

# Using GIS to Identify Behavioral Healthcare Underserved Areas



## Monterey County Health Department

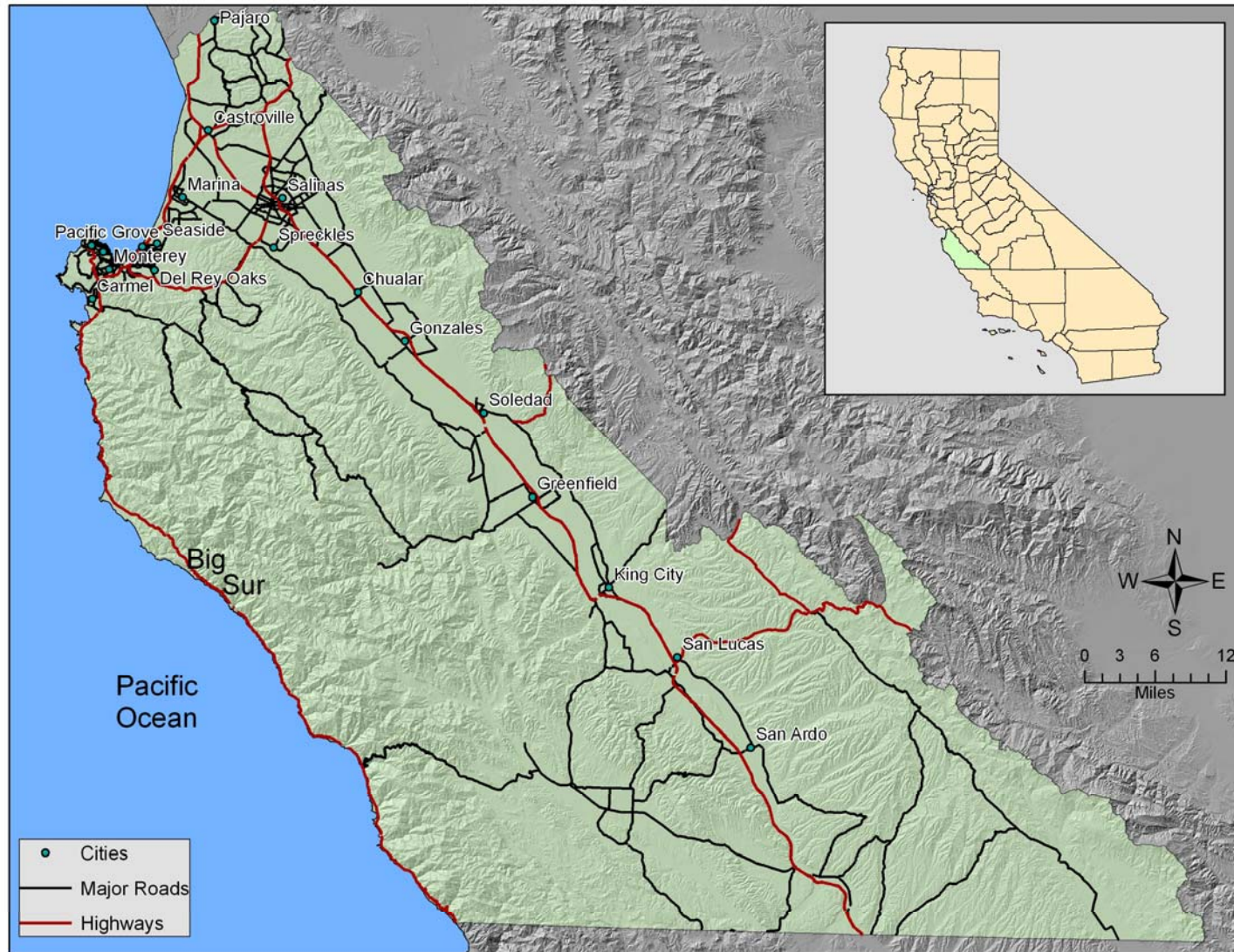
### Epidemiology Unit

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# Monterey County, California



# Monterey County Stats

- 2006 population = 433,782 (DOF 2004)
  - 52% Hispanic/Latino
  - 35% White, Non-Hispanic
  - 6% Asian and Pacific Islander
  - 4% African-American
  - 3% Other
- Major industries: agriculture, fishing, & tourism
- 71% have high school diploma (ACS 2005)

# Mental Health Services Act

- Effective 2005 in California
- Systems transformation for Monterey County
  - Consumer & family driven
  - Accessible & timely services
  - Wellness & recovery
  - Culturally & linguistically competent services
  - Strength & resilience
  - Integrated & coordinated services
- Monterey County funds (\$9M over three years)

# Project Goals

- Explore patterns of service utilization and need at sub-county scale
- Provide information for program planning and policy development

*Must be relatively quick, inexpensive, reliable, and easy to interpret*

# Methods

1. Research existing methods
2. Gather ecological and individual data
3. Calculate index of need
4. Map and explore spatial patterns
5. Explore differences between actual service patterns and predicted need
6. Share results

# Types of Methods

- Direct measures
  - Surveys
  - Focus groups
  - Interviews
- Indirect measures
  - Apply direct measures from another population
  - Existing service patterns
  - Provider ratios
  - Social indicators

# Data Layers

- Race/Ethnicity (ESRI)
- Median age (ESRI)
- Roads (MCITD)
- Cities/Towns (LAFCO)
- Monterey County service provider locations (geocoded)
- ZIP code boundaries (ESRI)
- Family income (ESRI)
- MST lines (MCITD)
- Hospitals (geocoded)
- Residential location of 2005-2006 FY clients (geocoded)
- Calculated index of need ( $I_z$ )



# Index of Need ( $I_z$ )

$$I_z = p_z * e_z * i_z$$

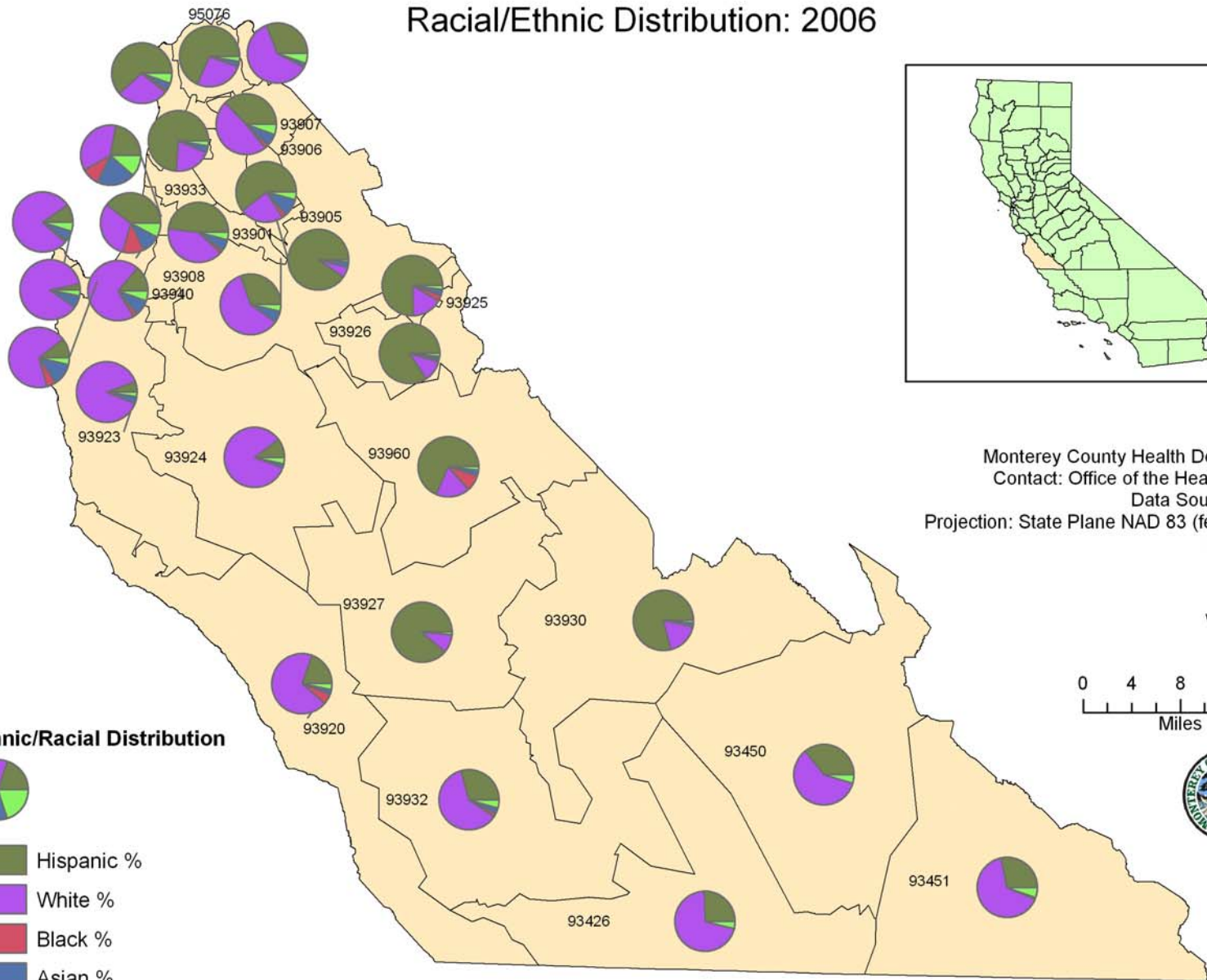
- $z$  = Zip code
- $p$  = proportion of total Monterey County population
- $e$  = proportion of population who are non-white
- $i$  = proportion of families with income below 2006 Federal Poverty Level (\$20,000 for family of four)

# Correlations

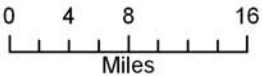
Variable	% Total	% Non-White	% in Poverty	% Served	Index	Median Age	Moran's I (z score)
<b>% Total</b> ( $r_p$ ) ( $p$ -value)	1.00 -						0.13 (3.30)
<b>% Non-White</b> ( $r_p$ ) ( $p$ -value)	0.28 0.15	1.00 -					0.12 (3.10)
<b>% in Poverty</b> ( $r_p$ ) ( $p$ -value)	-0.02 0.93	0.62 <0.01	1.00 -				-0.17 (-3.36)
<b>% Served</b> ( $r_p$ ) ( $p$ -value)	0.74 <0.01	0.40 0.04	0.12 0.49	1.00 -			0.10 (2.80)
<b>Index</b> ( $r_p$ ) ( $p$ -value)	0.84 <0.01	0.66 <0.01	0.43 0.03	0.75 <0.01	1.00 -		0.02 (1.47)
<b>Median Age</b> ( $r_p$ ) ( $p$ -value)	-0.23 0.25	-0.95 <0.01	-0.68 <0.01	-0.34 0.08	-0.34 0.08	1.00 -	0.06 (1.93)

$r_p$  = Pearson's correlation coefficient (SAS). Moran's I = measure of spatial autocorrelation (ArcGIS).

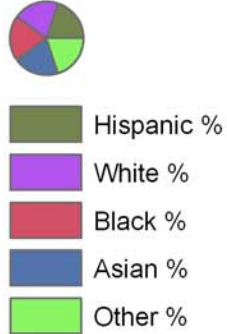
# Racial/Ethnic Distribution: 2006



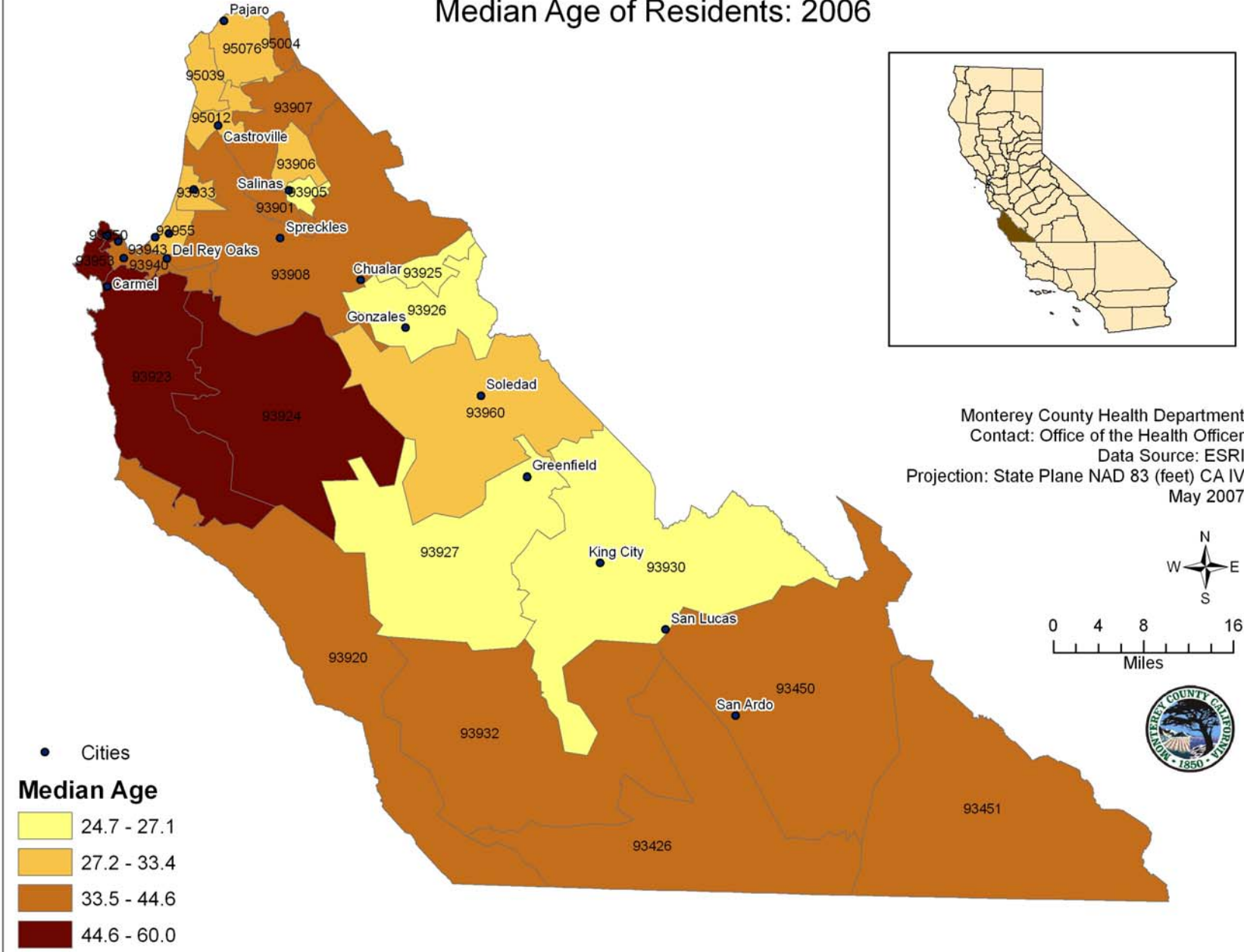
Monterey County Health Department  
 Contact: Office of the Health Officer  
 Data Source: ESRI  
 Projection: State Plane NAD 83 (feet) CA IV  
 May 2007



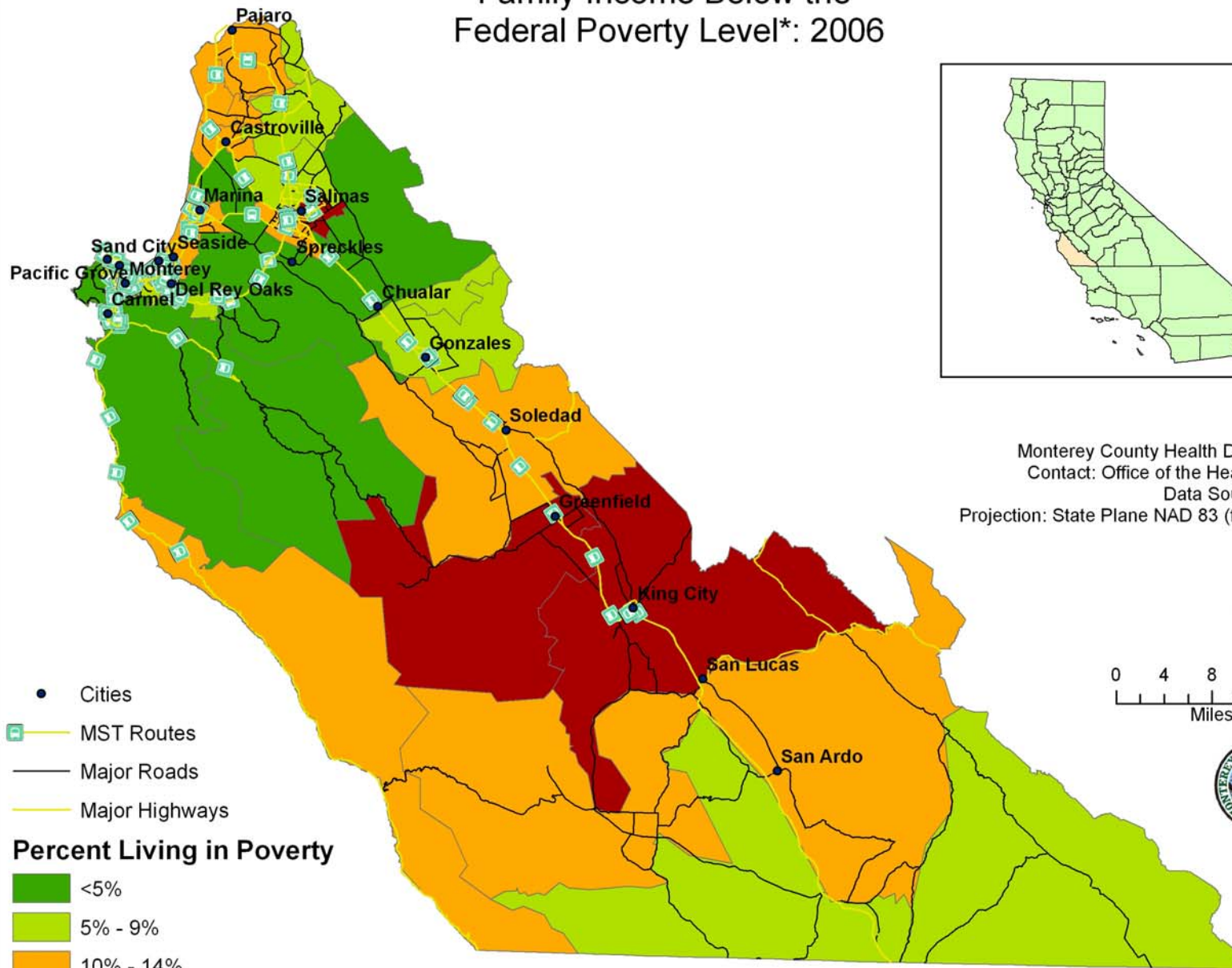
## Ethnic/Racial Distribution



# Median Age of Residents: 2006



# Family Income Below the Federal Poverty Level\*: 2006

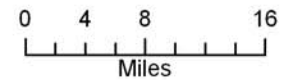


- Cities
- ☞ MST Routes
- Major Roads
- Major Highways

### Percent Living in Poverty

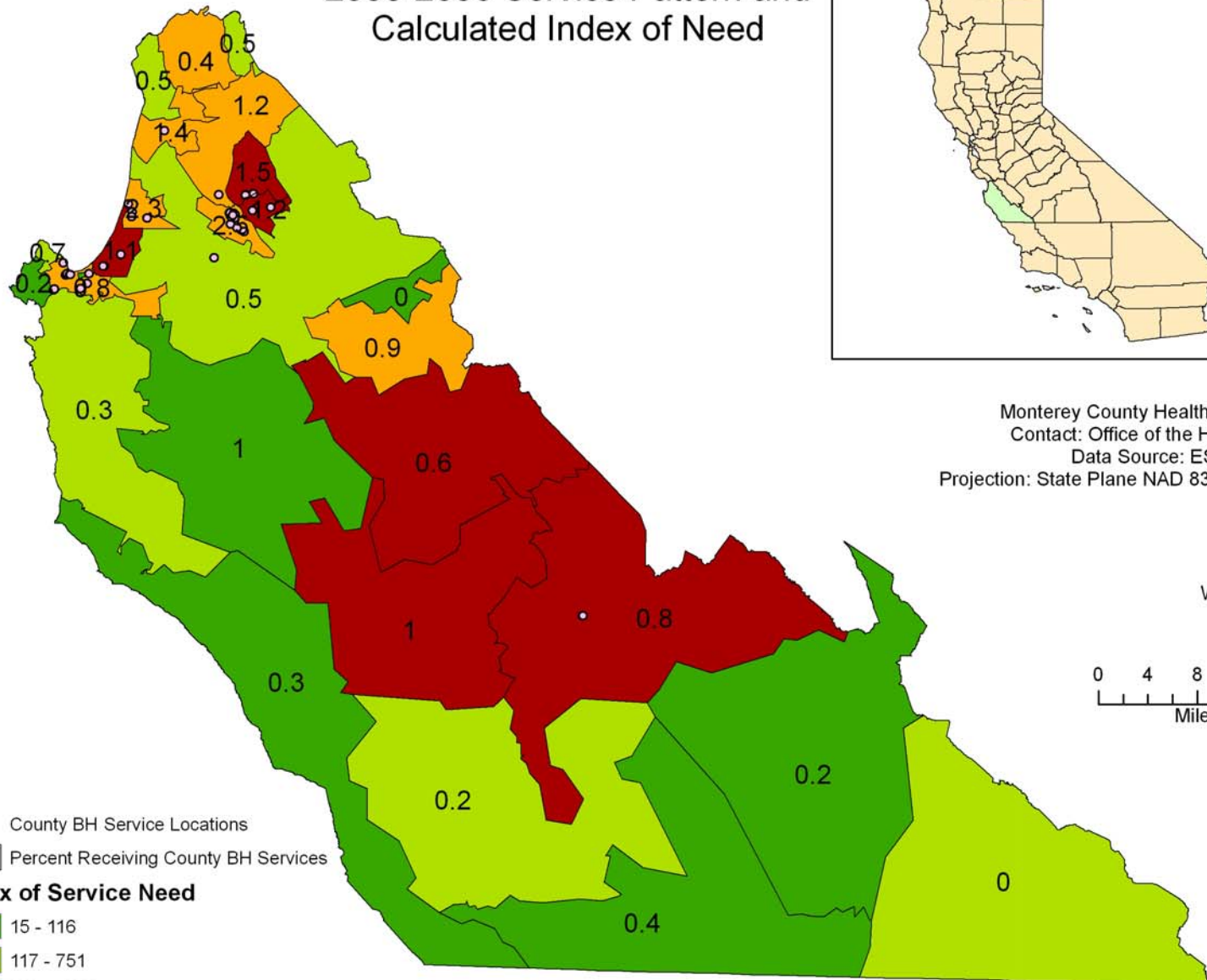
- <5%
- 5% - 9%
- 10% - 14%
- 15% +

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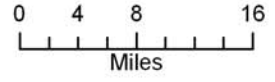


\*2006 Federal Poverty Level is \$20,000 for a family of four.

## 2005-2006 Service Pattern and Calculated Index of Need



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- County BH Service Locations
  - 0.2 Percent Receiving County BH Services
- Index of Service Need**
- 15 - 116
  - 117 - 751
  - 752 - 4315
  - 4316 - 26,240

# Results Summary

- Regional differences in service need exist
- Simply calculated index identifies highest needs
  - Uses readily available data
  - Accomplished with basic GIS skills and technology
  - Easy to interpret/understand
- Additional analyses required to site facilities within regions

# Progress

- Community feedback
  - Travel time
  - Cultural issues influence patterns
- Castroville Child & Family Resource Center
- King City service “hub”
- Continued planning and evaluation



# Contact Information

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