NEW AND POWERFUL WAYS TO MEASURE LEARNING

A Presentation to
MSBA/MASA Annual Conference

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Office of Social and Economic Data Analysis
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October 22, 2010

SESSION GOALS

- Explore the power of data to inform instructionally relevant decisions – Getting focused.
- Explore different ways of looking at student performance to view progress over time at the district, school, class and individual student levels – ***"Growth Models"***

Office of Social and Economic Data Analysis
University of Missouri

- Data
- Information
- Knowledge
- Wisdom

"The construction of knowledge involves more the orderly loss of information than it's meaningless accumulation."

-- Kenneth Boulding

Http://WWW.OSEDA.MISSOURI.EDU

OSEDA Mission:

Collaborate **with partners to conduct *analysis* that contributes to *improvements* in the health, *education* and well-being of people and communities in Missouri and the world.**

Utilization Focused Information

"Answers" **are "*useful*" when they reduce the risks of making the wrong *decision.***

To know you have asked the "right" questions and produced "useful" answers….focus on decision makers and decision-making ….. In particular…

Instructional decision-making ….

Governance, Administration, Teachers

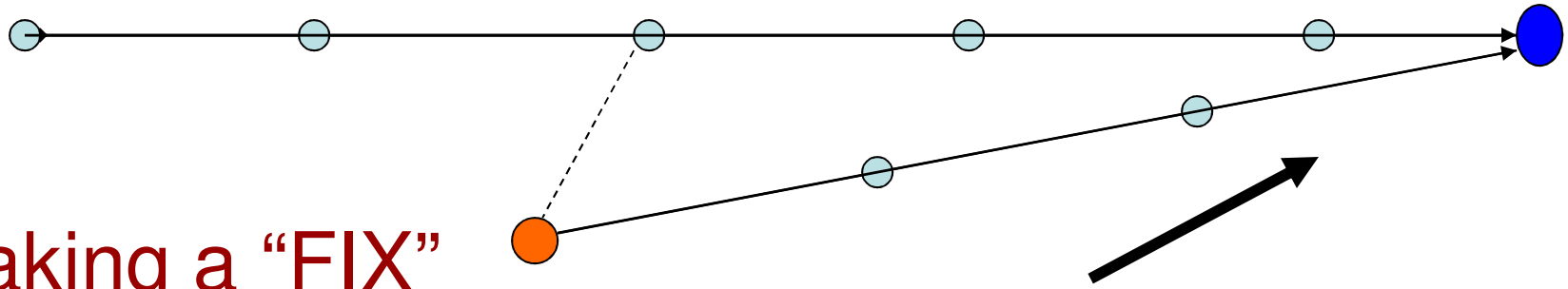
Parents and Students

Educational Decision-Making

- **Formative**
  - "Improve"
  - Periodic and timely
  - Focus on program activities and outputs
  - Leads to early recommendations for program improvement
- **Summative**
  - "Prove"
  - Were resources committed worthwhile?
  - Focus on outcomes and impact
  - Measures value of program based on impact

"Summative" Result

Plotting a Course ➔ Estimating Position ➔ Choosing and Getting to Port
(Making a plan) (Where we might be) (Where we're going)

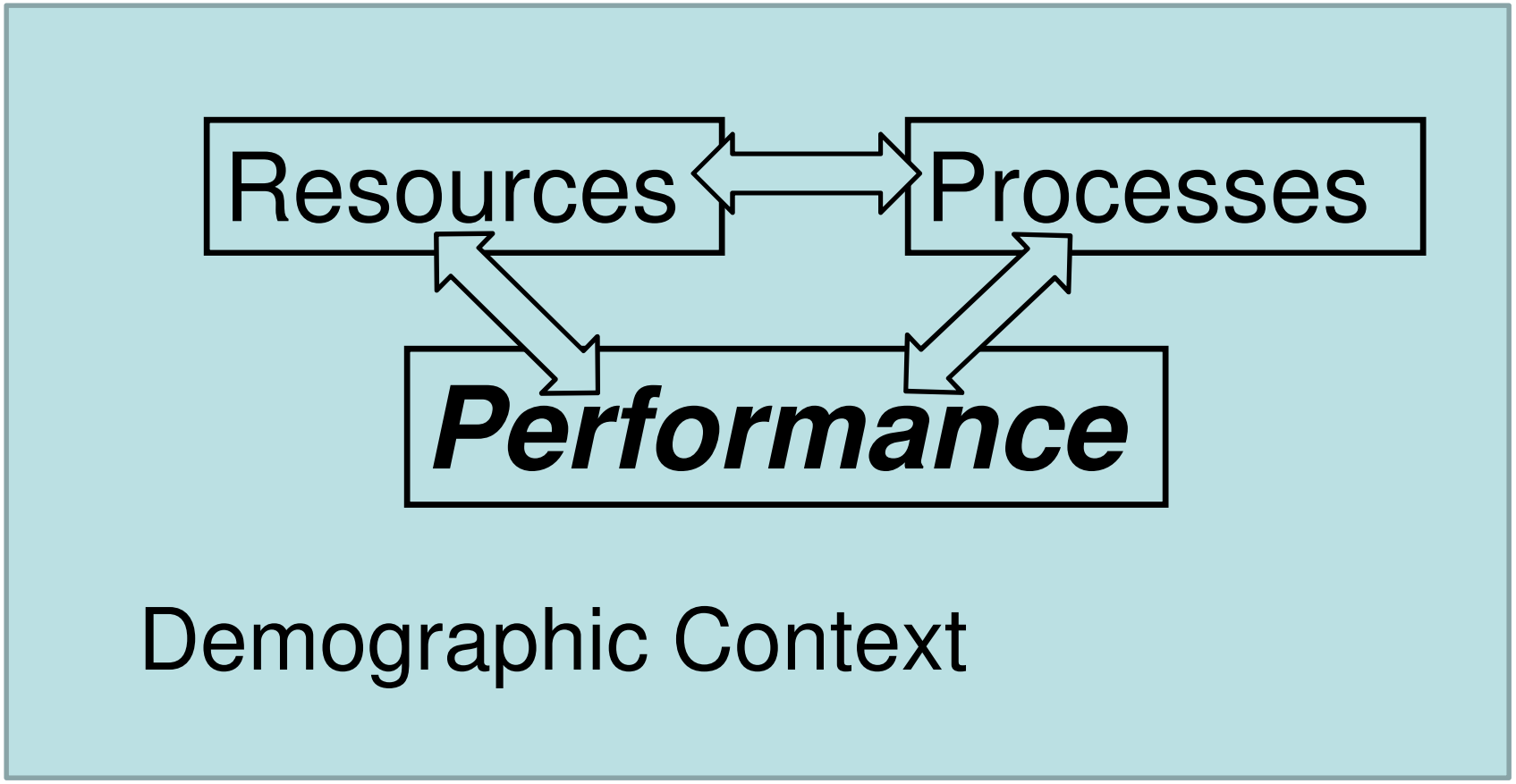


Taking a "FIX"
(where we really are)
"Set and Drift"

Adjusting Course

"Formative" Information

The MSIP Educational Framework



Educational Resources

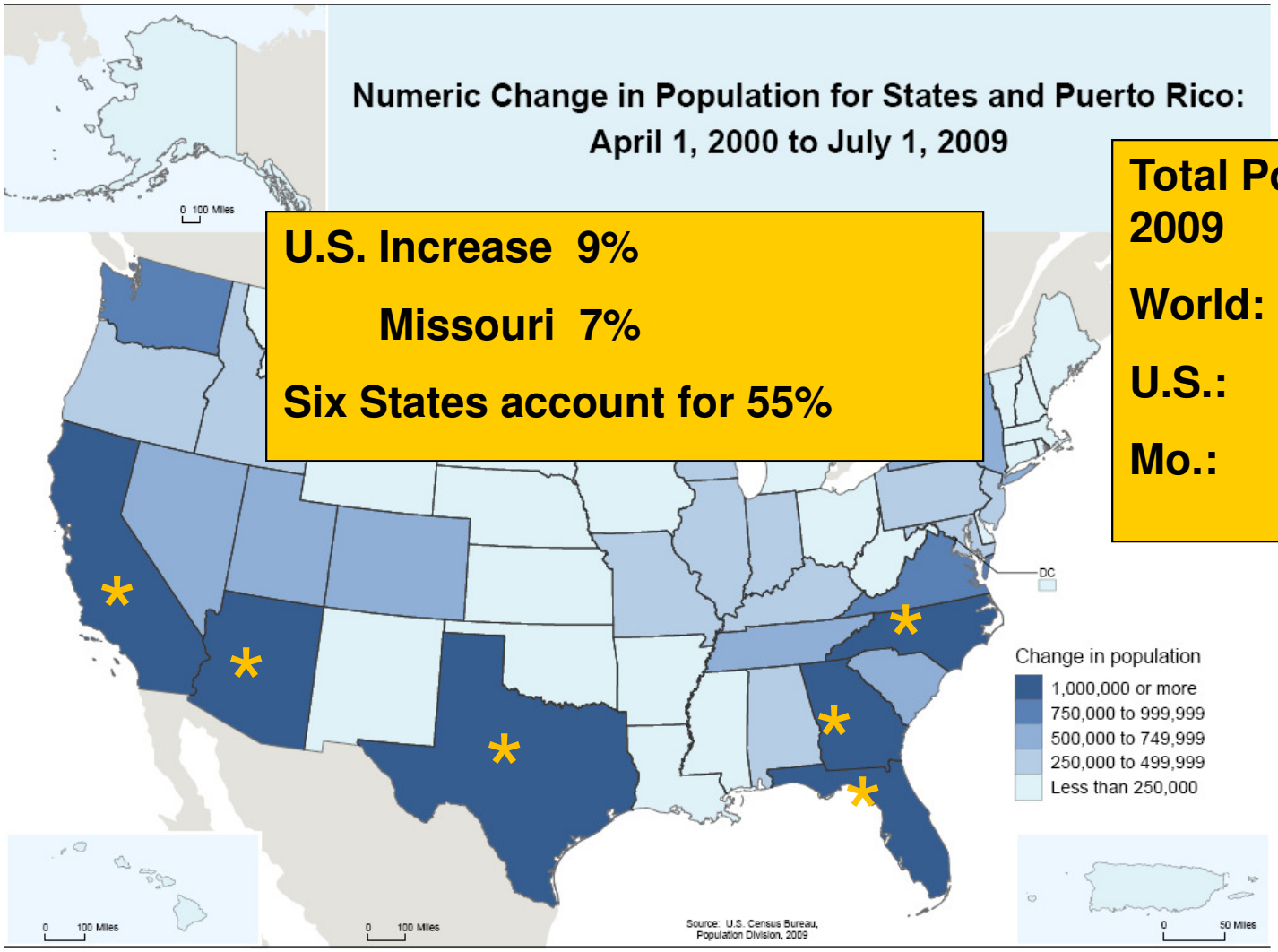
Resources

Maximum Calendar Days and Hours, 2005-2009

	Missouri				
Year	**2005**	**2006**	**2007**	**2008**	**2009**
Total Calendar Days	**175**	**174.9**	**173.8**	**174.3**	**174.6**
Total Calendar Hours	**1,095**	**1,100**	**1,099**	**1,092**	**1,095**
Length of the Day (Hours)	**6.2**	**6.2**	**6.2**	**6.3**	**6.3**

Demographic Context

Quick Review of Demographics



U.S. Increase 9%

Missouri 7%

Six States account for 55%

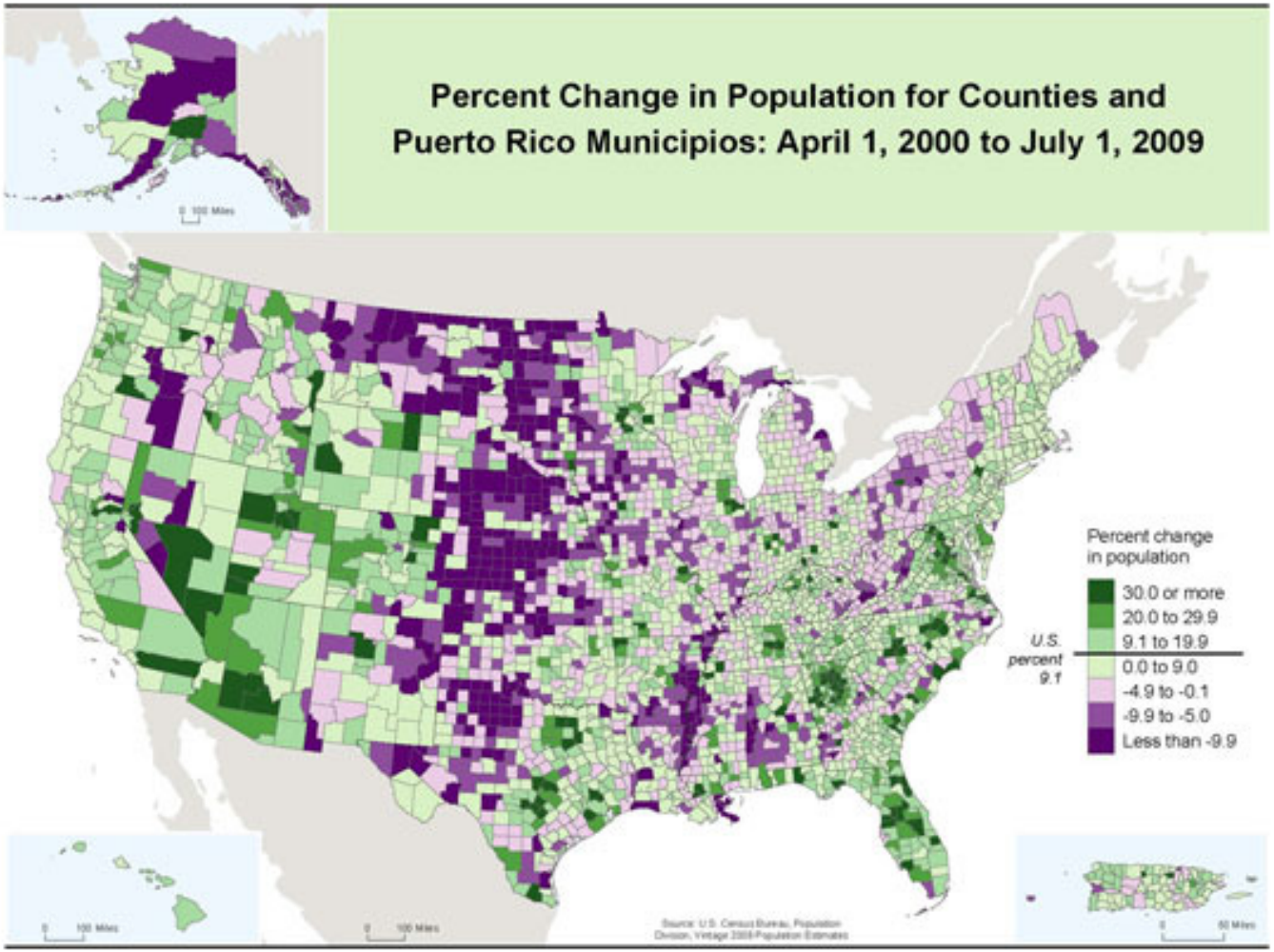
Total Population 2009

World: 6.8 Billion

U.S.: 307 Million

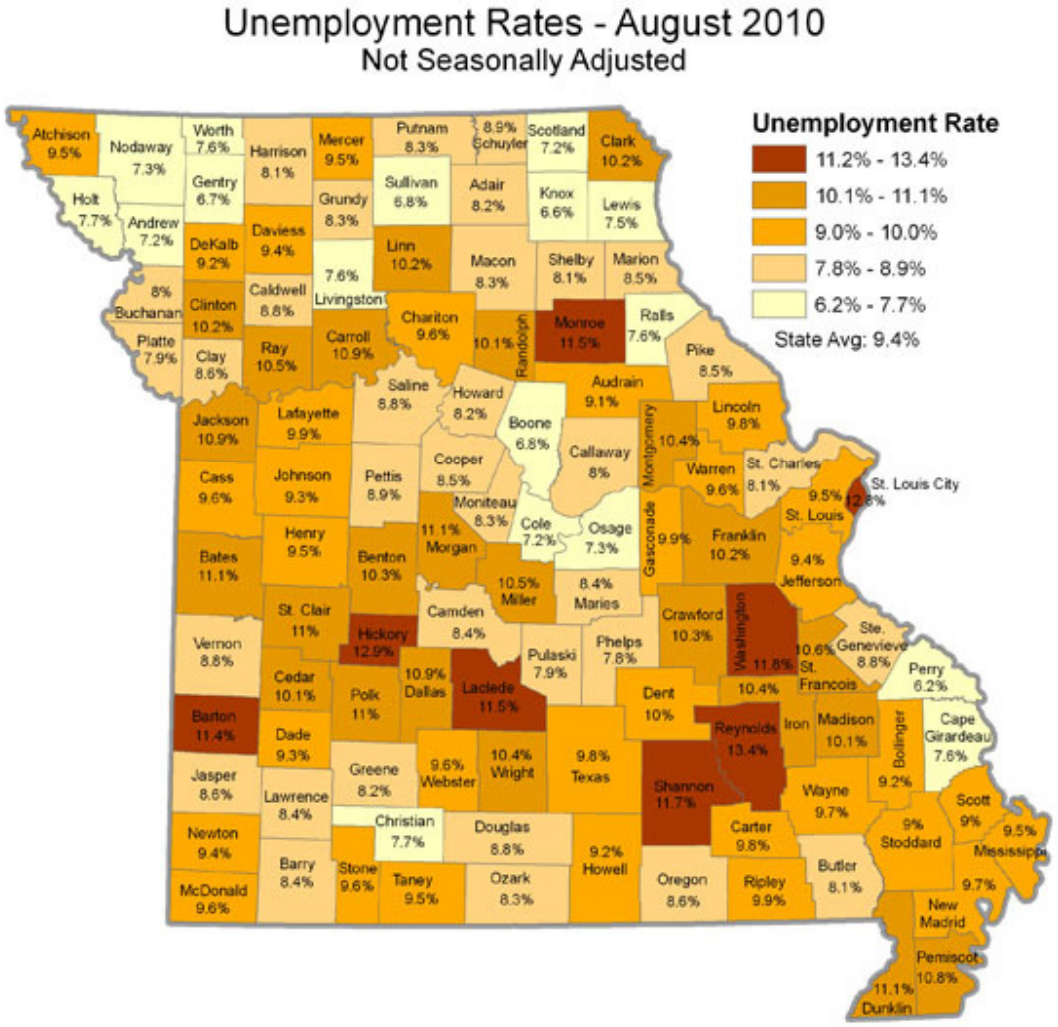
Mo.: 5,987,580

Diverse Trends: Regions within Regions – and within urban areas



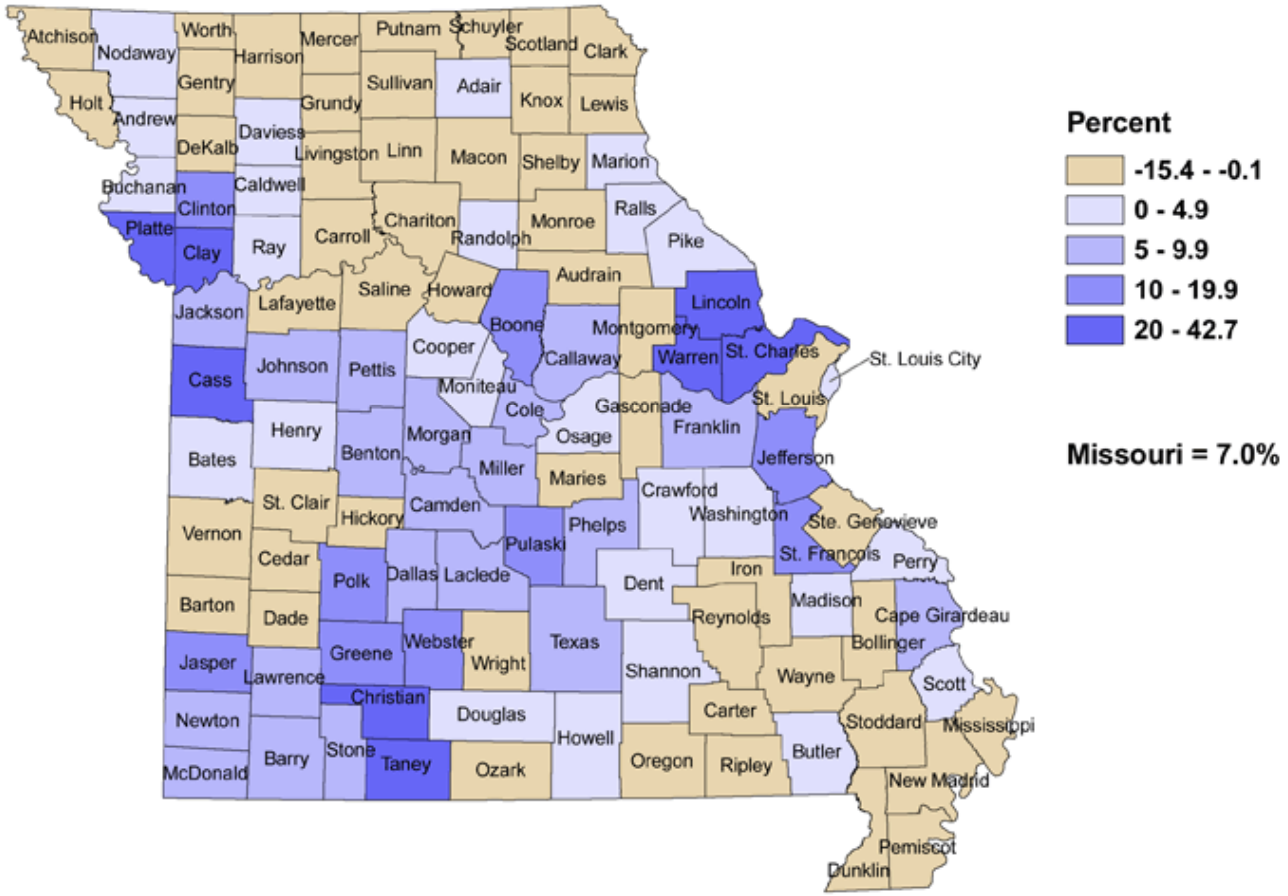
Challenging Times….

Challenging Times ... Regional Differences



Patterns of Growth

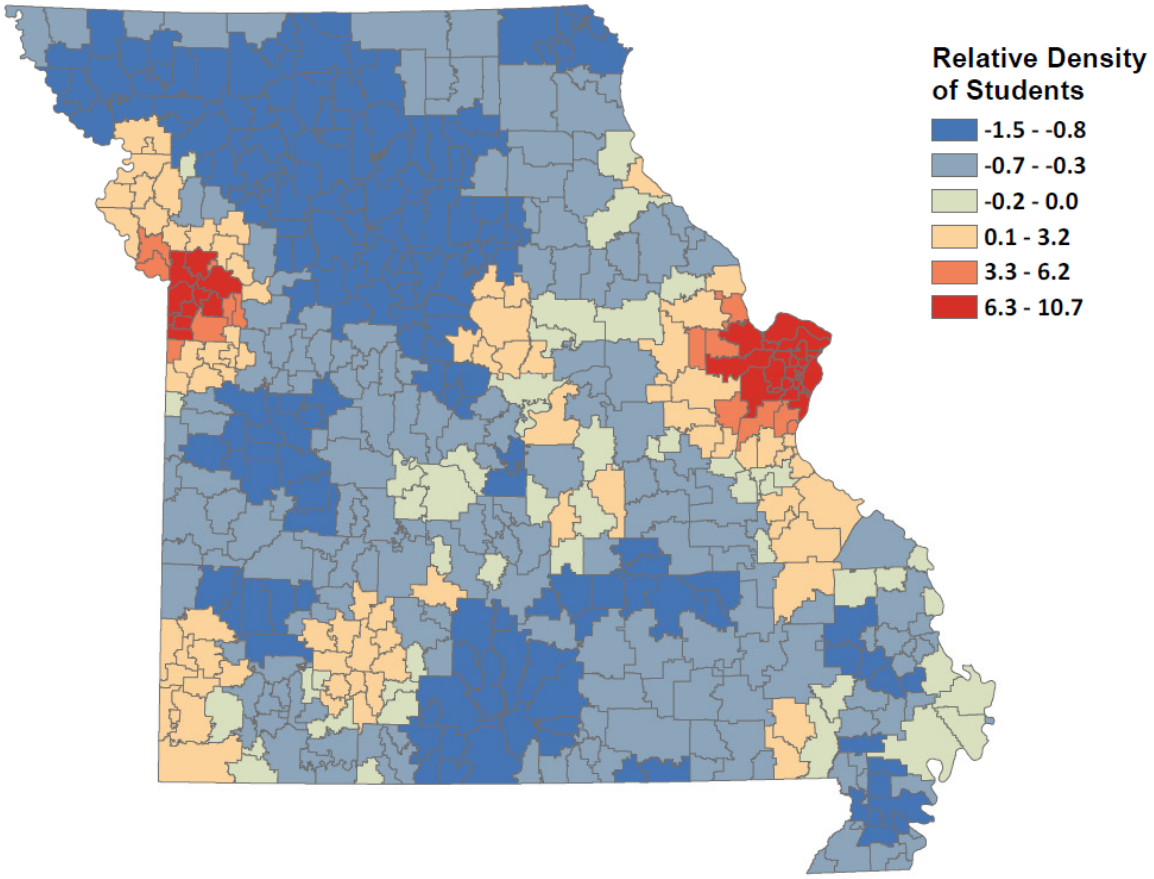
Percent Change in Total Population by County, 2000-2009



Data Source: USDC, Bureau of the Census, Federal State Cooperative for Population Estimates, 2009
Map Prepared By: University of Missouri Extension, Office of Social and Economic Data Analysis (OSEDA)
Map Generated On: 15 Jun 2010

Patterns of Growth

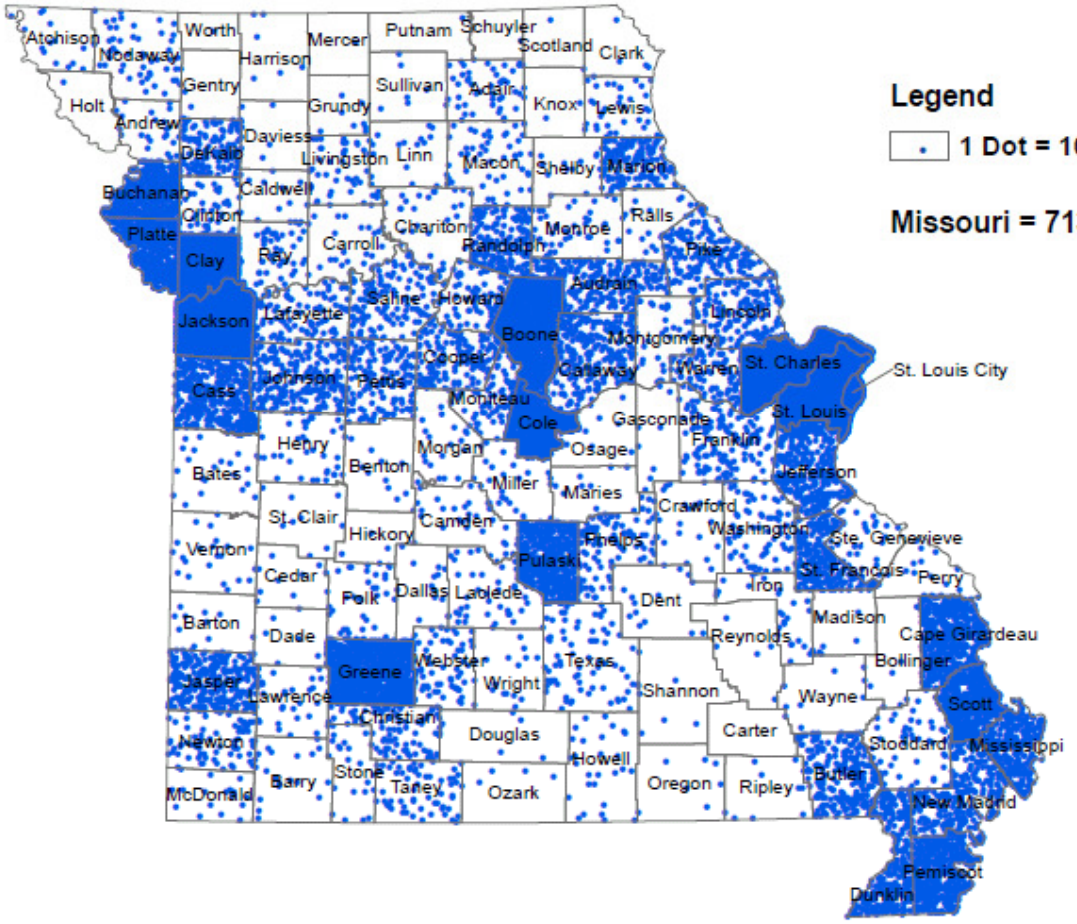
K-12 Relative Density of Student Enrollment by School District, 2010



Data Source: Department of Elementary and Secondary Education, 2010
Map Prepared By: University of Missouri Extension, Office of Social and Economic Data Analysis (OSEDA)
Map Generated On: 21 Sep 2010

Expanding Stakeholder Groups

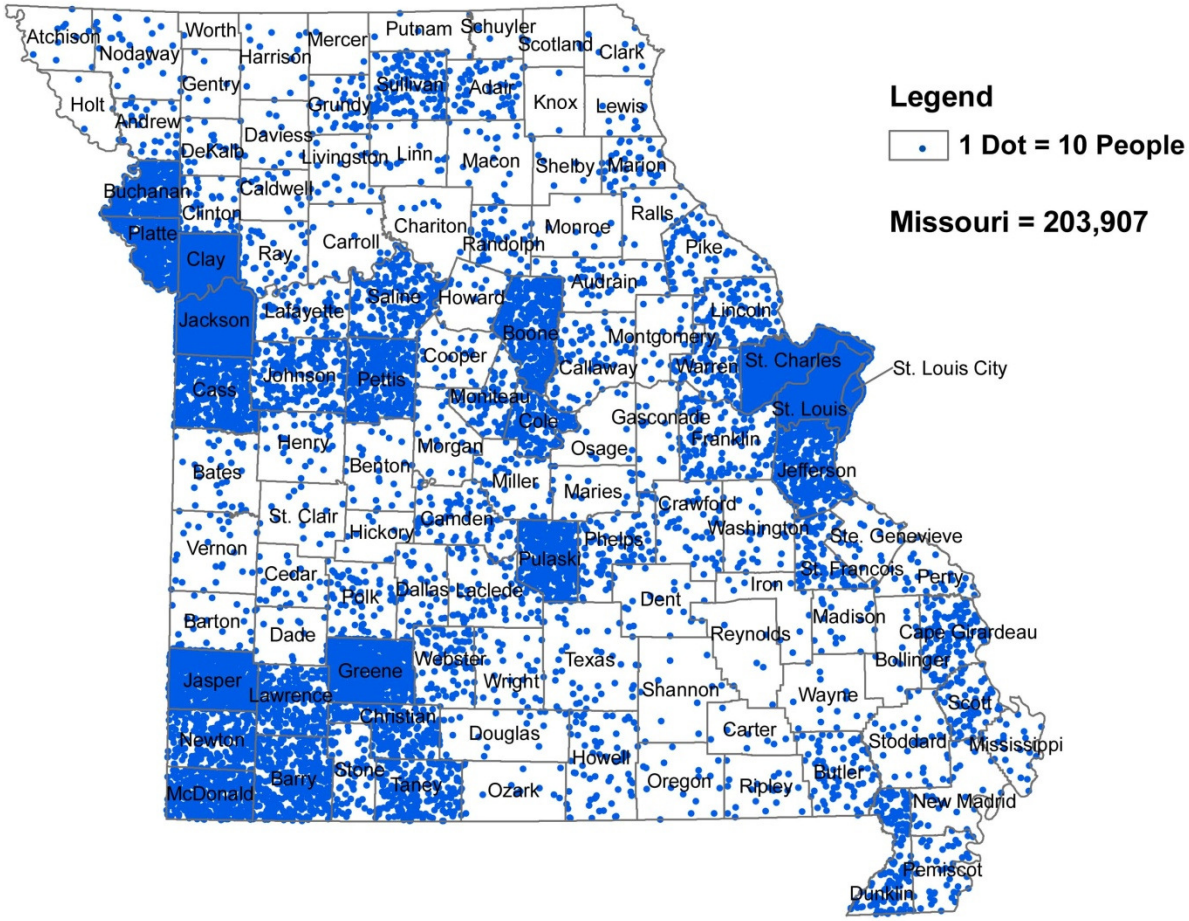
African American Population, 2009



Data Source: U.S. Census Bureau, Population Division, Population Estiamtes, 2010
Map Prepared By: University of Missouri Extension, Office of Social and Economic Data Analysis (OSEDA)
Map Generated On: 28 Sep 2010

Latino Growth

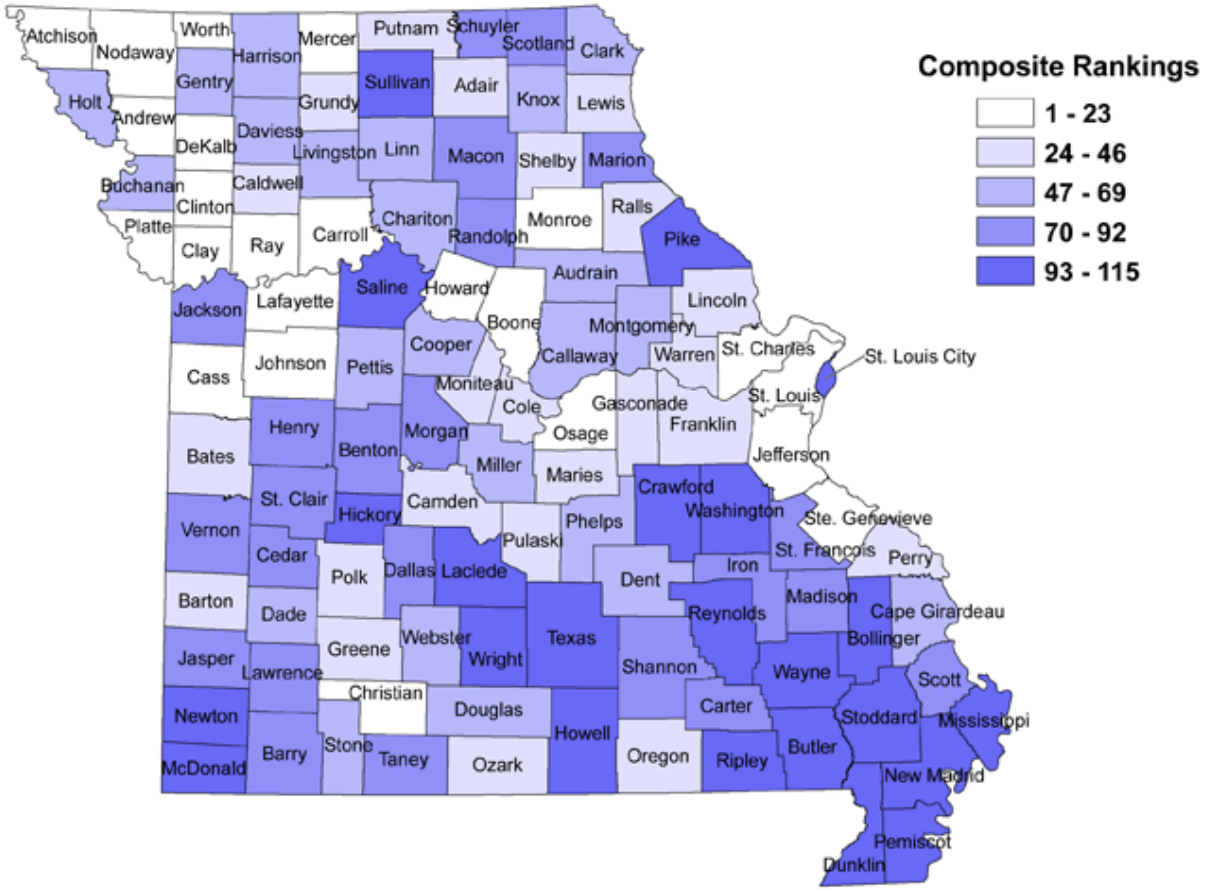
Hispanic or Latino Population, 2009



Data Source: U.S. Census Bureau, Population Division, Population Estiamtes, 2010
Map Prepared By: University of Missouri Extension, Office of Social and Economic Data Analysis (OSEDA)
Map Generated On: 23 Sep 2010

Quality of Life --- Children

Missouri Kids Count, 2009 Composite County Rankings



Data Source: Missouri Kids Count, 2009
Map Prepared By: University of Missouri Extension, Office of Social and Economic Data Analysis (OSEDA)
Map Generated On: 02 Feb 2010

On the Brink of New Data

- New ***American Community Survey***
- New (5 year) ACS in December
- New 2010 counts in December
- ***Be careful with small areas***
  - ***Plus and Minus of Estimates is large***

Educational Processes
Professional Practice

The Advance Questionnaire (AQ)

- Perceptual data obtained through a questionnaire(s)
- Provides a voice for all key stakeholder groups
- Includes questions based on critical research-based elements
- Allows development of additive scales consistent with Effective Schools Research

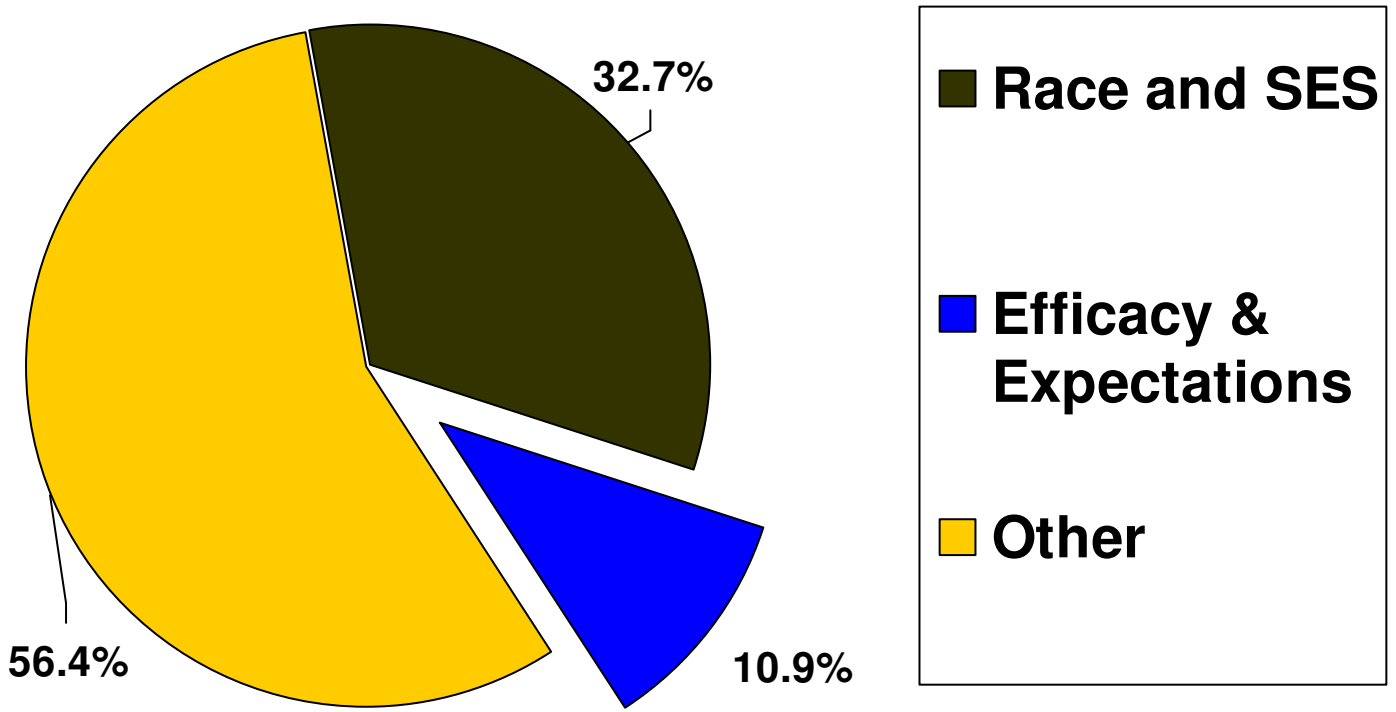
Selected Additive Scales/Definitions

- **Leadership:** This scale identifies the degree to which leadership is perceived as effective in improving student learning.
- **School Climate:** This scale identifies the degree to which all students feel respected and valued.
- **Efficacy and Expectations:** This scale identifies the degree to which teachers and students believe that they are capable of impacting student achievement.

Efficacy/Expectations Scale
(Faculty)

1. There are effective supports in place to assist students who are in jeopardy of academic failure.
2. I emphasize the importance of effort with students.
3. I have the skills necessary to meet the needs of all learners in my classroom.
4. I believe that I can positively impact student performance.

FACULTY: Efficacy & expectations explains 10.9% of the variance in communication arts achievement



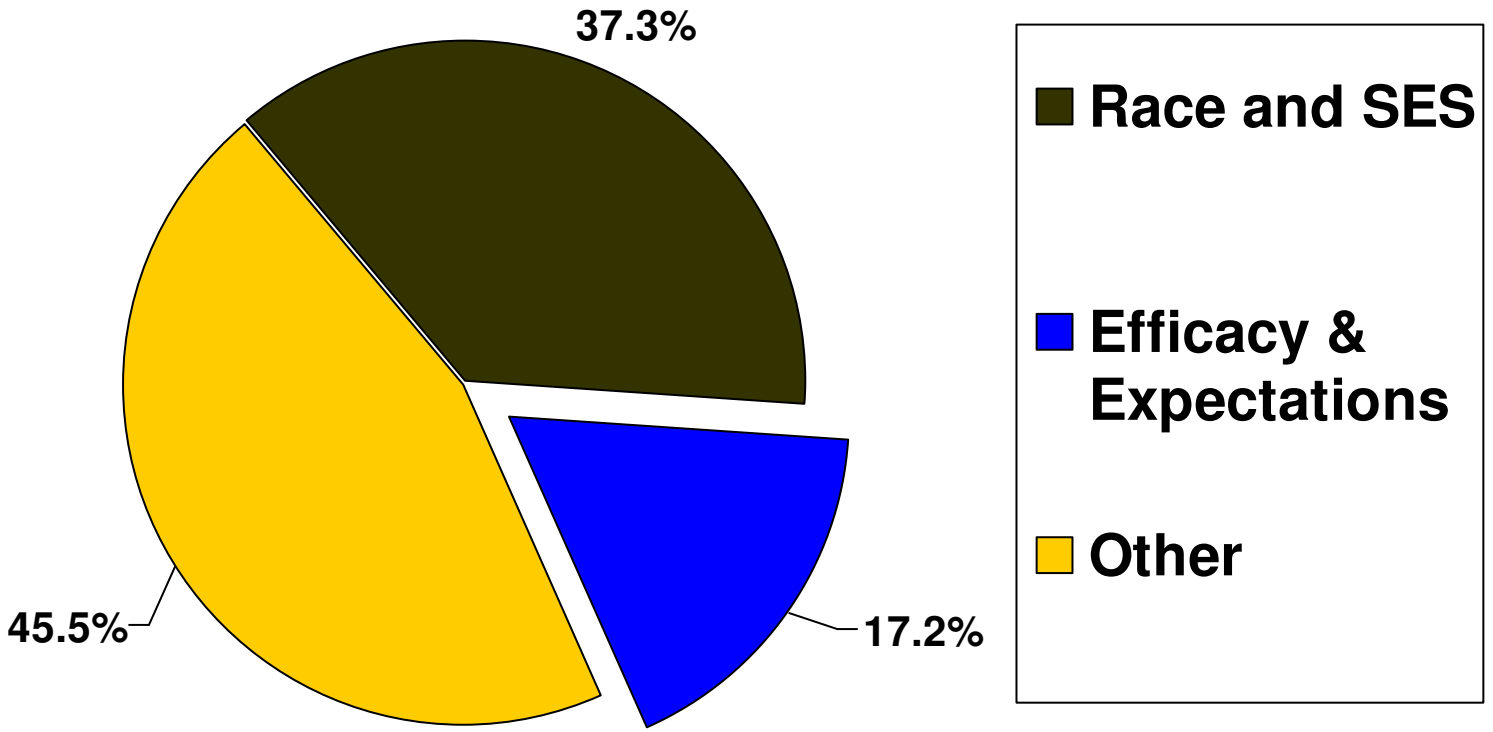
Efficacy/Expectations Scale
(Students)

1. If I do well in school, it will help me when I grow up.
2. Being successful in school today will help me in my future.
3. I can do well in school.
4. I learn a lot in this school.

Efficacy/Expectations Scale
(Students)

5. My teachers think I can learn.
6. My family believes that I can do well in school.
7. My teachers expect very good work from me.

STUDENTS: Efficacy & expectations explains 17.2% of the variance in communication arts achievement



CLASSROOM OBSERVATION TOOL

- Provides a means to maintain a longitudinal record of prevailing instructional practice
- Provides a means to look at instructional practice by subject area, grade level, school, etc.
- Provides a means to examine instructional leadership within each school

Educational Performance

Student Growth Models

Student Growth Percentiles

PERFORMANCE DATA

- Annual Performance Report (APR)
- APR and AYP disaggregated by gender, race, free and reduced lunch, etc.
- MAP/EOC Results
- Benchmark or Common Assessments
- Student Growth Data

Growth Models Explored to Date

- Missouri AYP "Increment" Model
- Student Growth Percentiles using R (SGP)
- Hierarchical Linear Models (HLM)
- Ordinary Square Regression (OLS)
- Mixed Models

All of these have advantages depending on the question and the audience

All Models are Highly Correlated

Spearman's Rho Correlations of Growth Percentiles among Growth Models

Data: MAP 2006-2008 Communication Arts, Cohort Grade 5 in 2008 (N=56,231)

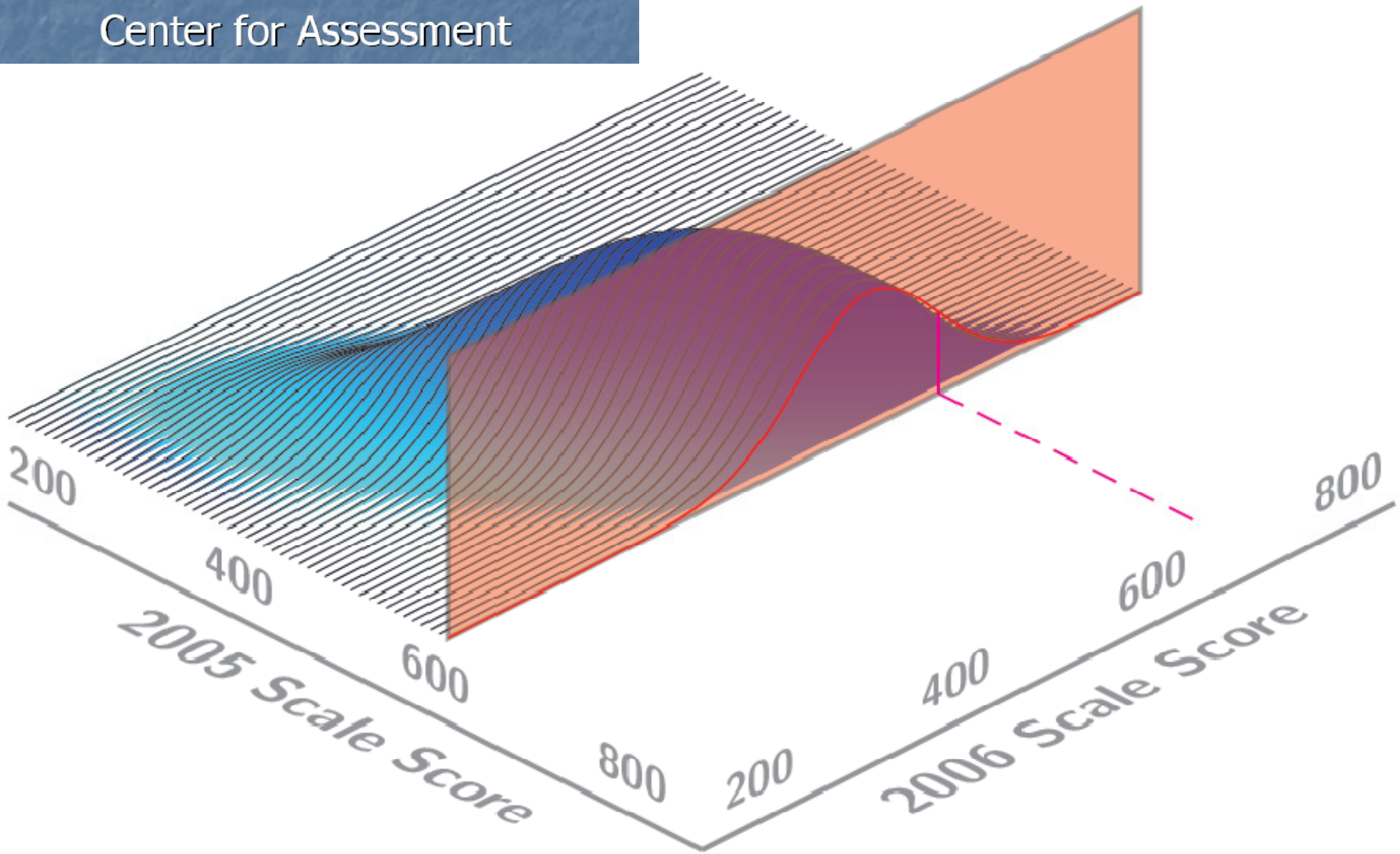
Growth Models	SGP	HLM	OLS	Mixed Model
SGP_Betebenner	1.000			
HLM	.990	1.000		
OLS	.986	.989	1.000	
Mixed Model	.986	.989	.999	1.000

Note. SGP = Student Growth Percentile; HLM = Hierarchical Linear Modeling; OLS = Ordinary Least Squares.

What is a Student Growth Percentile (SGP)?

- A student's progress compared to other students with similar MAP score history
- A student's growth percentile indicates the percentage of students, *starting at the same place*, that the student's growth exceeded
- Typical growth is equal to 50th percentile
- Similar to pediatric growth charts

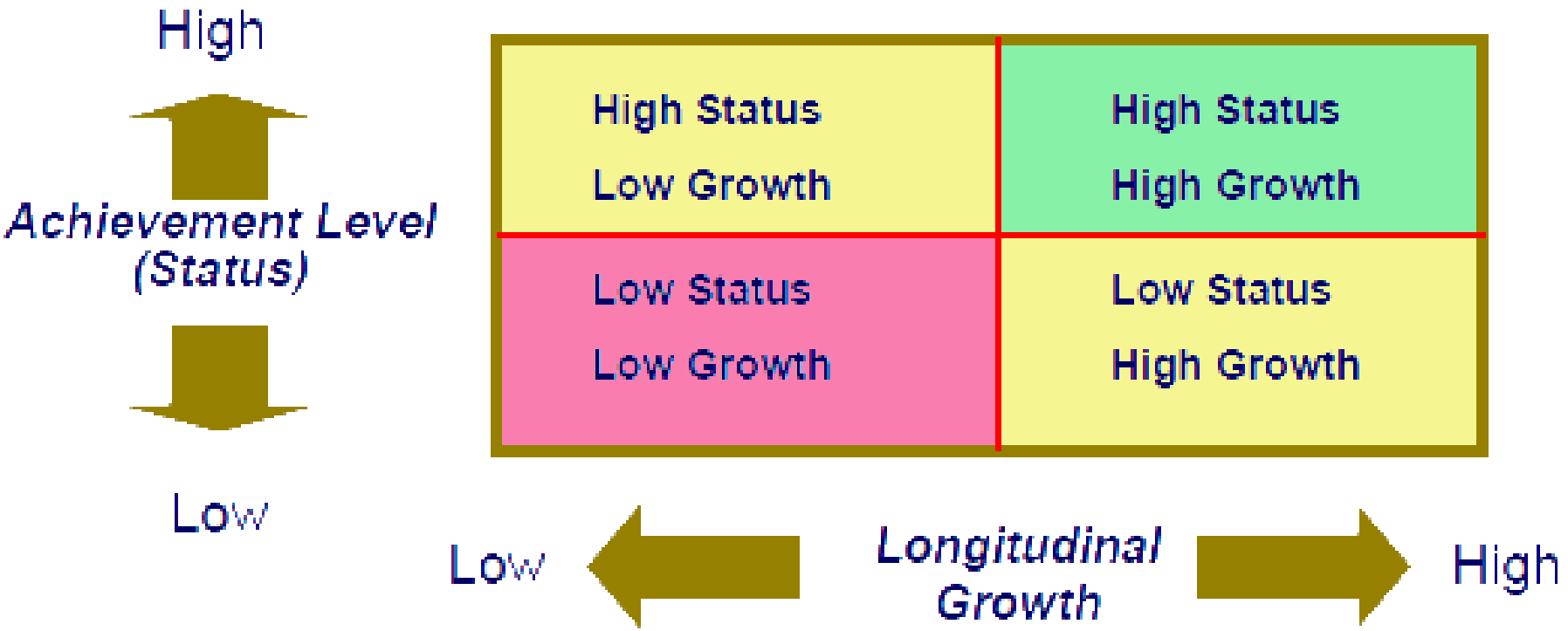
Scott Marion & Damian Betebenner
Center for Assessment



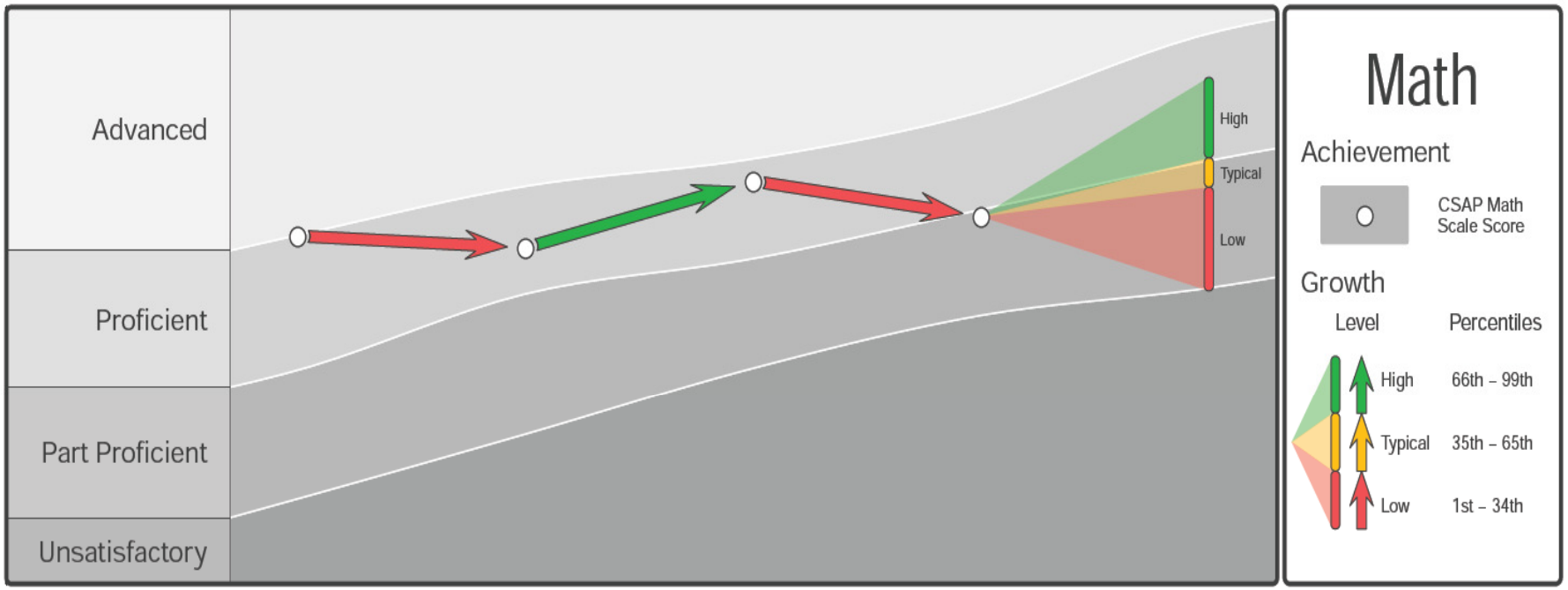
Questions Answered by Growth Model

- How much growth did a child make in one year? (What is?)
- How much growth is enough to reach proficient or advanced? (What should be?)
- How much growth is the best in Missouri (What could be?)

Relationship of Status to Growth



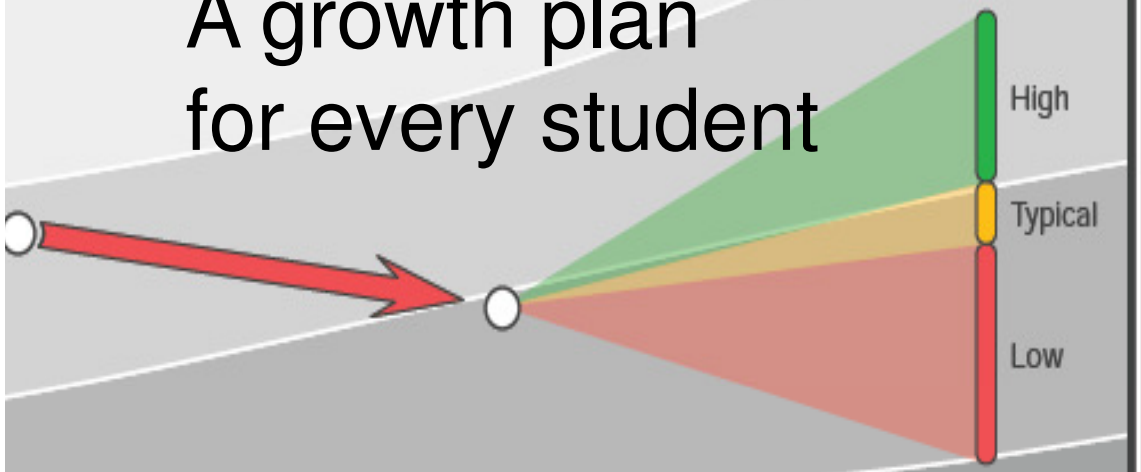
Example Student 24 (1234567824) — Example High School



	Grade 6 2006	Grade 7 2007	Grade 8 2008	Grade 9 2009	Next Year	
Scale Score Achievement Level	588 Proficient	582 Proficient	616 Proficient	598 Part Proficient		Achievement
Growth Percentile Growth Level		26 Low	76 High	9 Low		Growth

Example High School

A growth plan
for every student



Expanding to include more current Benchmark and Authentic Assessment

Math

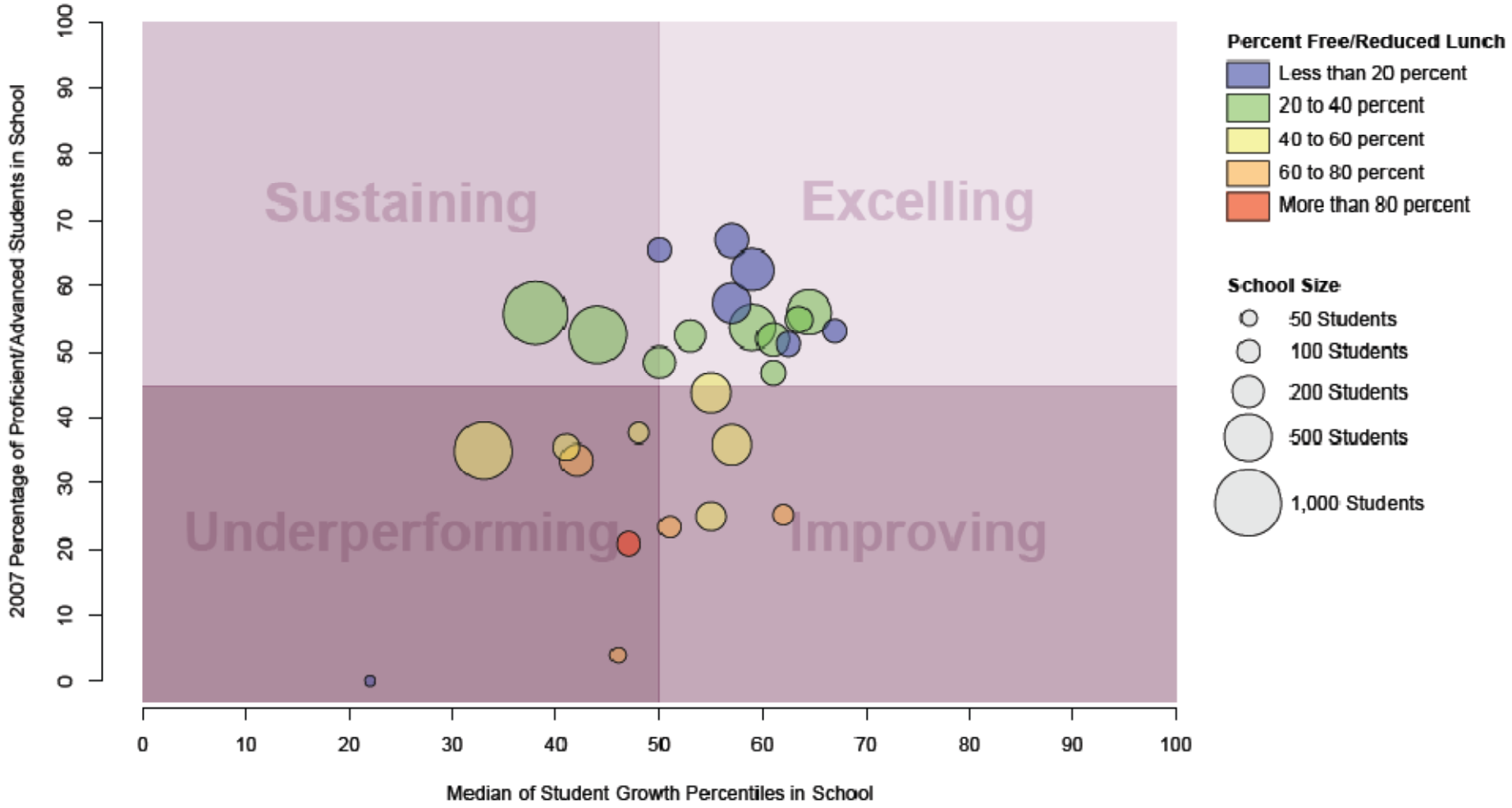
Achievement

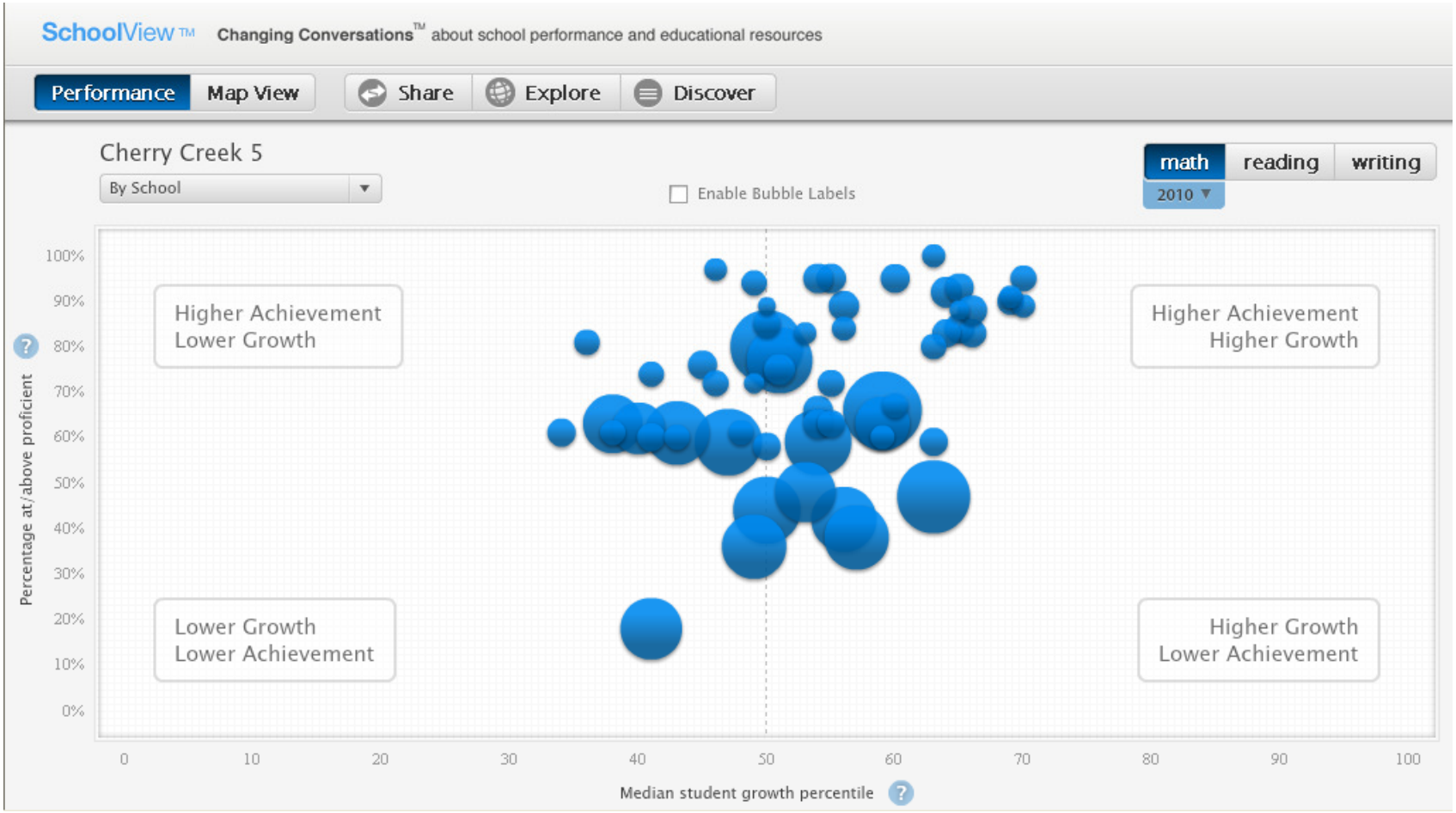
CSAP Math Scale Score

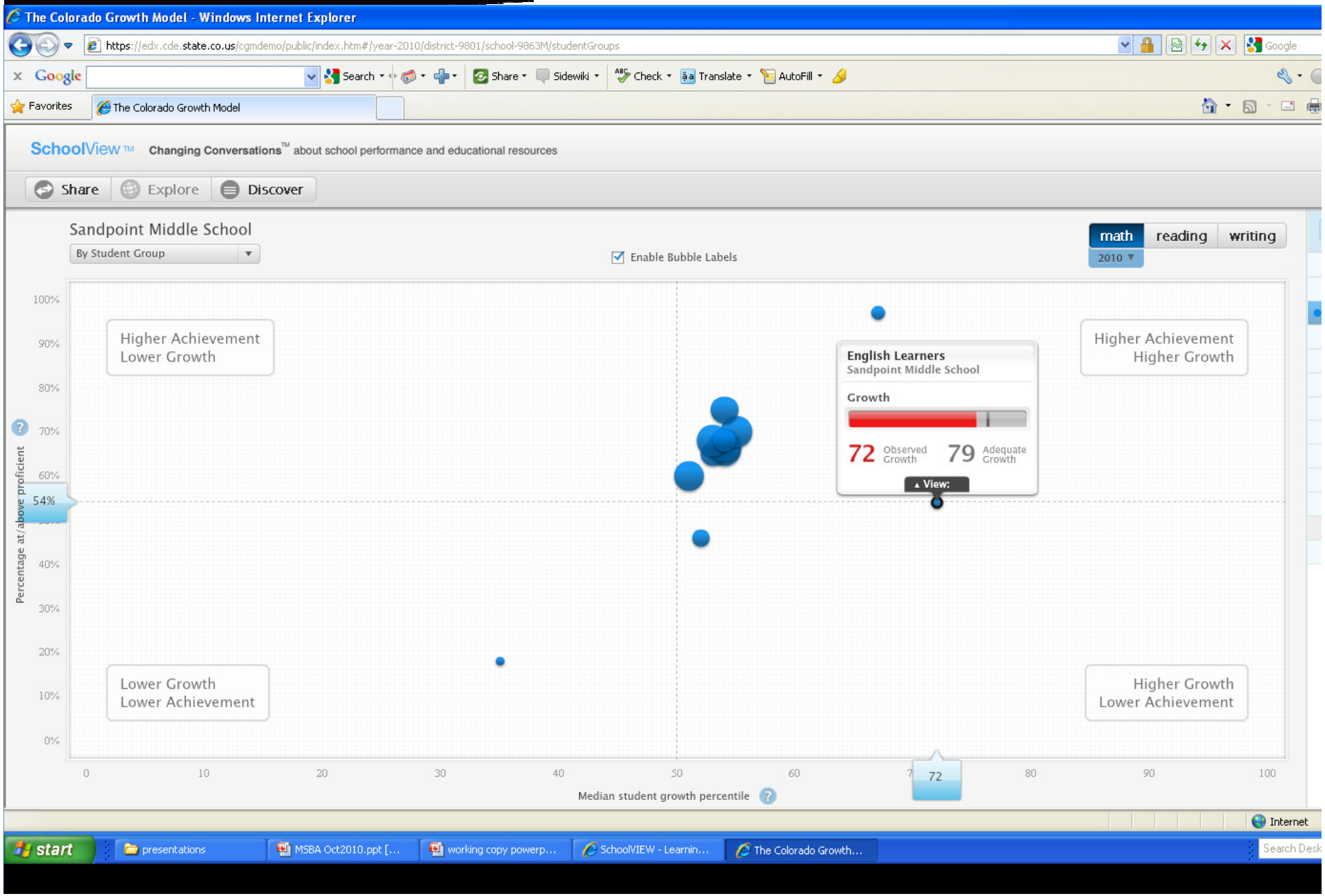
Growth

Level	Percentiles
High	66th – 99th
Typical	35th – 65th
Low	1st – 34th

Student Growth versus 2007 Student Achievement by Free/Reduced Lunch Percentage




SchoolView™
Changing Conversations™ about school performance and educational resources
Performance
Map View
Share
Explore
Discover
Cherry Creek 5
By School
Enable Bubble Labels
math
reading
writing
2010
Higher Achievement
Lower Growth
Higher Achievement
Higher Growth
Lower Growth
Lower Achievement
Higher Growth
Lower Achievement
Percentage at/above proficient
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
10
20
30
40
50
60
70
80
90
100
Median student growth percentile


The Colorado Growth Model - Windows Internet Explorer
https://edx.cde.state.co.us/cgmdemo/public/index.htm#/year-2010/district-9801/school-9863M/studentGroups
The Colorado Growth Model
SchoolView™ Changing Conversations™ about school performance and educational resources
Share
Explore
Discover
Sandpoint Middle School
By Student Group
Enable Bubble Labels
math
reading
writing
2010
Higher Achievement
Lower Growth
Higher Achievement
Higher Growth
Lower Growth
Lower Achievement
Higher Growth
Lower Achievement
English Learners
Sandpoint Middle School
Growth
72 Observed Growth
79 Adequate Growth
View:
Percentage at/above proficient
54%
Median student growth percentile
72
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presentations
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SchoolVIEW - Learnin...
The Colorado Growth...
Internet

What is Next --Pilots

- Explore Various Types of Growth Models
- Explore Student Growth Percentiles to Inform Instructional Decision-making
- Explore Practical Data Visualization Options for ***Student Growth Percentiles***
  - ***Missouri Pilot Project 2010-2011***
  - ***Include Benchmark and Local Assessments***

Working with Other States and with Missouri Districts

COLORADO GROWTH MODEL RESOURCES

http://www.schoolview.org/learningcenter.asp

CONCLUDING THOUGHTS YOURS AND OURS

- What about leadership?
- How can we make evidence based instructional decision making more accessible and meaningful?

THE POWER OF DATA ANALYSIS TO INFORM IMPROVEMENT

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