

Current Population Survey Local Area Unemployment Statistics

Response to Hurricane Katrina

Diane Herz and Sandra Mason

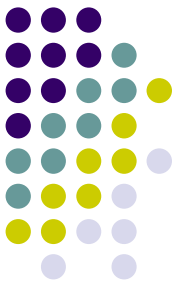
Bureau of Labor Statistics

ASA Strategic Initiative Workshop on Modifying Surveys in
Response to Disruptions

March 15-16, 2007



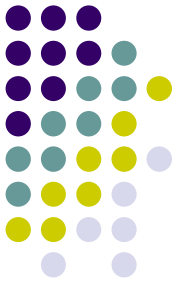
The Current Population Survey



- Nation's labor force survey
- Co-sponsored by BLS and Census
- Conducted monthly
- Produces timely statistics on the labor force, including the unemployment rate
- Used as an input to models for state & local employment and unemployment measures
- Demographic data all persons
- Labor force data for age 15+



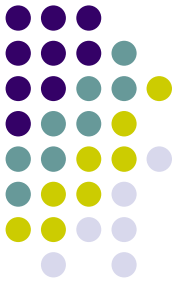
The CPS Sample & Operations



- About 72,000 addresses selected each month
- Residential units only
- Non-residential units, such as shelters, hotels, and stadiums, are not included in the sample
- Frame: decennial census + periodic updates from administrative sources
- Computer-assisted telephone and personal interviews
- 4-8-4 rotation pattern
- Survey does not follow movers



Survey Timing & Katrina



Current Population Survey calendar, August-September, 2005

August 2005

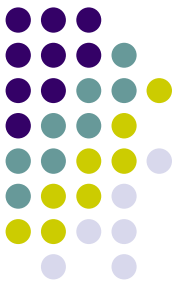
	1	2	3	4	5	6
7	8	9	10	11	12	13
Survey reference week						
14	15	16	17	18	19	20
Survey collection period						
21	22	23	24	25	26	27
28	29 Katrina landfall	30	31			

September 2005

				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
Survey reference week						
18	19	20	21	22	23	24 Rita landfall
Survey collection period						
25	26	27	28	29	30	



BLS and Census Priorities



- Assessing safety of Field Representatives
- Assessing impact of massive evacuation
 - CPS not designed to pick up migration
 - Would miss Respondents living in out-of-scope locations
 - Would find R's who relocated to other in-scope units



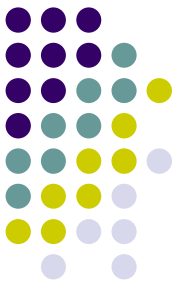
Briefly considered special survey on out-of-scope evacuees



- Not clear how to adequately draw a sample that would represent group, especially within time constraints
- Access to evacuees was limited
- Evacuees were highly mobile
- No budget for the effort



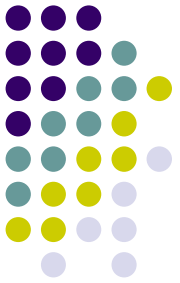
Maximized chances of reaching affected households



- Three types of non-interviews in CPS
 - Uninhabitable households are coded as “Type C” and taken out of sample
 - Modified procedures to code these households as “Other Type B” to keep them in sample
- Clarified interviewer procedures
 - Unless evacuees in CPS HHs had a “usual residence elsewhere” to which they “could return at any time,” they would be interviewed where they were found
 - With a job, bad weather



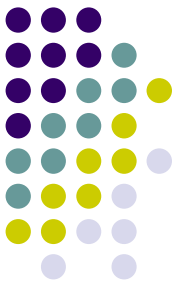
CPS completed interviews



Number completed interviews, August-November 2005 and June 2006, in selected areas affected by Hurricanes Katrina and Rita							
Geographic area	2005		2006	<i>Percent change from August 2005 to:</i>			
	August	September	June	September 2005	October 2005	November 2005	June 2006
Louisiana, total	580	372	518	-35.9	-25.5	-21.0	-10.7
New Orleans metropolitan area	174	16	113	-90.8	-62.1	-54.6	-35.1
Orleans parish	63	0	22	-100.0	-81.0	-74.6	-65.1
Jefferson parish	62	3	49	-95.2	-48.4	-46.8	-21.0
Balance of New Orleans	49	13	42	-73.5	-55.1	-38.8	-14.3
Calcasieu parish	34	13	38	-61.8	-85.3	-11.8	11.8
Balance of Louisiana	372	343	367	-7.8	-3.0	-6.2	-1.3
Mississippi, total	570	498	512	-12.6	-10.0	-9.1	-10.2
Hancock, Harrison, & Jackson counties	78	46	65	-41.0	-29.5	-25.6	-16.7
Balance of Mississippi	492	452	447	-8.1	-6.9	-6.5	-9.1
Florida, total	2,335	2,313	2,341	-0.9	-0.4	1.4	0.3
Texas, total	2,654	2,388	2,604	-10.0	-2.0	-0.1	-1.9



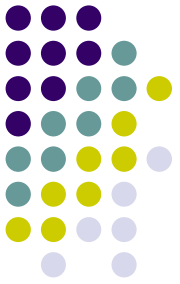
Impact of missing households on estimation procedures



- Non-interview adjustment
 - Reduced numerator and denominator
 - Did not make a large impact
- Second-stage raking
 - Controlled to population totals
- Augmenting population controls
 - NCOA database beginning in October



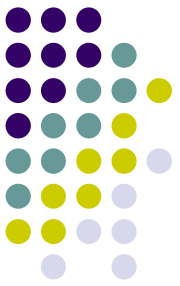
Relevance of CPS concepts



- Press would expect a large spike in unemployment, declines in employment
- CPS concepts still worked well for evacuees
 - Unemployment:
 - Employment
 - With a job, but not at work
 - Not in labor force



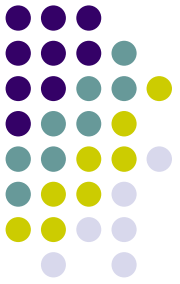
Special Katrina questions



- New questions were added beginning in October 2005
- Objectives
 - Determine employment status of people who evacuated in August due to Katrina
 - Distinguish returnees from non-returnees
 - Collect demographic information
 - Collect state of origin (for population controls)



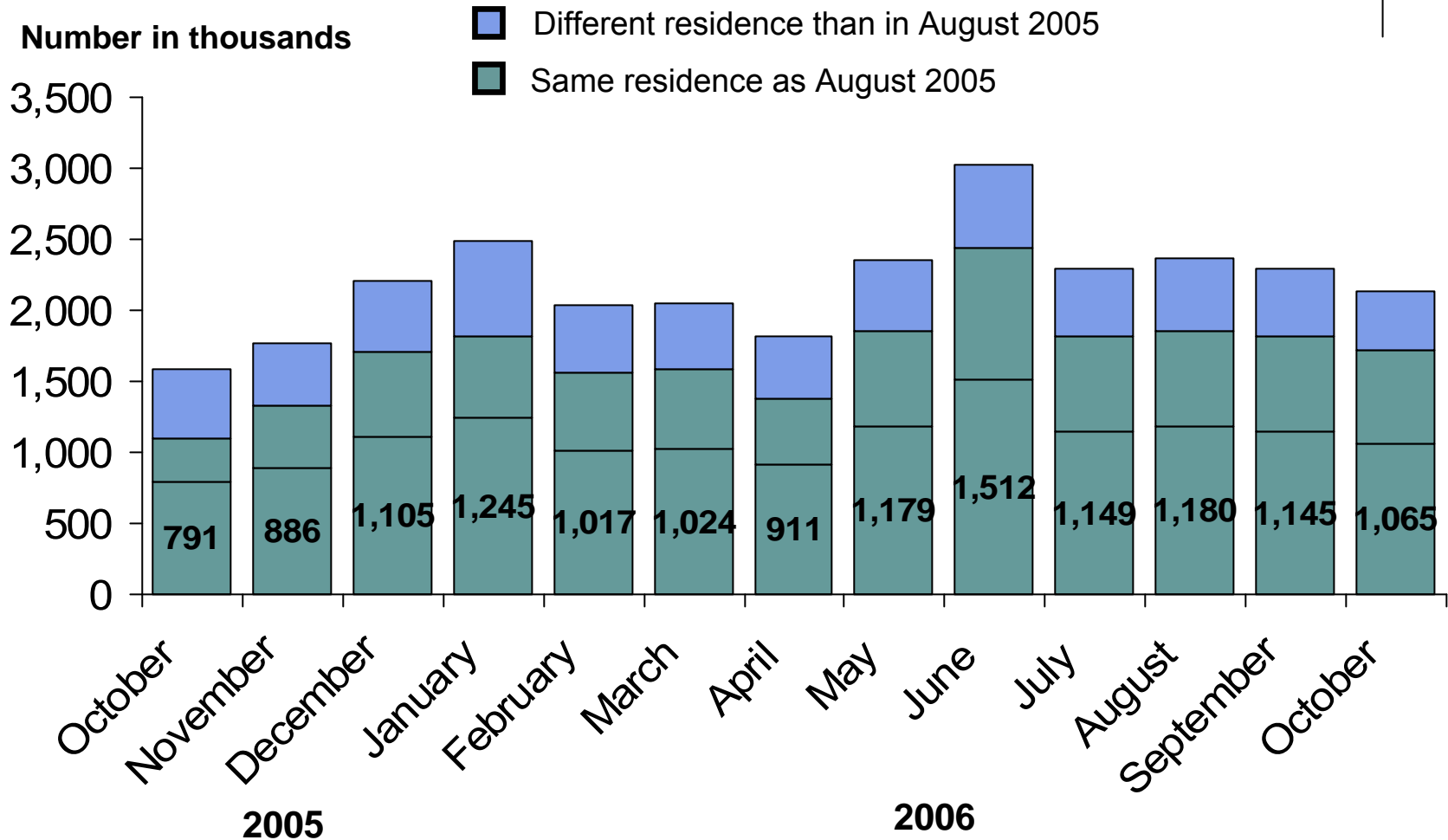
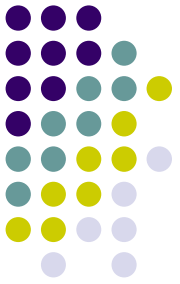
Question text



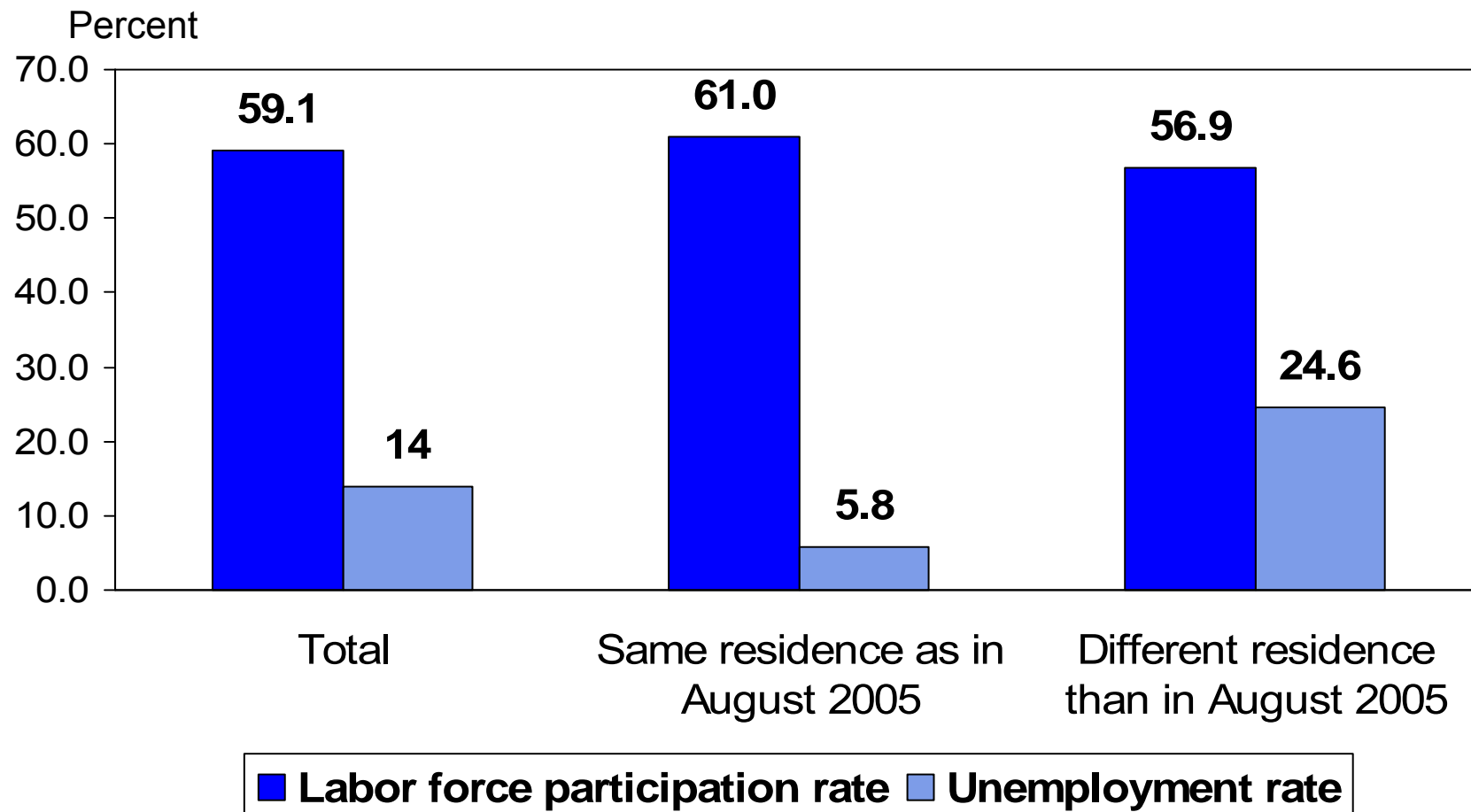
- *Is anyone living or staying here who had to evacuate, even temporarily, where he or she was living in August because of Hurricane Katrina?*
- *Earlier you indicated that at least one person in the household had to evacuate where he or she was living in August because of Hurricane Katrina. Who was that?*
- *In August, prior to the Hurricane warning, where was [NAME] living? (this address, Not this address: LA, MS, AL, FL)*
- *What county, parish, or city was [NAME] living in prior to the hurricane warning?*



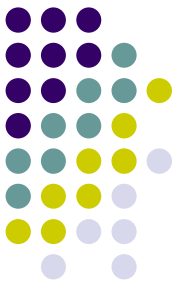
Evacuees represented in CPS



Labor force participation rates and unemployment rates of Hurricane Katrina evacuees, 13-month average, October 2005-October 2006



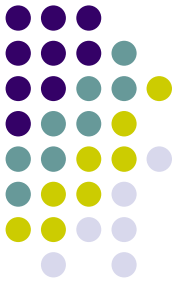
Issues with the questions



- Low match rate month to month
- Assumed 1 Yes = Evacuee
- Met with interviewers
 - Some R's had exempted themselves out
 - Some thought reporting once was enough
- Additional instructions provided in June
- Also concerned we were finding regular movers



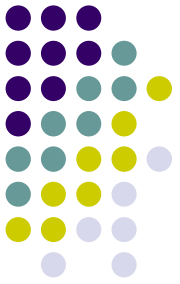
Questions added in June 2006



- *Did you move back, even temporarily, to the address you had prior to Hurricane Katrina? If yes*
- *How long did you stay?*
 - ❑ Less than 2 weeks
 - ❑ 2 to 4 weeks
 - ❑ A month or more
- *Why did you leave after returning?*



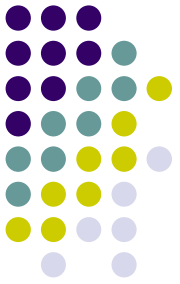
Lessons learned



- Emergency preparedness in field is critical
- Disaster planning for questionnaire and estimation is important & solutions vary
- CPS is resilient
- Partnerships with other agencies are important



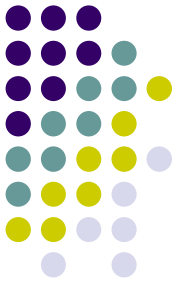
CPS next steps



- Census considering options for updating sample frame in affected areas
- Continue analysis of evacuee data
- Consulting methodologists
- Would like to develop disaster plans for various scenarios



Local Area Unemployment Statistics



Local Area Unemployment Statistics (LAUS)

- Federal-State cooperative program
- Responsible for the development of monthly estimates of
 - the civilian labor force
 - total employment
 - total unemployment and the unemployment rate
- More than 7,200 areas in the nation.



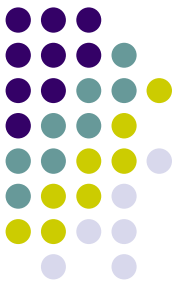


The LAUS Program in brief

- **Data:** Civilian labor force, total employment, total unemployment, unemployment rate
- **Geography:** Census regions and divisions, States, DC, Puerto Rico, metropolitan areas, micropolitan areas, small labor market areas, counties, cities and towns in New England, cities of 25,000+ population elsewhere
- **Estimation:** Model-based, with varying levels of sophistication depending on data availability
- **Frequency:** Monthly—one of the most timely and important subnational economic indicators
- **Uses:** Current economic analyses, labor market studies, Federal fund allocations exceeding \$45 billion a year

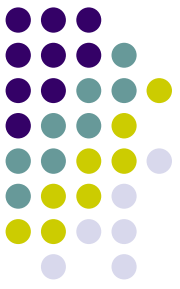


Sources of data for LAUS estimation

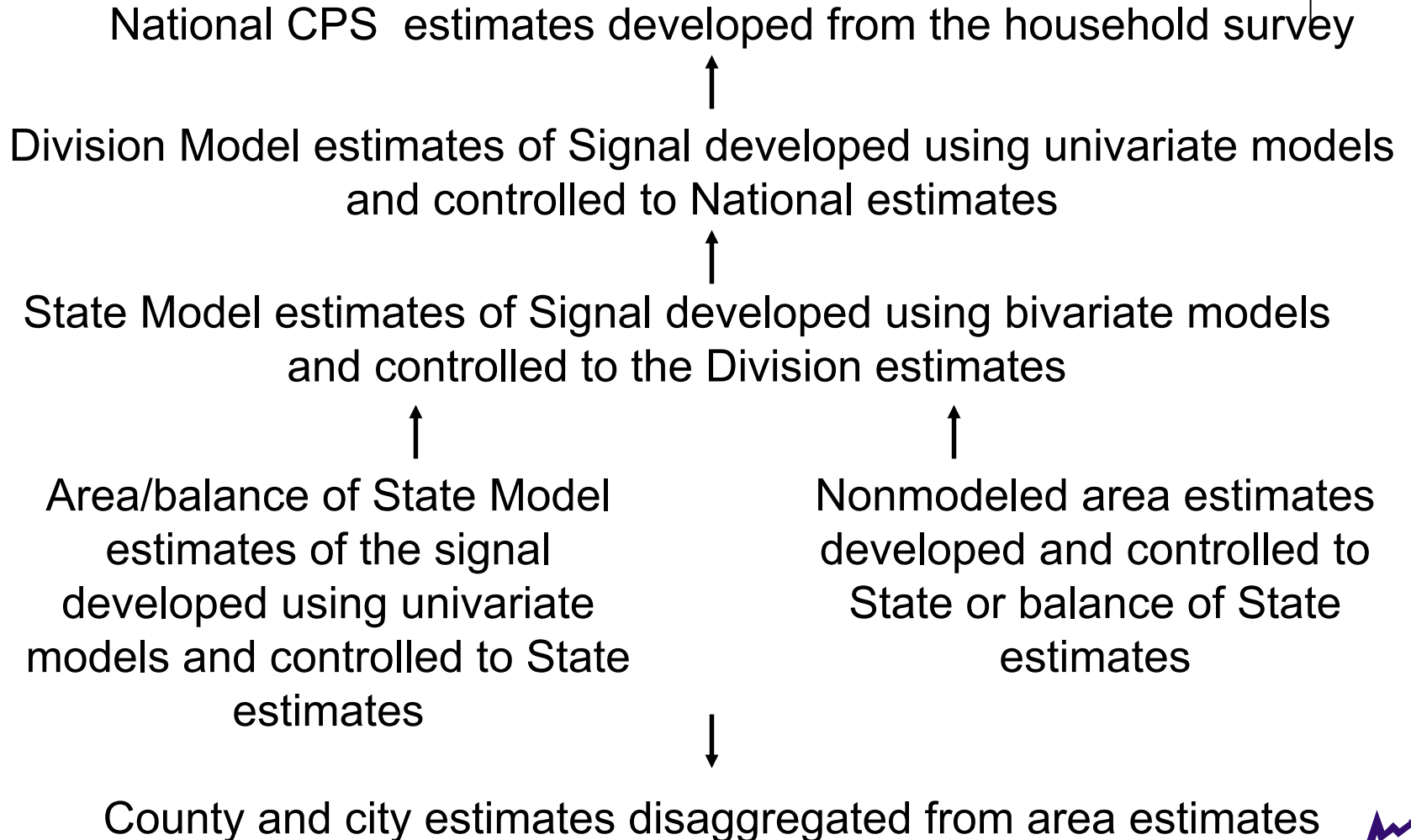


- **CPS estimates of employed and unemployed** --divisions, States, and selected areas
- **Nonfarm wage and salary establishment employment** --States and all labor market areas
- **Unemployment Insurance statistics** on people covered by unemployment compensation who are jobless in the CPS reference week for the States and all substate areas
- **Decennial Census** for population, employment, and unemployment





Structure of LAUS estimation



LAUS Models



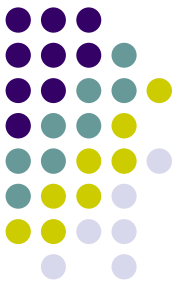
- CPS = “Truth” + Survey Error

$$y_t = Y_t + e_t$$

- Combine model of truth with model of survey error and fit to long historical series



Model of “Truth”

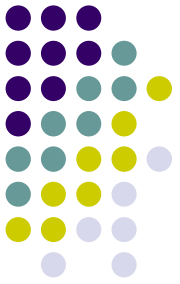


- Exploits strong time series regularities in historical CPS
- Based on classical decomposition
 - Long term : Trend (T)
 - Short term : Seasonal (S)

$$Y_t = T_{y,t} + S_{y,t} + I_{y,t}$$



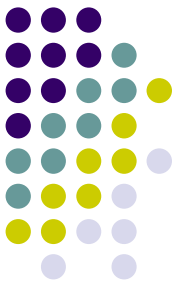
How to account for Shocks?



- Extend time series model to include a model of the shocks
- Regression to explain deviations from normal behavior
- Effect of shock: $K_t = \alpha D_t$
 - D_t = special regression variable specifies
 - timing
 - duration
 - response pattern
 - α = magnitude & direction of initial effect



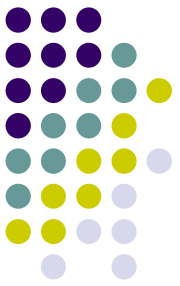
Intervention model assumes a lot is known



- Timing – when disturbance first occurs
- Duration – how long it will last
- Response pattern–
 - does series jump to new level & stay there?
 - continue to change abruptly?
 - gradually decay?



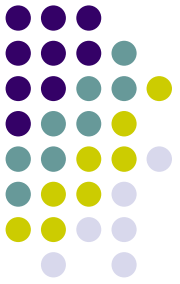
Outlier detection & correction in historical time



- Standard practice in LAUS models
- Usually have several years of data following occurrence of outlier
- Usually do not attempt to correct for outliers in real time
 - Not enough information at end of series



Katrina is different

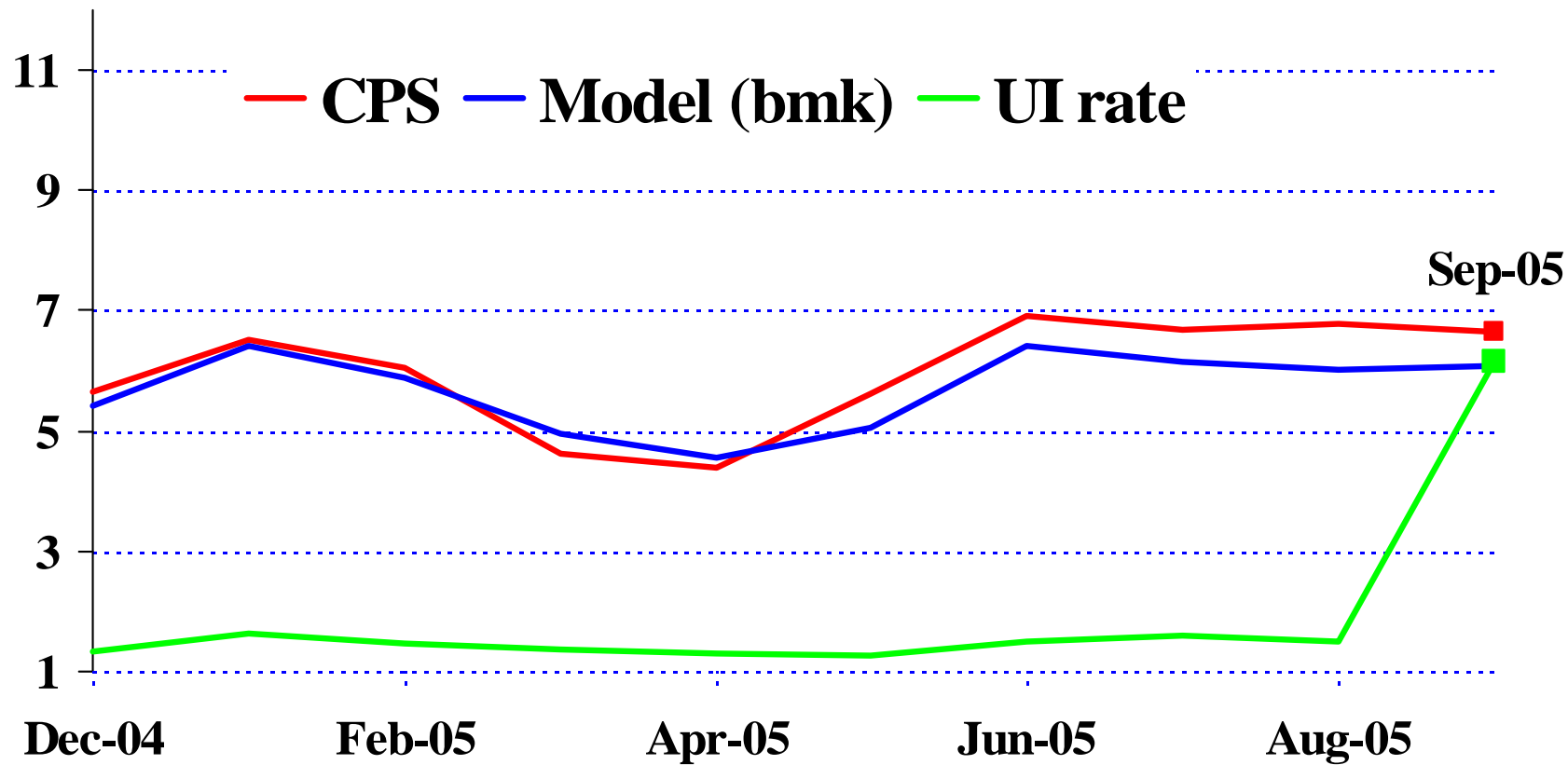


- We know
 - When: September (1st reflected in data)
 - Where: LA, MS (AL, FL & TX not strongly affected)
- But disturbance only partially reflected in data--not in CPS but in State-supplied (UI claims and payroll employment) variables
- Focus on developing intervention models for UI and CES

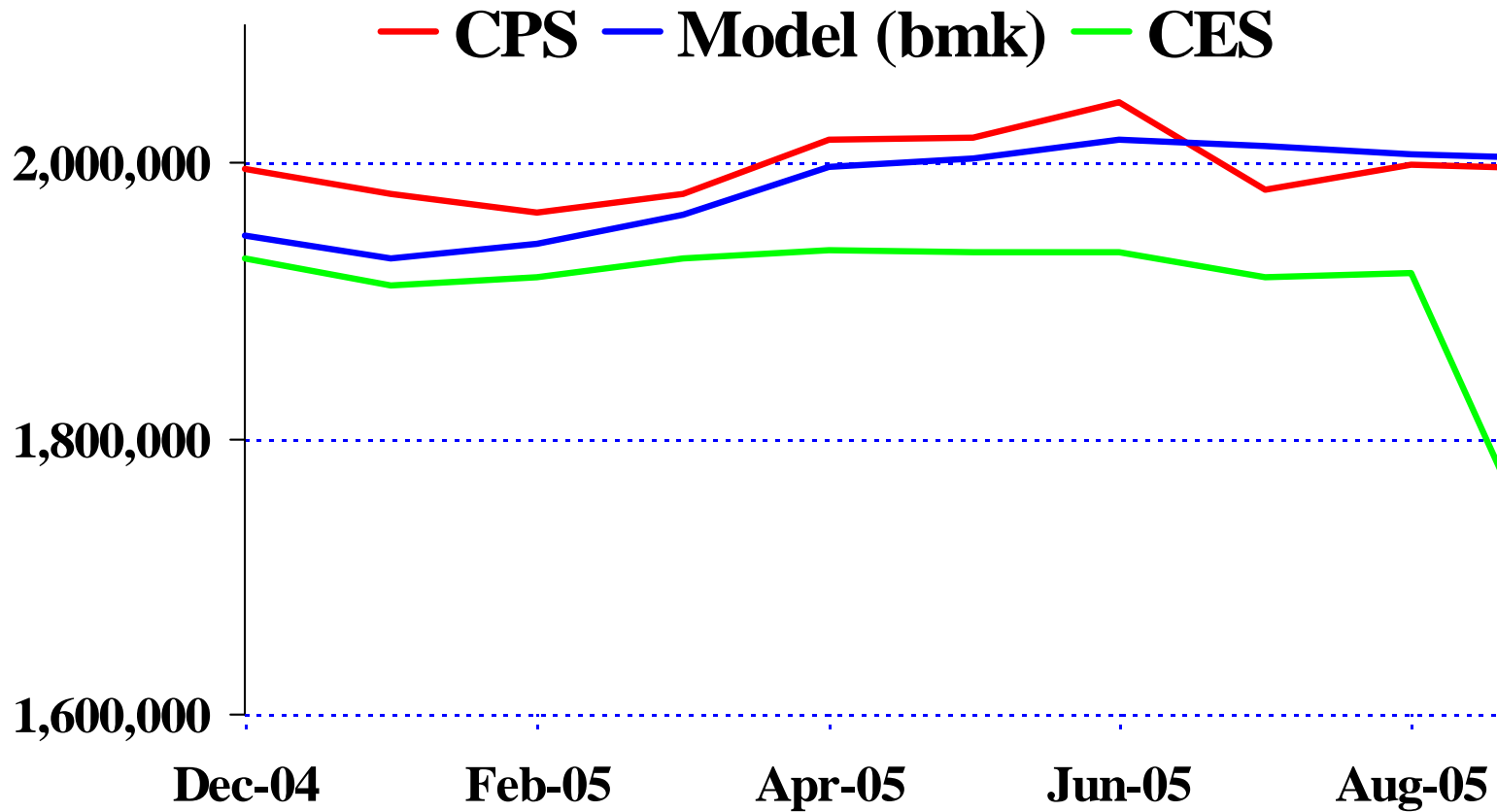
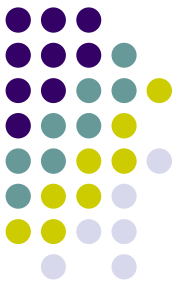




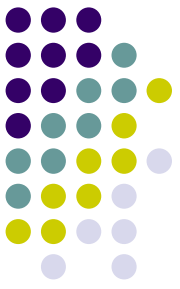
LA Unemployment rate



LA Employment



Steps in estimating Katrina effects on CPS



- Specify, test and fit intervention model to X_t (State-supplied inputs) and estimate $K_{x,t}$
- Adjust CPS
- Specify, test and fit intervention model to adjusted CPS
 - Yields estimate of Katrina effect



How to specify IV models?



- To adapt UI and CES models to reflect Katrina must add appropriate regression variables
- Don't know
 - Duration
 - Response pattern



A Number of Possibilities



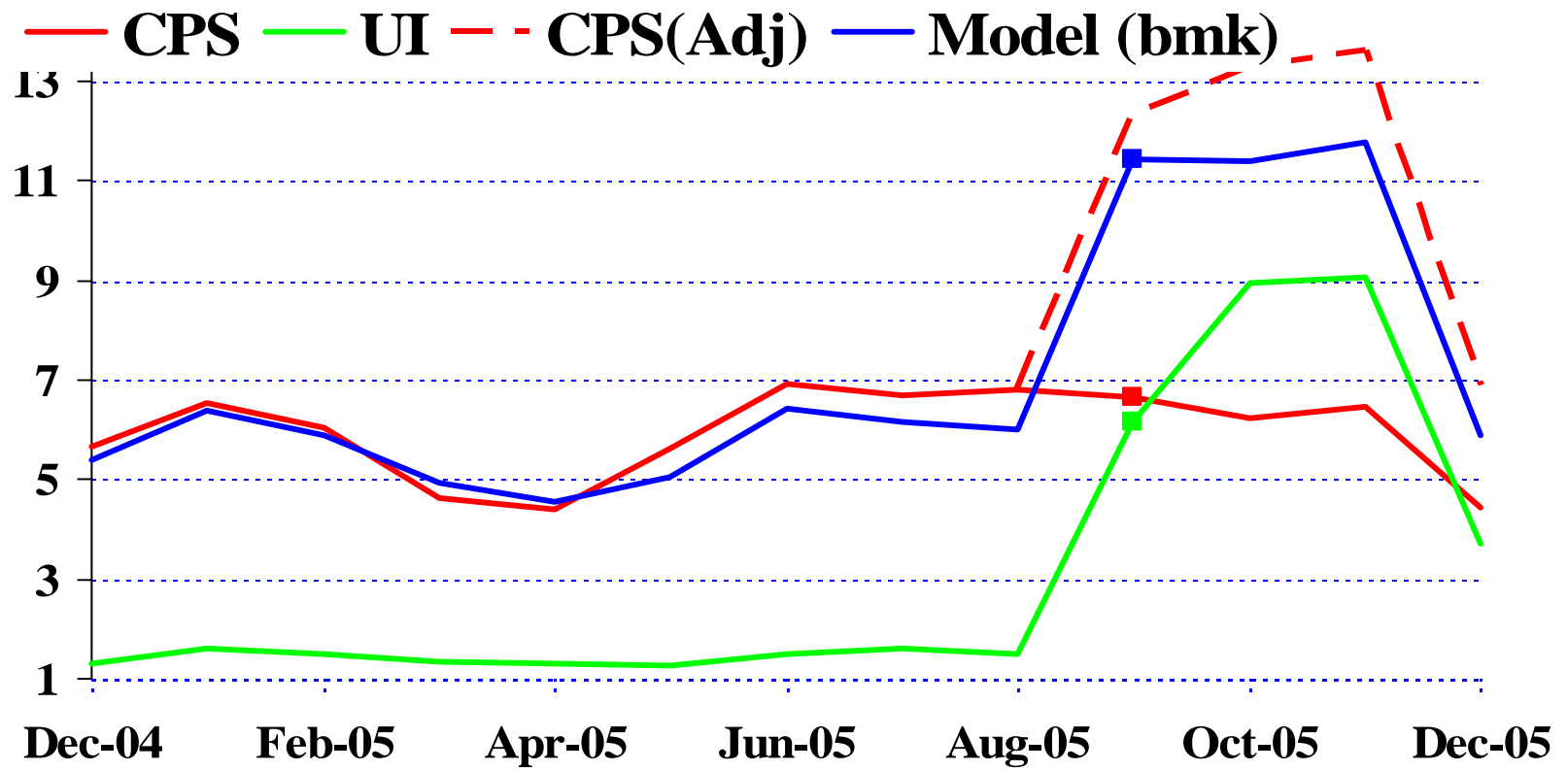
- Initially have only one observation available to estimate deviation from normal
 - Any intervention model will fit equally well
- Problem is in succeeding months
 - New data may invalidate initial assumptions
 - Made modifications on-the-fly in 2005 with little disruption because prior months were revised each month during 2005
 - Dropped prior month revisions in 2006





LA Unemp Model

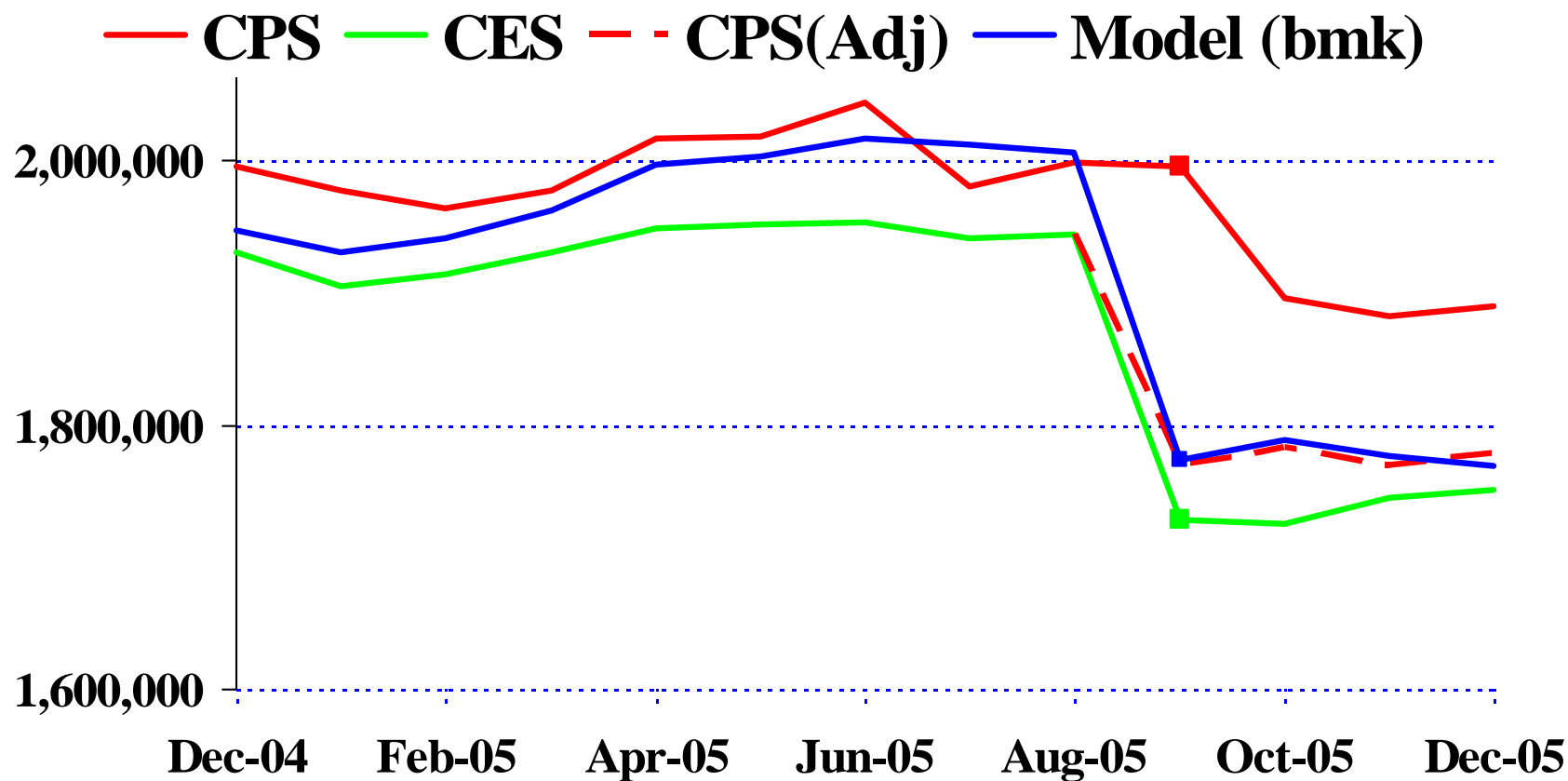
+LS Sep05 & -LS Dec05





LA Employment Model

CPS & CES: -LS Sep05



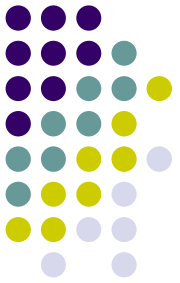
Communications



- Nature of hurricane and impact on program operations and estimation resulted in heightened communication with regional and State partners
 - Conference calls with impacted States each month
 - Information on BLS website regarding LAUS actions



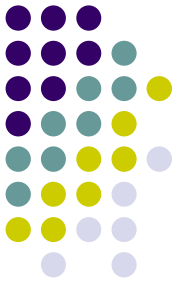
Summary of LAUS Actions



- Katrina effects not evident in State CPS samples, but in CES and UI series
 - Basic relationship of State models was shifted to place more weight than normal on these supporting variables
- But, UI claims series was greatly affected by administrative decisions made in Louisiana regarding payment of unemployment insurance



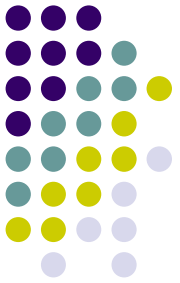
Summary of LAUS Actions



- On the employment side, some employers continued to issue checks for employees who may have been receiving UI benefits
 - Some double-counting of employed and unemployed may have occurred
- Still feel that the UI and CES series were the best indicators for Katrina effects



Summary of LAUS Actions



- Identifying outliers in real time was difficult
 - Form of the outliers initially determined with one month's data
 - Changed as more information was obtained
 - Significant revisions to previous estimates

