

# Statistical Methods to Account for Excluded Students in NAEP

This Research and Development (R&D) paper at NCES has been initiated:

1. To share studies and research that are developmental in nature. The results of such studies may be revised as the work continues and additional data becomes available.
2. To share the results of studies that are, to some extent, on the “cutting edge” of methodological developments. Emerging analytical approaches and new computer software development often permit new and sometimes controversial analyses to be done. By participating in “frontier research,” we hope to contribute to the resolution of issues and improved analysis.
3. To participate in discussions of emerging issues of interest to educational researchers, statisticians, and the federal statistical community in general. Such reports may document workshops and symposia sponsored by NCES that address methodological and analytical issues or may share and discuss issues regarding NCES practices, procedures, and standards.

The common theme in all three goals is that these reports present results or discussions that do not reach definitive conclusions at this point in time, either because the data are tentative, the methodology is new and developing, or the topic is one on which there are divergent views. Therefore, the techniques and inferences made from the data are tentative and subject to revision. To facilitate the process of closure on the issues, we invite comment, criticism, and alternatives to what we have done. Such responses should be directed to:

Marilyn Seastrom  
Chief Statistician  
Statistical Standards Program  
National Center for Education Statistics  
1990 K Street, NW  
Washington, DC 20006–5654

Prepared by:

Mary J. Pitoniak  
Nancy A. Mead

Educational Testing Service

Prepared for:

U.S. Department of Education  
Institute of Education Sciences  
National Center for Education Statistics

June 2003

## Table of Contents

Introduction .....	1
Background.....	2
Exclusion Rates.....	3
Exclusion Rates Within Year .....	4
Exclusion Rates Over Time .....	9
Description of Adjustment Scenarios .....	12
Beaton Scenario.....	12
McLaughlin Scenario.....	14
Results .....	16
Grade 4.....	16
Grade 8.....	35
Future Research.....	53
Summary.....	53
References.....	54
Appendix .....	55

## Introduction

From NAEP's inception, some students have been excluded from the assessment because school officials believed that either they could not participate meaningfully in the assessment or that they could not participate without assessment accommodations that the program did not, at the time, make available. These students fall into the general categories of students with disabilities (SD) and limited-English-proficient students (LEP). Some identified students fall within both of these categories.

Consistently high levels of student inclusion across state and national samples are necessary to ensure the validity of NAEP results and enable accurate comparisons among groups of students both within a NAEP administration and across time. In response to exclusion rates, NCES commissioned studies to investigate methods for estimating what the results in states and the nation might have been had the excluded students been assessed.

Two such scenarios have been developed based on different hypotheses about how excluded students might have performed. One scenario was developed by Albert Beaton of Boston College and is based on an assumption that excluded students perform below the median for assessed students, or below the basic achievement level, whichever is lower. A second scenario, developed by Donald McLaughlin of American Institutes for Research, assumes that excluded students would perform as well as included students with similar disabilities, level of English proficiency, and background characteristics.

These scenarios have been applied to the NAEP 1998 and 2002 reading data for grades 4 and 8.<sup>1</sup> Each has yielded results for the full population (i.e., including estimates for excluded students) in each state and each assessment year. Although these scenarios are somewhat speculative, these techniques do provide some indication as to which statements about trend gains or losses might change if the hypotheses about the performance of excluded students are correct.

A summary of the McLaughlin results has been provided in appendix A of *The Nation's Report Card: Reading 2002*. This paper on *Statistical Methods to Account for Excluded Students in NAEP* describes the two scenarios in detail. It is important, however, to note that these methods are still under development and that the results should in no way be interpreted as official.

Following a historical review of the exclusion issue in NAEP, information on exclusion rates for reading is presented. Next, the two scenarios referred to above are described in more detail. Results from the two scenarios as applied to 1998 and 2002 reading are also presented and discussed. Areas for future research are then reviewed.

---

<sup>1</sup> These scenarios have also been applied to NAEP 1996 and 2000 mathematics data for grades 4 and 8, but those results will not be presented here.

## Background

The National Assessment of Educational Progress (NAEP) has provided accurate and reliable information about student achievement in the United States for more than 30 years. From its inception, NAEP has made use of sophisticated sampling technology to estimate the educational performance of students from across the nation, as well as those from specific geographic regions, important subgroups, and, since 1990, states and other jurisdictions.<sup>2</sup> The state component of the assessment was introduced as a voluntary program and was later implemented as an add-on to the national program. Over time, the state program has become an established part of NAEP.

The validity of statements made about NAEP results is dependent upon, among other factors, the degree to which sampled schools and students participate in the survey. Until the 2003 assessment, school participation in NAEP has been voluntary. However, the benign nature of the assessment and rigorous recruitment historically has resulted in high levels of school participation. However, at the state level, NAEP has experienced low school participation in some states. In order to maintain high standards of data quality, NCES has introduced rules for reporting that flag state results when states fail to meet one or more criteria for acceptable school participation and that suppress state results when states fall below minimum standards.

The level of student participation is another factor that impacts the validity of NAEP results. Students are selected at random from sampled schools. Their participation is voluntary, but, until the 2003 assessment, the method of obtaining parental consent was determined by the schools. Again, good public relations and well-implemented plans for data collection, including make-up sessions, have resulted in high student participation.

NAEP distinguishes between two types of student nonparticipation and treats each type differently. (1) Students who are absent or who refuse to participate are considered to be non-respondents. NAEP assumes that these students are missing at random and accounts for them through sample weighting procedures. These procedures essentially “weight up” assessed students who have background characteristics similar to nonparticipants. (2) Students who are excluded from the assessment because they cannot participate meaningfully are considered to be outside the target population of inference and NAEP makes no adjustments for these students. Some would argue that it would be counter-factual to estimate scores for students who have been excluded because they cannot meaningfully respond to a test. Others may argue that not adjusting for these excluded students in fact assumes that they score at the mean, an assumption that might be difficult to justify.

Testing all sampled students is the best way for NAEP to ensure that the statistics generated by the assessment are as representative as possible of the performance of the entire national population and the populations of participating states. However, all groups of students include certain proportions who cannot be tested in large-scale assessments (such as students who have profound mental disabilities or with very little proficiency in English) or who can be tested only through the use of accommodations such as extra time. When accommodations are not allowed (as was the case in NAEP

---

<sup>2</sup> The term “state” will hereafter be used to refer to both states and other jurisdictions, including the District of Columbia, territories, and Department of Defense domestic and overseas school systems.

prior to 1996), students requiring such adjustments are often excluded from large-scale assessments.

The exclusion of students when accommodations are not available has become more common in the last decade in part due to federal legislation. The passage of the 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA) required students with disabilities to be included in state and district assessments with appropriate accommodations. In addition, as the proportion of limited-English-proficient students in the population has increased, some states have started offering accommodations, such as translations of assessments or the use of bilingual dictionaries.

Before 1996, NAEP did not allow any testing under nonstandard conditions (i.e., accommodations were not permitted). At that time, NAEP was able to include a large proportion of all sampled students in standard assessment sessions. However, as the influence of IDEA grew more widespread, the failure to provide accommodations led to increasing levels of exclusion in the assessment. Such increases posed two threats to the program: (1) They jeopardized the stability of trend lines because excluding more students in one year than a prior year might lead to apparent rather than real gains; and (2) they restricted the population to which NAEP could generalize because students who were testable with appropriate accommodations were not included.

NAEP reacted to this challenge by adopting a multipart strategy. Over time, the program moved toward allowing the same assessment accommodations that were offered to students in state and district testing programs. However, allowing accommodations represented a change in testing conditions that might affect measurement of performance changes over time. Therefore, beginning with the 1996 national assessments and continuing with trend subjects in the 1998 and 2000 national and state assessments, NAEP assessed parallel samples of students. In one set of samples, testing accommodations were not permitted, which allowed NAEP to maintain the measurement of achievement trends. In addition, parallel samples in which accommodations were permitted were also assessed. By having two samples and two sets of related data points, NAEP met two core program goals. First, data trends could be maintained. Second, parallel trend lines could be set to ensure that in future years the program would be able to use the most inclusive practices possible and mirror the procedures used by most state and district assessments. As of 2002, NAEP results are reported only for the more inclusive samples in which assessment accommodations are permitted.

## **Exclusion Rates**

Exclusion of students with disabilities and limited English proficiency may affect the NAEP results in two distinct though related ways. First, different states exclude different percentages of students in any given year. Similarly, within states (and within the national sample), subgroups may have differential exclusion rates. These differences can affect comparisons between states (and groups), and may, at some point, raise concerns about whether or not the reporting samples are truly representative. Second, changes in exclusion rates over time may affect the interpretation of trends in performance.

### *Exclusion Rates Within Year*

Identification, exclusion, and accommodation rates for national public schools and for each state that participated in the 2002 NAEP reading assessment in grades 4 and 8 are shown in tables 1 and 2.

As shown in table 1, the percentage of fourth-grade students identified as having disabilities or limited English proficiency varies markedly from state to state. On the low side, Mississippi and the Virgin Islands identified only 7 percent of their grade four students as falling into these categories. Guam, New Mexico, and California identified 39, 37, and 34 percent, respectively. One source of variation is “true” demographic differences; Guam, New Mexico, and California have very high concentration of limited-English-proficient students. However, demographic differences are not the only contributing factor. There also are considerable differences in the identification rates for students with disabilities; these range from 3 percent in the Virgin Islands to 19 percent in Louisiana and in Rhode Island. While some of this variation may be due to demographic differences, most of this variation is almost certainly due to differential public policy.

In some cases, different identification rates (especially of limited-English-proficient students) do provide an important context for interpreting state performance differences. However, in and of themselves, identification rates have only a limited importance to the interpretation of NAEP results. Much more troubling are state-to-state variations in exclusion rates. In the national fourth-grade public-school sample, 7 percent of students were excluded. However, 16 states excluded less than 5 percent of their students, while seven states excluded 10 or more percent of students. Again, some variation may be expected, given the different percentages of LEP students in the states. However, many of the states excluding the most students are not high-LEP states. In addition, the range of exclusion of SD students across states runs from 1 to 10 percent.

At grade 8 (table 2), the situation is similar, although the percentages tend to be a bit lower. In other words, slightly fewer students are identified as SD or LEP, and the variation is somewhat less. Identification percentages for SD and LEP combined run from 10 to 31 percent. For students with disabilities, the identified range runs from 7 to 18 percent.

Exclusion at grade 8 is also a bit less variable than at grade 4. The national public-school average is a point lower, and no states excluded more than 10 percent of their students. However, there is still substantial variability among states.

**Table 1**

Percentage identified as students with disabilities (SD) and/or limited English proficient (LEP), excluded, and accommodated in NAEP 2002 reading: grade 4

	SD and LEP			SD Only			LEP Only		
	Identified	Excluded	Accommodated	Identified	Excluded	Accommodated	Identified	Excluded	Accommodated
Nation (Public)	20.6	6.8	4.0	12.8	5.1	3.5	9.3	2.4	0.7
Alabama	14.3	2.6	2.5	13.4	2.5	2.5	1.4	0.4	0.0
Arizona	28.5	7.8	2.6	11.4	4.6	2.0	20.6	4.9	0.9
Arkansas	14.3	4.5	2.1	11.7	4.2	2.1	3.3	0.7	0.1
California	33.9	5.1	1.1	7.3	2.9	1.1	29.4	3.4	0.5
Connecticut	16.2	4.9	6.2	13.2	3.8	5.8	3.9	1.7	0.5
Delaware	16.8	8.0	4.9	14.9	6.9	4.8	2.6	1.6	0.3
Florida	24.7	6.8	8.4	17.4	4.6	6.6	10.1	3.2	2.2
Georgia	12.9	3.9	3.5	10.1	3.0	3.2	3.7	1.2	0.5
Hawaii	18.0	5.6	5.3	11.8	4.1	4.4	7.6	2.0	1.2
Idaho	17.4	4.5	2.2	12.5	3.9	2.0	6.6	1.0	0.5
Illinois	20.4	6.8	5.7	13.0	3.9	5.1	9.0	3.6	0.9
Indiana	13.2	4.6	1.9	12.0	4.3	1.9	1.8	0.7	0.0
Iowa	16.2	7.8	5.2	15.0	7.4	4.9	2.0	1.1	0.3
Kansas	19.4	5.4	6.7	13.8	4.3	5.4	7.2	1.5	1.9
Kentucky	11.8	8.0	1.1	11.3	7.8	1.1	0.8	0.3	0.0
Louisiana	19.1	10.4	5.5	18.6	10.2	5.5	1.1	0.6	0.1
Maine	16.8	6.1	6.0	16.3	5.9	5.9	0.6	0.2	0.2
Maryland	13.9	6.9	1.5	11.7	5.7	1.5	2.9	1.8	0.0
Massachusetts	19.0	5.9	9.2	16.0	4.4	8.7	4.0	2.0	0.7
Michigan	13.6	7.4	1.1	11.5	7.1	0.9	2.7	0.5	0.2
Minnesota	18.7	5.4	3.8	13.3	3.7	3.3	6.6	2.1	0.7
Mississippi	7.0	4.2	0.8	6.7	4.2	0.8	0.3	0.1	0.0
Missouri	16.3	8.7	3.3	15.1	8.2	3.2	1.5	0.7	0.1
Montana	14.8	6.4	4.5	13.3	5.4	4.5	1.9	1.1	0.1
Nebraska	20.6	5.4	6.3	17.5	4.5	6.0	4.4	1.6	0.5
Nevada	26.9	10.3	3.0	12.2	5.3	2.2	17.6	6.8	1.2
New Mexico	37.2	10.1	4.4	15.3	6.5	3.3	27.5	6.4	1.8
New York	17.6	8.2	6.1	13.7	6.2	5.3	5.9	3.3	1.2
North Carolina	19.4	11.9	4.1	16.6	10.3	3.7	4.7	3.2	0.6
North Dakota	18.2	5.4	3.3	16.4	5.1	3.1	2.3	0.7	0.3
Ohio	13.9	8.4	1.5	12.9	8.0	1.5	1.3	0.6	0.0
Oklahoma	20.8	5.5	5.1	17.1	4.5	4.7	5.1	1.3	0.6
Oregon	24.5	7.8	4.1	15.5	5.2	3.0	11.9	4.2	1.5
Pennsylvania	14.2	4.6	5.1	12.5	3.8	4.9	2.2	1.0	0.3
Rhode Island	24.8	5.5	10.9	18.9	3.5	9.8	8.5	3.2	1.6
South Carolina	16.4	4.7	3.0	15.7	4.4	3.0	1.6	0.7	0.1
Tennessee	13.6	3.5	1.5	10.7	3.0	1.4	3.5	0.6	0.0
Texas	26.9	11.2	2.0	13.9	7.8	1.5	16.3	5.5	0.9
Utah	18.7	5.8	3.5	11.8	4.4	2.7	9.2	2.6	1.3
Vermont	14.6	4.8	5.9	13.3	4.6	5.8	1.8	0.5	0.2
Virginia	18.3	10.0	3.2	13.7	8.1	2.5	5.6	2.7	0.8

See notes at end of table.

**Table 1**

Percentage identified as students with disabilities (SD) and/or limited English proficient (LEP), excluded, and accommodated in NAEP 2002 reading: grade 4—Continued

	SD and LEP			SD Only			LEP Only		
	Identified	Excluded	Accom- modated	Identified	Excluded	Accom- modated	Identified	Excluded	Accom- modated
Washington	15.2	4.5	3.6	13.0	3.6	3.5	3.2	1.3	0.2
West Virginia	15.6	10.2	2.4	15.4	10.1	2.4	0.5	0.3	0.0
Wisconsin	18.6	8.2	5.3	13.3	5.7	4.3	6.0	3.0	1.1
Wyoming	17.3	2.6	7.5	14.2	2.4	7.2	4.6	0.6	0.7
American Samoa	--	--	--	--	--	--	--	--	--
District of Columbia	18.8	8.3	5.3	13.7	6.8	3.8	7.4	3.0	1.8
DoDEA/DDESS	14.5	4.4	4.0	9.9	3.3	3.8	5.7	1.7	0.6
DoDEA/DoDDS	16.0	3.0	3.9	9.5	2.2	3.5	8.2	1.4	0.8
Guam	38.6	6.5	6.5	7.0	3.6	1.3	36.2	4.9	6.0
Virgin Islands	7.0	2.5	0.8	2.9	1.0	0.3	4.6	1.5	0.5

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.



**Table 2**

Percentage identified as students with disabilities (SD) and/or limited English proficient (LEP), excluded, and accommodated in NAEP 2002 reading: grade 8

	SD and LEP			SD Only			LEP Only		
	Identified	Excluded	Accom- modated	Identified	Excluded	Accom- modated	Identified	Excluded	Accom- modated
Nation (Public)	17.8	5.8	3.9	13.1	4.7	3.6	6.1	1.7	0.5
Alabama	14.3	2.2	0.9	13.8	2.1	0.9	0.7	0.2	0.0
Arizona	21.3	5.1	1.9	11.0	3.7	1.7	12.8	2.5	0.5
Arkansas	15.1	4.9	1.6	13.4	4.4	1.6	2.1	0.6	0.0
California	26.4	3.7	2.0	10.0	2.5	1.8	20.2	2.0	0.7
Connecticut	16.5	4.3	6.0	14.5	3.4	5.8	3.1	1.7	0.4
Delaware	15.0	6.3	6.2	13.6	5.6	6.0	1.7	1.0	0.3
Florida	21.2	6.0	7.7	16.1	4.0	6.2	6.8	2.5	2.1
Georgia	12.6	4.2	3.3	10.3	3.1	3.1	2.8	1.3	0.2
Hawaii	19.9	4.8	5.2	15.3	3.5	4.9	6.6	2.0	0.9
Idaho	14.2	3.7	2.2	11.3	3.2	2.2	3.6	0.9	0.1
Illinois	16.4	3.8	5.8	12.3	2.8	5.7	5.0	1.5	0.5
Indiana	14.5	3.9	3.2	13.6	3.7	3.2	1.5	0.5	0.2
Iowa	--	--	--	--	--	--	--	--	--
Kansas	16.1	5.4	5.0	13.3	4.4	4.3	3.7	1.5	0.9
Kentucky	11.9	6.7	1.2	11.6	6.5	1.2	0.6	0.5	0.0
Louisiana	15.9	9.8	3.3	15.7	9.7	3.3	0.5	0.3	0.0
Maine	17.4	3.9	5.9	16.2	3.8	5.8	1.7	0.3	0.0
Maryland	14.9	4.4	2.3	13.0	3.9	2.1	2.7	1.0	0.3
Massachusetts	20.2	5.9	7.9	17.3	4.3	7.6	4.5	2.6	0.7
Michigan	12.8	6.7	1.9	11.2	6.1	1.9	1.8	0.9	0.0
Minnesota	15.1	2.9	3.0	11.4	2.0	2.8	4.5	1.3	0.4
Mississippi	10.1	5.3	1.5	9.9	5.2	1.5	0.2	0.1	0.0
Missouri	15.5	7.6	3.9	14.7	7.4	3.8	1.1	0.5	0.1
Montana	13.0	3.8	1.9	11.3	3.8	1.6	2.8	0.8	0.3
Nebraska	16.6	6.9	2.3	13.7	4.9	2.2	3.7	2.5	0.2
Nevada	20.0	6.0	2.0	13.0	4.1	2.0	9.5	3.2	0.1
New Mexico	30.8	8.3	5.5	18.4	6.6	5.1	19.7	4.9	1.7
New York	20.0	9.4	7.1	15.3	7.6	5.8	6.4	2.8	1.6
North Carolina	18.1	9.2	6.3	16.2	8.1	6.0	3.2	2.1	0.4
North Dakota	14.9	4.2	2.4	13.7	4.1	2.3	2.2	0.5	0.2
Ohio	12.4	7.1	1.4	11.9	6.8	1.4	1.2	0.8	0.0
Oklahoma	17.4	4.1	3.7	15.1	3.6	3.7	3.7	0.7	0.1
Oregon	17.8	5.2	2.6	12.7	3.8	2.3	7.4	2.3	0.7
Pennsylvania	14.8	2.8	7.7	13.7	2.3	7.6	1.3	0.5	0.3
Rhode Island	20.1	5.0	7.4	15.9	3.6	7.1	5.3	2.0	0.5
South Carolina	14.5	5.5	2.9	14.0	5.3	2.9	0.9	0.4	0.0
Tennessee	12.8	3.5	0.5	12.0	3.2	0.5	1.3	0.4	0.1
Texas	20.3	8.0	1.0	14.0	6.2	0.7	9.1	3.2	0.3
Utah	15.3	3.9	2.4	10.1	2.8	2.0	7.1	1.6	0.9
Vermont	18.2	4.7	5.9	17.4	4.5	5.8	1.3	0.4	0.4
Virginia	16.5	7.9	3.7	13.9	6.5	3.7	3.4	1.8	0.1

See notes at end of table.

**Table 2**

Percentage identified as students with disabilities (SD) and/or limited English proficient (LEP), excluded, and accommodated in NAEP 2002 reading: grade 8—Continued

	SD and LEP			SD Only			LEP Only		
	Identified	Excluded	Accom- modated	Identified	Excluded	Accom- modated	Identified	Excluded	Accom- modated
Washington	13.9	3.6	4.5	10.5	2.6	3.6	4.6	1.3	1.5
West Virginia	16.2	9.7	2.5	16.2	9.6	2.5	0.5	0.3	0.0
Wisconsin	15.9	6.8	5.1	13.6	5.5	4.9	2.8	1.8	0.3
Wyoming	14.4	3.0	5.7	13.0	3.0	5.6	2.2	0.3	0.4
American Samoa	21.7	7.9	4.2	11.5	3.1	1.2	15.7	7.5	3.3
District of Columbia	20.6	7.5	8.0	16.4	5.8	6.6	5.3	2.1	1.9
DoDEA/DDESS	13.1	2.6	5.2	8.4	1.6	3.9	5.4	1.7	1.3
DoDEA/DoDDS	9.9	1.7	2.5	6.6	0.9	2.4	4.1	1.0	0.5
Guam	29.1	2.0	2.6	10.4	1.4	2.6	23.7	0.9	0.3
Virgin Islands	11.3	8.3	0.4	7.9	5.7	0.4	3.4	2.6	0.0

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.

Within-year differences in exclusion pose challenges for NAEP reporting. First, between-state differences might be larger or smaller if all students were included. Second—and far more important—some states may simply exclude a large percentage of students. At some point, the program must address concerns about whether the assessed sample includes all students who would be viewed as testable were appropriate accommodations provided. Moreover, if the exclusion rate is more than 10 percent overall, it will be far higher for some populations, for example Hispanics, where larger percents of limited-English-proficient students are excluded. Finally, if one combines the percentages of students excluded with those accommodated, a disturbing picture emerges in some states. In a number of states, more than 15 percent of fourth- or eighth-grade students are either excluded or assessed under non-standard conditions. Differential increases in the use of accommodations across states may set NAEP's next research agenda.

### *Exclusion Rates Over Time*

Within-year variation in exclusion rates is only one problem. Perhaps a more serious issue relates to changes in exclusion rates over time. This issue emerged with the release of the 1998 national and state reading results. Significant achievement gains in several states were brought into question because of substantial increases in the percentages of students with disabilities excluded from the NAEP assessment. In response to these concerns, NCES directed ETS to conduct a number of analyses to investigate the situation.

NCES and ETS have continued to monitor exclusion rates for the nation and for states. table 3 shows changes in exclusion rates at grades 4 and 8 in reading from 1998 to 2002. Changes in percentages were calculated by subtracting 1998 rates from 2002 rates.

At grade 4, exclusion for national public schools as a whole was essentially unchanged between 1998 and 2002 (7.0 and 6.8 respectively). However, nine states had changes of more than three percentage points in exclusion rates (four declines and five increases). At grade 8, exclusions for national public schools overall increased 1.7 percent (a significant increase) and seven states had changes of more than three percentage points (two declines and five increases).

Clearly, changes in exclusion rates over time can have an effect on state performance trends. Excluding more students in one year may boost scores compared to years in which more students were assessed.

While it is possible that exclusion affects trends, it is impossible to know precisely how much. It is unlikely that states exclude only low performing students. For example, exclusion rates in South Carolina at grade 4 have declined significantly (-2.9 percentage points) while scores have increased significantly (from 209 to 214). In addition, exclusion increases are usually not the “whole story”; the 2002 national public-school results show a significant gain (from 213 to 217), while exclusion rates have remained unchanged. Focusing too much on exclusion increases in a small number of states may tend to overshadow this real and positive finding.

**Table 3**

Changes in percentage identified as students with disabilities (SD) and/or limited English Proficient (LEP), excluded and accommodated in NAEP reading from 1998 to 2002: grades 4 and 8

	Grade 4			Grade 8		
	SD and LEP			SD and LEP		
	Identified	Excluded	Accommodated	Identified	Excluded	Accommodated
Nation (Public)	2.8	-0.3	0.7	4.1	1.7	1.2
Alabama	1.4	-5.8	1.1	2.2	-4.1	0.4
Arizona	6.3	-2.5	1.2	4.1	-0.3	0.6
Arkansas	3.3	-0.3	0.2	3.6	-0.2	0.4
California	3.3	-9.2	-0.3	3.1	-0.7	0.1
Connecticut	-2.0	-5.2	2.9	1.5	-1.4	3.1
Delaware	0.7	6.6	1.3	0.7	4.5	4.0
Florida	6.5	0.9	3.6	4.2	0.5	5.1
Georgia	2.1	-0.9	0.9	0.7	0.0	0.4
Hawaii	3.1	0.8	3.8	5.1	0.2	2.3
Idaho	--	--	--	--	--	--
Illinois	6.3	1.0	3.6	4.3	0.1	3.0
Indiana	--	--	--	--	--	--
Iowa	1.4	2.5	2.4	--	--	--
Kansas	7.3	1.5	3.2	4.5	1.8	3.3
Kentucky	-0.7	0.7	-1.3	2.2	3.5	-1.5
Louisiana	3.8	3.2	0.6	2.1	4.6	-1.6
Maine	1.9	-1.3	2.9	3.6	-1.1	3.1
Maryland	0.4	1.2	-2.6	3.3	1.4	-2.8
Massachusetts	-0.2	0.8	3.9	3.3	1.5	3.0
Michigan	3.5	1.4	-0.3	--	--	--
Minnesota	3.9	2.2	0.6	2.0	1.6	0.3
Mississippi	0.0	0.1	0.4	-0.5	-0.4	0.8
Missouri	2.1	2.2	-1.0	3.0	4.1	0.5
Montana	4.9	3.9	2.5	1.8	0.1	0.7
Nebraska	--	--	--	--	--	--
Nevada	7.3	-0.8	1.9	4.8	0.2	0.2
New Mexico	9.3	0.6	2.1	8.5	0.0	1.7
New York	3.4	0.8	1.8	4.5	1.9	2.2
North Carolina	4.0	5.1	-1.5	4.3	3.5	1.3
North Dakota	--	--	--	--	--	--
Ohio	--	--	--	--	--	--
Oklahoma	5.6	-3.7	3.9	4.0	-4.9	2.9
Oregon	4.8	2.2	-0.4	3.6	1.3	-1.6
Pennsylvania	--	--	--	--	--	--
Rhode Island	4.9	-1.1	6.9	3.7	-1.3	6.0
South Carolina	0.3	-2.9	0.4	2.7	0.4	1.4
Tennessee	0.7	-0.1	0.0	-0.7	-2.2	-0.5
Texas	0.6	-1.4	-0.7	1.6	2.7	-1.5
Utah	4.8	-0.4	1.7	4.0	0.1	0.9
Vermont	--	--	--	--	--	--

See notes at end of table.

**Table 3**

Changes in percentage identified as students with disabilities (SD) and/or limited English Proficient (LEP), excluded and accommodated in NAEP reading from 1998 to 2002: grades 4 and 8—Continued

	Grade 4			Grade 8		
	SD and LEP			SD and LEP		
	Identified	Excluded	Accommodated	Identified	Excluded	Accommodated
Virginia	3.3	3.7	-1.4	3.7	2.5	0.2
Washington	-0.1	-0.4	0.2	1.2	-0.2	1.9
West Virginia	3.5	1.8	0.9	2.3	2.2	0.2
Wisconsin	2.8	0.2	2.7	1.8	1.9	0.8
Wyoming	3.7	-0.6	3.5	3.9	0.8	4.3
American Samoa	--	--	--	--	--	--
District of Columbia	2.6	-0.4	2.6	6.6	2.2	5.2
DoDEA/DDESS	6.3	0.3	1.9	3.0	1.0	1.3
DoDEA/DoDDS	8.6	0.0	2.8	1.8	0.3	0.5
Guam	--	--	--	--	--	--
Virgin Islands	-0.8	-2.6	-0.1	4.4	1.4	0.4

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

## Description of Adjustment Scenarios

As noted in the Introduction, NCES has commissioned research to investigate methods for estimating what NAEP scores might have been had excluded students been assessed. Two of these scenarios will be described within this memorandum and the results of their application to 1998 and 2002 reading data for grades 4 and 8 will be presented. These descriptions assume at least a basic level of understanding of NAEP analysis procedures; for further information about standard NAEP procedures, the reader is referred to Allen, Donoghue, and Schoeps (2001).

Before turning to the descriptions, however, it is important to once again stress that these scenarios are speculative in nature. They rely upon assumptions that require verification, and employ procedures that need to be empirically replicated and explored in further detail. Since the scenarios attempt to predict something that has not occurred (i.e., performance for those students whose performance was not assessed), they, by definition, employ counterfactuals. By using counterfactuals—defined as “contrary to the facts”—we are simulating alternatives to past factual events; the results of these scenarios must therefore be viewed with caution.

However, the scenarios can be used to explore how statements about how excluded students *may have* affected population and subgroup performance had they been assessed. They are useful in providing a sense of the magnitude of possible changes in performance, but should not be viewed as a replacement for the reported results. Viewing the scenarios’ results as one piece of information to inform a more complete picture of the effects of exclusion on NAEP results also allows for the disadvantages described below to be put in proper perspective. And lastly, it should not be lost sight of that the best outcome would be to increase inclusion in NAEP, which would render these scenarios less necessary.

### *Beaton Scenario*

The first scenario to be described was developed by Albert Beaton of Boston College (Beaton, 2000). This scenario is based on the assumption that excluded students, if assessed, would perform below the median for assessed students in the population or a given subgroup. The steps in the analysis will be reviewed first, followed by a summary of the scenario’s assumptions, advantages, and disadvantages.

**Analysis steps.** First, the median of the score distribution for those students assessed is calculated. Appropriate sampling weights are used, including those used to adjust for school and student nonresponse. The excluded students then are added to the sample, and the median for the score distribution for the augmented sample is recalculated with the assumption that those excluded students would have performed below the median of those students assessed. If the median for a given subgroup is needed, the procedure is performed separately for that subgroup (i.e., excluded males are assumed to fall below the median for assessed males, and the median is recalculated as described above).

This scenario may also be used to calculate the percentage of students performing at or above a given achievement level. Beaton (2000) suggested that the excluded students

be assumed to fall below the *Basic* level. The percentage of students at or above the *Basic*, *Proficient*, or *Advanced* levels could then be recalculated.

**Assumptions.** The Beaton scenario obviously assumes that excluded students would perform less well than included SD or LEP students. As Beaton (2000) argued, this may be a reasonable assumption given that these students had been considered not able to take the assessment. However, as Jones and Olkin (2000) noted in their summary of a National Institute of Statistical Sciences (NISS) workshop on the inclusion/exclusion issue, an attempt should be made to check this assumption empirically.

An additional assumption of the scenario is that the excluded students would not have shown growth relative to the assessed students, had they been included. Within a given year, the excluded students' scores will always fall below the median of the assessed students. In estimating changes in the percentages at or above the achievement levels, it is not possible for the performance of the excluded students to move out of the below *Basic* category in either year.

**Advantages.** This scenario is conceptually simple, and the assumptions underlying it are not difficult to convey to those viewing NAEP results. The only data utilized are the score distributions of those students assessed, and a count of the number excluded. The scenario is easy to implement, including retroactively for previous years' results. It is also similar to what many states do in accounting for exclusion in their summary statistics.

The Beaton scenario may also be viewed as an incentive to states to include students in the assessment wherever possible. Since the statistics estimated under this scenario cannot be made any lower by alternative assumptions, including additional students could only result in estimates equal to or higher than those given by the scenario.

**Disadvantages.** Though its simplicity is appealing, there are a number of disadvantages to this approach. First, it makes a strong assumption that all excluded students with disabilities and LEP students are low performing (either below the median or below the *Basic* level). This is probably not true as there may be students in each state who achieve at levels more like those of the general population but whose disability or current mastery of English make testing in NAEP impractical. This assumption may become more untenable in cases in which a *Basic* cutscore or a subgroup median sits relatively low on the score scale; the Beaton assumption may end up placing all excluded students below a very low percentile.

Second, a necessary consequence of the Beaton scenario is that it does not utilize any of the additional data available for these students. In this sense it is more of a reporting assumption than an approach that seeks to develop a picture of how excluded students might have performed were they assessed. Perhaps the most basic disadvantage with this scenario is that it does not generalize to allow NAEP to report alternative scenarios for the full range of statistics (e.g., means, percentiles, and standard deviations) that are traditionally included in reports and on the NAEP Data Tool. In particular, use of this scenario as a basis for "official program statistics" would require moving from the reporting of mean performance to that of median performance. A related issue is that exploratory research has shown that NAEP results based on the median would not necessarily show the same patterns as those based on the mean; this would raise complex issues about past published results.

In summary, the Beaton scenario is characterized by relatively simple assumptions, and the steps required for its implementation are easy to understand. However, the very simplicity of its assumptions raises questions about their appropriateness, and the scenario requires moving to a reporting statistic that is different from that currently used and presented in past reports.

### *McLaughlin Scenario*

The scenario developed by Donald McLaughlin of American Institutes for Research (McLaughlin, 2001, 2002, 2003) assumes that excluded students would perform as well as included students with similar disabilities, levels of English proficiency, demographic characteristics, and teacher-reported levels of achievement and instruction. Its implementation is more complex than that of the Beaton method, as reflected in the following description of the analysis steps.

**Analysis steps.** As described by McLaughlin (2003), the first major piece of the analysis is to estimate prediction equations. However, the database must first be manipulated separately for each state. For each observation for the assessed SD/LEP students, two sets of variables are used: (1) the dependent variables, consisting of the NAEP-scale-score plausible values, and (2) the independent variables, consisting of data collected from two sources—(a) the administration schedule (demographic, Title I, school lunch, etc.), and (b) the SD/LEP questionnaire (specific information about the disability and/or native language, and the type of instruction received and accommodations usually provided). For missing observations on the SD/LEP questionnaire, it is assumed that the student is not SD or LEP, and is operating at the nominal grade level; these values are then entered into the database. Then, the mean of each variable is set to zero. Next, each observation on a variable is subtracted from the mean for that variable, and that value is used in subsequent analyses. The centered data are then pooled across states, since McLaughlin (2003) determined that the small sample sizes for SD/LEP students did not permit stable estimation by state. SD and LEP were not disaggregated in the analysis, presumably for similar reasons.

Next, weighted multiple linear regression is employed, and the combination of predictors that results in the greatest amount of variance being accounted for in terms of student proficiency (plausible values) is determined, based on the degree to which the regression weights were significantly different from zero.<sup>3</sup> At this point in the analysis, the regression is done once to find the best prediction equation for the average of the five plausible values that are available for each included student. For the 1998 and 2002 analyses, between 14 and 17 predictors were found to be statistically significant, depending on grade analyzed.

The amount of error variance needed for the next step of the analysis has two sources according to McLaughlin (2000, 2003). The first represents the error resulting from the fact that sample data was used to estimate the prediction equation. To facilitate this part of the analysis, five prediction equations are calculated—one for the first plausible value for all students, one for the second plausible value, and so on. The mean, across students, of the variance of the five estimated plausible values based on those five

---

<sup>3</sup> Appropriate sampling weights are used in this part of the analysis.



separate regressions is then taken as an estimate of this first component of error. The second source, representing error resulting from the fact that the prediction equation is not perfect, is estimated by taking the mean squared error in the regression estimate for one plausible value.

The second major piece of the analysis involves the generation of plausible values for the excluded students. The intercept in each state's prediction equation is set so that the mean predicted plausible value is the same as the mean of the actual plausible values for the SD/LEP students that were assessed in that state. As McLaughlin (2003) observed, this would have the effect of causing the predicted achievement of included and excluded students to be the same if their values on the predictor variables were the same. However, analysis of his data demonstrate that, since excluded students tend to have values on predictor values that are similar to those of the lower performing included students, lower predicted scores for the excluded students are likely to result.

Next, five plausible values are created for each excluded student. This is done by creating a distribution of scores for each student from which five values are drawn at random. The mean of the distribution, which is assumed normal, is the value predicted by the regression equation, using the predictor values for that student. The variance of the distribution is comprised of the two error variance components described above.

After these plausible values are generated, they are added to the record for the excluded students, and these students' records are then appended to the data file for those students assessed. Next, standard NAEP analysis steps are undertaken in order to calculate population and subgroup proficiency estimates.

**Assumptions.** By design, this scenario assumes that SD/LEP students who were excluded would, if assessed, perform at the same level as those included students with similar characteristics. This assumption may be questionable, since at least some substantial portion of these students may have been excluded because they simply *could not be assessed*. In addition, it may not be unreasonable to assume that even SD or LEP students who *could* have been assessed might have performed worse than those who were assessed.

**Advantages.** This method, in contrast to the Beaton scenario, utilizes the data available for those students who were not assessed. In doing so, it estimates more than just a relative score for excluded students; actual distributions of scores are computed for the group of excluded students. In terms of reporting, the method has the advantage of allowing for the continuation of the use of the mean as a measure of central tendency. Achievement levels and percentiles may also be estimated without encountering the difficulties potentially present for the Beaton scenario. Past results could be re-calculated and re-reported as well without changing reporting conventions.

**Disadvantages.** The more complex assumptions on which this scenario relies are a characteristic for which the method can be criticized. The view that excluded students would do as well as assessed students with similar characteristics may be viewed with skepticism.

The complexity of the method, and its requiring NAEP to rely on imputation to produce results for students for which no test data are available, may invite public criticism. The exclusive reliance in the McLaughlin method on SD/LEP questionnaire and demographic

data for the excluded students (i.e., no cognitive data at all) makes the issues of accuracy of questionnaire data critical. Finally, because this approach will give “higher” estimates of excluded students performance than the Beaton approach, it may be viewed as an inappropriate attempt to “soften” the impact of exclusion. Related to this, this scenario can produce results that, upon initial review, look counter-intuitive (states whose exclusion rates increase may get larger trend gains in this approach).

There are several technical issues that warrant further research. These include the appropriateness of the standard errors for the scenario’s estimates, the relatively low values of the  $R^2$ s yielded by the regressions (in McLaughlin, 2003, the values were 0.24 for grade 4, and 0.25 for grade 8, respectively), the use of only one regression equation for the average of the five plausible values for the primary analysis (vs. five regression equations for the variance-estimation component), and the impact of changes from year to year in the amount of variance accounted for in the regressions on the scenarios estimates of changes in state results. (See Holland, 2000, for a technical review of McLaughlin’s and Beaton’s scenarios.)

Several other features of the analysis also warrant consideration. First, the method and effects of the pooling of data across states in order to obtain the regression coefficients is in need of further study, as is the use of the state performance of included SD/LEP students as a “starting point.” Second, both differences across states in identification of students as SD or LEP and differential exclusion practices may affect the validity of the projections; these effects, as well as local differences in the ways in which SD/LEP questionnaires are completed, must be studied carefully.

## Results

This section presents the results obtained by implementing the two scenarios. Information is provided separately by grade, but the types of data presented are the same. Information on trend results, comparing 1998 and 2002, is provided first, followed by across-state comparison results for 2002 only. For the former, it is important to note that not all states participated in both the 1998 and 2002 assessments, and therefore not all states assessed in 2002 are included in the trend tables. The states analyzed for each of the scenarios may differ slightly as well. And finally, the standard errors for the score estimates presented in the trend tables are presented in the appendix.

### *Grade 4*

**Trend results.** Measures of central tendency for the reported sample and for the scenario are presented first. As the previous review has illustrated, the two scenarios use different statistics—the McLaughlin scenario uses the mean, and the Beaton scenario the median. For that reason the scenarios’ results are presented in separate tables.

In table 4, mean scores for the reported sample and the McLaughlin scenario are provided for 1998 and 2002. The change in scores are included, as well as whether that score was statistically significant. In addition, footnotes indicate those states for which the significance of the trend results would change from 1998 to 2002. Six of the states would have such changes. For 5 of the states (Arkansas, California, Nevada, Texas, Virgin Islands), the difference goes from not significant to significantly higher. For the

remaining state (Oklahoma), the difference goes from significantly lower to not significant.

Median scores for the reported sample and the Beaton scenario are presented in table 5. The general structure of the table is the same as in table 4. Again, 5 states have changes between the reported sample and the Beaton scenario, though the identity of those states is not the same. For 1 state (California), the difference goes from not significant to significantly higher. For 1 state (Oklahoma), the difference goes from significantly lower to not significant. For 3 states (Louisiana, New York, and Oregon), the difference goes from significantly higher to not significant.

Estimated percentages of students performing at or above given achievement levels are presented in tables 6 and 7. Because both scenarios allow for the calculation of achievement-level performance data, both scenarios can be compared to the reported sample in one table. As shown in table 6, several states do show changes in trends for the percentage of students at or above the *Basic* achievement level under the scenarios as compared to the reported sample. Changes under the McLaughlin scenario include 2 states where the change goes from not significant to significantly higher (California and Wyoming) and 1 state where the change goes from significantly higher to not significant (Louisiana). With the Beaton scenario, the change for 1 state goes from not significant to significantly higher (California), 1 state where the change goes from significantly lower to not significant (Oklahoma), and 2 states where the change goes from significantly higher to not significant (Louisiana and North Carolina). Thus, for 2 states (California and Louisiana), the scenarios yield the same type of change in significance.

Presented in table 7 are results for the percentage of students at or above the *Proficient* achievement level. For the McLaughlin scenario, 1 state goes from significantly lower to not significant (Oklahoma), and 2 states go from significantly higher to not significant (North Carolina and Oregon). For the Beaton scenario, Oklahoma again goes from significantly lower to not significant. North Carolina and Oregon again go from significantly higher to not significant, but Georgia also joins that list for the Beaton scenario. In addition, 1 state (South Carolina) goes from not significant to significantly higher.

**Table 4**

Changes in mean NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 4

State	Reported Sample				McLaughlin Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
Alabama	211.3	206.9	-4.5	n.s.	207.0	205.5	-1.5	n.s.
Arizona	206.4	205.3	-1.1	n.s.	199.6	202.0	2.4	n.s.
Arkansas <sup>2</sup>	208.7	212.9	4.1	n.s.	205.3	210.8	5.5	>
California <sup>2</sup>	202.4	205.9	3.5	n.s.	195.0	204.0	9.0	>
Connecticut	230.0	229.4	-0.6	n.s.	224.5	227.0	2.5	n.s.
Delaware	207.0	224.3	17.3	>	206.0	221.2	15.2	>
Florida	205.7	214.4	8.7	>	203.0	211.8	8.7	>
Georgia	208.5	214.8	6.3	>	206.0	213.2	7.2	>
Hawaii	199.7	207.6	7.9	>	196.8	204.3	7.6	>
Iowa	220.1	223.3	3.2	n.s.	216.8	219.4	2.6	n.s.
Kansas	221.3	222.0	0.7	n.s.	218.8	219.1	0.3	n.s.
Kentucky	217.5	219.0	1.5	n.s.	215.1	215.6	0.5	n.s.
Louisiana	200.3	206.6	6.3	>	196.3	203.8	7.5	>
Maine	224.8	224.5	-0.3	n.s.	221.7	222.4	0.7	n.s.
Maryland	211.7	217.2	5.5	>	208.7	214.5	5.8	>
Massachusetts	222.8	233.7	10.9	>	219.5	231.5	12.0	>
Michigan	216.0	218.6	2.7	n.s.	212.8	215.6	2.8	n.s.
Minnesota	219.2	225.3	6.0	>	216.9	223.0	6.1	>
Mississippi	203.2	202.8	-0.4	n.s.	200.5	201.1	0.6	n.s.
Missouri	215.6	220.2	4.6	>	212.9	217.2	4.3	>
Montana	224.8	224.2	-0.6	n.s.	223.2	222.3	-0.9	n.s.
Nevada <sup>2</sup>	205.8	209.1	3.3	n.s.	199.4	205.5	6.1	>
New Mexico	204.9	207.5	2.6	n.s.	198.9	203.2	4.3	n.s.
New York	215.4	222.4	7.0	>	212.1	219.6	7.5	>
North Carolina	212.9	221.6	8.7	>	208.4	218.1	9.8	>
Oklahoma <sup>2</sup>	219.2	213.3	-5.9	<	214.2	211.3	-2.9	n.s.

See notes at end of table.

**Table 4**

Changes in mean NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 4—Continued

State	Reported Sample				McLaughlin Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
Oregon	211.6	219.9	8.4	>	207.9	217.0	9.1	>
Rhode Island	217.9	219.6	1.7	n.s.	214.2	216.9	2.7	n.s.
South Carolina	208.8	213.9	5.0	>	204.7	211.8	7.1	>
Tennessee	211.8	213.7	1.9	n.s.	210.0	212.4	2.4	n.s.
Texas <sup>2</sup>	214.2	216.9	2.8	n.s.	207.4	212.9	5.4	>
Utah	216.2	221.5	5.3	>	213.1	219.1	6.0	>
Virginia	217.2	225.0	7.8	>	213.9	221.4	7.5	>
Washington	218.2	223.7	5.5	>	216.4	221.7	5.3	>
West Virginia	215.6	218.8	3.2	n.s.	210.8	214.3	3.5	n.s.
Wyoming	218.2	221.1	2.9	n.s.	216.7	219.9	3.2	n.s.
District of Columbia	179.2	190.5	11.3	>	174.5	187.6	13.1	>
Virgin Islands <sup>2</sup>	174.0	179.4	5.4	n.s.	170.3	178.7	8.4	>

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the McLaughlin scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table 5**

Changes in median NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the Beaton scenario: grade 4

State	Reported Sample				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
Alabama	212.8	209.9	-2.9	n.s.	209.1	208.3	-0.8	n.s.
Arizona	209.0	208.6	-0.3	n.s.	203.3	204.6	1.4	n.s.
Arkansas	211.9	215.9	4.0	n.s.	209.7	213.6	3.9	n.s.
California <sup>2</sup>	205.9	208.5	2.5	n.s.	196.6	205.9	9.3	>
Connecticut	232.9	232.0	-1.0	n.s.	228.3	229.4	1.0	n.s.
Delaware	211.0	224.9	14.0	>	210.3	222.0	11.7	>
Florida	210.6	217.6	7.0	>	207.4	214.1	6.7	>
Georgia	211.8	216.8	5.0	>	209.3	214.8	5.4	>
Hawaii	203.1	210.0	6.9	>	200.4	207.1	6.8	>
Iowa	224.1	225.4	1.4	n.s.	221.6	222.2	0.6	n.s.
Kansas	225.2	224.3	-0.9	n.s.	223.4	221.7	-1.7	n.s.
Kentucky	219.0	220.7	1.7	n.s.	215.4	216.9	1.4	n.s.
Louisiana <sup>2</sup>	202.6	208.3	5.8	>	198.8	202.9	4.1	n.s.
Maine	226.7	226.1	-0.5	n.s.	223.5	223.6	0.1	n.s.
Maryland	216.0	218.5	2.5	n.s.	212.9	215.5	2.6	n.s.
Massachusetts	226.0	235.8	9.8	>	224.0	233.0	8.9	>
Michigan	219.2	220.8	1.5	n.s.	216.2	217.4	1.2	n.s.
Minnesota	224.7	228.2	3.6	n.s.	223.2	225.8	2.6	n.s.
Mississippi	204.7	203.8	-0.8	n.s.	202.8	201.9	-0.9	n.s.
Missouri	218.8	222.9	4.1	n.s.	215.7	218.6	2.9	n.s.
Montana	227.3	227.6	0.2	n.s.	226.2	224.2	-2.0	n.s.
Nevada	208.5	211.4	2.9	n.s.	202.8	206.2	3.4	n.s.
New Mexico	208.5	209.8	1.3	n.s.	203.3	204.5	1.1	n.s.
New York <sup>2</sup>	219.1	224.8	5.7	>	215.7	220.2	4.4	n.s.

See notes at end of table.

**Table 5**

Changes in median NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the Beaton scenario:  
grade 4—Continued

State	Reported Sample				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
North Carolina	216.2	222.4	6.3	>	212.6	216.7	4.1	>
Oklahoma <sup>2</sup>	221.5	216.7	-4.8	<	217.5	214.5	-3.0	n.s.
Oregon <sup>2</sup>	216.0	221.7	5.7	>	213.2	218.6	5.4	n.s.
Rhode Island	221.5	222.3	0.8	n.s.	218.4	218.8	0.5	n.s.
South Carolina	211.2	216.7	5.4	>	207.0	214.1	7.1	>
Tennessee	214.3	216.1	1.8	n.s.	212.7	214.4	1.7	n.s.
Texas	217.6	218.1	0.5	n.s.	210.1	212.9	2.8	n.s.
Utah	219.1	224.4	5.2	>	216.2	221.6	5.4	>
Virginia	219.6	227.0	7.4	>	216.7	222.5	5.8	>
Washington	221.2	225.8	4.6	>	218.7	224.1	5.4	>
West Virginia	217.5	220.3	2.8	n.s.	213.5	216.0	2.6	n.s.
Wyoming	220.3	223.0	2.7	n.s.	218.8	222.0	3.2	n.s.
District of Columbia	179.8	190.9	11.1	>	174.5	186.5	12.0	>
Virgin Islands	177.9	181.4	3.5	n.s.	174.4	180.3	5.9	n.s.

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the Beaton scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table 6**

Changes in percentage of students at or above *Basic* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
Alabama	55.7	51.9	-3.8	n.s.	51.5	50.2	-1.3	n.s.	51.0	50.4	-0.7	n.s.
Arizona	51.1	50.6	-0.5	n.s.	45.8	46.5	0.8	n.s.	45.8	46.9	1.2	n.s.
Arkansas	54.1	58.3	4.2	n.s.	52.1	56.4	4.3	n.s.	51.5	55.7	4.2	n.s.
California <sup>2,3</sup>	48.1	50.4	2.3	n.s.	40.8	48.5	7.7	>	41.2	47.8	6.6	>
Connecticut	76.3	74.4	-1.9	n.s.	71.1	72.1	1.0	n.s.	68.6	70.4	1.9	n.s.
Delaware	53.2	70.8	17.6	>	53.0	67.8	14.9	>	52.5	65.4	13.0	>
Florida	52.6	60.3	7.7	>	49.8	58.4	8.6	>	49.5	56.1	6.6	>
Georgia	53.8	59.0	5.2	>	51.8	57.4	5.5	>	51.2	56.9	5.7	>
Hawaii	45.3	52.1	6.9	>	43.0	48.8	5.8	>	43.1	49.2	6.1	>
Iowa	67.4	69.3	1.9	n.s.	65.0	66.5	1.5	n.s.	63.8	64.3	0.5	n.s.
Kansas	69.6	68.0	-1.6	n.s.	68.9	66.4	-2.4	n.s.	66.9	64.8	-2.1	n.s.
Kentucky	62.1	64.4	2.3	n.s.	59.8	60.1	0.3	n.s.	57.6	59.3	1.8	n.s.
Louisiana <sup>2,3</sup>	44.2	50.4	6.2	>	41.5	45.7	4.2	n.s.	41.0	45.1	4.1	n.s.
Maine	71.7	71.7	-0.1	n.s.	68.7	68.8	0.1	n.s.	66.4	67.5	1.1	n.s.
Maryland	58.0	61.7	3.7	n.s.	55.1	57.4	2.4	n.s.	54.6	57.1	2.5	n.s.
Massachusetts	70.0	80.0	10.1	>	67.6	77.8	10.3	>	66.4	75.2	8.8	>
Michigan	62.2	64.4	2.2	n.s.	60.2	60.9	0.7	n.s.	58.5	59.6	1.1	n.s.
Minnesota	66.7	72.9	6.2	>	65.3	71.7	6.4	>	64.6	69.3	4.7	>
Mississippi	46.5	45.5	-1.1	n.s.	44.1	42.7	-1.4	n.s.	44.6	43.5	-1.1	n.s.
Missouri	61.5	65.8	4.3	n.s.	58.4	61.7	3.3	n.s.	57.5	60.0	2.6	n.s.
Montana	71.5	70.8	-0.7	n.s.	72.2	69.3	-2.9	n.s.	69.8	66.3	-3.4	n.s.
Nevada	50.6	53.7	3.1	n.s.	45.7	48.3	2.7	n.s.	45.0	48.1	3.1	n.s.
New Mexico	50.5	51.8	1.3	n.s.	45.4	46.7	1.3	n.s.	45.7	46.7	0.9	n.s.

See notes at end of table.



**Table 6**

Changes in percentage of students at or above *Basic* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4—Continued

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
New York	62.0	66.8	4.8	n.s.	58.7	63.1	4.3	n.s.	57.4	61.1	3.7	n.s.
North Carolina <sup>3</sup>	58.5	66.7	8.2	>	55.1	61.8	6.7	>	54.5	58.6	4.1	n.s.
Oklahoma <sup>3</sup>	65.9	59.8	-6.2	<	61.2	56.7	-4.5	<	59.9	56.4	-3.5	n.s.
Oregon	58.3	65.7	7.4	>	56.1	62.2	6.1	>	55.0	60.9	5.9	>
Rhode Island	64.4	64.8	0.4	n.s.	62.5	61.7	-0.8	n.s.	60.2	60.9	0.8	n.s.
South Carolina	53.2	58.4	5.3	>	49.2	56.8	7.6	>	49.1	56.6	7.4	>
Tennessee	56.8	58.5	1.6	n.s.	55.1	56.8	1.7	n.s.	54.8	56.5	1.7	n.s.
Texas	59.1	61.7	2.7	n.s.	52.4	56.6	4.2	n.s.	51.6	55.0	3.4	n.s.
Utah	62.2	68.7	6.5	>	59.2	66.1	6.9	>	58.3	64.5	6.2	>
Virginia	62.4	70.9	8.5	>	59.6	66.5	6.9	>	58.5	63.8	5.3	>
Washington	64.3	70.1	5.8	>	62.3	69.2	6.9	>	61.1	67.3	6.2	>
West Virginia	60.4	65.0	4.7	n.s.	56.0	59.8	3.8	n.s.	55.3	58.4	3.0	n.s.
Wyoming <sup>2</sup>	63.9	68.3	4.4	n.s.	62.7	67.6	4.9	>	61.8	66.4	4.6	n.s.
District of Columbia	26.9	31.1	4.3	>			6.5	>			4.8	>
Virgin Islands	24.4	24.8	0.4	n.s.	20.8	27.3			24.5	29.3		
					17.3	22.1	4.8	n.s.	23.1	24.1	1.0	n.s.

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the McLaughlin scenario.

<sup>3</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the Beaton scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table 7**

Changes in percentage of students at or above *Proficient* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
Alabama	23.6	22.3	-1.3	n.s.	20.5	20.5	0.0	n.s.	21.6	21.6	0.0	n.s.
Arizona	22.0	21.8	-0.2	n.s.	17.9	19.1	1.2	n.s.	19.7	20.1	0.4	n.s.
Arkansas	22.5	25.8	3.2	n.s.	20.2	24.0	3.8	n.s.	21.5	24.4	2.9	n.s.
California	20.3	21.1	0.8	n.s.	16.2	18.6	2.4	n.s.	17.4	20.0	2.6	n.s.
Connecticut	43.5	42.8	-0.7	n.s.	40.0	40.4	0.4	n.s.	39.1	40.3	1.2	n.s.
Delaware	22.5	34.7	12.2	>	19.6	30.3	10.7	>	22.2	31.3	9.1	>
Florida	22.0	27.1	5.1	>	19.2	23.9	4.8	>	20.7	25.0	4.3	>
Georgia <sup>3</sup>	24.1	28.0	3.9	>	21.4	25.4	4.0	>	22.9	26.4	3.5	n.s.
Hawaii	17.2	21.3	4.0	>	14.1	18.6	4.4	>	16.4	20.0	3.6	>
Iowa	33.1	34.9	1.8	n.s.	30.3	32.5	2.3	n.s.	31.4	31.8	0.4	n.s.
Kansas	33.6	33.5	-0.1	n.s.	30.9	29.9	-1.0	n.s.	32.2	31.2	-1.1	n.s.
Kentucky	28.8	29.6	0.8	n.s.	25.7	25.9	0.1	n.s.	26.7	27.2	0.5	n.s.
Louisiana	17.5	20.0	2.5	n.s.	15.0	17.0	2.0	n.s.	16.2	17.8	1.6	n.s.
Maine	35.5	34.9	-0.6	n.s.	32.0	32.3	0.3	n.s.	32.9	33.0	0.1	n.s.
Maryland	26.7	29.6	2.9	n.s.	24.0	26.5	2.4	n.s.	25.1	27.1	1.9	n.s.
Massachusetts	35.1	47.1	12.0	>	32.8	44.7	11.9	>	33.3	44.1	10.8	>
Michigan	27.9	29.9	2.0	n.s.	24.8	26.9	2.1	n.s.	26.2	27.5	1.3	n.s.
Minnesota	34.9	36.5	1.7	n.s.	33.4	34.5	1.1	n.s.	33.8	34.6	0.9	n.s.
Mississippi	16.9	15.8	-1.1	n.s.	14.3	13.6	-0.6	n.s.	16.2	15.1	-1.2	n.s.
Missouri	28.2	32.0	3.8	n.s.	25.9	29.4	3.5	n.s.	26.4	29.0	2.6	n.s.
Montana	37.0	36.1	-0.9	n.s.	34.0	32.6	-1.3	n.s.	36.0	33.7	-2.3	n.s.
Nevada	19.9	20.9	1.0	n.s.	16.5	17.3	0.9	n.s.	17.7	19.0	1.2	n.s.
New Mexico	20.6	21.3	0.7	n.s.	16.8	17.8	1.1	n.s.	18.6	19.2	0.5	n.s.

See notes at end of table.

**Table 7**

Changes in percentage of students at or above *Proficient* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4—Continued

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
New York	29.0	35.5	6.5	>	25.7	33.0	7.3	>	26.8	32.5	5.6	>
North Carolina <sup>2,3</sup>	27.2	31.9	4.6	>	24.0	27.4	3.4	n.s.	25.4	28.2	2.8	n.s.
Oklahoma <sup>2,3</sup>	30.3	26.3	-4.0	<	26.0	23.6	-2.4	n.s.	27.5	24.7	-2.8	n.s.
Oregon <sup>2,3</sup>	26.3	31.3	5.0	>	23.3	27.5	4.2	n.s.	24.9	28.3	3.4	n.s.
Rhode Island	31.3	32.2	0.9	n.s.	28.3	29.6	1.3	n.s.	29.2	30.1	0.9	n.s.
South Carolina <sup>3</sup>	22.1	25.7	3.6	n.s.	19.7	22.6	2.9	n.s.	20.4	24.5	4.1	>
Tennessee	24.7	25.3	0.6	n.s.	22.0	23.7	1.7	n.s.	23.8	24.2	0.4	n.s.
Texas	28.2	27.9	-0.2	n.s.	23.7	23.4	-0.3	n.s.	24.6	24.6	0.0	n.s.
Utah	27.7	32.6	4.9	>	24.5	29.6	5.1	>	26.0	30.6	4.6	>
Virginia	29.7	37.0	7.3	>	27.3	32.9	5.6	>	27.8	33.2	5.4	>
Washington	30.3	34.7	4.4	>	27.9	32.8	5.0	>	28.8	33.4	4.6	>
West Virginia	27.6	27.9	0.3	n.s.	24.7	24.7	0.0	n.s.	25.3	25.0	-0.3	n.s.
Wyoming	29.5	31.4	2.0	n.s.	26.4	29.7	3.2	n.s.	28.5	30.5	2.0	n.s.
District of Columbia	10.2	9.6	-0.7	n.s.			0.0	n.s.			-0.8	n.s.
Virgin Islands	7.5	5.9	-1.6	n.s.	7.6	7.5			9.3	8.6		
					3.9	4.2	0.3	n.s.	7.1	5.7	-1.4	n.s.

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the McLaughlin scenario.

<sup>3</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the Beaton scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**State comparisons for 2002.** In tables 8 through 11, across-state comparisons are presented for 2002 for the reported sample and the two scenarios. In the tables are columns indicating the rank of the state and the number of states that a given state is significantly higher than, not significantly different from, and significantly lower than, respectively. The order of the tables is the same as those for the trend results (i.e., mean, median, at or above *Basic*, at or above *Proficient*).

Ranking information is of interest to states as they compare their results to that of others. However, the comparison of sets of ranks, which is ordinal data, must be done cautiously. A change in rank may reflect a large change in performance under a given scenario or a small change; the rank itself does not provide information about the size of the change. Therefore, a somewhat more informative comparison is that of the number of states above which the state is ranked before and after the application of the scenario.

Inspection of tables 8 and 9 indicates that in terms of central tendency, slightly more states experienced changes in the number of states that they are ranked above (in terms of absolute value of number of states) in the McLaughlin scenario than the Beaton scenario: 30 states for McLaughlin and 27 states for Beaton (out of 46 states). The biggest change for the McLaughlin scenario is 11; for the Beaton scenario it is 6. For the McLaughlin scenario, the biggest change is for Utah, which under the scenario is higher than 11 more states than it is under the reported sample (i.e., in the reported sample Utah is higher than 19 states, and in the scenario it is higher than 30 states). For the Beaton scenario, the biggest changes are for New York and North Carolina, which under the scenario are higher than 6 fewer states than under the reported sample. However, the average change in the number of states that a state is higher than is only 1 or 2, depending on scenario.

An examination of the results for percentages above achievement levels (tables 10 and 11) reveals that the scenarios have a greater effect on ranks at the at or above *Basic* level than the at or above *Proficient* level. For the at or above *Basic* level (table 10), about the same number of states have changes in the number of states that they are ranked above under the scenarios: 29 states for McLaughlin and 28 states for Beaton. The biggest change for the McLaughlin scenario is 10 states; for the Beaton scenario it is 8 states. For the McLaughlin scenario, the biggest change is for Virginia, which under the scenario is higher than 10 more states than it is under the reported sample. For the Beaton scenario, the biggest change is for Wyoming, which under the scenario is higher than 8 more states than under the reported sample. The average change for both scenarios is 2 states.

For the at or above *Proficient* level (table 11), the two scenarios again have about the same number of changes: 27 states for McLaughlin and 26 states for Beaton. The biggest change for the McLaughlin scenario is 7 states; for the Beaton scenario it is 5 states. For the McLaughlin scenario, the biggest change is for Utah, which under the scenario is higher than 7 more states than it is under the reported sample. For the Beaton scenario, the biggest change is for North Carolina, which under the scenario is lower than 5 more states than under the reported sample. The average change for both scenarios is 1 state.

**Table 8**

Across-state comparisons in mean NAEP reading scores for 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 4

State	Reported Sample				McLaughlin Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<
Alabama	39	3	7	35	36	0	12	33
Arizona	42	3	7	35	42	3	6	36
Arkansas	35	10	8	27	35	11	8	26
California	41	3	7	35	39	3	6	36
Connecticut	2	43	1	1	2	43	1	1
Delaware	7	30	12	3	10	27	15	3
Florida	31	11	7	27	32	9	12	24
Georgia	30	11	7	27	29	11	10	24
Hawaii	37	4	6	35	38	3	7	35
Idaho	21	17	19	9	21	19	15	11
Indiana	15	19	23	3	11	22	20	3
Iowa	11	23	19	3	14	22	19	4
Kansas	14	19	23	3	15	12	29	4
Kentucky	25	17	17	11	25	10	20	15
Louisiana	40	3	7	35	40	3	6	36
Maine	6	28	15	2	5	29	14	2
Maryland	28	11	17	17	27	11	15	19
Massachusetts	1	45	0	0	1	45	0	0
Michigan	27	17	16	12	26	20	10	15
Minnesota	4	30	13	2	4	34	9	2
Mississippi	43	3	4	38	43	3	6	36
Missouri	22	17	20	8	22	18	16	11
Montana	8	22	21	2	6	27	16	2
Nebraska	17	17	25	3	17	19	21	5
Nevada	36	4	7	34	37	8	3	34
New Mexico	38	4	6	35	41	3	6	36
New York	12	19	23	3	13	22	20	3
North Carolina	16	19	21	5	20	20	14	11
North Dakota	10	26	16	3	9	27	15	3
Ohio	13	20	22	3	19	20	19	6
Oklahoma	34	11	7	27	34	11	9	25
Oregon	23	17	20	8	23	17	17	11
Pennsylvania	20	17	21	7	18	20	19	6
Rhode Island	24	17	18	10	24	17	17	11
South Carolina	32	11	7	27	33	13	8	24
Tennessee	33	11	7	27	31	11	10	24
Texas	29	11	17	17	30	11	12	22
Utah	18	19	20	6	16	30	11	4
Vermont	3	38	6	1	3	39	5	1
Virginia	5	29	14	2	8	27	15	3
Washington	9	24	19	2	7	27	16	2

See notes at end of table.

**Table 8**

Across-state comparisons in mean NAEP reading scores for 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 4—Continued

State	Reported Sample				McLaughlin Scenario			
	Rank	>	n.s.	<	Rank	>	n.s.	<
West Virginia	26	17	17	11	28	11	13	21
Wyoming	19	17	21	7	12	22	19	4
District of Columbia	44	2	0	43	44	2	1	42
Guam	45	1	0	44	45	0	2	43
Virgin Islands	46	0	0	45	46	0	2	43

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.

**Table 9**

Across-state comparisons in median NAEP reading scores for 2002 in the official NAEP reported sample and the Beaton scenario: grade 4

State	Reported Sample				Beaton Scenario			
	Rank	>	n.s.	<	Rank	>	n.s.	<
Alabama	38	4	6	35	36	5	7	33
Arizona	40	3	7	35	40	3	7	35
Arkansas	35	11	8	26	34	10	16	19
California	41	3	7	35	39	3	7	35
Connecticut	2	43	2	0	2	42	3	0
Delaware	13	22	20	3	13	22	19	4
Florida	30	11	10	24	33	11	14	20
Georgia	31	11	8	26	29	11	14	20
Hawaii	37	4	6	35	37	5	5	35
Idaho	19	19	22	4	16	22	19	4
Indiana	17	19	23	3	14	21	22	2
Iowa	10	21	22	2	11	22	21	2
Kansas	16	19	24	2	15	21	22	2
Kentucky	26	11	27	7	25	11	26	8
Louisiana	42	3	7	35	42	3	5	37
Maine	7	23	20	2	7	26	17	2
Maryland	28	11	14	20	28	11	17	17
Massachusetts	1	44	1	0	1	44	1	0
Michigan	25	15	18	12	24	11	20	14
Minnesota	4	30	14	1	4	31	13	1
Mississippi	43	3	4	38	43	3	4	38
Missouri	21	17	23	5	23	13	25	7
Montana	5	27	16	2	5	26	17	2
Nebraska	11	20	23	2	10	21	22	2
Nevada	36	4	6	35	38	4	6	35
New Mexico	39	3	7	35	41	3	7	35
New York	14	19	24	2	20	13	30	2
North Carolina	22	17	23	5	26	11	16	18
North Dakota	9	21	22	2	8	24	19	2
Ohio	12	19	24	2	19	19	22	4
Oklahoma	32	11	10	24	30	11	14	20
Oregon	24	17	19	9	22	13	25	7
Pennsylvania	18	20	21	4	18	20	23	2
Rhode Island	23	17	22	6	21	16	21	8
South Carolina	33	11	8	26	32	11	11	23
Tennessee	34	11	8	26	31	11	15	19
Texas	29	11	14	20	35	10	12	23
Utah	15	21	20	4	17	22	19	4
Vermont	3	32	11	2	3	31	13	1
Virginia	6	24	19	2	9	22	21	2
Washington	8	22	21	2	6	26	17	2

See notes at end of table.

**Table 9**

Across-state comparisons in median NAEP reading scores for 2002 in the official NAEP reported sample and the Beaton scenario: grade 4—Continued

State	Reported Sample				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<
West Virginia	27	15	16	14	27	11	15	19
Wyoming	20	19	21	5	12	22	19	4
District of Columbia	44	1	1	43	44	0	2	43
Guam	45	0	2	43	45	0	2	43
Virgin Islands	46	0	1	44	46	0	2	43

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.



**Table 10**

Across-state comparisons in percentage at or above *Basic* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
Alabama	38	4	6	35	36	4	8	33	36	5	6	34
Arizona	40	3	7	35	41	3	7	35	40	3	7	35
Arkansas	35	10	8	27	35	11	8	26	34	11	12	22
California	42	3	7	35	38	3	9	33	39	3	7	35
Connecticut	2	37	7	1	2	38	6	1	2	37	7	1
Delaware	8	28	16	1	9	28	14	3	10	27	14	4
Florida	30	11	11	23	28	11	15	19	33	11	12	22
Georgia	32	11	7	27	29	6	19	20	29	11	14	20
Hawaii	37	4	6	35	37	4	8	33	37	4	6	35
Idaho	18	19	20	6	17	22	16	7	15	24	17	4
Indiana	17	18	23	4	15	22	19	4	11	24	19	2
Iowa	11	22	21	2	11	17	25	3	14	23	18	4
Kansas	16	19	23	3	13	23	18	4	12	23	20	2
Kentucky	27	16	17	12	26	11	16	18	25	11	19	15
Louisiana	41	3	7	35	42	3	7	35	42	3	6	36
Maine	5	26	18	1	8	29	15	1	6	29	15	1
Maryland	29	11	15	19	30	16	6	23	28	11	15	19
Massachusetts	1	45	0	0	1	45	0	0	1	45	0	0
Michigan	26	16	17	12	25	12	16	17	24	11	19	15
Minnesota	4	33	11	1	3	38	6	1	4	34	10	1
Mississippi	43	3	3	39	43	3	4	38	43	3	4	38
Missouri	22	17	20	8	23	12	21	12	23	12	20	13
Montana	9	23	21	1	6	29	15	1	9	26	18	1
Nebraska	15	19	23	3	16	22	19	4	16	21	22	2
Nevada	36	4	7	34	39	4	7	34	38	4	6	35

See notes at end of table.

**Table 10**

Across-state comparisons in percentage at or above *Basic* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4—Continued

State	Reported Sample			McLaughlin Scenario			Beaton Scenario					
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
New Mexico	39	4	6	35	40	3	8	34	41	3	7	35
New York	19	17	24	4	20	18	17	10	20	14	22	9
North Carolina	20	18	21	6	22	17	16	12	26	11	16	18
North Dakota	6	28	16	1	5	30	14	1	5	29	15	1
Ohio	14	19	22	4	19	19	17	9	19	19	20	6
Oklahoma	31	11	7	27	33	11	8	26	32	11	13	21
Oregon	23	17	21	7	21	17	17	11	22	15	20	10
Pennsylvania	21	17	21	7	18	21	14	10	18	21	18	6
Rhode Island	25	16	18	11	24	22	10	13	21	18	17	10
South Carolina	34	11	7	27	31	8	13	24	30	11	14	20
Tennessee	33	11	7	27	32	14	7	24	31	11	14	20
Texas	28	11	17	17	34	11	9	25	35	10	12	23
Utah	12	21	20	4	14	25	15	5	13	24	17	4
Vermont	3	35	9	1	4	31	13	1	3	34	10	1
Virginia	7	24	20	1	12	34	8	3	17	21	20	4
Washington	10	23	20	2	7	30	14	1	7	27	17	1
West Virginia	24	16	19	10	27	11	16	18	27	11	16	18
Wyoming	13	19	22	4	10	26	16	3	8	27	17	1
District of Columbia	44	1	1	43	44	1	1	43	44	1	1	43
Guam	45	0	2	43	45	0	2	43	45	0	2	43
Virgin Islands	46	0	1	44	46	0	1	44	46	0	1	44

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.

**Table 11**

Across-state comparisons in percentage at or above *Proficient* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
Alabama	36	4	9	32	36	4	12	29	36	5	12	28
Arizona	37	4	9	32	37	4	7	34	37	4	7	34
Arkansas	33	8	13	24	30	10	14	21	34	9	14	22
California	40	4	9	32	38	1	10	34	39	4	10	31
Connecticut	2	43	2	0	2	43	2	0	2	43	2	0
Delaware	11	22	20	3	15	23	18	4	15	23	19	3
Florida	31	11	11	23	31	10	13	22	29	10	13	22
Georgia	28	11	13	21	28	11	14	20	28	11	15	19
Hawaii	39	4	7	34	39	7	3	35	38	4	6	35
Idaho	19	17	25	3	18	20	21	4	18	19	23	3
Indiana	17	18	24	3	14	20	22	3	12	22	20	3
Iowa	8	22	21	2	10	24	19	2	14	22	20	3
Kansas	16	18	24	3	17	18	24	3	16	19	23	3
Kentucky	26	11	21	13	27	11	16	18	26	11	19	15
Louisiana	42	4	6	35	42	4	5	36	42	3	6	36
Maine	9	22	21	2	11	24	19	2	9	23	20	2
Maryland	27	11	21	13	26	11	19	15	27	11	19	15
Massachusetts	1	44	1	0	1	44	1	0	1	44	1	0
Michigan	25	12	20	13	25	12	18	15	25	11	19	15
Minnesota	5	27	16	2	4	30	13	2	4	27	16	2
Mississippi	43	3	0	42	43	3	1	41	43	3	1	41
Missouri	21	16	24	5	22	19	21	5	22	17	23	5
Montana	6	22	21	2	9	22	21	2	5	22	21	2
Nebraska	12	22	21	2	12	23	20	2	11	22	21	2
Nevada	41	4	6	35	41	4	5	36	41	4	6	35

See notes at end of table.

**Table 11**

Across-state comparisons in percentage at or above *Proficient* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4—Continued

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
New Mexico	38	4	7	34	40	4	5	36	40	4	6	35
New York	7	22	21	2	5	24	19	2	10	23	20	2
North Carolina	22	17	23	5	24	14	18	13	24	12	23	10
North Dakota	15	19	23	3	13	22	20	3	13	22	20	3
Ohio	14	18	24	3	16	20	22	3	20	18	24	3
Oklahoma	32	11	10	24	33	10	13	22	31	10	12	23
Oregon	24	15	25	5	23	12	22	11	23	11	27	7
Pennsylvania	13	22	20	3	8	24	19	2	8	25	18	2
Rhode Island	20	17	23	5	20	13	28	4	21	18	23	4
South Carolina	34	8	13	24	35	8	12	25	33	9	14	22
Tennessee	35	6	14	25	32	10	14	21	35	8	15	22
Texas	29	11	20	14	34	10	13	22	32	9	15	21
Utah	18	18	24	3	21	25	16	4	17	19	22	4
Vermont	3	35	9	1	3	34	10	1	3	35	9	1
Virginia	4	27	16	2	6	24	19	2	7	24	19	2
Washington	10	22	21	2	7	24	19	2	6	24	19	2
West Virginia	30	11	16	18	29	11	13	21	30	10	13	22
Wyoming	23	16	24	5	19	19	22	4	19	19	23	3
District of Columbia	44	1	1	43	44	1	2	42	44	1	1	43
Guam	45	0	2	43	45	0	3	42	45	0	2	43
Virgin Islands	46	0	1	44	46	0	1	44	46	0	1	44

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.

## Grade 8

**Trend results.** In table 12, mean scores for the reported sample and the McLaughlin scenario are provided for 1998 and 2002 for grade 8. Of the 35 states, 5 have changes in the significance of trend results. For 1 state (Tennessee), the difference goes from not significant to significantly higher. For 2 states (Connecticut and Oklahoma), the difference goes from significantly lower to not significant. For 2 states (Louisiana and the Virgin Islands), the difference goes from significantly higher to not significant.

Median scores for the reported sample and the Beaton scenario are presented in table 13. Five states have changes between the reported sample and the Beaton scenario. For 2 states (Arkansas and Mississippi), the difference goes from not significant to significantly higher. For 1 state (Connecticut), the difference goes from significantly lower to not significant. For 2 states (Hawaii and Louisiana), the difference goes from significantly higher to not significant. Thus, for only 2 states (Connecticut and Louisiana) is the change in pattern the same with the McLaughlin and Beaton scenarios.

Estimated percentages of students performing at or above given achievement levels are presented in tables 14 and 15. As shown in table 14, for the at or above *Basic* level, changes under the McLaughlin scenario include 2 states where the change goes from not significant to significantly higher (Arkansas and Florida), 2 states where the change goes from significantly lower to not significant (Connecticut and Oklahoma), 1 state where the change goes from significantly higher to not significant (Louisiana), and 1 state where the change goes from not significant to significantly lower (Utah). With the Beaton scenario, there are no states that go from not significant to significantly higher, 1 state where the change goes from significantly lower to not significant (Oklahoma), 2 states where the change goes from significantly higher to not significant (Louisiana and Missouri), and 1 state where the change goes from not significant to significantly lower (Rhode Island). Thus, for 2 states (Louisiana and Oklahoma), the scenarios yield the same type of change in significance.

Presented in table 15 are results for the percentage of students at or above the *Proficient* achievement level. For the McLaughlin scenario, there is 1 state that goes from not significant to significantly higher (Arkansas), and 1 state where the change goes from significantly higher to not significant (Missouri). The Beaton scenario shows the same results as the McLaughlin scenario for Arkansas and Missouri. In addition, there is 1 state (Louisiana) where the change goes from significantly higher to not significant.

**Table 12**

Changes in mean NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 8

State	Reported Sample				McLaughlin Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
Alabama	255.0	252.5	-2.5	n.s.	251.5	251.1	-0.3	n.s.
Arizona	260.0	256.7	-3.2	n.s.	257.6	254.6	-3.1	n.s.
Arkansas	256.0	260.1	4.1	>	252.8	257.7	4.8	>
California	252.3	250.5	-1.9	n.s.	249.9	248.8	-1.1	n.s.
Connecticut <sup>2</sup>	270.5	267.0	-3.4	<	267.3	265.2	-2.1	n.s.
Delaware	253.7	267.3	13.6	>	253.1	264.2	11.1	>
Florida	254.5	261.1	6.5	>	251.7	258.6	6.9	>
Georgia	257.2	258.0	0.8	n.s.	254.8	256.1	1.3	n.s.
Hawaii	248.8	251.6	2.8	>	246.1	249.2	3.1	>
Kansas	267.6	269.1	1.5	n.s.	265.6	266.5	0.9	n.s.
Kentucky	262.3	265.2	2.9	n.s.	260.4	262.4	2.0	n.s.
Louisiana <sup>2</sup>	251.5	256.3	4.8	>	249.5	252.7	3.2	n.s.
Maine	271.4	269.8	-1.6	n.s.	268.9	268.1	-0.8	n.s.
Maryland	261.0	263.3	2.4	n.s.	259.4	261.3	1.9	n.s.
Massachusetts	268.8	270.5	1.7	n.s.	266.5	267.9	1.4	n.s.
Mississippi	251.5	255.0	3.6	>	248.0	252.2	4.2	>
Missouri	262.3	267.9	5.6	>	260.8	265.1	4.3	>
Montana	270.9	270.2	-0.8	n.s.	269.0	268.2	-0.8	n.s.
Nevada	257.8	251.4	-6.4	<	254.4	248.6	-5.7	<
New Mexico	258.0	253.7	-4.3	<	254.8	249.9	-4.8	<
New York	264.8	263.9	-0.8	n.s.	260.8	260.8	0.0	n.s.
North Carolina	262.3	265.0	2.7	n.s.	259.0	261.6	2.6	n.s.
Oklahoma <sup>2</sup>	265.2	262.0	-3.2	<	260.7	260.4	-0.4	n.s.
Oregon	266.0	268.1	2.1	n.s.	263.8	265.8	2.0	n.s.
Rhode Island	264.4	261.9	-2.5	n.s.	260.7	259.4	-1.3	n.s.

See notes at end of table.

**Table 12**

Changes in mean NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the McLaughlin scenario:  
grade 8—Continued

State	Reported Sample				McLaughlin Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
South Carolina	254.8	257.6	2.8	n.s.	251.5	254.6	3.2	n.s.
Tennessee <sup>2</sup>	257.9	260.3	2.3	n.s.	253.5	258.6	5.1	>
Texas	261.2	262.1	0.9	n.s.	258.2	258.1	-0.1	n.s.
Utah	263.4	263.3	-0.1	n.s.	261.0	261.3	0.3	n.s.
Virginia	266.5	269.2	2.7	n.s.	264.2	266.2	2.0	n.s.
Washington	263.8	268.2	4.4	>	261.1	266.5	5.5	>
West Virginia	261.8	263.7	1.9	n.s.	257.8	259.1	1.3	n.s.
Wyoming	263.2	264.9	1.7	n.s.	262.0	263.8	1.8	n.s.
District of Columbia	235.7	239.8	4.1	n.s.	233.3	236.4	3.1	n.s.
Virgin Islands <sup>2</sup>	231.2	240.9	9.6	>	231.2	235.8	4.6	n.s.

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the McLaughlin scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table 13**

Changes in median NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the Beaton scenario: grade 8

State	Reported Sample				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
Alabama	257.5	255.9	-1.7	n.s.	254.8	254.9	0.1	n.s.
Arizona	262.1	259.3	-2.7	n.s.	260.0	256.8	-3.2	n.s.
Arkansas <sup>2</sup>	258.9	262.6	3.7	n.s.	256.7	260.5	3.8	>
California	254.5	252.7	-1.8	n.s.	252.6	251.3	-1.3	n.s.
Connecticut <sup>2</sup>	273.2	269.9	-3.3	<	270.8	267.6	-3.2	n.s.
Delaware	255.5	268.8	13.4	>	254.5	266.5	12.0	>
Florida	257.5	263.9	6.3	>	255.1	261.1	6.0	>
Georgia	260.1	260.7	0.6	n.s.	258.0	259.0	1.0	n.s.
Hawaii <sup>2</sup>	251.4	255.1	3.8	>	249.4	252.9	3.5	n.s.
Kansas	270.3	271.8	1.5	n.s.	268.9	269.6	0.7	n.s.
Kentucky	265.0	266.7	1.7	n.s.	263.8	264.2	0.4	n.s.
Louisiana <sup>2</sup>	253.5	258.1	4.6	>	251.6	254.4	2.8	n.s.
Maine	274.2	272.2	-2.0	n.s.	272.0	270.6	-1.4	n.s.
Maryland	263.3	265.5	2.2	n.s.	261.9	262.6	0.6	n.s.
Massachusetts	271.4	272.9	1.5	n.s.	269.5	270.6	1.1	n.s.
Mississippi <sup>2</sup>	253.3	256.7	3.3	n.s.	250.7	254.3	3.6	>
Missouri	264.9	269.4	4.4	n.s.	263.6	266.4	2.9	n.s.
Montana	273.9	272.6	-1.3	n.s.	272.6	271.3	-1.3	n.s.
Nevada	259.6	253.6	-6.0	<	257.2	250.8	-6.5	<
New Mexico	260.1	254.7	-5.3	<	256.6	251.0	-5.6	<
New York	267.3	266.2	-1.1	n.s.	264.0	262.0	-2.0	n.s.
North Carolina	264.9	266.7	1.8	n.s.	262.5	262.6	0.1	n.s.
Oklahoma	266.9	265.1	-1.8	n.s.	263.8	263.6	-0.2	n.s.
Oregon	269.7	270.2	0.5	n.s.	268.2	267.9	-0.2	n.s.
Rhode Island	266.1	264.8	-1.3	n.s.	263.5	262.6	-0.9	n.s.

See notes at end of table.



**Table 13**

Changes in median NAEP reading scores from 1998 to 2002 in the official NAEP reported sample and the Beaton scenario:  
grade 8—Continued

State	Reported Sample				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Significance <sup>1</sup>
South Carolina	257.2	259.1	1.8	n.s.	254.8	257.2	2.3	n.s.
Tennessee	261.6	263.0	1.5	n.s.	259.1	261.6	2.6	n.s.
Texas	263.6	264.7	1.0	n.s.	261.6	261.6	0.1	n.s.
Utah	267.6	266.4	-1.2	n.s.	266.1	264.8	-1.3	n.s.
Virginia	267.7	270.8	3.1	n.s.	265.4	267.5	2.1	n.s.
Washington	266.7	270.8	4.1	n.s.	265.1	269.3	4.2	n.s.
West Virginia	263.7	265.6	1.9	n.s.	260.5	261.6	1.1	n.s.
Wyoming	265.9	267.0	1.1	n.s.	265.1	265.8	0.7	n.s.
District of Columbia	236.8	241.3	4.5	n.s.	234.0	238.0	4.0	n.s.
Virgin Islands	233.5	242.2	8.5	>	229.4	238.9	9.5	>

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the Beaton scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table 14**

Changes in percentage of students at or above *Basic* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
Alabama	67.0	64.0	-3.1	n.s.	58.9	58.7	-0.3	n.s.	62.7	62.8	0.1	n.s.
Arizona	72.1	68.1	-4.0	n.s.	65.1	61.5	-3.5	n.s.	68.2	64.8	-3.4	n.s.
Arkansas <sup>2</sup>	68.3	71.9	3.6	n.s.	60.6	65.1	4.5	>	64.8	67.9	3.1	n.s.
California	63.3	61.0	-2.3	n.s.	56.1	53.3	-2.8	n.s.	60.5	59.1	-1.4	n.s.
Connecticut <sup>2</sup>	80.9	76.4	-4.5	<	74.7	71.3	-3.4	n.s.	76.3	73.4	-2.9	<
Delaware	63.7	80.6	16.9	>	58.2	73.4	15.3	>	62.6	75.3	12.7	>
Florida <sup>2</sup>	66.9	72.1	5.2	n.s.	59.0	65.0	6.0	>	63.3	67.9	4.6	n.s.
Georgia	68.1	69.8	1.6	n.s.	61.7	63.3	1.6	n.s.	65.2	66.6	1.3	n.s.
Hawaii	59.1	63.7	4.7	>	51.3	56.7	5.4	>	56.4	60.6	4.3	>
Kansas	81.3	80.6	-0.7	n.s.	76.4	74.0	-2.4	n.s.	78.4	76.2	-2.1	n.s.
Kentucky	74.1	77.8	3.6	n.s.	67.7	69.9	2.3	n.s.	71.7	72.1	0.4	n.s.
Louisiana <sup>2,3</sup>	62.8	68.0	5.2	>	54.9	59.5	4.7	n.s.	59.6	62.1	2.6	n.s.
Maine	82.7	81.7	-1.0	n.s.	77.6	77.0	-0.7	n.s.	78.6	78.0	-0.5	n.s.
Maryland	70.1	72.5	2.4	n.s.	64.5	66.5	2.0	n.s.	68.0	69.5	1.6	n.s.
Massachusetts	79.3	81.3	2.0	n.s.	73.7	75.1	1.4	n.s.	75.8	76.7	0.9	n.s.
Mississippi	62.0	66.8	4.8	>	53.2	58.1	4.8	>	58.5	63.1	4.6	>
Missouri <sup>3</sup>	74.9	81.9	7.0	>	68.8	73.9	5.0	>	72.2	75.6	3.3	n.s.
Montana	83.3	84.7	1.4	n.s.	78.6	79.6	1.1	n.s.	80.2	81.4	1.1	n.s.
Nevada	70.0	61.8	-8.2	<	61.9	54.1	-7.8	<	66.0	58.0	-7.9	<
New Mexico	70.8	64.4	-6.4	<	62.2	54.4	-7.8	<	65.0	58.9	-6.1	<
New York	75.9	75.9	0.0	n.s.	67.4	67.5	0.0	n.s.	70.1	68.9	-1.3	n.s.
North Carolina	74.2	76.3	2.1	n.s.	66.3	67.7	1.4	n.s.	70.0	69.2	-0.8	n.s.
Oklahoma <sup>2,3</sup>	80.3	76.0	-4.3	<	70.2	70.3	0.2	n.s.	73.0	72.9	-0.1	n.s.

See notes at end of table.

**Table 14**

Changes in percentage of students at or above *Basic* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8—Continued

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
Oregon	77.6	79.6	2.0	n.s.	72.2	73.7	1.5	n.s.	74.7	74.8	0.2	n.s.
Rhode Island <sup>3</sup>	75.7	73.1	-2.6	n.s.	68.7	66.0	-2.7	n.s.	70.9	69.4	-1.5	<
South Carolina	66.0	68.5	2.4	n.s.	58.3	61.1	2.7	n.s.	62.7	65.0	2.3	n.s.
Tennessee	70.5	71.3	0.8	n.s.	63.1	66.4	3.4	n.s.	66.5	69.0	2.5	n.s.
Texas	74.2	73.5	-0.7	n.s.	67.1	65.0	-2.1	n.s.	70.3	67.7	-2.6	n.s.
Utah <sup>2</sup>	77.2	74.9	-2.3	n.s.	72.3	69.0	-3.3	<	74.3	71.8	-2.4	n.s.
Virginia	78.0	80.4	2.4	n.s.	71.9	73.1	1.2	n.s.	73.9	74.2	0.3	n.s.
Washington	75.7	77.9	2.3	n.s.	70.1	73.8	3.7	n.s.	72.8	75.3	2.5	n.s.
West Virginia	74.8	77.4	2.6	n.s.	65.7	67.1	1.4	n.s.	69.2	69.9	0.7	n.s.
Wyoming	75.7	78.2	2.5	n.s.	71.8	73.1	1.3	n.s.	74.1	75.9	1.8	n.s.
District of Columbia	43.5	48.0	4.5	n.s.	34.3	37.4	3.0	n.s.	41.2	44.3	3.1	n.s.
Virgin Islands	39.1	48.7	9.6	>	29.7	37.3	7.6	>	36.4	44.6	8.2	>

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the McLaughlin scenario.

<sup>3</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the Beaton scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table 15**

Changes in percentage of students at or above *Proficient* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
Alabama	21.7	21.3	-0.4	n.s.	18.9	19.8	0.9	n.s.	20.3	20.8	0.5	n.s.
Arizona	26.6	23.3	-3.3	n.s.	24.7	20.8	-3.9	n.s.	25.2	22.1	-3.0	n.s.
Arkansas <sup>2,3</sup>	23.3	27.3	4.0	n.s.	20.8	25.2	4.4	>	22.1	26.3	4.2	>
California	21.0	20.1	-0.9	n.s.	19.5	18.6	-0.9	n.s.	20.1	19.4	-0.7	n.s.
Connecticut	39.8	37.1	-2.7	n.s.	38.2	34.9	-3.3	n.s.	37.6	35.4	-2.1	n.s.
Delaware	23.3	32.9	9.5	>	20.8	30.4	9.5	>	22.9	31.4	8.4	>
Florida	22.5	29.1	6.6	>	20.5	27.3	6.8	>	21.3	27.7	6.3	>
Georgia	25.2	25.9	0.7	n.s.	23.4	23.9	0.5	n.s.	24.1	25.1	1.0	n.s.
Hawaii	18.9	19.9	1.0	n.s.	15.8	17.4	1.7	n.s.	18.0	19.0	1.0	n.s.
Kansas	35.8	38.2	2.4	n.s.	34.1	35.7	1.6	n.s.	34.5	35.3	0.8	n.s.
Kentucky	30.1	31.8	1.6	n.s.	27.8	28.8	1.1	n.s.	29.2	29.1	0.0	n.s.
Louisiana <sup>3</sup>	17.3	22.4	5.1	>	14.0	18.2	4.2	>	16.4	19.9	3.5	n.s.
Maine	41.2	38.0	-3.2	n.s.	39.1	36.2	-2.9	n.s.	39.2	36.6	-2.5	n.s.
Maryland	30.6	32.2	1.6	n.s.	29.3	29.9	0.5	n.s.	29.7	30.6	0.9	n.s.
Massachusetts	37.5	39.4	1.9	n.s.	36.0	38.2	2.1	n.s.	35.9	37.5	1.6	n.s.
Mississippi	18.5	20.2	1.7	n.s.	16.0	18.6	2.6	n.s.	17.5	19.4	2.0	n.s.
Missouri <sup>2,3</sup>	28.0	32.8	4.8	>	26.2	30.1	3.9	n.s.	27.0	31.0	4.0	n.s.
Montana	40.1	36.9	-3.2	n.s.	38.1	34.7	-3.5	n.s.	38.6	35.0	-3.6	n.s.
Nevada	23.3	19.3	-4.0	<	20.2	16.1	-4.1	<	21.9	17.9	-4.0	<
New Mexico	23.4	19.9	-3.4	n.s.	20.0	17.4	-2.6	n.s.	21.4	18.1	-3.3	n.s.
New York	32.3	31.8	-0.4	n.s.	29.9	27.5	-2.5	n.s.	29.8	28.4	-1.4	n.s.
North Carolina	30.1	31.7	1.6	n.s.	28.0	27.9	-0.1	n.s.	28.4	28.9	0.5	n.s.
Oklahoma	29.9	27.5	-2.3	n.s.	25.4	25.2	-0.2	n.s.	27.2	26.2	-1.0	n.s.

See notes at end of table.

**Table 15**

Changes in percentage of students at or above *Proficient* in NAEP reading from 1998 to 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8—Continued

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>	1998	2002	Difference (2002 minus 1998)	Sig. <sup>1</sup>
Oregon	34.9	36.7	1.8	n.s.	33.9	33.5	-0.4	n.s.	33.6	34.4	0.8	n.s.
Rhode Island	31.8	30.1	-1.7	n.s.	28.4	27.7	-0.7	n.s.	29.8	28.7	-1.1	n.s.
South Carolina	21.9	24.1	2.2	n.s.	19.5	21.1	1.5	n.s.	20.8	22.6	1.9	n.s.
Tennessee	26.8	28.3	1.5	n.s.	24.3	26.0	1.6	n.s.	25.3	27.0	1.7	n.s.
Texas	27.1	30.6	3.5	n.s.	24.7	27.6	2.9	n.s.	25.7	28.2	2.5	n.s.
Utah	31.1	31.9	0.8	n.s.	29.1	30.2	1.1	n.s.	29.9	30.7	0.8	n.s.
Virginia	33.3	37.1	3.8	n.s.	30.7	33.5	2.8	n.s.	31.5	33.8	2.3	n.s.
Washington	31.7	37.0	5.3	>	29.5	35.0	5.5	>	30.5	36.0	5.5	>
West Virginia	27.9	29.3	1.4	n.s.	24.9	25.1	0.2	n.s.	25.8	26.4	0.5	n.s.
Wyoming	30.7	30.8	0.1	n.s.	27.2	29.5	2.3	n.s.	30.0	29.9	-0.1	n.s.
District of Columbia	11.5	9.9	-1.6	n.s.	7.7	7.1	-0.6	n.s.	10.9	9.1	-1.7	n.s.
Virgin Islands	8.7	6.7	-1.9	n.s.	3.6	4.3	0.7	n.s.	8.1	6.2	-1.9	n.s.

<sup>1</sup>n.s. indicates that the difference between 2002 and 1998 results was not statistically significant; < indicates that 2002 results were significantly lower than 1998 results; > indicates that 2002 results were significantly higher than 1998 results.

<sup>2</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the McLaughlin scenario.

<sup>3</sup>The official reported 1998 vs. 2002 trend results for this state would be different under the Beaton scenario.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**State comparisons for 2002.** In tables 16 through 19, across-state comparisons are presented for 2002 for the reported sample and the two scenarios for grade 8. The caveat given above for grade 4 in terms of the comparison of ranking data holds here as well.

Inspection of tables 16 and 17 indicates that in terms of central tendency, slightly fewer states experience changes in the number of states that they are ranked above (in terms of absolute value of number of states) in the McLaughlin scenario than the Beaton scenario: 22 states for McLaughlin and 29 states for Beaton (out of 45 states). The biggest change for the McLaughlin scenario is 4; for the Beaton scenario it is 7. For the McLaughlin scenario, the biggest changes are for Indiana, which under the scenario is higher than 4 more states than it is under the reported sample, and North Carolina, which is lower than 4 more states than it had been. For the Beaton scenario, the biggest change is for Idaho, which under the scenario is higher than 7 more states than under the reported sample. However, the average change in the number of states that a state is higher than is only 1 for both scenarios.

An examination of the results for percentages above achievement levels (tables 18 and 19) reveals that, as in grade 4, the scenarios have a greater effect on ranks at the at or above *Basic* level than the at or above *Proficient* level. For the at or above *Basic* level (table 18), about the same number of states have changes in the scenarios: 31 states for McLaughlin and 32 states for Beaton. The biggest change for the McLaughlin scenario is 6 states; for the Beaton scenario it is 7 states. For the McLaughlin scenario, the biggest change is for Missouri, which under the scenario is lower than 6 more states than it is under the reported sample. For the Beaton scenario, the biggest changes are for Connecticut, which under the scenario is higher than 7 more states than it is under the reported sample, and Missouri, which is lower than 7 more states than it had been. The average change for both scenarios is 2 states.

For the at or above *Proficient* level (table 19), the McLaughlin scenario has slightly more changes: 27 states for McLaughlin and 22 states for Beaton. The biggest change for the McLaughlin scenario is 6 states; for the Beaton scenario it is 5 states. For the McLaughlin scenario, the biggest changes are for Montana and Pennsylvania, which under the scenario are higher than 6 more states than they are under the reported sample. For the Beaton scenario, the biggest change is for Virginia, which under the scenario is lower than 5 more states than it is under the reported sample. The average change for both scenarios is 1 state.

**Table 16**

Across-state comparisons in mean NAEP reading scores for 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 8

State	Reported Sample				McLaughlin Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<
Alabama	38	4	6	34	37	4	8	32
Arizona	34	8	7	29	34	8	8	28
Arkansas	31	10	12	22	31	11	14	19
California	41	4	4	36	40	4	6	34
Connecticut	14	22	21	1	12	24	19	1
Delaware	13	24	15	5	15	24	15	5
Florida	29	12	14	18	29	11	15	18
Georgia	32	10	6	28	32	10	8	26
Hawaii	39	4	4	36	39	4	5	35
Idaho	15	20	19	5	14	23	18	3
Indiana	20	16	21	7	18	20	19	5
Kansas	7	30	14	0	7	27	16	1
Kentucky	17	19	17	8	19	19	16	9
Louisiana	35	7	8	29	35	5	8	31
Maine	5	32	12	0	3	32	12	0
Maryland	24	14	17	13	22	14	21	9
Massachusetts	2	32	12	0	4	30	14	0
Michigan	21	16	21	7	20	14	21	9
Mississippi	36	7	5	32	36	6	6	32
Missouri	12	25	18	1	13	24	19	1
Montana	3	32	12	0	2	32	12	0
Nebraska	4	32	12	0	5	30	14	0
Nevada	40	4	4	36	41	4	4	36
New Mexico	37	4	7	33	38	4	6	34
New York	22	14	20	10	24	14	15	15
North Carolina	18	18	18	8	21	14	17	13
North Dakota	11	27	16	1	8	27	16	1
Ohio	8	23	21	0	11	23	20	1
Oklahoma	27	14	11	19	25	14	13	17
Oregon	10	24	19	1	10	24	19	1
Pennsylvania	16	19	18	7	16	21	20	3
Rhode Island	28	14	11	19	26	14	11	19
South Carolina	33	9	7	28	33	8	8	28
Tennessee	30	10	13	21	28	13	12	19
Texas	26	14	15	15	30	11	14	19
Utah	25	14	16	14	23	14	15	15
Vermont	1	37	7	0	1	40	4	0
Virginia	6	30	14	0	9	27	16	1
Washington	9	25	18	1	6	27	16	1
West Virginia	23	15	15	14	27	13	12	19

See notes at end of table.

**Table 16**

Across-state comparisons in mean NAEP reading scores for 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 8—Continued

State	Reported Sample				McLaughlin Scenario			
	Rank	>	n.s. <sup>1</sup>	<	Rank	>	n.s. <sup>1</sup>	<
Wyoming	19	19	13	12	17	21	18	5
American Samoa	45	0	0	44	45	0	0	44
District of Columbia	44	1	2	41	43	1	2	41
Guam	43	1	2	41	42	1	2	41
Virgin Islands	42	1	2	41	44	1	2	41

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.



**Table 17**

Across-state comparisons in median NAEP reading scores for 2002 in the official NAEP reported sample and the Beaton scenario: grade 8

State	Reported Sample				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<
Alabama	37	4	8	32	35	4	9	31
Arizona	33	7	9	28	34	6	11	27
Arkansas	31	11	14	19	31	11	14	19
California	41	4	8	32	39	4	7	33
Connecticut	12	23	20	1	12	23	21	0
Delaware	16	18	21	5	15	23	17	4
Florida	29	11	22	11	30	11	18	15
Georgia	32	10	8	26	32	10	11	23
Hawaii	38	4	6	34	38	4	7	33
Idaho	14	18	25	1	11	25	16	3
Indiana	21	14	22	8	18	15	23	6
Kansas	6	28	16	0	5	29	15	0
Kentucky	20	15	18	11	20	14	23	7
Louisiana	35	5	8	31	36	4	8	32
Maine	4	31	13	0	4	34	10	0
Maryland	25	13	24	7	25	13	20	11
Massachusetts	2	31	13	0	3	30	14	0
Michigan	17	15	24	5	21	14	19	11
Mississippi	36	4	8	32	37	5	7	32
Missouri	13	18	26	0	16	16	25	3
Montana	3	31	13	0	2	34	10	0
Nebraska	5	31	13	0	7	28	16	0
Nevada	40	4	5	35	41	4	6	34
New Mexico	39	4	6	34	40	4	5	35
New York	23	14	21	9	26	13	15	16
North Carolina	19	14	22	8	23	13	17	14
North Dakota	10	25	18	1	8	27	17	0
Ohio	11	18	26	0	14	21	20	3
Oklahoma	26	14	14	16	22	14	17	13
Oregon	9	23	21	0	9	22	22	0
Pennsylvania	15	19	20	5	10	25	19	0
Rhode Island	27	14	14	16	24	14	14	16
South Carolina	34	7	9	28	33	8	7	29
Tennessee	30	11	17	16	27	12	17	15
Texas	28	13	20	11	28	12	17	15
Utah	22	14	21	9	19	16	21	7
Vermont	1	34	10	0	1	34	10	0
Virginia	8	28	16	0	13	25	16	3
Washington	7	27	17	0	6	25	19	0
West Virginia	24	14	18	12	29	13	13	18

See notes at end of table.

**Table 17**

Across-state comparisons in median NAEP reading scores for 2002 in the official NAEP reported sample and the Beaton scenario: grade 8—Continued

State	Reported Sample				Beaton Scenario			
	Rank	>	n.s. <sup>1</sup>	<	Rank	>	n.s. <sup>1</sup>	<
Wyoming	18	15	18	11	17	18	21	5
American Samoa	45	0	0	44	45	0	0	44
District of Columbia	44	1	2	41	44	1	1	42
Guam	42	1	2	41	42	2	1	41
Virgin Islands	43	1	2	41	43	1	2	41

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.

**Table 18**

Across-state comparisons in percentage at or above *Basic* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8

State	Reported Sample			McLaughlin Scenario			Beaton Scenario					
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
Alabama	38	4	8	32	36	4	9	31	36	5	11	28
Arizona	34	7	10	27	33	8	8	28	34	6	12	26
Arkansas	30	10	11	23	29	11	13	20	30	10	15	19
California	41	4	4	36	41	4	5	35	39	4	7	33
Connecticut	21	16	18	10	18	21	18	5	18	23	16	5
Delaware	9	28	15	1	13	27	14	3	12	25	17	2
Florida	29	10	16	18	31	10	15	19	29	9	16	19
Georgia	32	9	10	25	32	9	11	24	32	8	14	22
Hawaii	39	4	7	33	38	4	7	33	38	4	7	33
Idaho	13	22	20	2	12	25	17	2	7	27	16	1
Indiana	18	17	21	6	17	18	21	5	16	23	19	2
Kansas	10	22	22	0	8	25	18	1	8	25	18	1
Kentucky	16	20	18	6	20	17	19	8	20	14	23	7
Louisiana	35	6	11	27	35	7	7	30	37	4	9	31
Maine	6	31	13	0	3	32	12	0	4	29	15	0
Maryland	28	10	16	18	26	13	14	17	24	13	13	18
Massachusetts	8	26	18	0	6	27	16	1	6	26	17	1
Michigan	20	16	21	7	21	14	18	12	22	14	20	10
Mississippi	36	6	8	30	37	4	8	32	35	6	9	29
Missouri	4	31	13	0	9	25	18	1	11	24	19	1
Montana	1	36	8	0	1	40	4	0	1	40	4	0
Nebraska	2	33	11	0	5	30	14	0	5	28	16	0
Nevada	40	4	4	36	40	4	5	35	41	4	4	36
New Mexico	37	4	8	32	39	4	5	35	40	4	5	35
New York	24	14	21	9	24	13	16	15	28	11	15	18

See notes at end of table.

**Table 18**

Across-state comparisons in percentage at or above *Basic* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8—Continued

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
North Carolina	22	16	18	10	23	14	14	16	26	13	12	19
North Dakota	7	30	14	0	4	30	14	0	3	29	15	0
Ohio	5	26	18	0	7	26	17	1	10	23	20	1
Oklahoma	23	16	15	13	19	18	19	7	19	19	19	6
Oregon	12	22	21	1	11	24	19	1	15	23	19	2
Pennsylvania	19	19	15	10	16	22	17	5	14	23	20	1
Rhode Island	27	13	12	19	28	13	11	20	25	13	12	19
South Carolina	33	6	12	26	34	7	9	28	33	8	10	26
Tennessee	31	9	12	23	27	13	14	17	27	11	15	18
Texas	26	12	16	16	30	11	13	20	31	9	16	19
Utah	25	14	17	13	22	14	15	15	21	14	19	11
Vermont	3	32	12	0	2	34	10	0	2	32	12	0
Virginia	11	25	18	1	15	24	18	2	17	23	17	4
Washington	15	20	19	5	10	25	18	1	13	23	20	1
West Virginia	17	19	18	7	25	14	13	17	23	13	13	18
Wyoming	14	20	21	3	14	24	17	3	9	25	18	1
American Samoa	45	0	0	44	45	0	0	44	45	0	0	44
District of Columbia	44	1	2	41	43	1	1	42	44	1	1	42
Guam	42	1	2	41	42	2	1	41	42	2	1	41
Virgin Islands	43	1	2	41	44	1	2	41	43	1	2	41

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.

**Table 19**

Across-state comparisons in percentage at or above *Proficient* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
Alabama	36	4	8	32	35	5	7	32	35	4	8	32
Arizona	34	5	10	29	34	5	8	31	34	5	10	29
Arkansas	31	11	15	18	29	13	13	18	30	11	16	17
California	38	4	8	32	36	4	8	32	38	4	8	32
Connecticut	6	29	15	0	6	30	14	0	5	29	15	0
Delaware	15	17	19	8	15	19	18	7	15	19	20	5
Florida	28	12	20	12	27	13	20	11	27	13	19	12
Georgia	32	10	9	25	32	11	10	23	32	11	10	23
Hawaii	40	4	7	33	39	4	8	32	39	4	8	32
Idaho	14	16	27	1	12	18	24	2	14	18	25	1
Indiana	19	15	21	8	20	15	19	10	20	15	21	8
Kansas	3	31	13	0	4	31	13	0	6	28	16	0
Kentucky	22	14	22	8	22	14	20	10	22	14	19	11
Louisiana	35	4	9	31	38	4	8	32	36	4	8	32
Maine	4	31	13	0	3	31	13	0	3	31	13	0
Maryland	17	14	26	4	18	14	26	4	18	14	27	3
Massachusetts	2	31	13	0	1	35	9	0	2	31	13	0
Michigan	18	16	20	8	21	15	21	8	19	14	22	8
Mississippi	37	4	7	33	37	4	8	32	37	4	8	32
Missouri	16	16	24	4	17	17	22	5	16	17	23	4
Montana	8	23	21	0	7	29	15	0	7	27	17	0
Nebraska	10	28	16	0	11	25	17	2	8	27	17	0
Nevada	41	4	6	34	41	4	5	35	41	4	6	34
New Mexico	39	4	7	33	40	4	8	32	40	4	7	33
New York	21	14	24	6	26	13	20	11	25	13	20	11

See notes at end of table.

**Table 19**

Across-state comparisons in percentage at or above *Proficient* in NAEP reading for 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8—Continued

State	Reported Sample				McLaughlin Scenario				Beaton Scenario			
	Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>			Rank	Significance <sup>1</sup>		
		>	n.s.	<		>	n.s.	<		>	n.s.	<
North Carolina	23	14	22	8	23	13	20	11	23	13	20	11
North Dakota	13	21	22	1	14	18	24	2	12	21	22	1
Ohio	11	19	25	0	13	18	24	2	13	18	25	1
Oklahoma	30	11	14	19	30	12	14	18	31	11	16	17
Oregon	9	22	22	0	9	23	21	0	9	24	20	0
Pennsylvania	12	21	22	1	8	27	17	0	10	24	20	0
Rhode Island	26	14	17	13	24	14	18	12	24	14	17	13
South Carolina	33	8	9	27	33	5	9	30	33	6	10	28
Tennessee	29	12	18	14	28	13	15	16	28	13	16	15
Texas	25	13	21	10	25	13	20	11	26	13	19	12
Utah	20	16	19	9	16	18	19	7	17	17	21	6
Vermont	1	34	10	0	2	36	8	0	1	34	10	0
Virginia	5	29	15	0	10	25	18	1	11	24	20	0
Washington	7	28	16	0	5	29	15	0	4	30	14	0
West Virginia	27	13	18	13	31	13	11	20	29	12	13	19
Wyoming	24	14	18	12	19	17	19	8	21	15	21	8
American Samoa	45	0	0	44	45	0	0	44	45	0	0	44
District of Columbia	43	1	2	41	43	1	2	41	43	1	2	41
Guam	42	1	2	41	42	2	1	41	42	2	1	41
Virgin Islands	44	1	2	41	44	1	1	42	44	1	1	42

<sup>1</sup>The > column lists the number of states that the given state's results were significantly higher than; the n.s. column lists the number of states from which the given state's results were not significantly different; the < column lists the number of states that the given state's results were significantly lower than.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Reading Assessment.

## **Future Research**

Further research is necessary in several areas. The two scenarios described in this memorandum warrant scrutiny, and such research is planned or underway.

Perhaps the most important area for research is that of obtaining better estimates of how the excluded students would have performed were they assessed. Of course, if this were easily accomplished, procedures would already be in place. However, more aggressive attempts to obtain estimates of excluded students' proficiency, perhaps by administering a proxy assessment, should be explored. Obtaining these data would allow the assumptions underlying each scenario to be verified. The plausibility of assumptions could also be investigated by applying the scenarios to both existing data and data created with varying patterns of characteristics.

In terms of scenario-specific issues, for the Beaton scenario, one focus could be the investigation of a more efficient estimate than the sample median of the population median, as well as methods to reduce the standard error of the estimate. For the McLaughlin scenario, areas include the pooling of data across states, the estimation of error variance, and the degree to which the inclusion of additional predictor variables would affect the estimates. For both scenarios, the extent to which estimates would differ if the SD and LEP groups were analyzed separately needs to be investigated.

The execution of this and other avenues of research is critical to the exploration of ways to produce estimates for the entire NAEP population. These research initiatives are under development, and the schedule for their implementation will soon be under review. Until such research is conducted, and the findings carefully synthesized, the results presented in this memorandum should be viewed very cautiously.

## **Summary**

The utility of NAEP depends ultimately on the degree of confidence that can be placed on generalizations drawn from samples of students assessed. Threats to validity posed by student exclusions require serious attention. NCES is attacking these issues from a variety of fronts. The methods for estimating results for full populations presented here represent one approach. A project examining operational strategies for increasing participation in NAEP and promoting consistency in decisions made about student inclusion and accommodations provides another important line of attack. NAEP operates, however, within evolving national and state policy contexts. It will be important that NAEP remain thoughtful about the target population that it purports to assess and vigilant regarding the quality of the data it produces.

## References

- Allen, N. L., Donoghue, J. R., & Schoeps, T. L. (2001). *The NAEP 1998 technical report* (NCES 2001-509). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.
- Beaton, A. (2000, July). *Estimating the total population median*. Paper presented at the National Institute of Statistical Sciences (NISS) workshop on NAEP inclusion strategies, Research Triangle Park, NC.
- Grigg, S. W., Daane, M. C., Jin, Y., & Campbell, J. R. (2003). *The Nation's Report Card: Reading 2002* (NCES 2003-521). Washington, DC: U.S. Department of Education, Institute of Educational Sciences, National Center for Education Statistics.
- Holland, P. W. (2000, July). Notes on Beaton's and McLaughlin's proposals. In L. V. Jones & I. Olkin, *NAEP inclusion strategies: The report of a workshop at the National Institute of Statistical Sciences*. Unpublished memorandum.
- Jones, L. V., & Olkin, I. (2000, July). *NAEP inclusion strategies: The report of a workshop at the National Institute of Statistical Sciences*. Unpublished memorandum.
- McLaughlin, D. (2000, June). *Protecting state NAEP trends from changes in SD/LEP inclusion rates*. Unpublished research memorandum, American Institutes for Research, Palo Alto, CA.
- McLaughlin, D. (2001, November). *Exclusions and accommodations affect state NAEP gain statistics: Math grade 4, 1996 to 2000*. Unpublished research memorandum, American Institutes for Research, Palo Alto, CA.
- McLaughlin, D. (2003, April). *Full-population estimates of Reading achievement gains between 1998 and 2002*. Unpublished research memorandum, American Institutes for Research, Palo Alto, CA.



## **Appendix**

### Tables of Standard Errors

**Table A-1**

Standard errors for mean NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 4

State	Reported Sample		McLaughlin Scenario	
	1998	2002	1998	2002
Alabama	1.9	1.4	1.9	1.4
Arizona	1.4	1.5	1.4	1.5
Arkansas	1.6	1.4	1.7	1.3
California	2.5	2.5	2.3	2.4
Connecticut	1.6	1.1	1.8	1.3
Delaware	1.7	0.6	1.6	0.5
Florida	1.4	1.4	1.4	1.2
Georgia	1.4	1.0	1.3	1.0
Hawaii	1.5	0.9	1.5	1.0
Iowa	1.6	1.1	1.6	1.1
Kansas	1.4	1.4	1.5	1.3
Kentucky	1.5	1.1	1.4	1.2
Louisiana	1.6	1.7	1.8	1.7
Maine	1.4	1.1	1.2	1.3
Maryland	1.6	1.5	1.6	1.4
Massachusetts	1.4	1.1	1.3	1.1
Michigan	1.5	1.1	1.6	1.1
Minnesota	1.7	1.1	1.6	1.0
Mississippi	1.3	1.3	1.3	1.3
Missouri	1.3	1.3	1.3	1.2
Montana	1.5	1.8	1.5	1.6
Nevada	1.8	1.2	1.8	1.0
New Mexico	1.4	1.6	1.5	1.7
New York	1.6	1.5	1.5	1.5
North Carolina	1.6	1.0	1.7	0.9
Oklahoma	1.2	1.2	1.2	1.2
Oregon	1.8	1.4	1.9	1.2
Rhode Island	1.4	1.2	1.8	1.1
South Carolina	1.4	1.3	1.5	1.3
Tennessee	1.4	1.2	1.5	1.1
Texas	1.9	1.7	1.9	1.5
Utah	1.2	1.0	1.2	0.9
Virginia	1.2	1.3	1.3	1.2
Washington	1.4	1.2	1.4	1.2
West Virginia	1.7	1.2	1.6	1.1
Wyoming	1.5	1.0	1.5	1.0
District of Columbia	1.2	0.9	1.3	0.9
Virgin Islands	2.2	1.9	2.5	1.8

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table A-2**

Standard errors for median NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the Beaton scenario: grade 4

State	Reported Sample		Beaton Scenario	
	1998	2002	1998	2002
Alabama	2.2	1.4	2.2	1.5
Arizona	1.9	1.6	1.9	1.7
Arkansas	1.4	1.7	1.9	2.2
California	3.9	2.6	3.1	2.4
Connecticut	1.7	1.1	1.6	1.4
Delaware	1.7	0.7	1.2	0.8
Florida	1.6	1.2	1.6	1.6
Georgia	2.2	0.8	1.6	1.1
Hawaii	2.5	0.9	2.5	1.1
Iowa	1.7	1.4	1.4	1.6
Kansas	1.2	2.0	1.3	1.8
Kentucky	1.4	2.1	1.5	2.3
Louisiana	1.6	1.7	2.3	1.6
Maine	1.4	1.2	1.9	1.5
Maryland	1.9	1.3	2.4	2.2
Massachusetts	1.2	1.4	1.4	1.4
Michigan	1.7	1.3	1.4	1.4
Minnesota	1.5	1.4	2.0	1.4
Mississippi	1.3	1.7	1.6	1.4
Missouri	1.6	1.6	1.9	1.6
Montana	1.6	1.4	1.4	1.6
Nevada	1.7	1.2	2.0	1.3
New Mexico	1.6	2.2	1.5	2.4
New York	1.5	1.9	1.8	2.4
North Carolina	1.8	1.5	1.4	1.0
Oklahoma	1.7	1.7	1.5	1.5
Oregon	1.3	1.0	2.5	1.6
Rhode Island	1.2	1.3	1.8	1.3
South Carolina	1.4	1.2	1.9	1.0
Tennessee	1.2	1.4	1.9	1.8
Texas	2.6	1.9	1.9	1.7
Utah	2.0	1.0	2.0	1.1
Virginia	1.8	1.7	1.3	1.5
Washington	1.3	1.3	2.2	1.5
West Virginia	1.8	1.0	1.8	1.1
Wyoming	1.8	0.9	2.1	1.0
District of Columbia	1.6	0.9	1.5	1.0
Virgin Islands	2.2	2.8	2.9	2.8

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table A-3**

Standard errors for percentage at or above *Basic* in NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4

State	Reported Sample		McLaughlin Scenario		Beaton Scenario	
	1998	2002	1998	2002	1998	2002
Alabama	2.3	1.6	2.2	1.6	2.2	1.6
Arizona	1.4	1.8	1.2	1.8	1.3	1.7
Arkansas	1.8	1.7	1.8	1.7	1.8	1.7
California	2.6	2.6	2.3	2.3	2.3	2.2
Connecticut	1.7	1.4	1.8	1.5	1.9	1.5
Delaware	1.5	1.0	1.4	0.7	1.4	0.7
Florida	1.6	1.6	1.6	1.4	1.5	1.4
Georgia	1.7	1.2	1.7	1.3	1.7	1.3
Hawaii	1.7	1.1	1.7	1.1	1.6	1.1
Iowa	1.6	1.4	1.6	1.4	1.6	1.5
Kansas	1.7	1.9	1.7	1.7	1.6	1.8
Kentucky	1.7	1.4	1.6	1.5	1.7	1.5
Louisiana	1.8	1.9	1.7	1.8	1.8	1.7
Maine	1.7	1.9	1.6	1.5	1.6	1.5
Maryland	1.9	1.9	1.9	1.8	1.9	1.8
Massachusetts	1.9	1.1	1.7	1.1	1.7	1.2
Michigan	1.8	1.5	1.8	1.4	1.9	1.4
Minnesota	1.6	1.3	1.6	1.3	1.6	1.4
Mississippi	1.7	1.7	1.6	1.7	1.6	1.7
Missouri	1.7	1.6	1.6	1.5	1.6	1.4
Montana	2.0	1.9	1.9	1.8	1.9	1.9
Nevada	2.0	1.5	1.9	1.3	1.9	1.3
New Mexico	1.4	2.2	1.5	1.9	1.4	2.0
New York	2.0	1.7	1.8	1.9	1.9	1.9
North Carolina	1.8	1.4	1.7	1.3	1.7	1.3
Oklahoma	1.5	1.3	1.4	1.4	1.4	1.4
Oregon	2.2	1.8	2.2	1.5	2.2	1.6
Rhode Island	1.5	1.5	1.7	1.4	1.6	1.4
South Carolina	1.7	1.4	1.7	1.4	1.7	1.4
Tennessee	1.9	1.6	1.9	1.4	1.9	1.4
Texas	2.2	2.1	2.0	1.8	1.9	1.8
Utah	1.7	1.2	1.6	1.3	1.6	1.3
Virginia	1.5	1.7	1.5	1.5	1.5	1.6
Washington	1.8	1.3	1.7	1.5	1.8	1.5
West Virginia	1.8	1.8	1.8	1.3	1.7	1.3
Wyoming	2.0	1.4	1.9	1.4	1.9	1.4
District of Columbia	1.3	1.1	1.2	1.0	1.2	1.0
Virgin Islands	2.0	1.7	2.0	1.7	2.0	1.7

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table A-4**

Standard errors for percentage at or above *Proficient* in NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 4

State	Reported Sample		McLaughlin Scenario		Beaton Scenario	
	1998	2002	1998	2002	1998	2002
Alabama	2.0	1.4	1.8	1.2	1.8	1.2
Arizona	1.3	1.3	1.1	1.2	1.2	1.2
Arkansas	1.6	1.5	1.6	1.5	1.6	1.5
California	2.4	2.0	2.0	1.5	2.0	1.5
Connecticut	2.2	1.4	2.2	1.5	2.1	1.5
Delaware	1.4	1.0	1.3	0.9	1.4	1.0
Florida	1.2	1.3	1.1	1.2	1.1	1.1
Georgia	1.4	1.2	1.3	1.2	1.3	1.3
Hawaii	1.3	1.0	1.3	1.0	1.3	1.0
Iowa	1.7	1.6	1.6	1.5	1.6	1.5
Kansas	2.0	1.7	1.9	1.8	2.0	1.8
Kentucky	1.8	1.4	1.6	1.3	1.6	1.3
Louisiana	1.2	1.4	1.2	1.2	1.2	1.2
Maine	2.0	1.4	1.8	1.6	1.8	1.6
Maryland	1.6	1.6	1.6	1.5	1.6	1.5
Massachusetts	1.9	1.6	1.7	1.6	1.7	1.6
Michigan	1.7	1.4	1.6	1.2	1.6	1.2
Minnesota	1.9	1.4	1.9	1.5	1.9	1.5
Mississippi	1.0	1.0	1.0	1.0	1.0	1.0
Missouri	1.4	1.5	1.4	1.4	1.3	1.3
Montana	2.0	2.4	1.9	2.3	1.9	2.4
Nevada	1.5	1.0	1.4	1.0	1.4	1.0
New Mexico	1.2	1.3	1.1	1.3	1.1	1.3
New York	1.6	1.7	1.4	1.7	1.5	1.7
North Carolina	1.5	1.3	1.4	1.0	1.4	1.0
Oklahoma	1.3	1.1	1.3	1.1	1.2	1.1
Oregon	1.6	1.6	1.6	1.6	1.6	1.6
Rhode Island	1.7	1.4	1.7	1.4	1.6	1.4
South Carolina	1.2	1.4	1.1	1.5	1.2	1.5
Tennessee	1.5	1.6	1.5	1.6	1.5	1.5
Texas	2.1	2.1	1.9	1.6	1.8	1.6
Utah	1.4	1.5	1.3	1.2	1.3	1.1
Virginia	1.7	1.6	1.6	1.6	1.6	1.5
Washington	1.5	1.5	1.4	1.6	1.5	1.6
West Virginia	2.1	1.4	2.0	1.3	1.9	1.2
Wyoming	1.5	1.3	1.5	1.2	1.5	1.2
District of Columbia	0.8	0.7	0.7	0.7	0.7	0.7
Virgin Islands	1.1	0.9	1.1	0.9	1.1	0.9

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table A-5**

Standard errors for mean NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the McLaughlin scenario: grade 8

State	Reported Sample		McLaughlin Scenario	
	1998	2002	1998	2002
Alabama	1.4	1.3	1.4	1.5
Arizona	1.1	1.3	1.1	1.2
Arkansas	1.3	1.1	1.3	1.5
California	1.6	1.8	1.6	1.7
Connecticut	1.0	1.2	1.0	1.2
Delaware	1.3	0.5	1.3	0.5
Florida	1.4	1.6	1.4	1.6
Georgia	1.4	1.0	1.3	1.0
Hawaii	1.0	0.9	1.0	0.9
Kansas	1.4	1.3	1.3	1.3
Kentucky	1.4	1.0	1.3	1.0
Louisiana	1.4	1.5	1.5	1.5
Maine	1.2	0.9	1.2	1.0
Maryland	1.8	1.7	1.8	1.5
Massachusetts	1.4	1.3	1.4	1.5
Mississippi	1.2	0.9	1.2	1.0
Missouri	1.3	1.0	1.3	1.0
Montana	1.3	1.0	1.3	1.1
Nevada	1.0	0.8	0.9	0.8
New Mexico	1.2	1.0	1.3	1.0
New York	1.5	1.5	1.5	1.4
North Carolina	1.1	1.1	1.1	1.1
Oklahoma	1.2	0.8	1.2	0.9
Oregon	1.5	1.3	1.5	1.6
Rhode Island	0.9	0.8	1.0	0.8
South Carolina	1.1	1.1	1.2	1.2
Tennessee	1.2	1.4	1.3	1.3
Texas	1.4	1.4	1.5	1.4
Utah	1.0	1.1	0.9	1.1
Virginia	1.1	1.0	1.0	1.0
Washington	1.2	1.2	1.4	1.1
West Virginia	1.0	1.0	1.1	1.1
Wyoming	1.3	0.7	1.3	0.7
District of Columbia	2.1	0.9	2.0	0.9
Virgin Islands	2.1	1.3	2.1	1.2

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table A-6**

Standard errors for median NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the Beaton scenario: grade 8

State	Reported Sample		Beaton Scenario	
	1998	2002	1998	2002
Alabama	1.8	1.5	1.9	1.5
Arizona	0.9	1.1	1.3	1.7
Arkansas	1.2	1.4	1.0	1.4
California	1.4	3.0	2.4	2.2
Connecticut	1.1	1.0	1.4	1.5
Delaware	2.0	0.9	2.1	0.7
Florida	1.6	2.2	1.6	2.3
Georgia	1.9	1.0	1.9	1.1
Hawaii	1.1	1.0	1.4	1.2
Kansas	1.4	1.7	1.3	1.5
Kentucky	2.1	0.9	1.4	1.3
Louisiana	1.1	1.4	1.4	1.4
Maine	1.4	1.1	1.1	0.8
Maryland	2.3	2.1	2.5	1.8
Massachusetts	1.4	1.2	1.9	1.7
Mississippi	1.5	1.4	1.2	1.0
Missouri	1.7	1.7	1.8	1.7
Montana	1.7	1.1	1.7	1.2
Nevada	1.2	1.1	1.4	1.3
New Mexico	1.4	1.1	1.7	1.1
New York	1.8	1.4	2.5	1.4
North Carolina	1.3	1.3	1.3	1.5
Oklahoma	1.5	1.0	1.1	1.0
Oregon	1.8	1.2	1.7	1.8
Rhode Island	1.4	0.8	1.7	1.1
South Carolina	2.1	1.1	1.3	1.0
Tennessee	1.3	1.7	1.4	1.8
Texas	1.3	1.8	1.4	1.7
Utah	1.3	1.3	1.2	1.0
Virginia	1.6	1.0	0.8	1.0
Washington	1.8	1.3	1.5	2.0
West Virginia	0.9	1.2	1.4	1.0
Wyoming	1.4	0.8	1.1	0.9
District of Columbia	2.7	1.3	2.7	1.3
Virgin Islands	1.9	1.1	2.8	1.5

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.

**Table A-7**

Standard errors for percentage at or above *Basic* in NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8

State	Reported Sample		McLaughlin Scenario		Beaton Scenario	
	1998	2002	1998	2002	1998	2002
Alabama	2.1	1.8	2.0	1.8	1.9	1.7
Arizona	1.5	1.5	1.5	1.5	1.6	1.5
Arkansas	1.4	1.3	1.5	1.6	1.4	1.6
California	2.0	2.1	2.0	2.1	2.0	2.2
Connecticut	1.4	1.4	1.7	1.3	1.4	1.1
Delaware	2.0	0.7	1.7	0.8	2.0	0.8
Florida	1.8	1.9	1.9	2.0	1.8	1.9
Georgia	1.7	1.4	1.7	1.2	1.7	1.4
Hawaii	1.3	1.3	1.3	1.3	1.4	1.3
Kansas	1.6	1.7	1.7	1.5	1.6	1.5
Kentucky	1.7	1.3	1.8	1.3	1.6	1.2
Louisiana	1.9	1.8	1.9	1.7	2.0	1.7
Maine	1.4	1.0	1.4	1.2	1.4	1.1
Maryland	1.9	1.6	1.9	1.6	1.8	1.4
Massachusetts	1.3	1.5	1.5	1.5	1.3	1.7
Mississippi	1.7	1.4	1.5	1.4	1.6	1.5
Missouri	1.8	1.1	1.8	1.3	1.7	1.3
Montana	1.6	1.6	1.6	1.1	1.5	1.3
Nevada	1.3	1.1	1.5	1.3	1.3	1.2
New Mexico	1.7	1.3	2.0	1.2	2.0	1.0
New York	1.7	1.9	1.8	1.6	1.8	1.7
North Carolina	1.2	1.4	1.3	1.2	1.1	1.3
Oklahoma	1.2	0.9	1.4	1.2	1.3	0.9
Oregon	1.4	1.4	1.5	1.6	1.4	1.4
Rhode Island	1.4	1.0	1.4	1.2	1.5	0.9
South Carolina	1.6	1.8	1.7	1.6	1.6	1.4
Tennessee	1.5	1.6	1.7	1.6	1.5	1.7
Texas	1.7	1.5	1.8	1.8	1.8	1.7
Utah	1.2	1.2	1.0	1.2	1.0	1.2
Virginia	1.2	1.1	1.4	1.5	1.1	1.3
Washington	1.5	1.4	1.7	1.3	1.6	1.2
West Virginia	1.2	1.3	1.5	1.3	1.3	1.1
Wyoming	1.8	1.3	1.6	1.2	1.8	1.3
District of Columbia	2.4	1.1	2.2	1.2	2.3	1.1
Virgin Islands	2.2	2.3	2.5	2.3	2.3	2.1

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.



**Table A-8**

Standard errors for percentage at or above *Proficient* in NAEP reading scores in 1998 and 2002 in the official NAEP reported sample and the McLaughlin and Beaton scenarios: grade 8

State	Reported Sample		McLaughlin Scenario		Beaton Scenario	
	1998	2002	1998	2002	1998	2002
Alabama	1.9	1.3	1.8	1.4	1.8	1.4
Arizona	1.4	1.5	1.4	1.4	1.4	1.4
Arkansas	1.4	1.6	1.4	1.4	1.4	1.4
California	1.9	1.7	1.8	1.4	1.8	1.4
Connecticut	1.6	1.4	1.5	1.5	1.5	1.5
Delaware	1.4	0.8	1.4	0.8	1.4	0.8
Florida	1.7	2.0	1.7	1.8	1.6	1.9
Georgia	1.4	1.3	1.3	1.3	1.3	1.2
Hawaii	1.2	1.1	1.1	1.1	1.1	1.1
Kansas	1.8	1.6	1.8	1.7	1.8	1.6
Kentucky	1.8	1.5	1.7	1.3	1.7	1.3
Louisiana	1.5	1.5	1.4	1.4	1.4	1.5
Maine	1.9	1.2	1.8	1.4	1.8	1.4
Maryland	2.1	1.9	2.0	2.1	2.0	2.1
Massachusetts	1.7	1.9	1.7	1.6	1.7	1.7
Mississippi	1.2	1.3	1.1	1.0	1.1	0.9
Missouri	1.6	1.6	1.5	1.6	1.5	1.5
Montana	1.5	1.8	1.5	1.6	1.5	1.6
Nevada	1.2	0.9	1.1	0.8	1.1	0.8
New Mexico	1.3	1.3	1.3	1.4	1.2	1.5
New York	1.9	2.0	1.8	1.9	1.8	1.8
North Carolina	1.4	1.6	1.3	1.4	1.3	1.4
Oklahoma	1.9	1.4	1.7	1.4	1.7	1.4
Oregon	2.1	1.9	2.0	2.0	2.0	1.9
Rhode Island	1.2	1.0	1.1	0.9	1.1	0.9
South Carolina	1.0	1.2	1.0	1.3	1.0	1.3
Tennessee	1.6	1.5	1.5	1.4	1.5	1.4
Texas	1.6	1.8	1.6	1.4	1.6	1.4
Utah	1.6	1.3	1.6	1.2	1.5	1.2
Virginia	1.3	1.4	1.3	1.5	1.2	1.6
Washington	1.7	1.7	1.7	1.7	1.7	1.7
West Virginia	1.1	1.5	1.1	1.2	1.1	1.2
Wyoming	1.5	1.1	1.4	1.1	1.5	1.1
District of Columbia	1.0	0.9	0.9	0.8	0.9	0.8
Virgin Islands	1.9	1.5	1.8	1.4	1.8	1.4

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1998 and 2002 Reading Assessments.