An Evaluation of a Public Water Education and Technical Assistance Program in Mississippi

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Introduction

- 1996 Safe Drinking Water Act required capacity assessment in all states
  - Technical
  - Managerial
  - Financial
- Mississippi implemented this requirement through an annual, standardized inspection of ***all*** public water systems through regional engineers

Capacity Assessment Survey Instrument

288,131

Mississippi Department of Health
Bureau of Public Water Supply

STANDARD FORM

FY 2010 Public Water System Capacity Assessment Form

NOTE: This form must be completed whenever a routine sanitary survey of a public water system is conducted by a regional engineer of the Bureau of Public Water Supply

PWS ID#: _____ Class: ___ Survey Date: _____ County: _____

Public Water System: _____ Conn: _____

Certified Waterworks Operator: _____ Pop: _____

CAPACITY RATING DETERMINATION

Technical (T) Capacity Rating: [___] Managerial (M) Capacity Rating [___] Financial (F) Capacity Rating [___]

Capacity Rating = $\frac{T + M + F}{3}$ = $\frac{\_}{3}$ = **Overall Capacity Rating = _____**

Completed by on

Comments: _____

Technical Capacity Assessment	Point Scale	Point Award
[T1] 1) Was the water treatment process functioning properly? [Y N] (ie. Is pH, iron, free chlorine, etc. within acceptable range?) 2) Was needed water system equipment in place and functioning properly at the time of survey? (No significant deficiencies/adequacy of security)? [Y N] (**NOTE:** Equipment deficiencies must be identified in survey report.) (**NOTE:** All YESs required to receive point)	All Y - 1 pt. Else - 0 pt.	
[T2] Were records available to the regional engineer clearly showing that all water storage tanks have been inspected and cleaned or painted (if needed) within the past 5 years? [Y N NA]	Y - 1pt. N - 0pt.	
[T3] 1) Was the certified waterworks operator or his/her authorized representative present for the survey? [Y N] 2) Was log book up to date and properly maintained and did it show that MDH Minimum JOB Guidelines for W. W. Operators were being met? [Y N] 3) Was the water system properly maintained at the time of survey? [Y N] 4) Did operator satisfactorily demonstrate to the regional engineer that he/she could fully perform all water quality tests required to properly operate this water system? [Y N] (**NOTE:** All YESs required to receive point)	All Y - 1 pt. Else - 0 pt.	
[T4] 1) Does water system routinely track water loss and were acceptable water loss records available for review by the regional engineer? [Y N] 2) Is water system overloaded? (i.e. serving customers in excess of MDH approved design capacity)? [Y N] 3) Was there any indication that the water system is/has been experiencing pressure problems in any part(s) of the distribution system? [Y N] (based on operator information, customer complaints, MDH records, other information) (**NOTE:** YES FOR #1 AND NOs FOR #2 & #3 required to receive point)	1)Y - pt. 2)N - pt. 3)N - pt.	
[T5] Does the water system have the ability to provide water during power outages? (i.e. generator, emergency tie-ins, etc.) [Y N] (**NOTE:** Must be documented on survey report)	Y - 1pt. N - 0pt.	
TECHNICAL CAPACITY RATING = [_____] (Total Points)		

Revision Date: 06/15/2009

Public Water System: _____ PWS ID#: _____

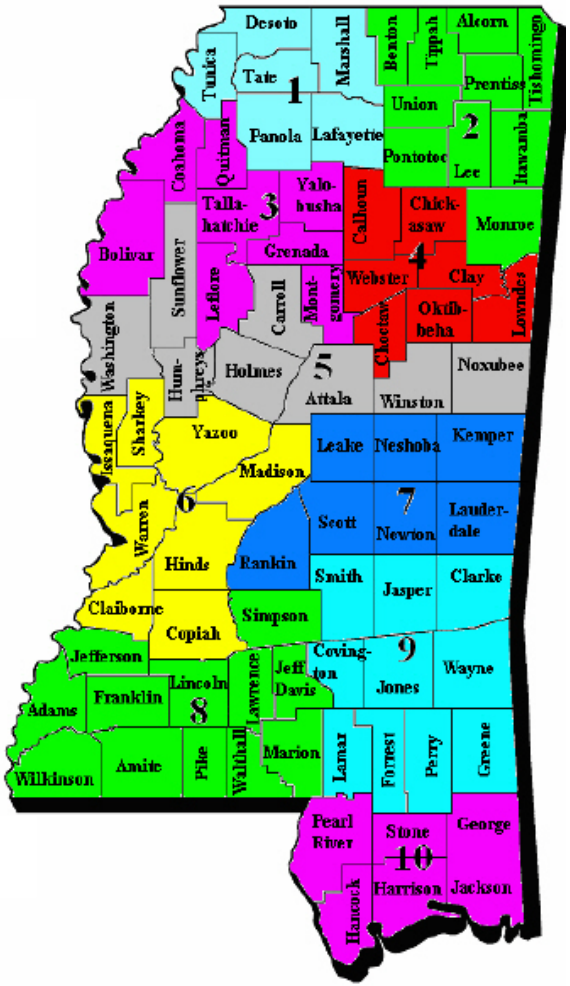
FY 2010 Public Water System Capacity Assessment Form Survey Date: _____

Managerial Capacity Assessment	Point Scale	Point Award
[M1] Were all SDWA required records maintained in a logical and orderly manner and available for review by the regional engineer during the survey? [Y N]	Y - 1pt. N - 0pt.	
[M2] 1) Have acceptable written policies and procedures for operating this water system been formally adopted and were these policies available for review during the survey? [Y N] 2) Have all board members (in office more than 12 months) completed Board Member Training? [Y N NA] 3) Does the Board of Directors meet monthly and were minutes of Board meetings available for review during the survey? (**NOTE:** Quarterly meetings allowed if system has an officially designated full time manager) [Y N NA] (**NOTE:** ALL YESs or NAs required to receive point. NA - Not Applicable)	All Y - 1 pt. Else - 0 pt.	
[M3] Has the water system had any SDWA violations since the last Capacity Assessment? [Y N]	N - 1pt. Y - 0pt.	
[M4] Has the water system developed a long range improvements plan and was this plan available for review during the survey? [Y N]	Y - 1pt. N - 0pt.	
[M5] 1) Does the water system have an effective cross connection control program in compliance with MDH regulations? [Y N] 2) Was a copy of the MDH approved bacti site plan and lead/copper site plan available for review during the survey and do the bacti results clearly show that this approved plan is being followed? [Y N] (**NOTE:** All YESs required to receive point)	All Y - 1 pt. Else - 0 pt.	
MANAGERIAL CAPACITY RATING = [_____] (Total Points)		

Financial Capacity Assessment	Point Scale	Point Award
[F1] Has the water system raised water rates in the past 5 years? [Y N] (**NOTE:** Point may be awarded if the water system provides acceptable financial documentation clearly showing that a rate increase is not needed, i.e. revenue has consistently exceeded expenditures by at least 10%, etc.)	Y - 1pt. N - 0pt.	
[F2] Does the water system have an officially adopted policy requiring that water rates be routinely reviewed and adjusted as appropriate and was this policy available for review during the survey? [Y N]	Y - 1pt. N - 0pt.	
[F3] Does the water system have an officially adopted cut-off policy for customers who do not pay their water bills, was a copy of this policy available for review by the regional engineer, and do system records (cut-off lists, etc.) clearly show that the water system effectively implements this cut-off policy? [Y N]	Y - 1pt. N - 0pt.	
[F4] Was a copy of the water system's officially adopted annual budget available for review by the regional engineer and does the water system's financial accounting system clearly and accurately track the expenditure and receipt of funds? [Y N]	Y - 1pt. N - 0pt.	
[F5 - Municipal Systems] 1) Is the municipality current in submitting audit reports to the State Auditor's Office? [Y N] 2) Was a copy of the latest audit report available for review at the time of the survey? [Y N] 3) Does this audit report clearly show that water and sewer fund account(s) are maintained separately from all other municipal accounts? [Y N] (**NOTE:** Yes answer to all questions required to receive point.)	All Y - 1 pt. Else - 0 pt.	
[F5 - Rural Systems] 1) Has the rural water system filed the required financial reports with the State Auditor's Office and were these reports available for review? [Y N] 2) Does the latest financial report show that receipts exceeded expenditures? [Y N] (**NOTE:** Yes answer to both questions required to receive point)	All Y - 1 pt. Else - 0 pt.	
FINANCIAL CAPACITY RATING = [_____] (Total Points)		

Revision Date: 06/15/2009

MSDH Regions



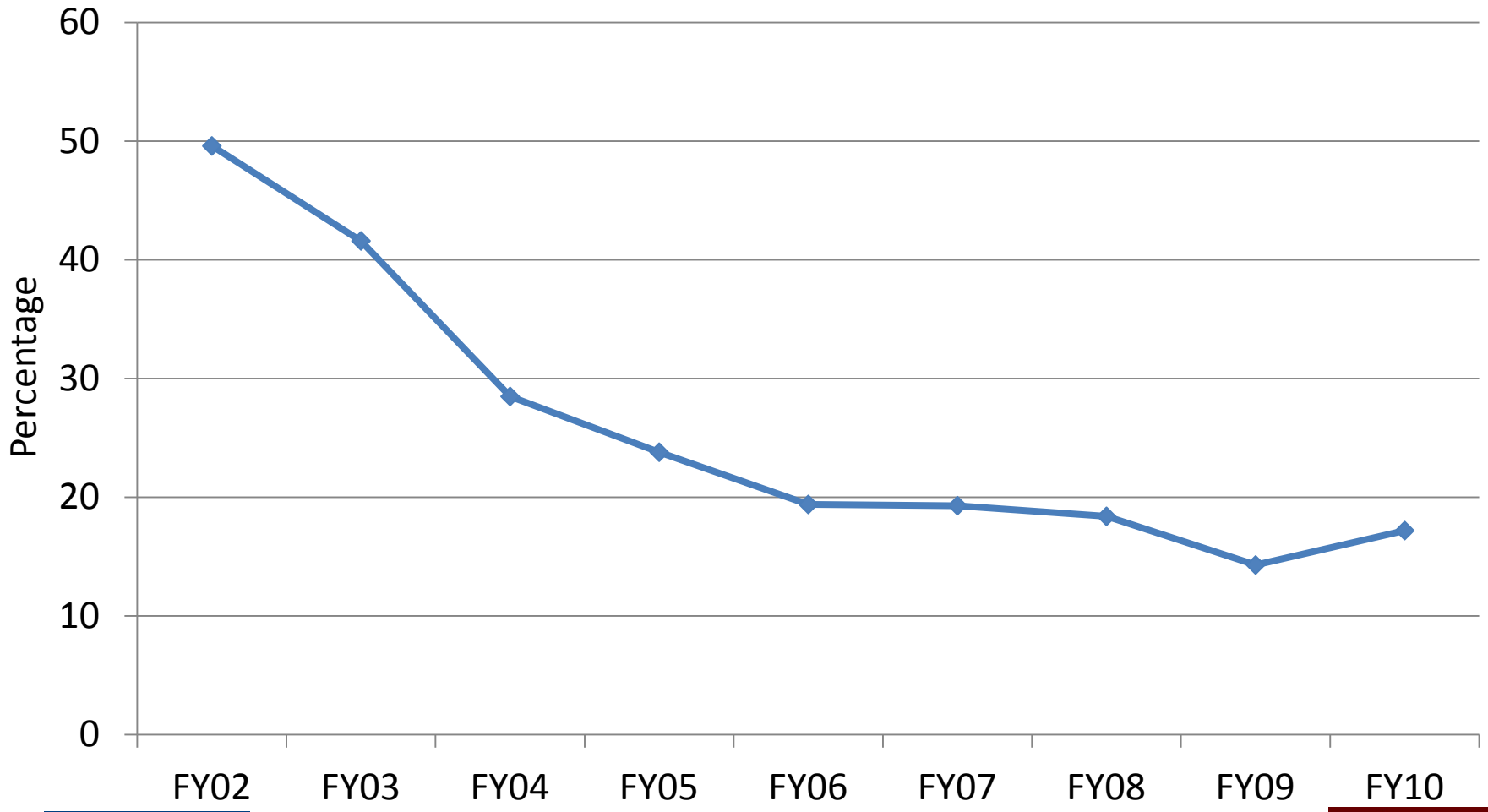
Mississippi State Department of Health

MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE

Introduction

- Deficiencies were pointed out and expected to be corrected
- Systems were scored on a scale of 0 to 5
- Mainly advisory in nature; but score was public knowledge and source of pride
- Each section worth 5 points; final score was arithmetic average of three sections

Pct of Systems Scoring 3.0 or Below



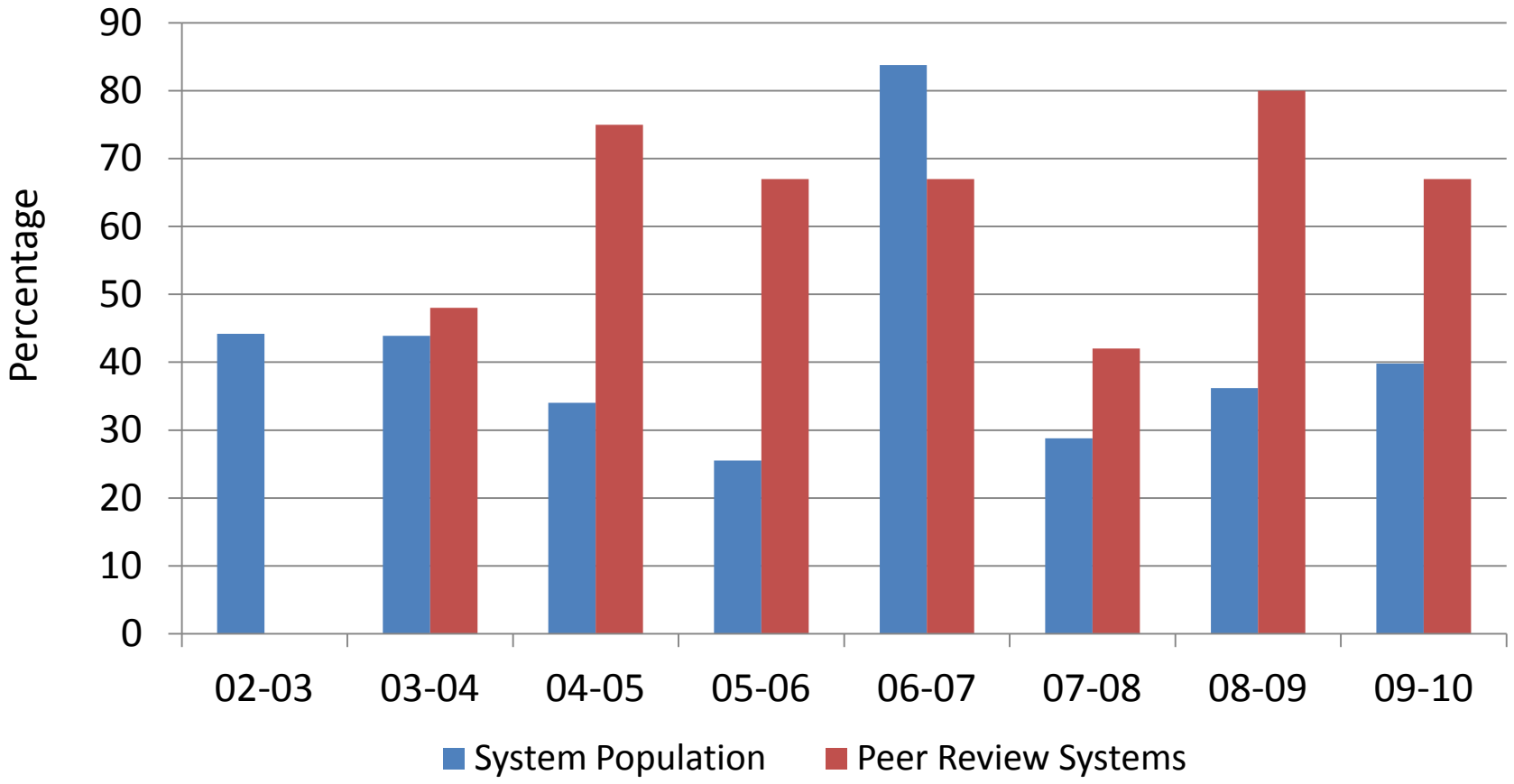
Mississippi State Department of Health

Mississippi State University Extension Service

Introduction

- Peer Review program established in FY2003
- Brought team of high performing operators to consult with low performing systems
- Targeted systems scored 3.0 or below on capacity assessment inspection survey
- Anonymous for regulatory agencies; completely voluntary
- Funded by State Drinking Water Revolving Fund

Pct of Systems Scoring 3.0 or Below In Year t and Achieving Success in t+1



Mississippi State Department of Health

Mississippi State University Extension Service

Introduction

- Peer Review program became more important in December 2009
- Implementation of Groundwater Rule required regulatory Sanitary Surveys
- Regulatory audit to be performed at least every 3 years
- Systems scoring 3.0 or below were considered to be “of concern” by MSDH

Objective

- Develop an evaluation of performance of Peer Review program to be used for future funding and marketing efforts
- Made possible with the availability of data contained in the Safe Drinking Water Information System (SDWIS) database
- Comprehensive database of capacity assessment inspection reports

Question

- What are the factors that comprise a "success"
- Success is defined as a system that scores a 3.0 or below in year t and then scores above a 3.0 in year t+1
- Failure is scoring 3.0 or below in t and t+1

Model

- Linear probability model was formulated
- Binary dependent variable
  - 1 if success
  - 0 if failure
- Analysis performed on 2646 observations
  - 32.4 percent of systems achieved success
  - 2.8 percent of systems underwent peer review

Model

SUCCESS=f(PR, OPCHG, OWNER, REG*i*, CLASS*j*, POPCHG, WEALTHCHG, HHYCHG) where

- SUCCESS=Capacity Assessment Success
- PR=Did system undergo Peer Review?
- OPCHG=Was the operator replaced?
- OWNER=Type of system “owner” (Private, Association, District, Municipality)
- REG*i*=MSDH region
- CLASS*j*=System class based on treatment procedure
- SYSPOP=Proportion of county population change
- WEALTHCHG=Proportion of county wealth index chg
- HHYCHG=Proportion of county HH income change

Results

	Marginal Effect	t-ratio	Robust t-ratio	Robust Std Error
Intercept	.2017	5.34, 0.000	3.48, 0.007	0.0580
PR	.2044	3.85, 0.000	2.83, 0.020	0.0721
OPCHG	-.0406	-1.70, 0.090	-2.32, 0.045	0.0175
PRIVATE	-.0520	-1.44, 0.150	-0.75, 0.475	0.0698
ASSOC	.1428	4.04, 0.000	2.29, 0.048	0.0623
DISTRICT	.1913	2.15, 0.032	1.47, 0.176	0.1303
MUNI	0.1575	2.15, 0.032	2.28, 0.049	0.0692
ACLASS	.0819	0.48, 0.633	0.51, 0.621	0.1601
BCLASS	.0696	1.62, 0.105	1.37, 0.205	0.0510
CCLASS	.1320	4.29, 0.000	7.53, 0.000	0.0175
ECLASS	-.0537	-1.57, 0.118	-1.32, 0.220	0.0407

Results

	Marginal Effect	t-ratio	Robust t-ratio	Robust Std Error
REG1	-0.1294	-3.38, 0.000	-7.21, 0.000	0.0179
REG2	0.0351	0.91, 0.362	1.14, 0.285	0.0309
REG3	-0.0730	-2.08, 0.037	-1.92, 0.087	0.0380
REG4	0.0801	1.69, 0.091	2.67, 0.025	0.0300
REG5	0.0031	0.08, 0.935	0.09, 0.933	0.0361
REG6	0.0908	2.23, 0.026	2.65, 0.026	0.0343
REG7	0.1860	3.42, 0.001	6.75, 0.000	0.0276
REG8	0.0517	1.22, 0.221	1.34, 0.214	0.0387
REG9	0.1652	3.61, 0.000	5.61, 0.000	0.0294
POPCHG	0.8208	0.87, 0.386	0.69, 0.505	1.1822
WEALTHCHG	-1.1679	-1.62, 0.106	-1.18, 0.267	0.9876
HHYCHG	0.4461	1.86, 0.063	1.39, 0.199	0.3219

Conclusions

- PR is positive, significant, large marginal effect – should be satisfactory to funder
- Delta regions have mostly negative, significant coefficients – most disturbing policy result
- Socioeconomic variables have no significance under robustness; finer data needs to be obtained (census tract level?)
- Change in the operator has negative effect – unexpected

Future Research

- Sustainability issues – success in t+2,3,4
- Insignificance of managerial issues – examine composition of governing board (municipal and association)?
- Why is sign for RPCIINC negative – look at components, particularly with regard to transfer payments