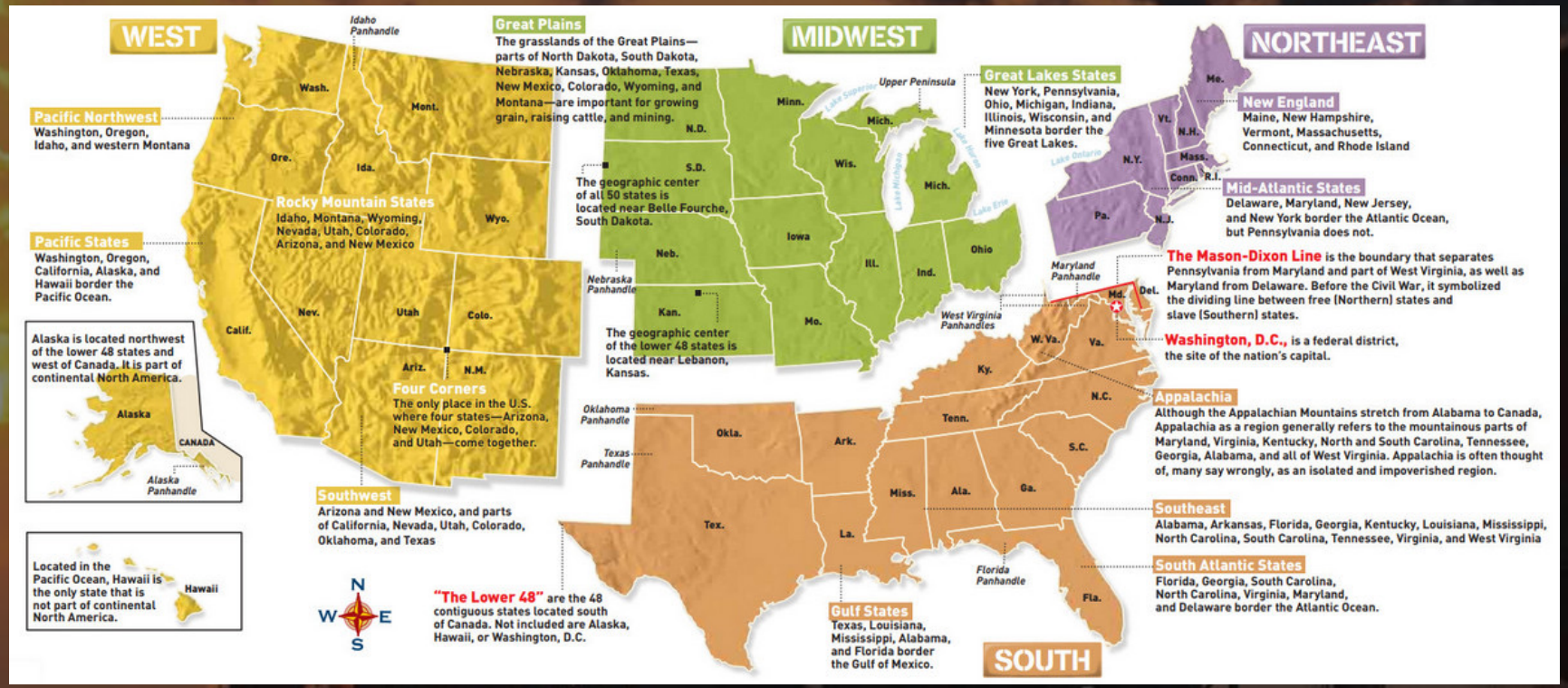
Percent of Population by Demographic Group: Black and Hispanic

- *Data provided by U.S. Census Bureau's Population Estimates Program (PEP)*
- *Limitations: Census utilizes current data on births, deaths, and migration to calculate population change since the most recent decennial census and produce a time series of estimates of population and demographic.*

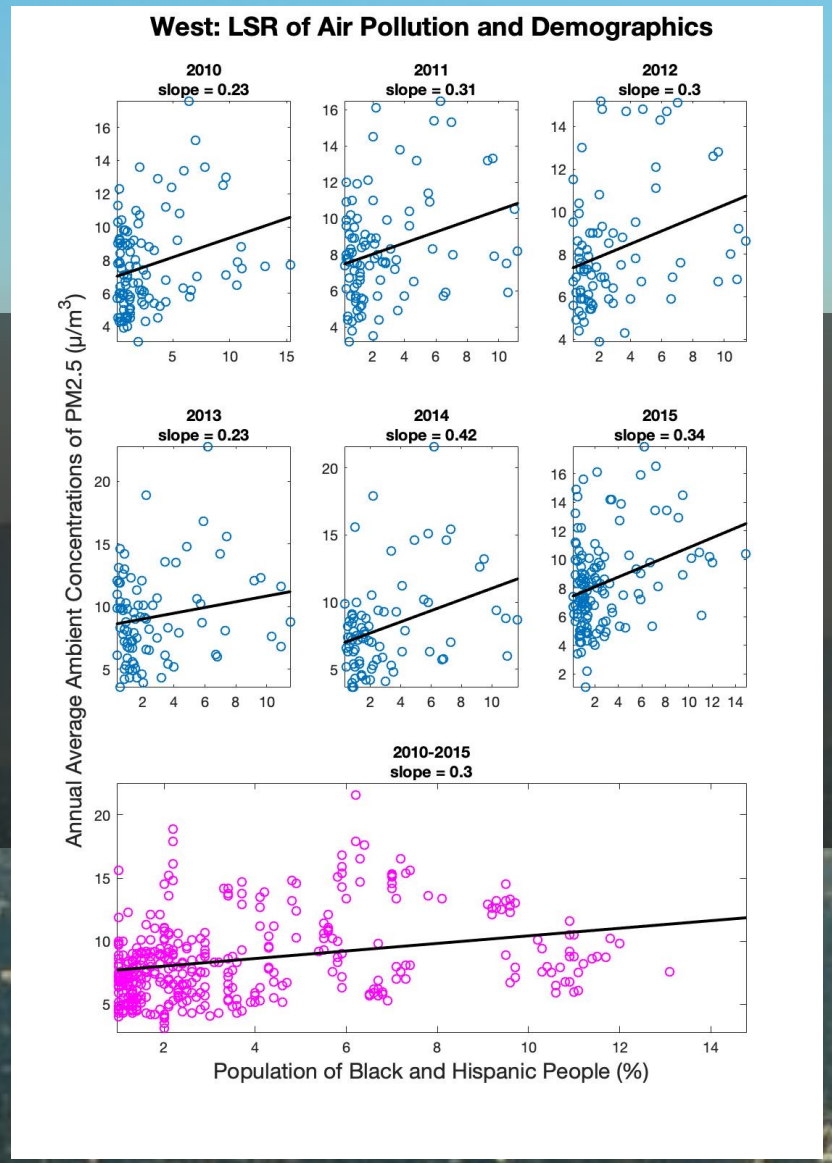
Annual PM2.5 Level (Monitored)

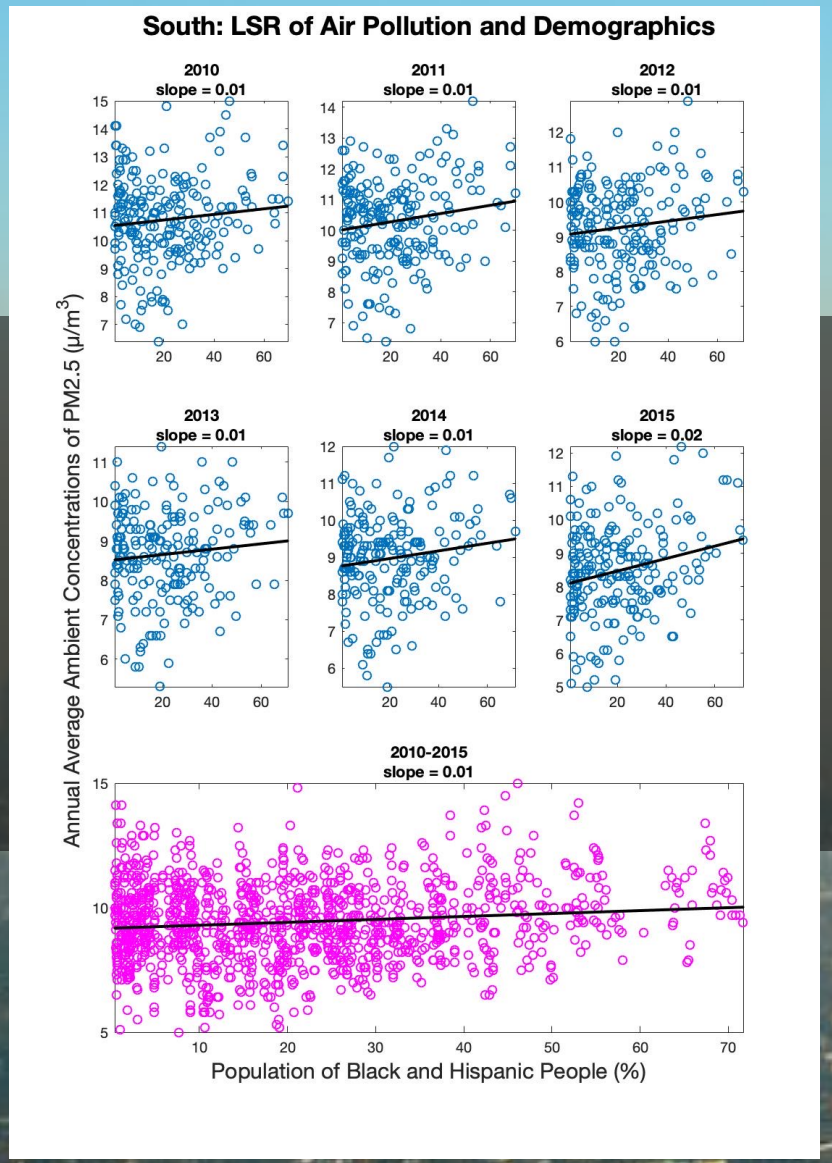
- *Extracted by US Environmental Protection Agency (EPA) from Air Quality System (AQS)*
- *PM2.5: airborne long-term particulate matter with an aerodynamic diameter of < 2.5 µm*
- *Limitations: Within-county variation in concentrations will likely exist but will not be captured in this measure.*

Data

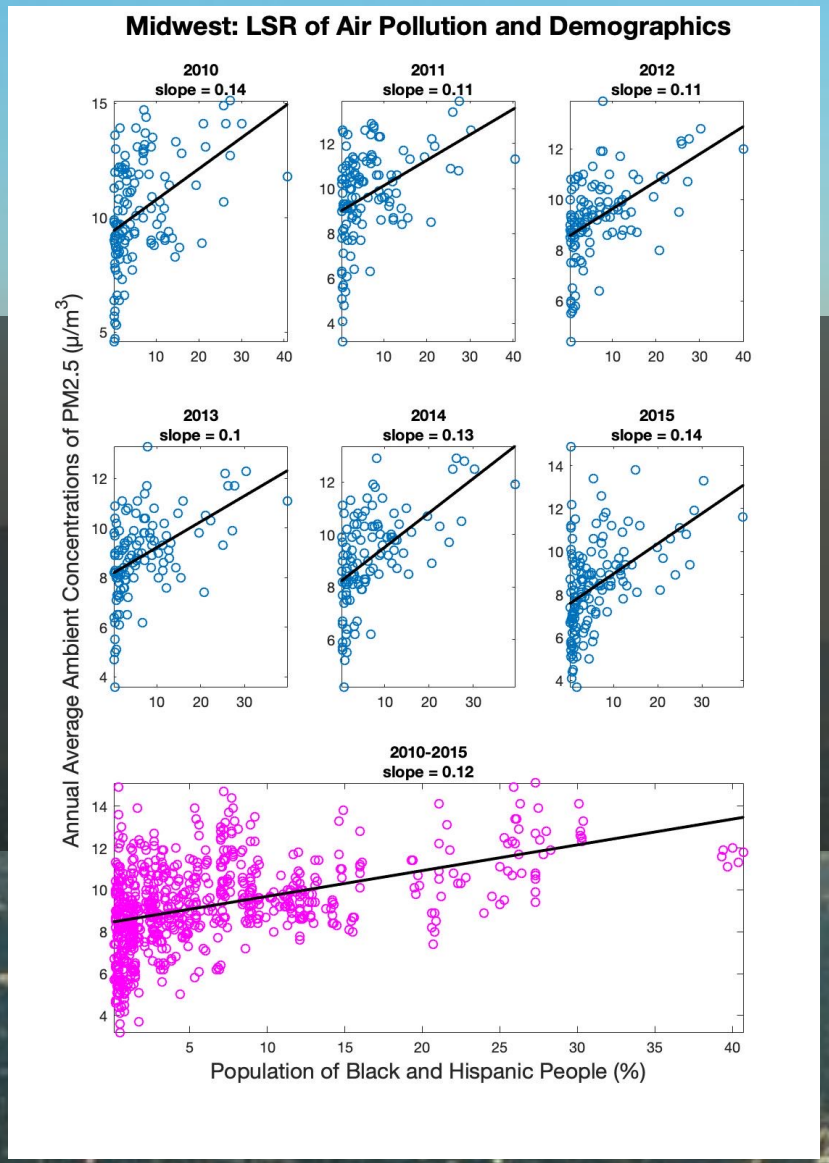

WEST
MIDWEST
NORTHEAST
SOUTH
Pacific Northwest
Washington, Oregon, Idaho, and western Montana
Pacific States
Washington, Oregon, California, Alaska, and Hawaii border the Pacific Ocean.
Rocky Mountain States
Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, and New Mexico
Four Corners
The only place in the U.S. where four states—Arizona, New Mexico, Colorado, and Utah—come together.
Great Plains
The grasslands of the Great Plains—parts of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, New Mexico, Colorado, Wyoming, and Montana—are important for growing grain, raising cattle, and mining.
The geographic center of all 50 states is located near Belle Fourche, South Dakota.
The geographic center of the lower 48 states is located near Lebanon, Kansas.
Great Lakes States
New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Wisconsin, and Minnesota border the five Great Lakes.
New England
Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island
Mid-Atlantic States
Delaware, Maryland, New Jersey, and New York border the Atlantic Ocean, but Pennsylvania does not.
The Mason-Dixon Line is the boundary that separates Pennsylvania from Maryland and part of West Virginia, as well as Maryland from Delaware. Before the Civil War, it symbolized the dividing line between free (Northern) states and slave (Southern) states.
Washington, D.C., is a federal district, the site of the nation's capital.
Appalachia
Although the Appalachian Mountains stretch from Alabama to Canada, Appalachia as a region generally refers to the mountainous parts of Maryland, Virginia, Kentucky, North and South Carolina, Tennessee, Georgia, Alabama, and all of West Virginia. Appalachia is often thought of, many say wrongly, as an isolated and impoverished region.
Southeast
Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia
South Atlantic States
Florida, Georgia, South Carolina, North Carolina, Virginia, Maryland, and Delaware border the Atlantic Ocean.
Gulf States
Texas, Louisiana, Mississippi, Alabama, and Florida border the Gulf of Mexico.
Southwest
Arizona and New Mexico, and parts of California, Nevada, Utah, Colorado, Oklahoma, and Texas
"The Lower 48" are the 48 contiguous states located south of Canada. Not included are Alaska, Hawaii, or Washington, D.C.
Alaska is located northwest of the lower 48 states and west of Canada. It is part of continental North America.
Located in the Pacific Ocean, Hawaii is the only state that is not part of continental North America.
Idaho Panhandle
Nebraska Panhandle
Oklahoma Panhandle
Texas Panhandle
Maryland Panhandle
West Virginia Panhandles
Florida Panhandle
Alaska Panhandle
Wash.
Ore.
Calif.
Ida.
Mont.
Wyo.
Nev.
Utah
Colo.
Ariz.
N.M.
N.D.
S.D.
Neb.
Kan.
Okla.
Tex.
Minn.
Iowa
Mo.
Ark.
La.
Wis.
Ill.
Mich.
Ind.
Ohio
Ky.
Tenn.
Miss.
Ala.
Ga.
Fla.
S.C.
N.C.
Va.
W. Va.
Pa.
N.Y.
Md.
Del.
N.J.
Conn.
R.I.
Mass.
Vt.
N.H.
Me.
Upper Peninsula
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
Alaska
CANADA
Hawaii
N
W
E
S

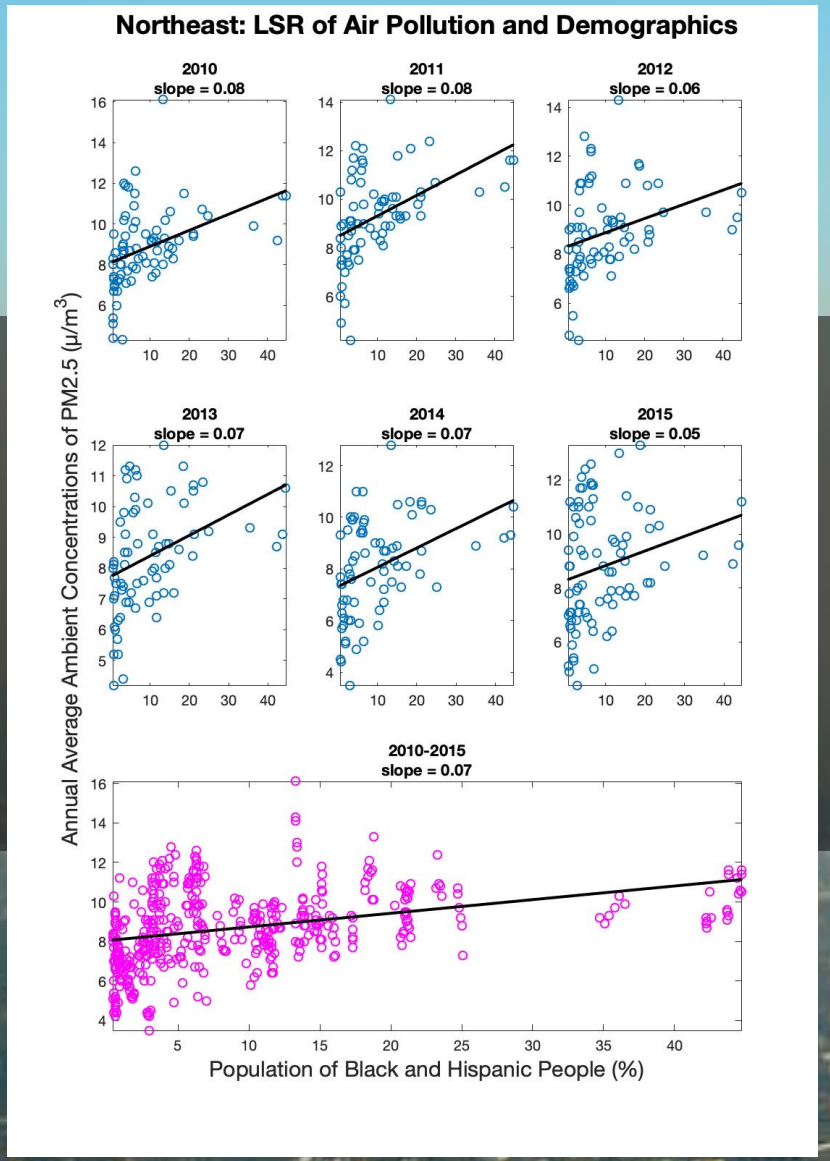
Least-Squares Regression

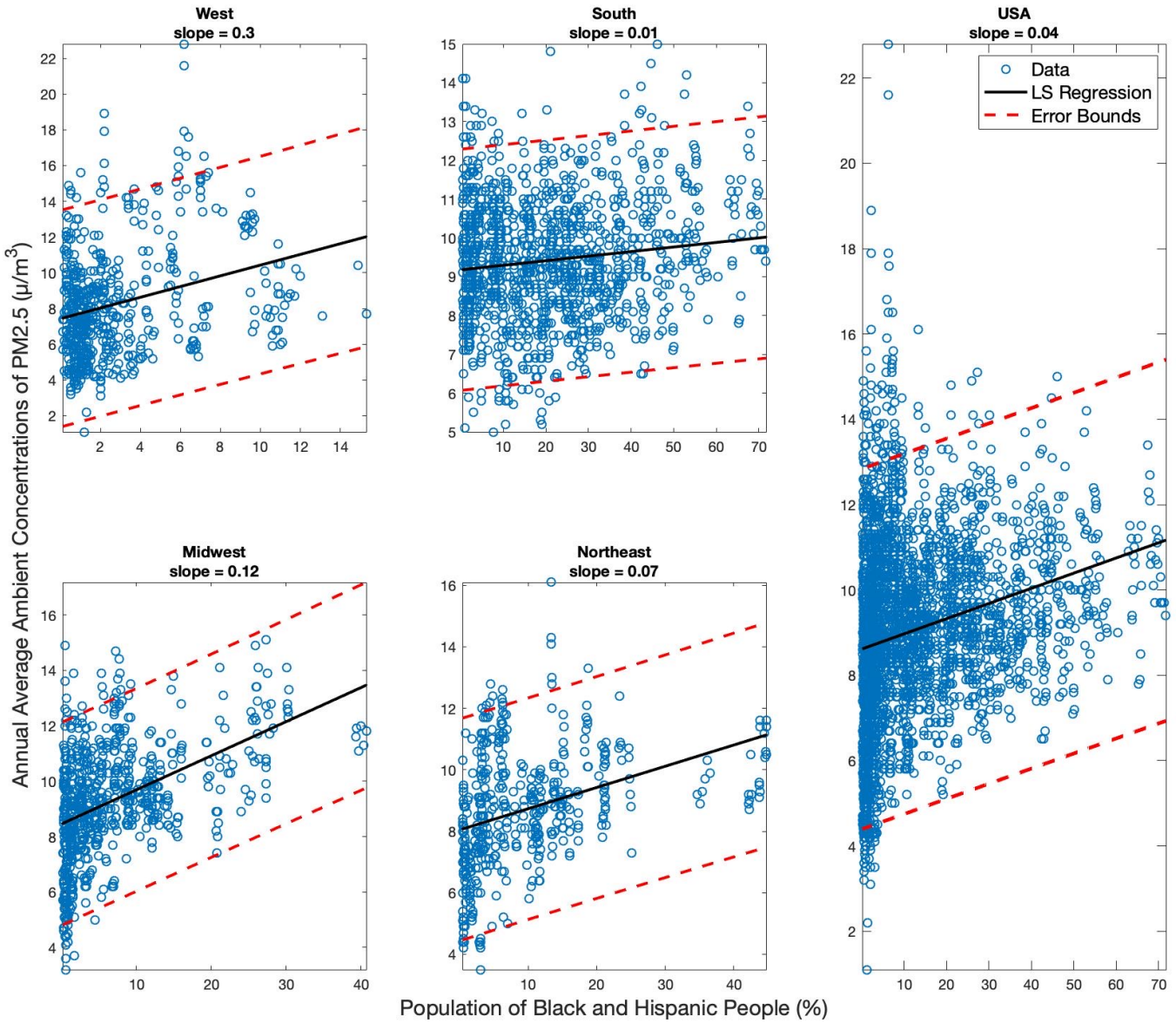




Least-Squares Regression







Least-Squares Regression: Error

Pearson Correlation Coefficient: Test of Significance, Confidence

	P-value	Statistically Significant?	Correlation Coefficient	95% Confidence Interval
West	0.0477	Yes	0.2784	0.2013 – 0.3520
South	0.0474	Yes	0.1252	0.0696 – 0.1800
Midwest	0.0476	Yes	0.4506	0.3909 – 0.5066
Northeast	0.0478	Yes	0.3578	0.2742 – 0.4361
USA	0.0473	Yes	0.2336	0.1993 – 0.2673

Jackknife: Correlation Coefficient