A Geospatial Approach for Environmental Justice Reviews

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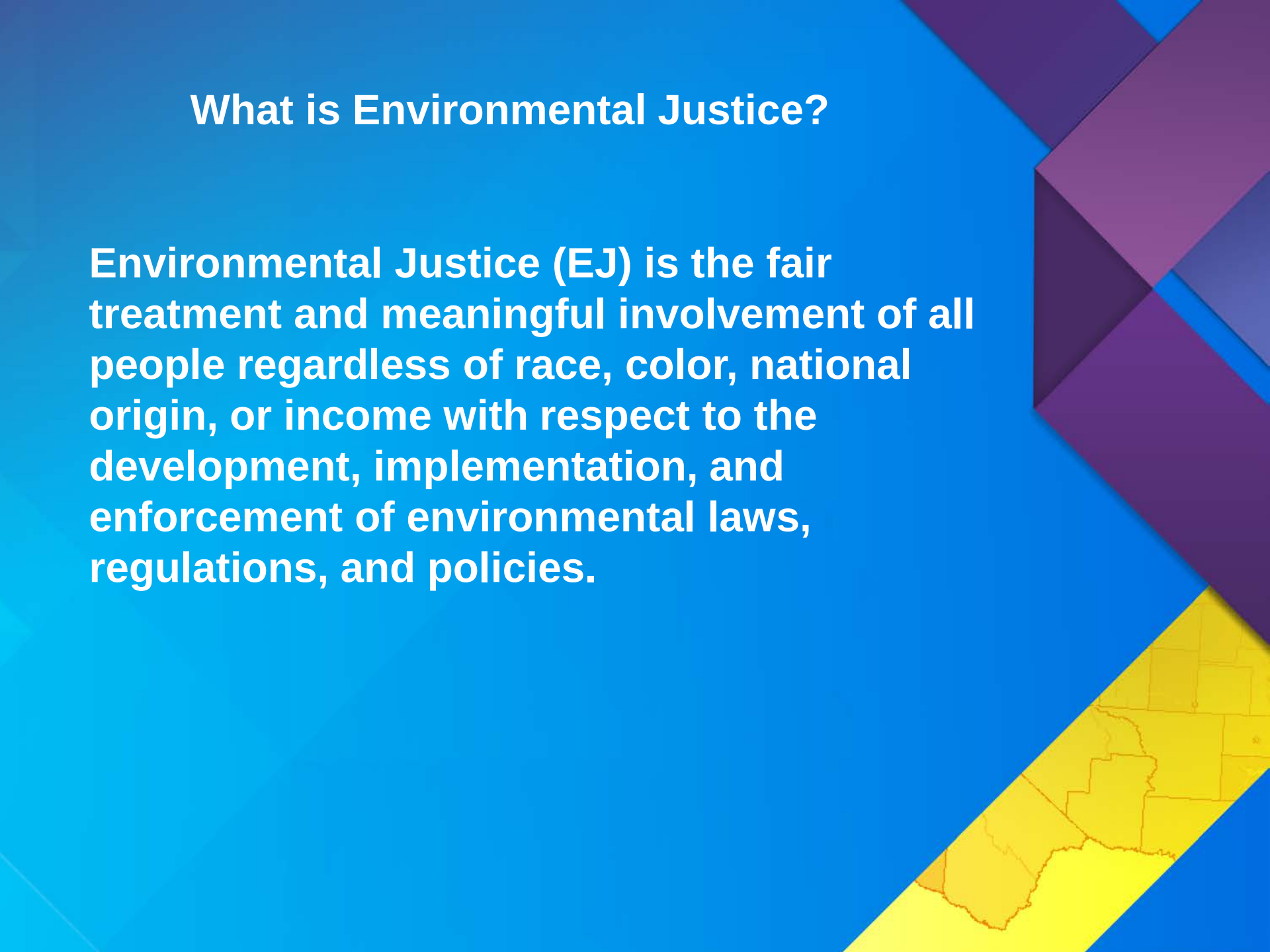
Overview

- Environmental Justice (EJ)
- Regulatory Drivers
- Minority and Low-Income Populations
- Impact Pathways
- Benefits of Using ArcGIS in EJ Analyses

What is Environmental Justice?

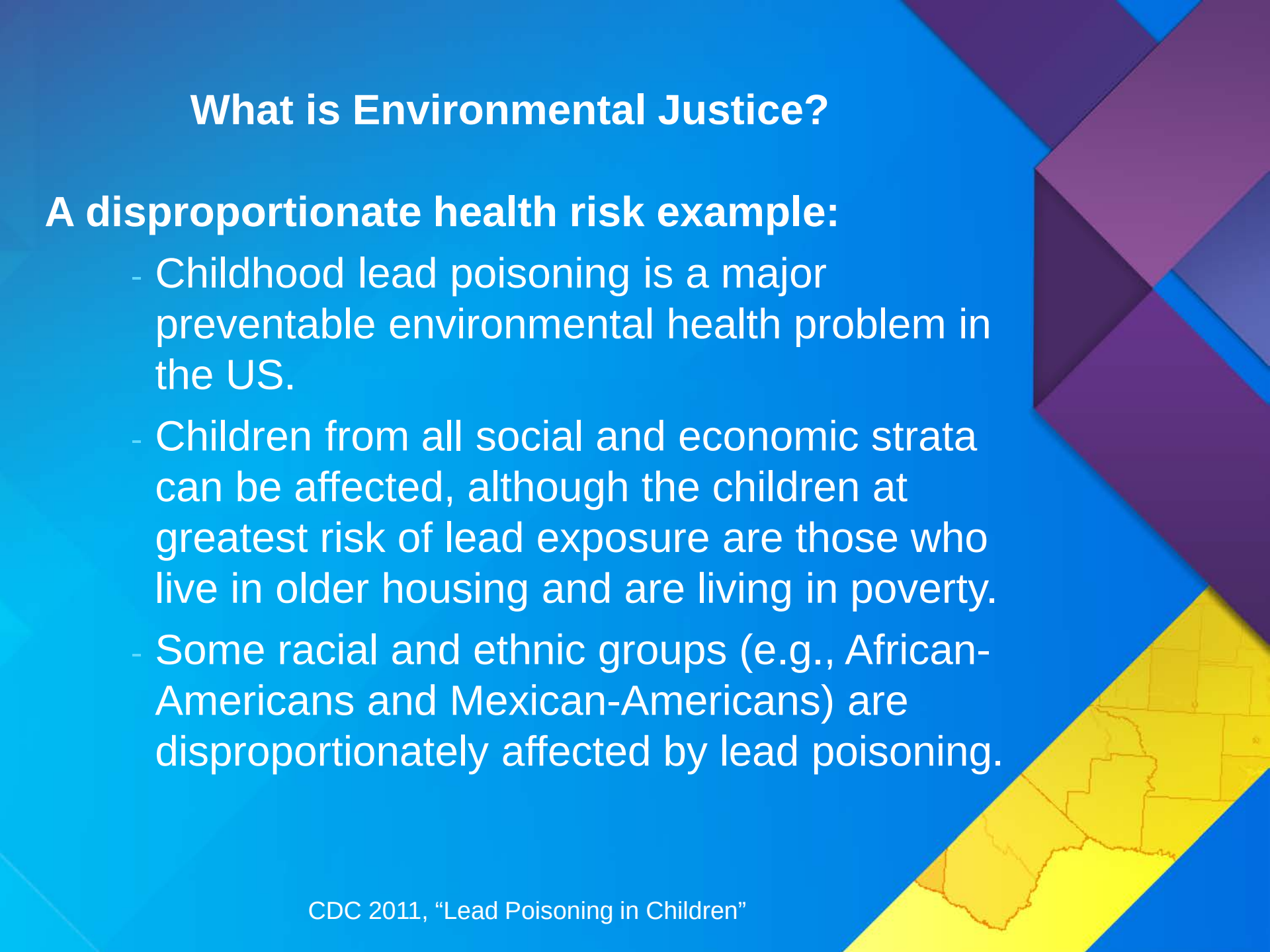
Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.



What is Environmental Justice?

A disproportionate health risk example:

- Childhood lead poisoning is a major preventable environmental health problem in the US.
- Children from all social and economic strata can be affected, although the children at greatest risk of lead exposure are those who live in older housing and are living in poverty.
- Some racial and ethnic groups (e.g., African-Americans and Mexican-Americans) are disproportionately affected by lead poisoning.

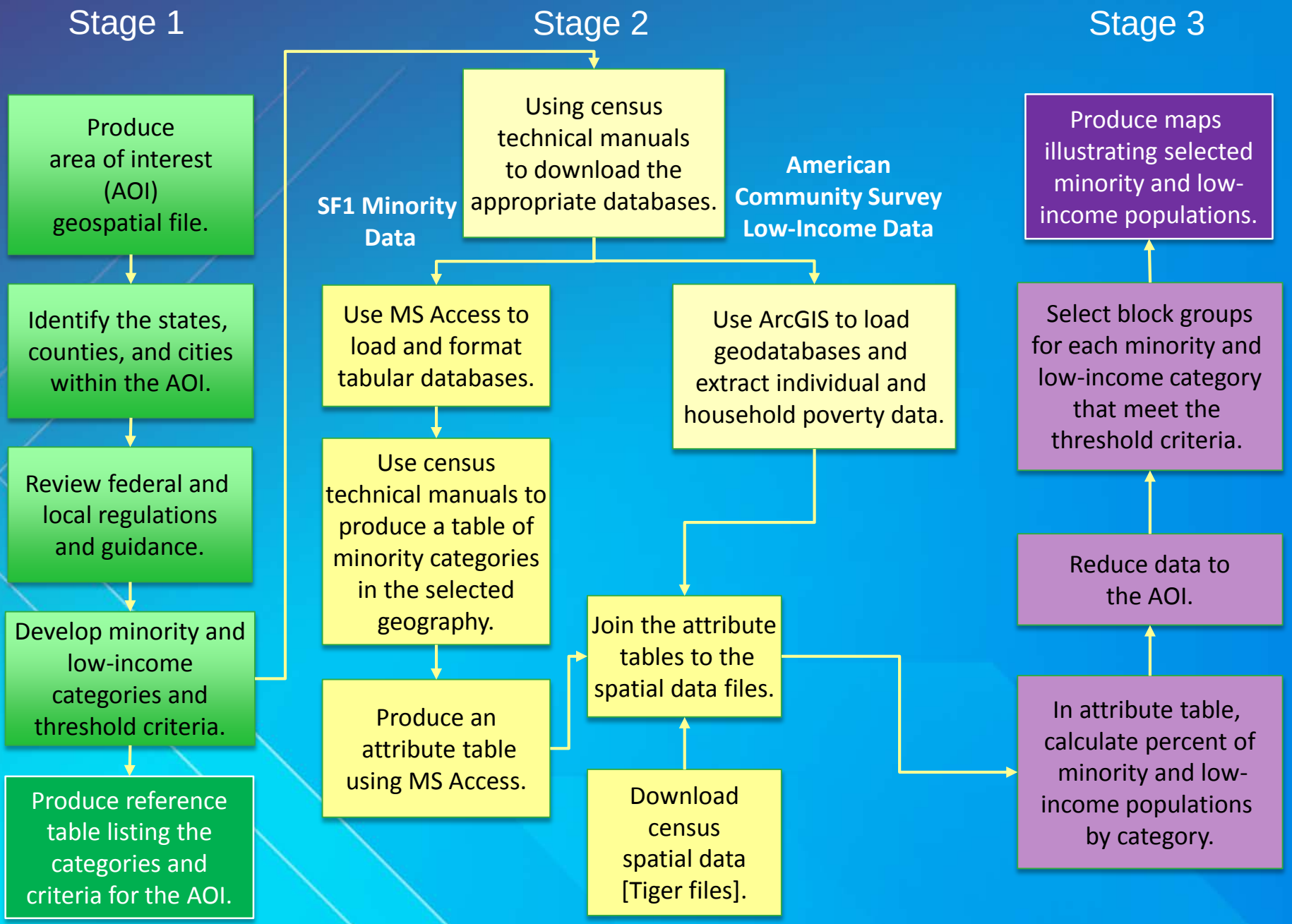


CDC 2011, “Lead Poisoning in Children”

What are the Regulatory Drivers?

- ***Executive Order 12898***
  - An order directing each federal agency to consider EJ by identifying disproportionate and adverse health or environmental effects of its activities on minority and low-income populations.
- ***National Environmental Policy Act (40 CFR Parts 1500-1508)***
  - Under NEPA, a discussion of social and economic effects is warranted if they are related to the natural or physical effects, and the definition of “effects” includes economic and social factors.
  - Implementation of NEPA defines “effects” to include economic and social effects, whether direct, indirect, or cumulative.
- **All projects requiring a NEPA analysis must include EJ reviews.**

Identifying Minority and Low-Income Populations

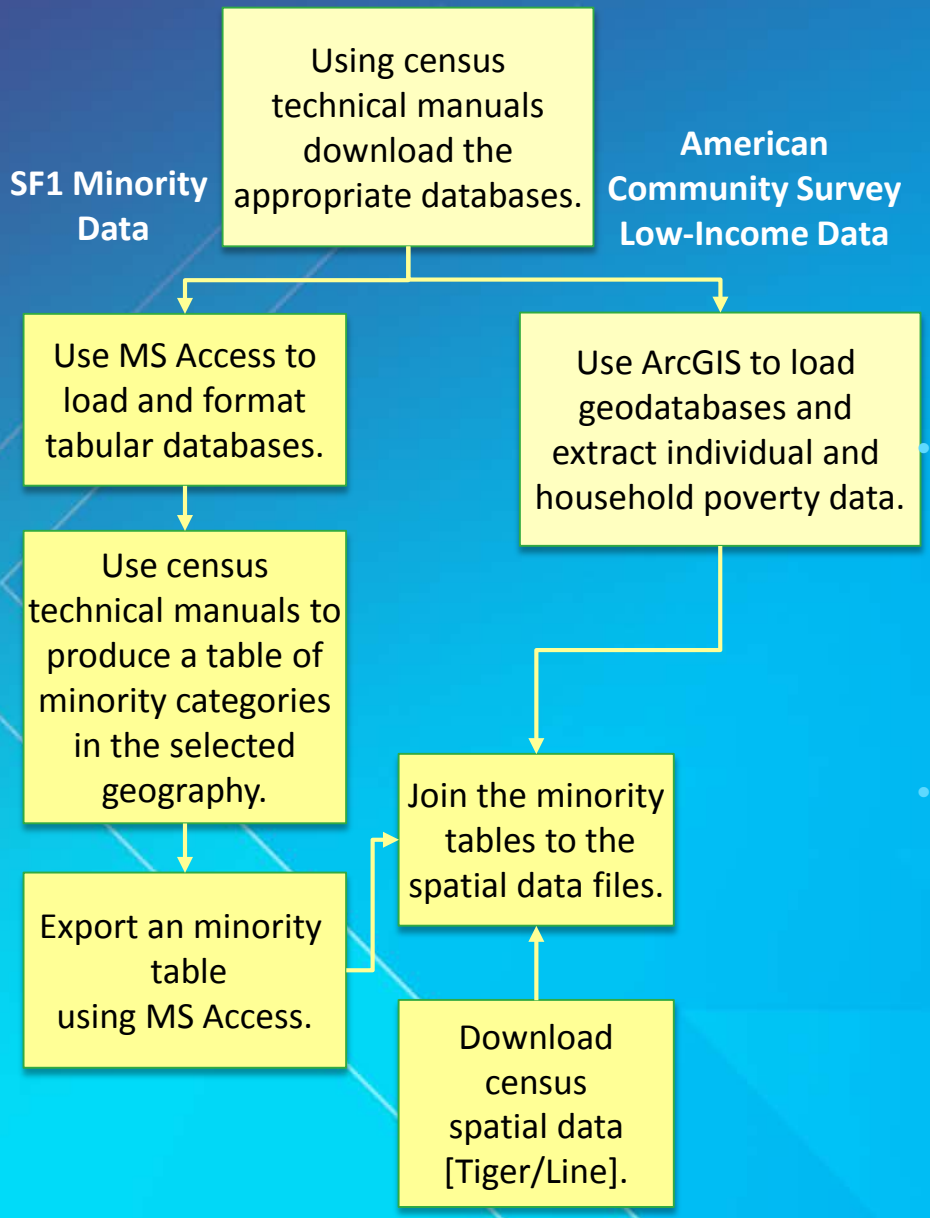


Stage 1: Initial Research and Development of Criteria

Identify AOI and Minority / Low-Income Categories

- **Determine the AOI for the Proposed Project.**
  - Generally defined as the maximum extent of the project-related impacts.
- **Identify the States, Counties, and Cities within AOI**
  - Depending upon the size of the AOI, a geographic area of comparison will be selected.
  - This area is often the state or county the AOI is located within.
- **Review the EPA Guidance, Executive Order 12898, and Applicable City, County, or State Guidance.**
- **Based on these requirements:**
  - Develop minority (e.g. race and ethnicity) and low-income (e.g. individual and household) categories, and
  - Determine the minimum threshold criteria for the geographic area of comparison that will be used to identify minority and low-income populations.
- **Produce Reference Table**

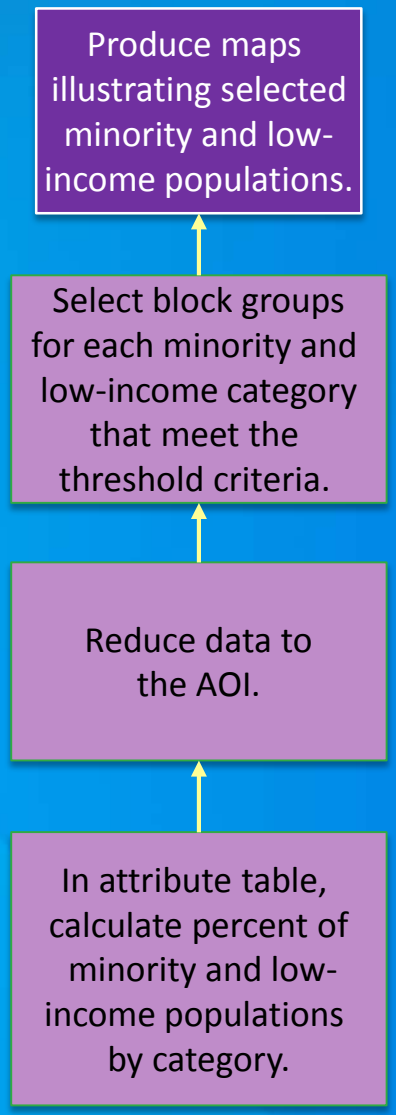
Stage 2: Create Minority and Low-Income Geospatial Data



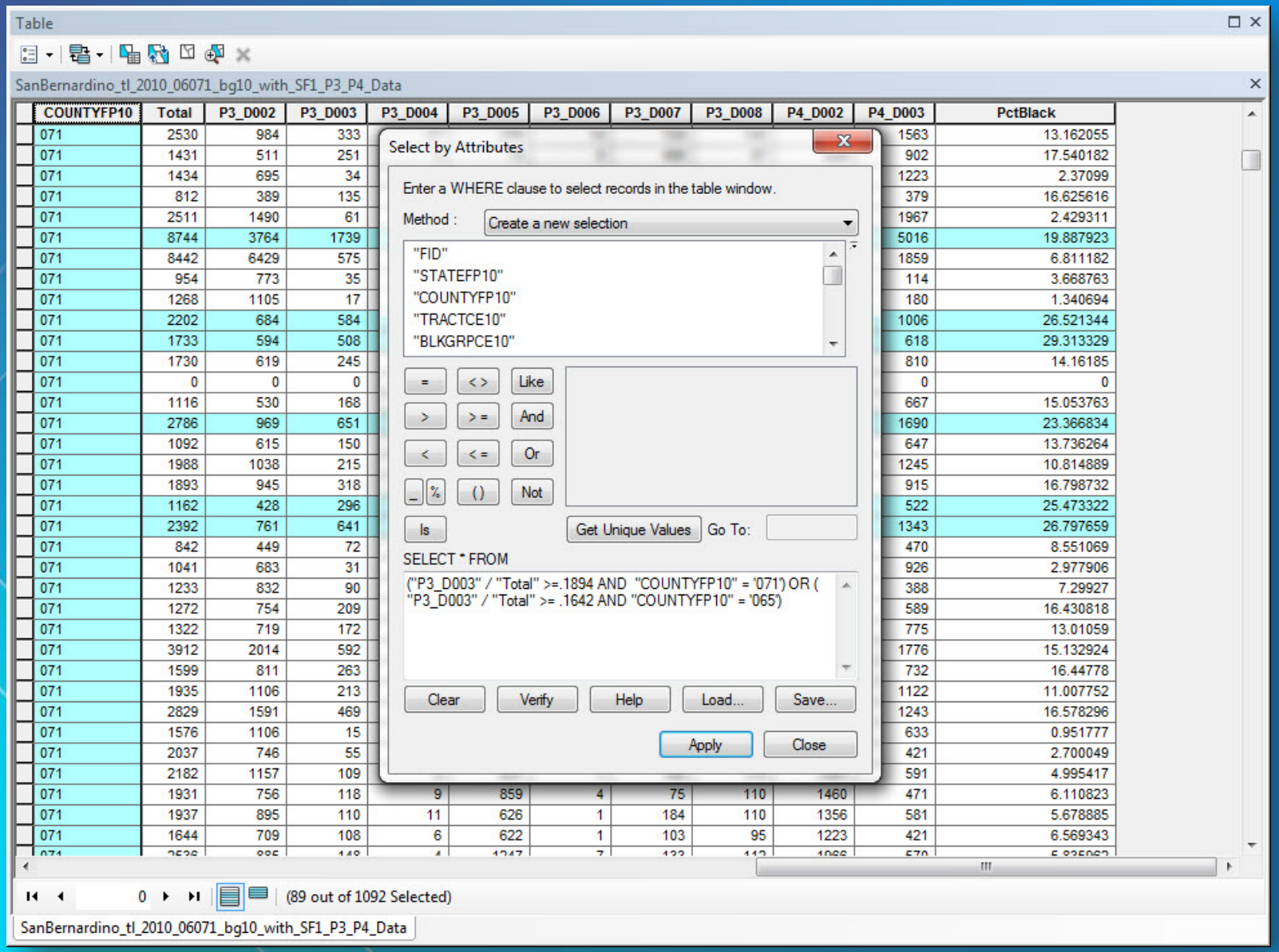
- **Download US Census and American Community Survey (ACS) Data**
  - Summary File (SF1) data is in a comma delineated format and the associated spatial data is in a Tiger/Line shapefile.
  - ACS data is available as a geodatabase.
- **Use Microsoft Access to:**
  - Format and organize SF1 data and extract minority population data.
  - SF1 data contains many attributes that are not needed for this evaluation.
- **Use ArcGIS to:**
  - Organize and extract ACS data.
  - Join SF1 and Tiger/Line data.
  - Assess minority and low-income data.

Stage 3: Identifying Minority and Low-Income Populations

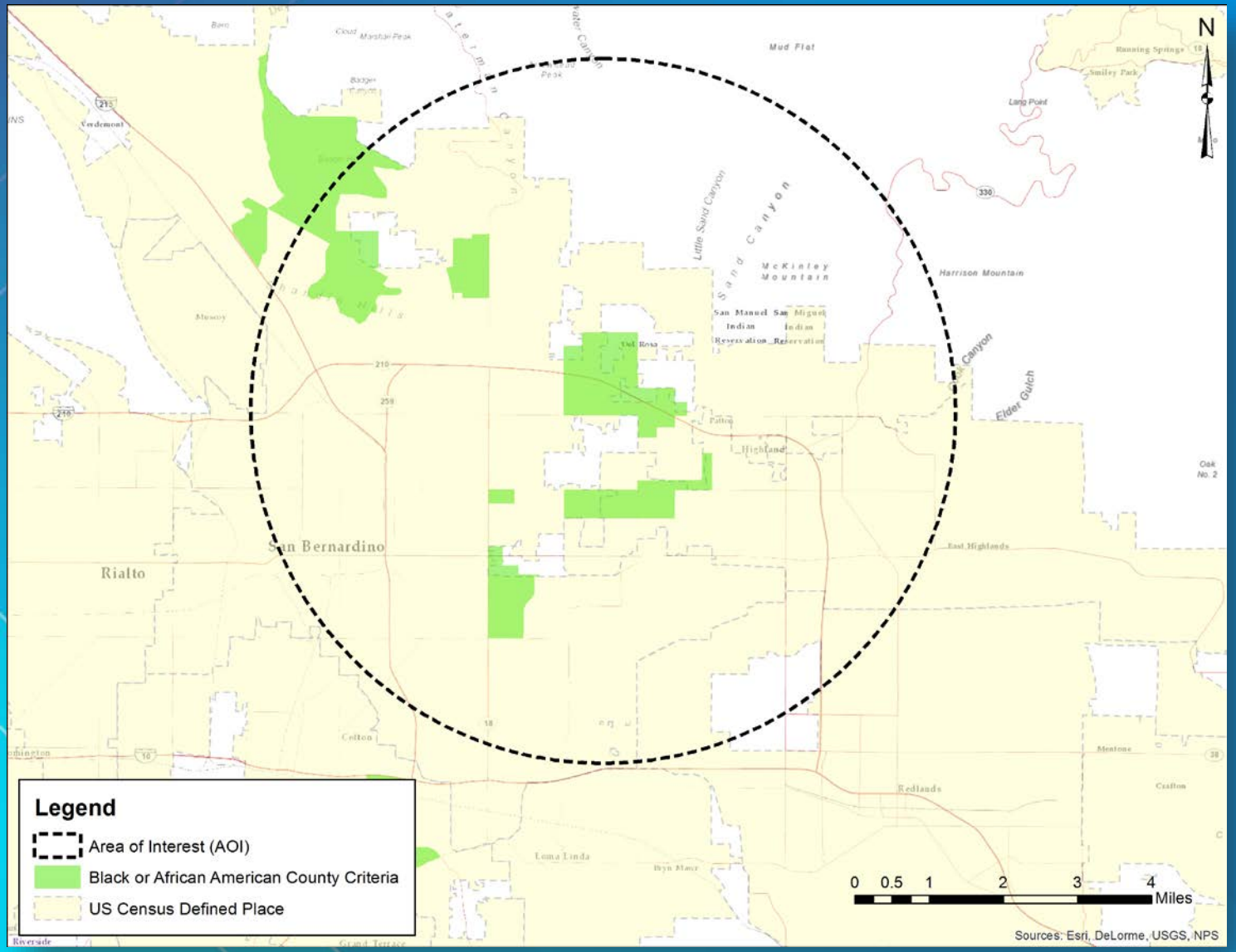
- **Calculate Percentage of Minority and Low-Income Populations**
  - For each minority and low-income category, calculate the percentage of that population for each block group.
- **Reduce Data to AOI**
  - The minority and low-income data is clipped to the AOI.
  - This will allow for an accurate block group count and comparison.
- **Select Block Groups that Meet the Threshold Criteria**
  - The percentage of each minority and low-income category for each block group is compared to the minimum threshold criteria (calculated in Step 1).
  - If the percentage in the block group, for any category, exceeds the minimum threshold criteria, then the block group is identified as a minority or low-income population.



Process Example: Selecting Block Groups in ArcGIS



Example Result: Census Block Groups Identified as Containing Low-Income or Minority Populations



Identifying Impact Pathways

- After the minority and low-income populations have been identified, a thorough evaluation of project impacts and their potential pathways to the identified populations is performed.
- Potential impact pathways can include:
  - Competition with in-migrating workforce for low cost housing and social services (e.g. schools, police, healthcare, etc.).
  - Decreased air quality due to machine emissions, increased traffic, etc.
  - Increased noise due to construction activities.
  - Construction-related impacts to natural resources or culturally significant lands.
- **Following this evaluation, potentially disproportionate, high, and adverse impact pathways are identified and prevention and mitigation measures can be determined.**

Benefits of Using ArcGIS for EJ Analyses

- **Accurate**
  - Esri's ArcMap processes have been proven to produce accurate results.
- **Repeatable and Defendable**
  - The ArcGIS processes and use of publicly available U.S. Census Bureau data allow the regulating agency to replicate processes, effectively reducing questions and requests for additional information (RAIs).
- **Geographically Based Analysis**
  - Using GIS to integrate population and income data in geospatial formats allows geographers to quickly identify areas in the region to be further evaluated, reducing potential project impacts.

Questions?

“It really boils down to this: that all life is interrelated. We are all caught in an inescapable network of mutuality, tied into a single garment of destiny. Whatever affects one destiny, affects all indirectly.”

Martin Luther King, Jr.