

Using GIS to Identify Behavioral Healthcare Underserved Areas



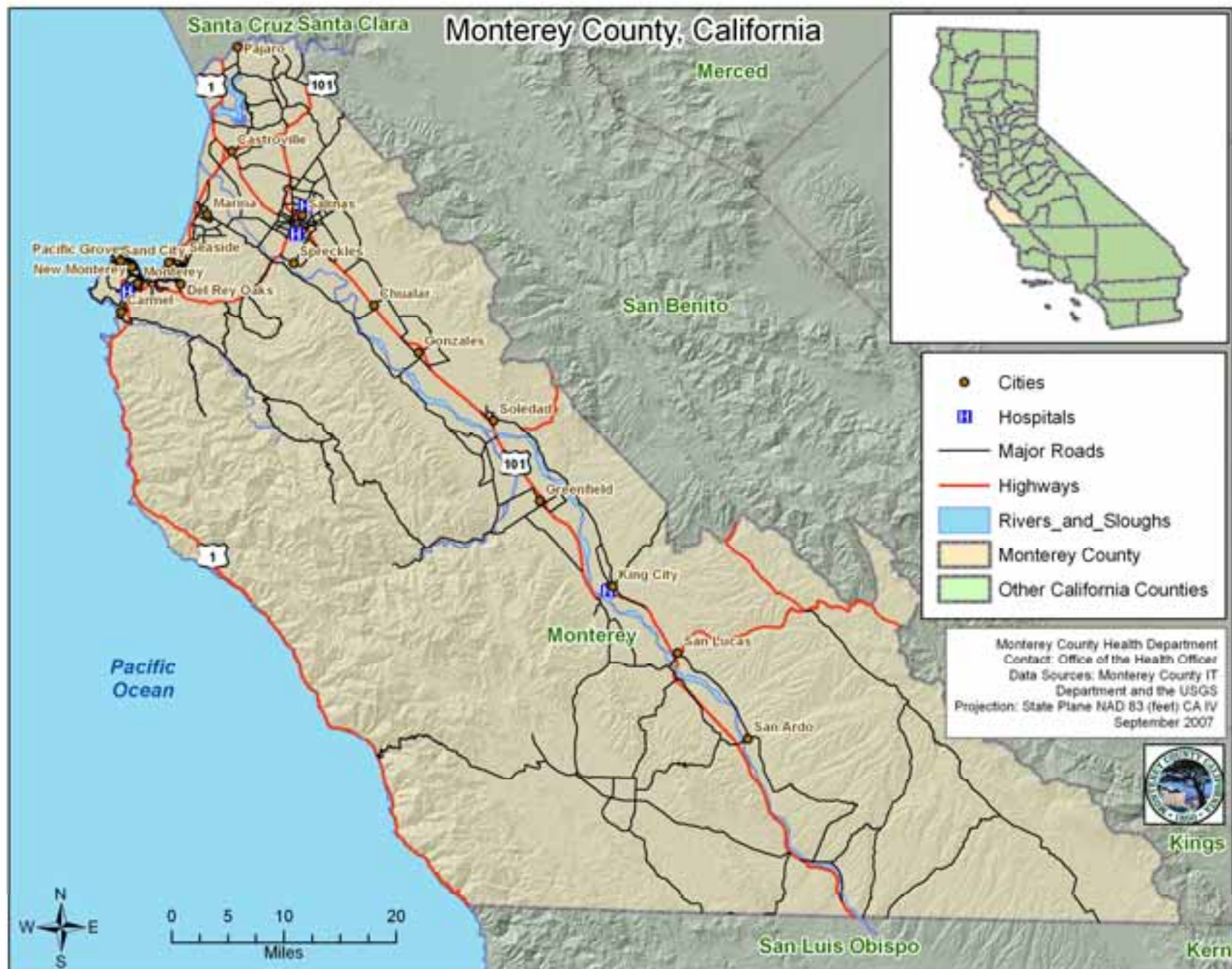
Monterey County Health Department

Epidemiology Unit

- Kristy Meyer, MS
- Patricia Zerounian, MPP
- Krista Hanni, PhD

Behavioral Health Division

- Alica Hendricks
- Wayne Clark, PhD



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

Roads
(MCITD)

Cities/Towns
(LAFCO)

MST Lines
(MCITD)

ZIP Code
Boundaries
(ESRI)

Hospitals
(geocoded)

Race/Ethnicity
(ESRI)

Median
Age
(ESRI)

Family
Income
(ESRI)

2005-2006
FY Clients
(geocoded)

County
Service
Providers
(geocoded)

Calculated
Index of
Need
(I₂)



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)



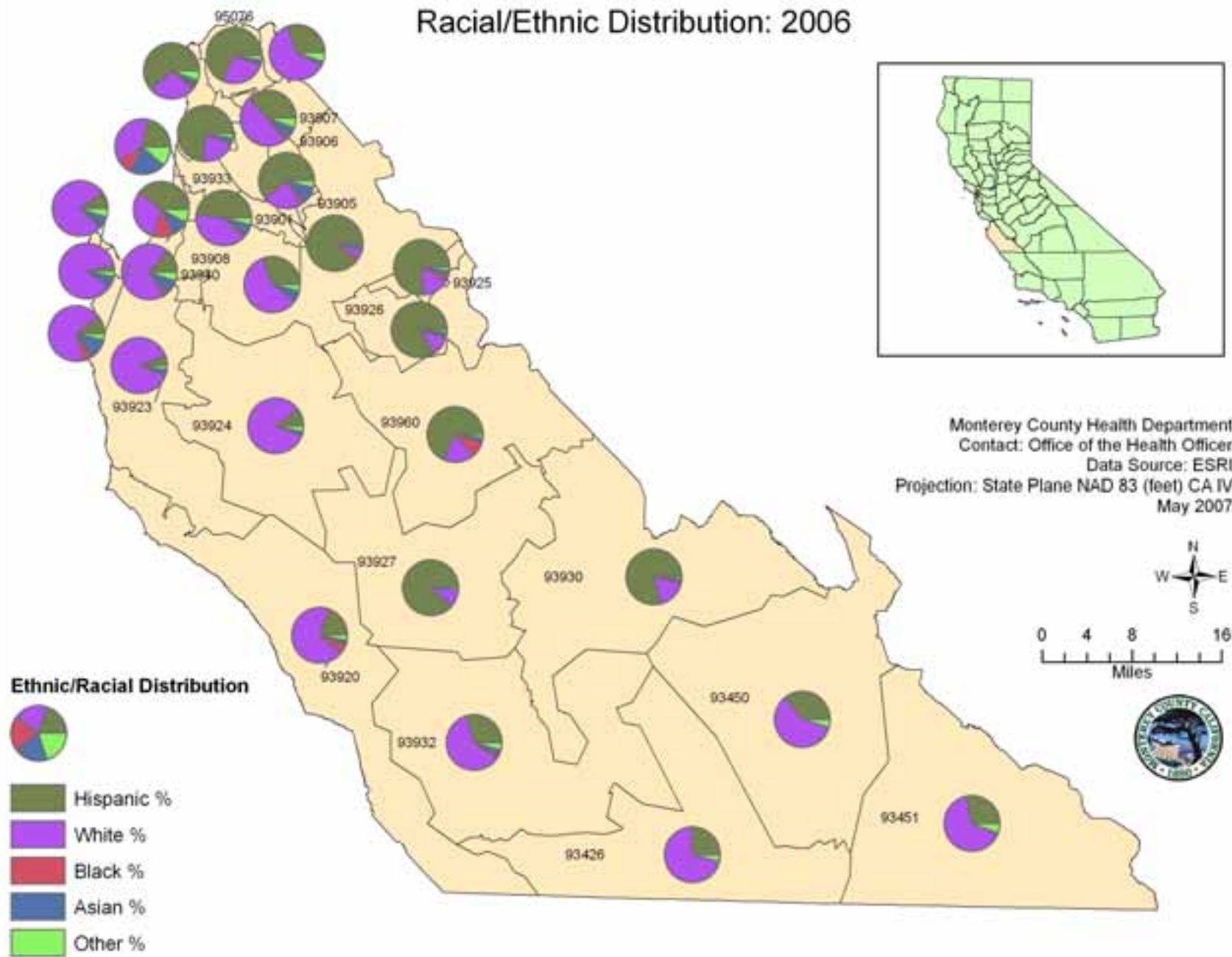
Correlations

Variable	% Total	% Non-White	% in Poverty	% Served	Index	Median Age	Moran's I (z score)
% Total (r_s) (p-value)	1.00 -						0.13 (3.30)
% Non-White (r_s) (p-value)	0.28 0.15	1.00 -					0.12 (3.10)
% in Poverty (r_s) (p-value)	-0.02 0.93	0.62 <0.01	1.00 -				-0.17 (-3.36)
% Served (r_s) (p-value)	0.74 <0.01	0.40 0.04	0.12 0.49	1.00 -			0.10 (2.80)
Index (r_s) (p-value)	0.84 <0.01	0.66 <0.01	0.43 0.03	0.75 <0.01	1.00 -		0.02 (1.47)
Median Age (r_s) (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)

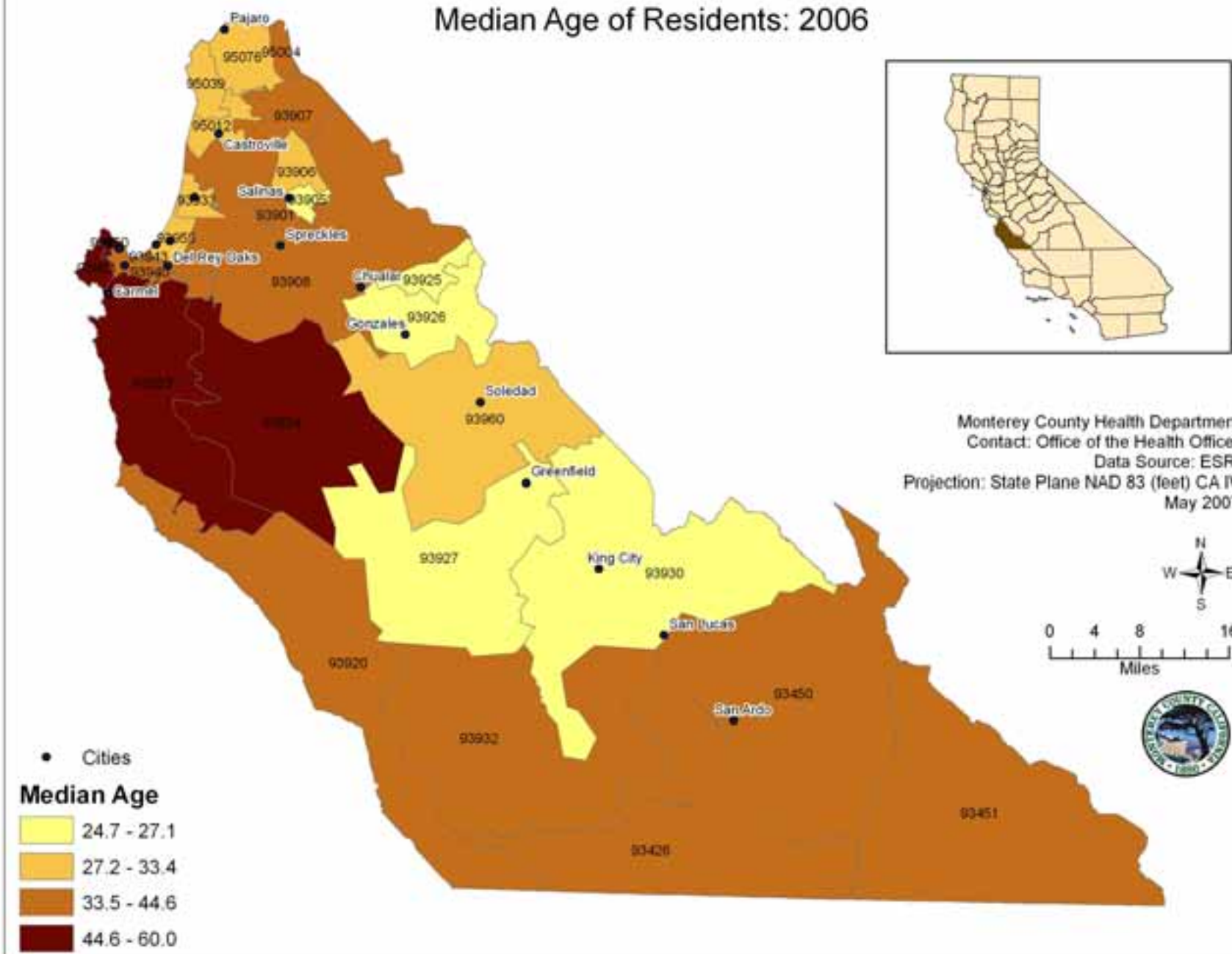
r_s = Spearman's correlation coefficient (SAS). Moran's I = measure of spatial autocorrelation (ArcGIS).



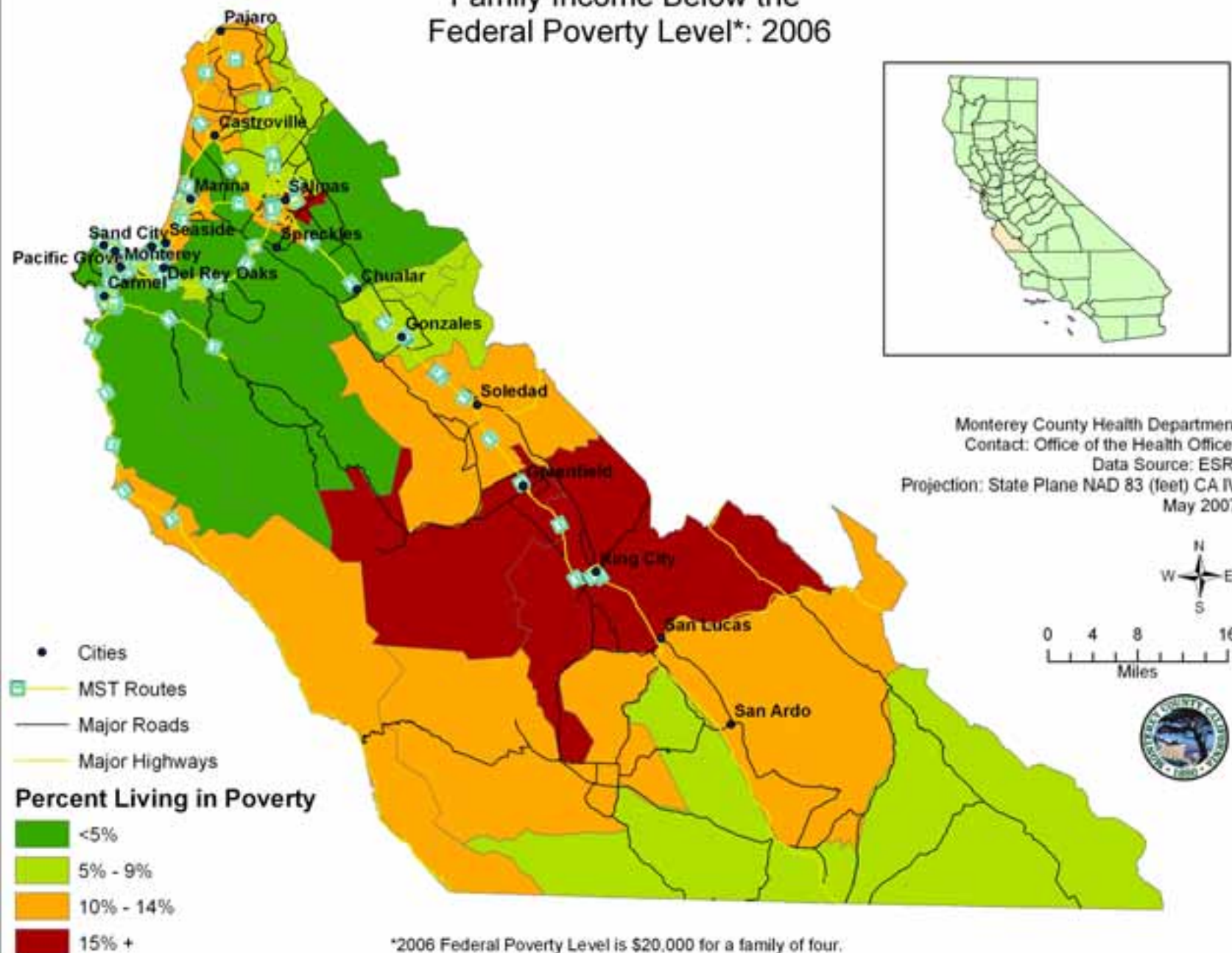
Racial/Ethnic Distribution: 2006



Median Age of Residents: 2006



Family Income Below the Federal Poverty Level*: 2006

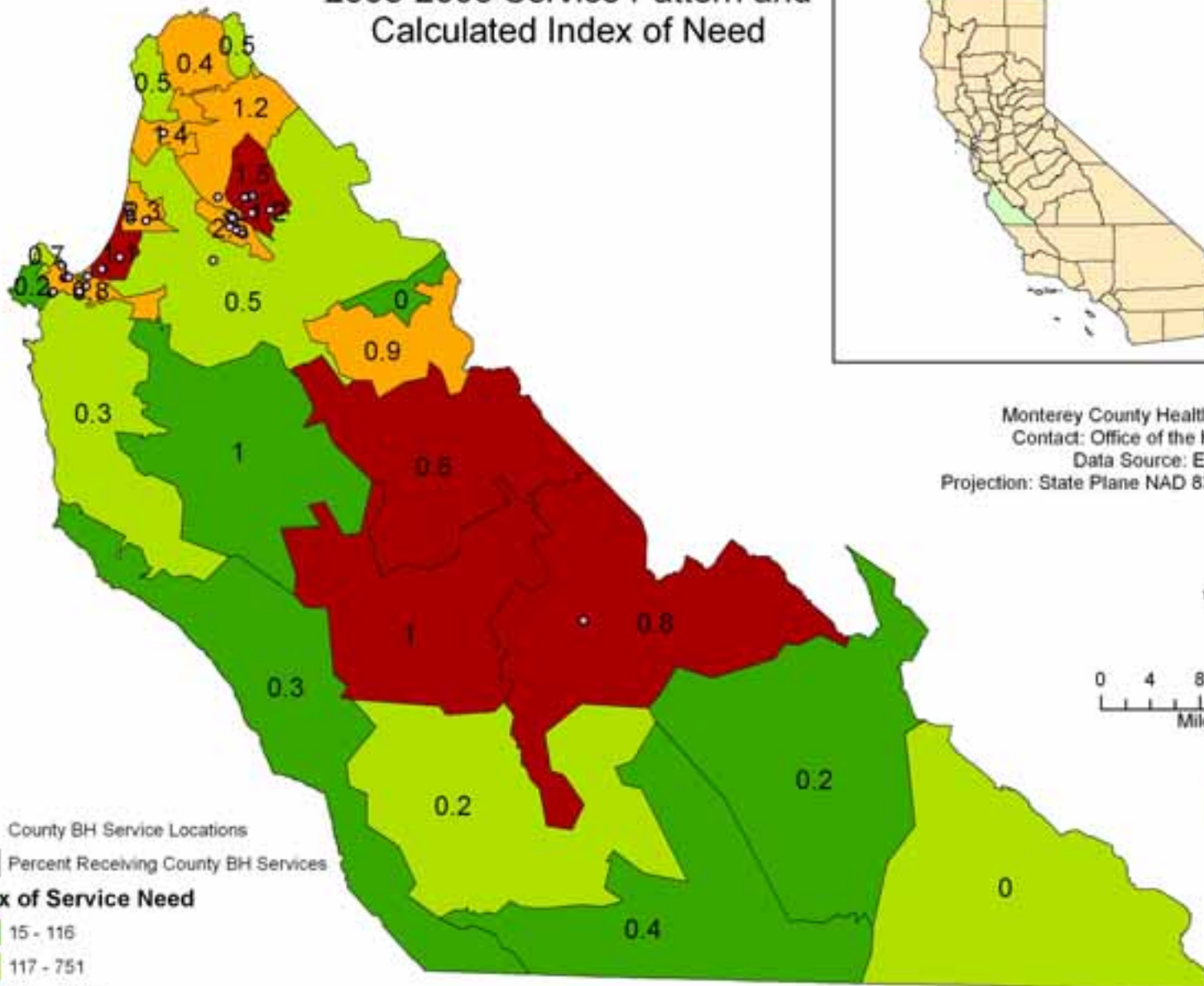
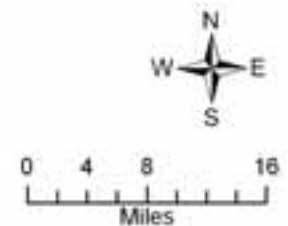
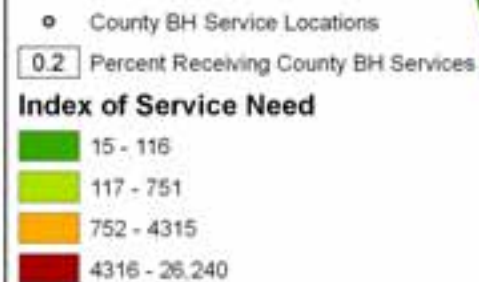


*2006 Federal Poverty Level is \$20,000 for a family of four.

2005-2006 Service Pattern and Calculated Index of Need



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



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
 - Equipment/resource distribution
- King City service “hub”
- Continued MHSA planning and evaluation
 - Penetration rates
 - Spatial patterns in service satisfaction



For More Information...

Kristy Meyer, Research Analyst
Monterey County Health Department
831.755.4698
meyerkj1@co.monterey.ca.us

