Community College Enrollment Projections

Update and Input Session

Barry Gribbons
Marc Beam
Craig Hayward
Terrence Willett

theRPgroup center for student success

Overview

- Purpose is to provide recommendations for producing enrollment projections that can be used to determine capital outlay funding.
- Specific recommendations
- Technically sound
- Sample analyses for five districts
- Feasible given limited CO resources

Review of Other Models:
Maryland Higher Education Commission

- Historical population data
- Ratio of in-state to out of state students is consistent over time
- High school graduates
- Community college enrollments (for predicting university enrollments)
- Tuition changes
- Per-capita disposable income
- Historical non-credit enrollments and population age 20 + for non-credit enrollment forecasting

Review of Other Models:
CSU Philip Garcia/ CPEC

- Persistence and graduation rates
- Scenarios with baseline and mid-range
- Enrollment demand vs. projection
- Population by age and ethnicity
- Regression model for participation rates
- Enrollment demand=participation rate x population projection
- FTES Capacity

Review of Other Models:
CSU Philip Garcia/ CPEC

- Qualified prospective students + continuing students
- Headcount by age and ethnicity
- Historical population estimates by age and ethnicity
- Student fees

Review of Other Models:
Iowa Fall Enrollment Report

- Time series model / ARIMA
- Economic factors: GPD and unemployment rate
- Scenarios
- Prior year enrollment
- High school enrollment
- High school seniors and graduates

Review of Other Models:

Texas Higher Education Coordinating Board

- Regression model
- Enrollment history
- Population projections
- Age/race participation rates for five years
- Multiple forecasts
- Out-of-state enrollments added after in-state enrollments

Review of Other Models:
Washington State

- Age
- County population
- Participation rate
- Unemployment rate (county vs. state)

Review of Other Models:
Washington State

- Age
- County population
- Participation rate
- Unemployment rate (county vs. state)

Review of Other Models:
CSU

- Spring enrollment of prior year
- Continuing enrollment (spring less grads and predicted drop outs)
- New students from applications for fall
- Add winter and spring based on historical proportions
- Convert headcount to FTES

Review of Other Models: CSU

- Long-term forecasts
  - High school graduates
  - Population by age
  - Historical participation rates

Issues Being Considered

- Data Sources
- Definition of district services area
  - Zip codes of actual students
  - Political boundaries
- Granularity
  - County
  - Zip code
  - Census track

Issues Being Considered

- Variables to Include
  - WSCH history
  - 2000, 2005 to 2010, and 2015 (projected) Population data by
    - Age,
    - Ethnicity,
    - Gender,
    - Employment status,
    - Educational attainment, and
    - Poverty.
  - HS Graduates
  - Funded Growth

Issues Being Considered

- Allowing districts to use a menu
  - Select salient variables
  - Vary weights
  - Use different methods for combining
  - No Gaming
    - Fixed menu of choices
    - No Changes for 5 years
    - Auditable by preselected sources

Current CCCCO Procedure

- Multiple regression run annually using:
- Fall unduplicated headcount (STD7=A,B,C,F)
- DOF county adult population projections
- Estimated student cost of attendance from Student Expenses and Resources Survey (SEARS)
- Enrollment fees
- Estimated district budgets
- Proposition 13 dummy variable

Previous Recommendations

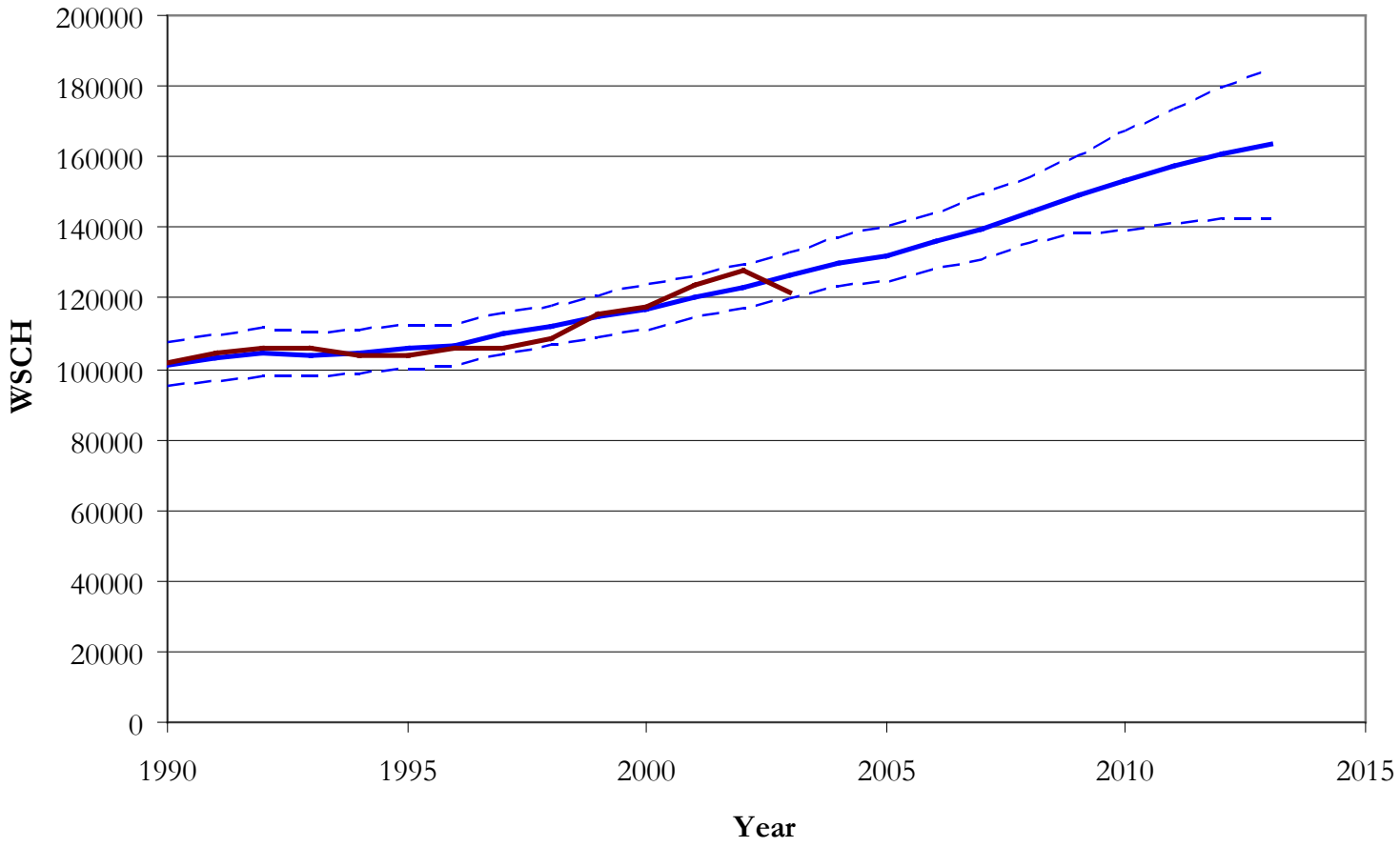
- Explored expanded set of variables and multiple models including stepwise regression and ARIMA
- More geographic granularity
- Objectively incorporate local factors
- Segment projection by important demographics
- Use confidence intervals

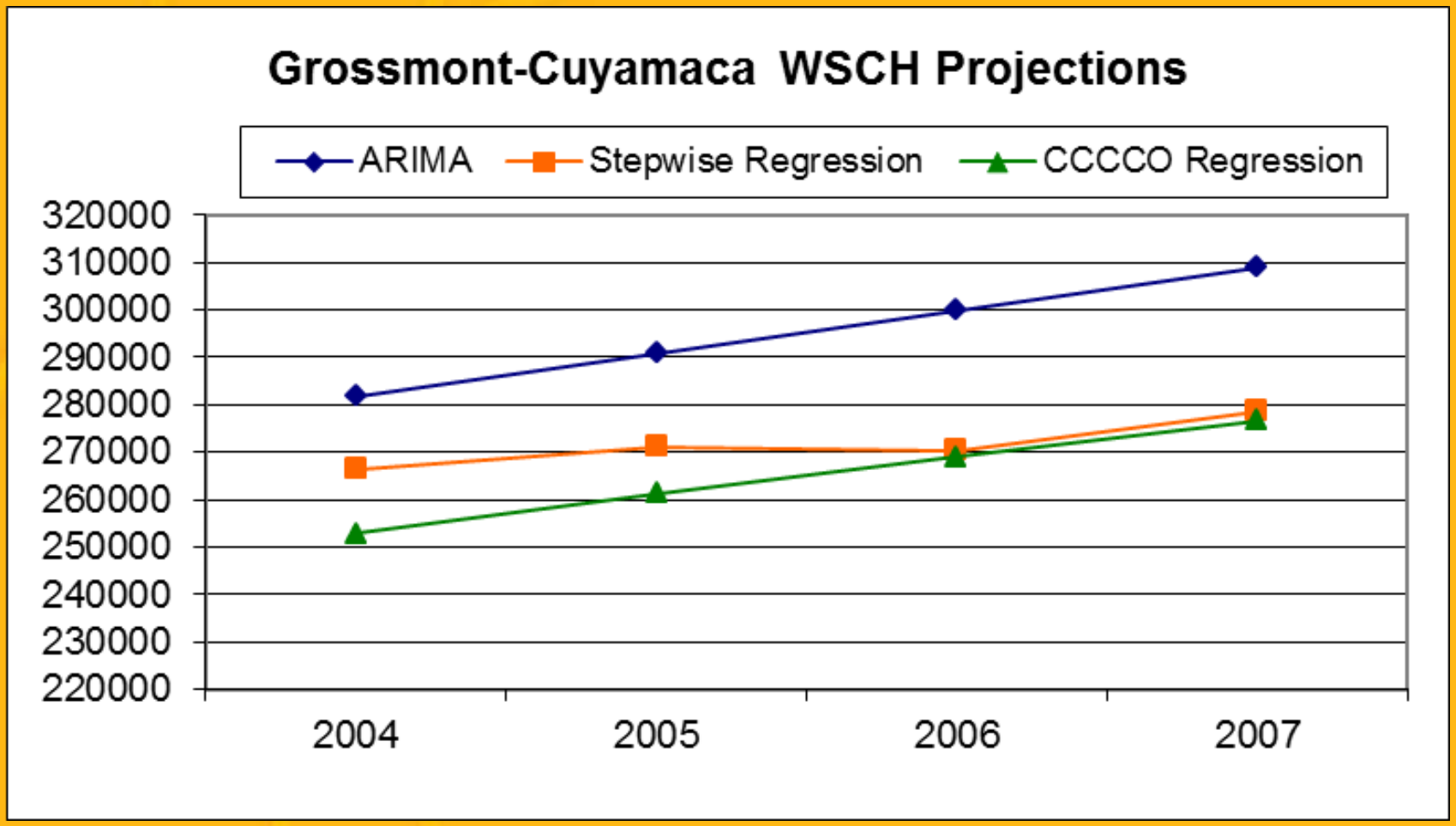
- County adult population (Census 2000)
- HS Grads for district area (& capture rate)
- Fees
- Current and historical enrollment
- % FTES by Transfer/B.S./CDC-Basic Credit/College
- Age groups
- Apportionment growth cap
- Cap/Load ratio
- College operating budgets (adjusted by C.P.I.)
- Dummy variables for outliers / poor fit districts / x-factors
- Enrollment impaction / Redirected students
- Local County Data
- Participation rates
- Population characteristics by zip code or census tract
- Population density within district
- Sears cost of enrollment (Student Aid Commission report)
- Unemployment by county
- WSCH/Enrollment

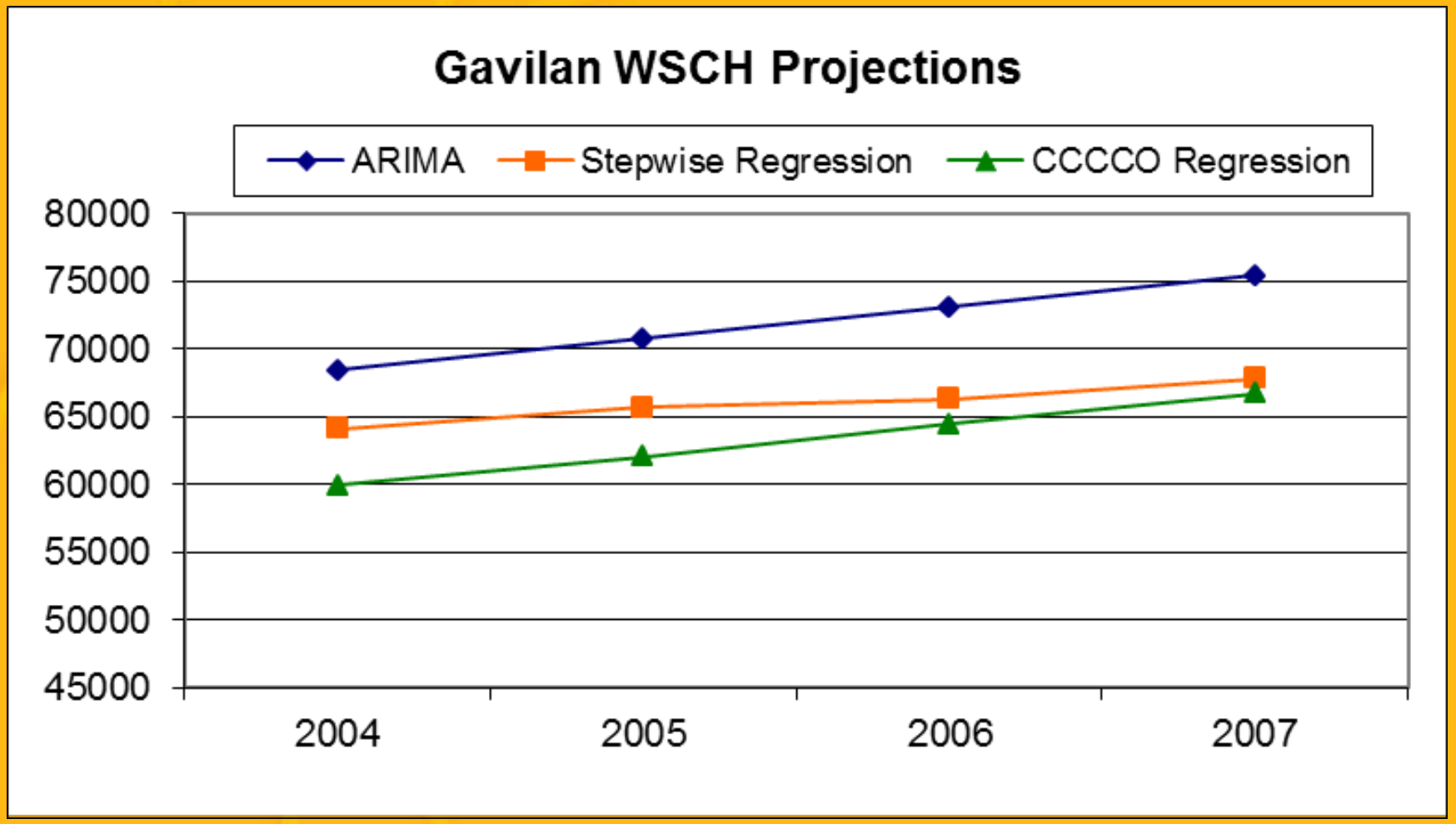
Final Equation

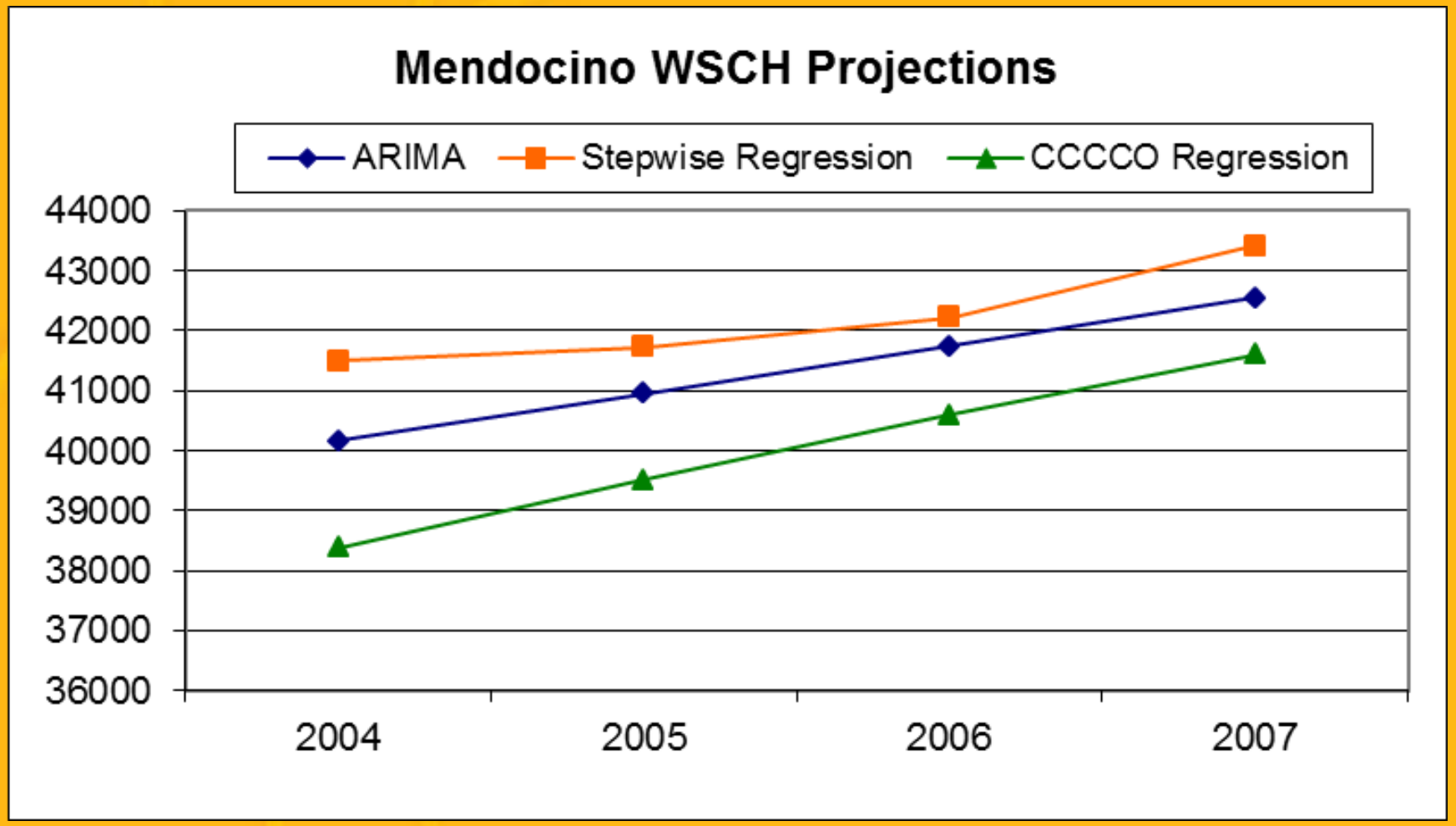
WSCH=county popn + hs grads + fees + time

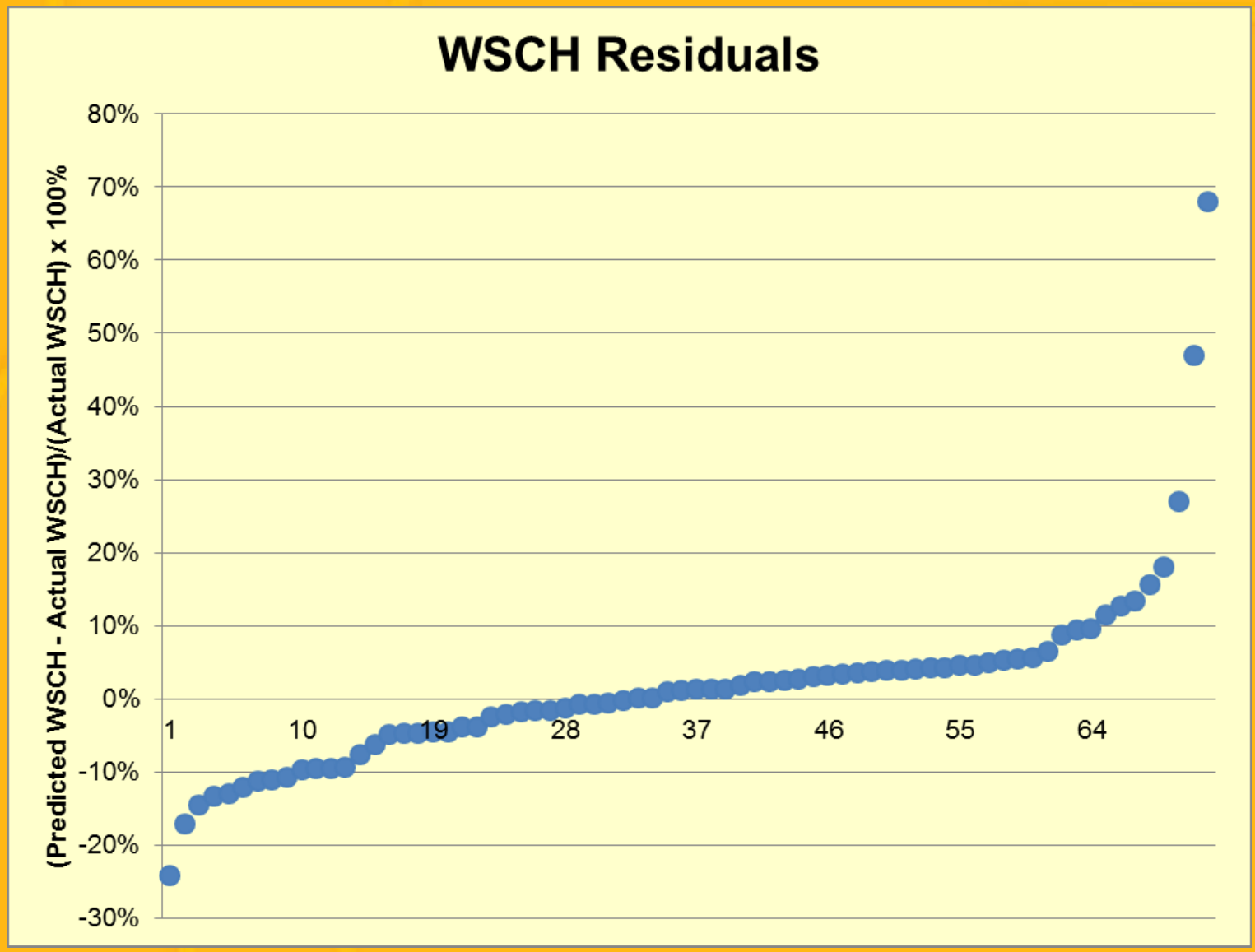
Stepwise Regression with 90% Confidence Intervals
WSCH = County Popn + Fees (R-square=0.93)




Grossmont-Cuyamaca WSCH Projections
ARIMA
Stepwise Regression
CCCCO Regression
320000
310000
300000
290000
280000
270000
260000
250000
240000
230000
220000
2004
2005
2006
2007


Gavilan WSCH Projections
ARIMA
Stepwise Regression
CCCCO Regression
80000
75000
70000
65000
60000
55000
50000
45000
2004
2005
2006
2007

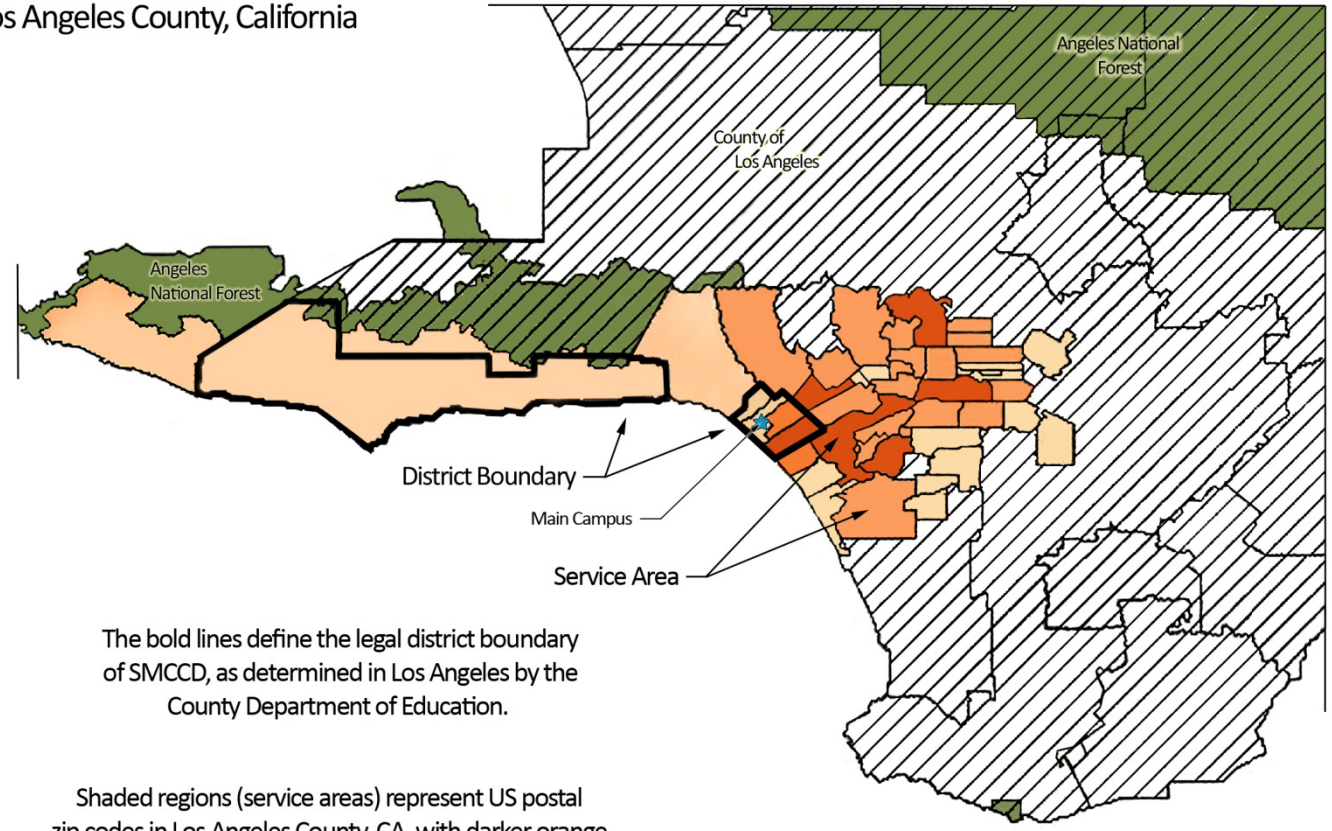

Mendocino WSCH Projections
ARIMA
Stepwise Regression
CCCCO Regression
44000
43000
42000
41000
40000
39000
38000
37000
36000
2004
2005
2006
2007


WSCH Residuals
(Predicted WSCH - Actual WSCH)/(Actual WSCH) x 100%
80%
70%
60%
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
1
10
19
28
37
46
55
64

GIS and Projections

- CCC GIS Description and Demonstration
- Student flow analysis at Gavilan College

Santa Monica
Community College District (SMCCD)
Los Angeles County, California



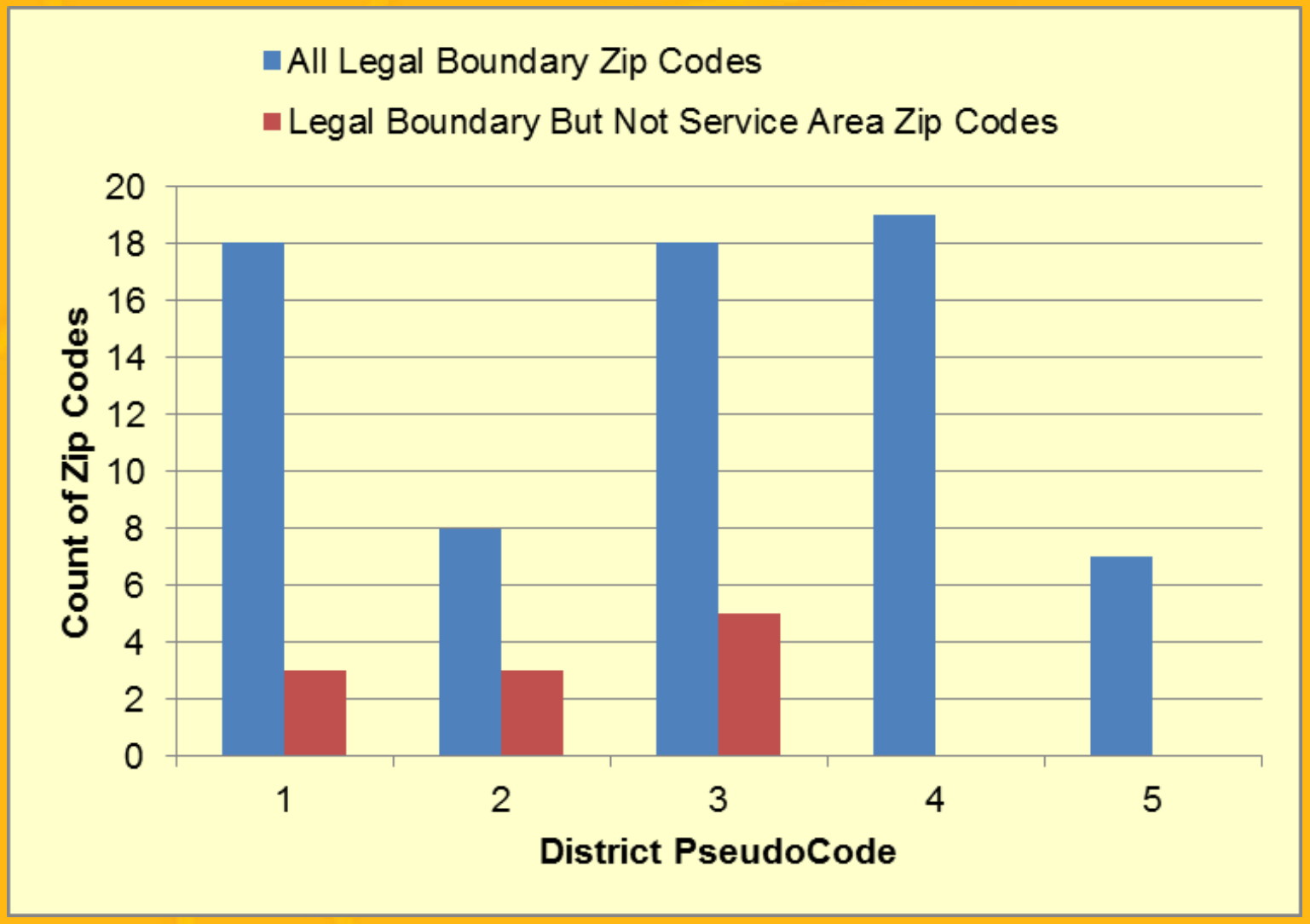
The bold lines define the legal district boundary of SMCCD, as determined in Los Angeles by the County Department of Education.

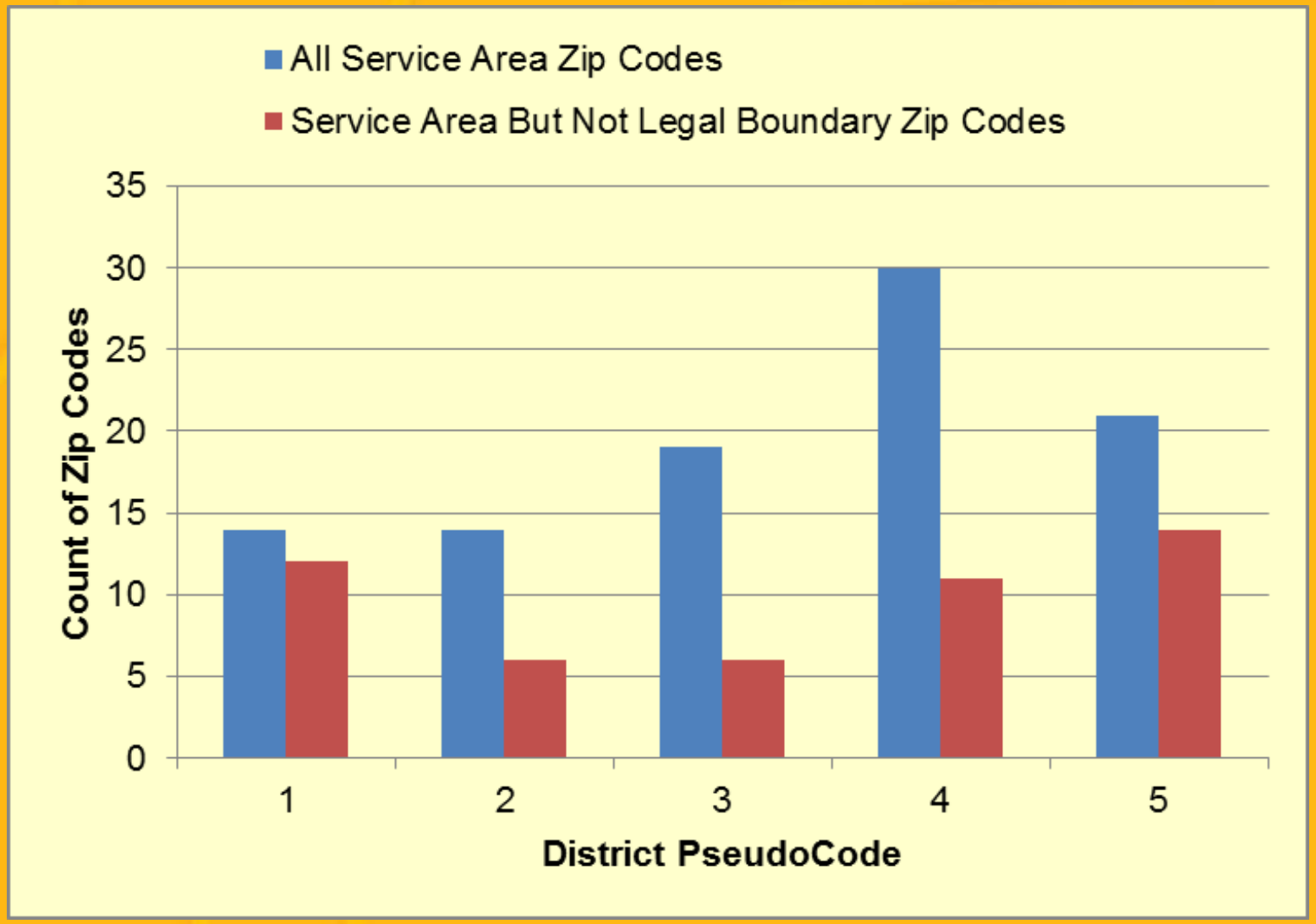
Shaded regions (service areas) represent US postal zip codes in Los Angeles County, CA, with darker orange areas having higher student participation rates at Santa Monica City College.

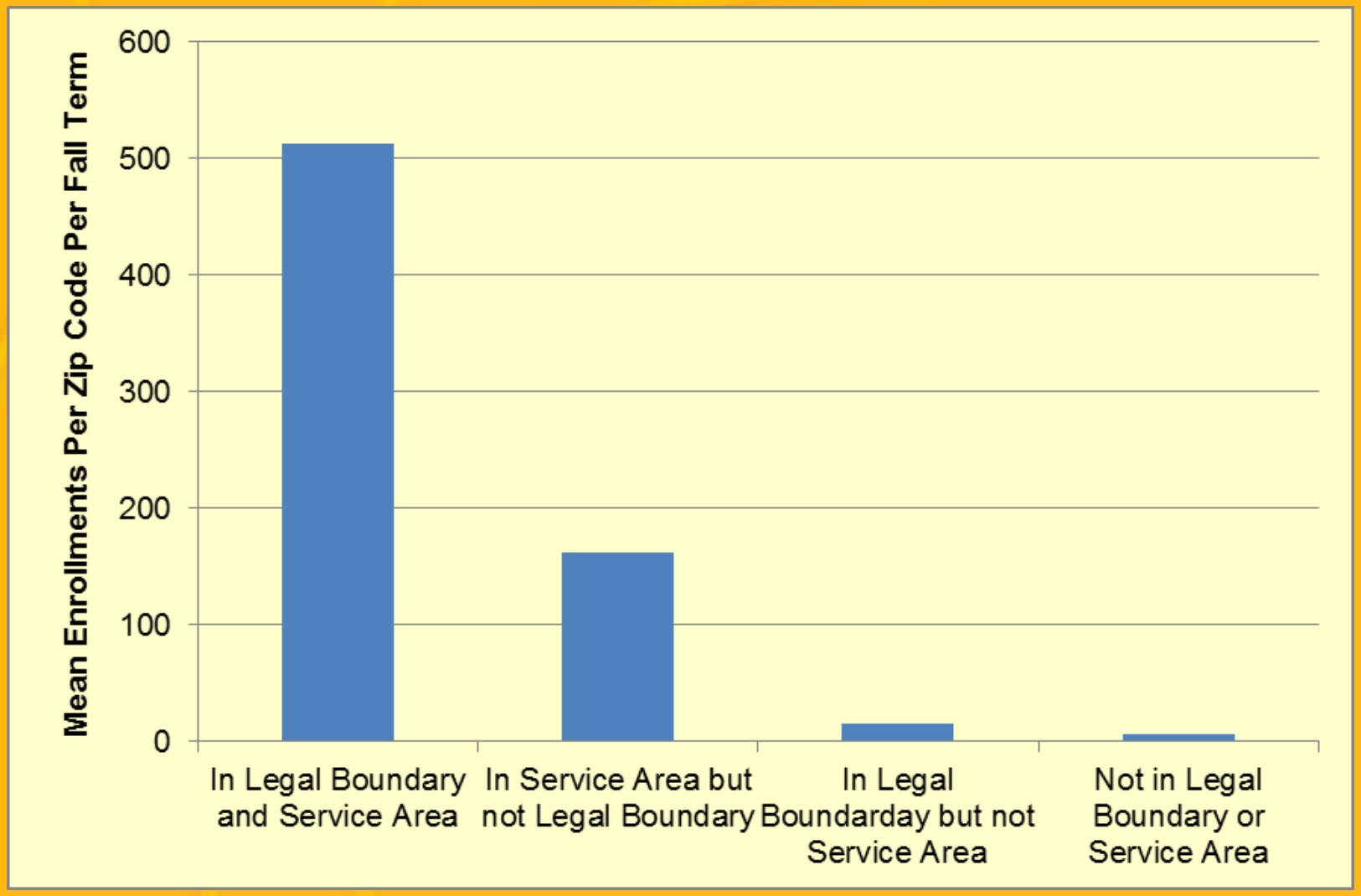
Original Map provided by: Author Unknown

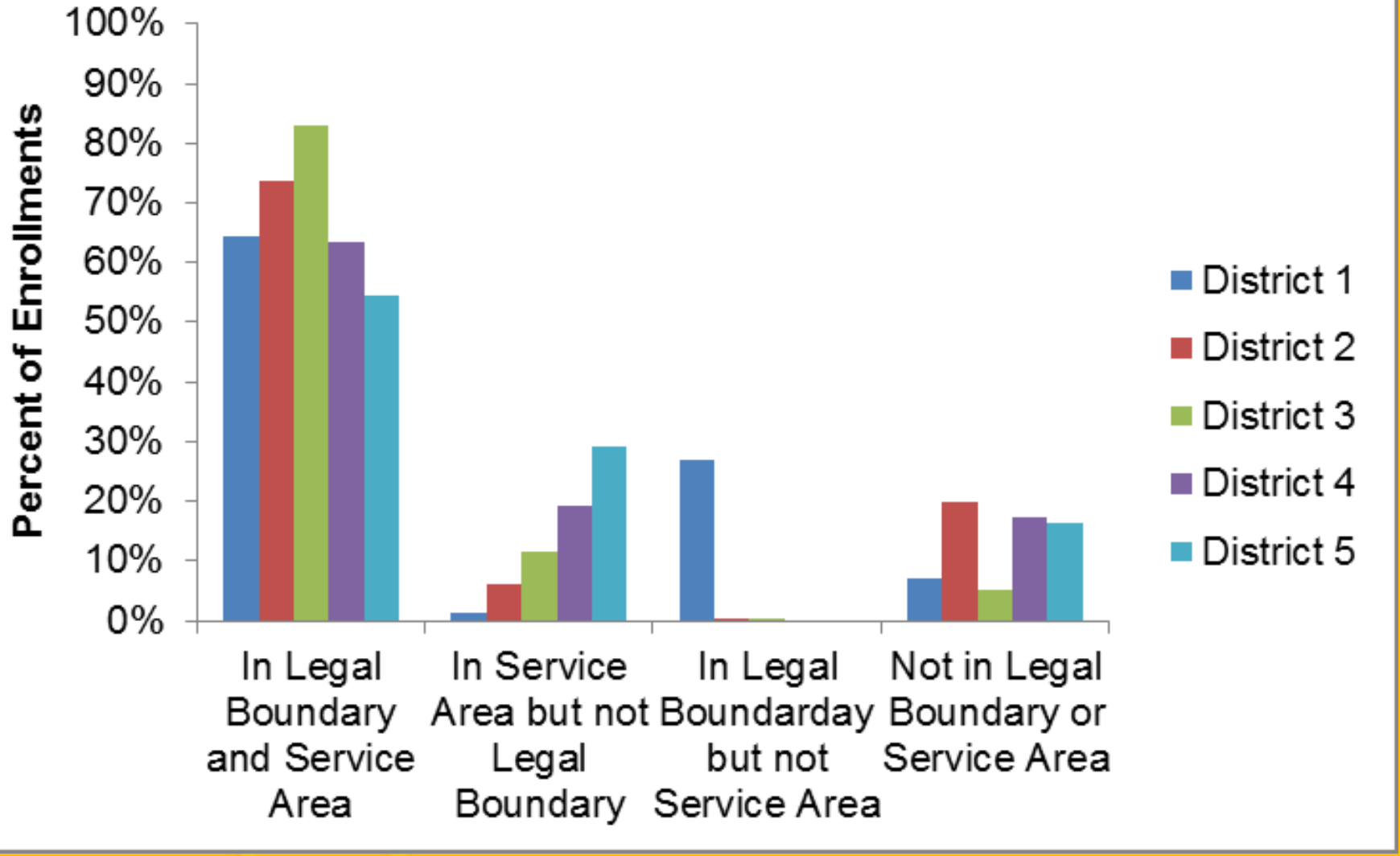
Current Project

- Received data by zip from Claritas
- Pulling enrollments by zip
- Beginning modeling process
- Test simple and disaggregated models
  - Compare R-squares
  - Provide confidence intervals
  - Most parsimonious = all zip codes combined, single ethnicity variable, 5 to 30 variables
  - Most disaggregated = each service area zip disaggregated by ethnicity, gender, and age, etc. over 700 variables


All Legal Boundary Zip Codes
Legal Boundary But Not Service Area Zip Codes
Count of Zip Codes
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
District PseudoCode


All Service Area Zip Codes
Service Area But Not Legal Boundary Zip Codes
Count of Zip Codes
35
30
25
20
15
10
5
0
1
2
3
4
5
District PseudoCode


Mean Enrollments Per Zip Code Per Fall Term
600
500
400
300
200
100
0
In Legal Boundary and Service Area
In Service Area but not Legal Boundary
In Legal Boundarday but not Service Area
Not in Legal Boundary or Service Area


Percent of Enrollments
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
In Legal Boundary and Service Area
In Service Area but not Legal Boundary
In Legal Boundarday but not Service Area
Not in Legal Boundary or Service Area
District 1
District 2
District 3
District 4
District 5

Input

- Suggestions

Contact Information

Barry Gribbons
Barry.Gribbons@canyons.edu
Marc Beam
mbeam.dcs@gmail.com
Craig Hayward
doc9x@yahoo.com
Terrence Willett
Terrence.Willett@calcentral.com