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In Depth Policy Analysis

Growth Models
and Students with Disabilities:
Report of State Interviews

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December 2009

Project Forum
National Association of State Directors of Special Education
(NASDSE)
1800 Diagonal Road - Suite 320

Project Forum at National Association of State Directors of Special Education (NASDSE) is a cooperative agreement funded by the Office of Special Education Programs of the U.S. Department of Education. The project carries out a variety of activities that provide information needed for program improvement and promote the utilization of research data and other information for improving outcomes for students with disabilities. The project also provides technical assistance and information on emerging issues and convenes small work groups to gather expert input, obtain feedback and develop conceptual frameworks related to critical topics in special education.

This report was supported by the U.S. Department of Education (Cooperative Agreements No. H326F050001). However, the opinions expressed herein do not necessarily reflect the position of the U.S. Department of Education, and no official endorsement by the Department should be inferred.

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Growth Models and Students with Disabilities: Report of State Interviews

INTRODUCTION

The 2001 No Child Left Behind Act (NCLB) that reauthorized the Elementary and Secondary Education Act (ESEA) brought about a significant increase in the use of state-level assessments to meet new accountability requirements. Each state had to submit a Title I Accountability Workbook describing how the state would implement the assessment provisions of the law and its regulations to demonstrate accountability. The law requires states to assess all students in grades three through eight and once in high school in mathematics and reading/language arts. A variety of consequences are triggered by the results of those tests plus other factors that are used to determine Adequate Yearly Progress (AYP) for states as well as their schools and districts. Each state is allowed to set its own achievement standards and the annual measurable objectives (AMO) it will use toward the requirement that all students must meet proficiency on state standards by 2014.

The assessments states use for accountability purposes must meet specific requirements, e.g., they must be aligned with the state's academic achievement standards and include at least three achievement levels (e.g., advanced, proficient and basic) that determine how well children are mastering academic content standards. Essentially, the accountability approach used for NCLB purposes provides test results for the group of students in a grade level for a single year—this is referred to as a 'status model.' It is a "snapshot in time" that does not refer to past achievement. Early in the implementation of the law, assessment experts began discussions about the possibility of using a different type of accountability approach, referred to as a 'growth model,' that would allow comparison of test results for individuals and/or the same group of children over two or more years. In November 2005, the Secretary of Education announced a pilot program "where interested and qualified states can submit proposals for developing growth models that follow the bright-line principles of *No Child Left Behind*."¹

As of 2009, a total of 15 states have been approved to include a type of growth model in their accountability assessments. This document is a report of interviews with state personnel about the inclusion of students with disabilities in their approved growth model pilots. Project Forum at the National Association of State Directors of Special Education (NASDSE) conducted this analysis as part of its cooperative agreement with the U. S. Department of Education Office of Special Education Programs (OSEP).

BACKGROUND

While much has been written about growth models, they can pose significant challenges to understanding them for anyone who is not a psychometrician trained in the use and interpretation of test statistics. For purposes of this document, the following brief overview will provide a basic description. The references listed at the end of this document contain additional sources of information.

¹ See <http://www.ed.gov/news/pressreleases/2005/11/11182005.html> for that announcement.

The Original NCLB Model

A *status model* was the approach of NCLB as it was originally passed. It requires that, for purposes of AYP, all states use only the current-year assessment with no comparison to prior achievement to indicate student performance level in AYP calculations.

Prior to the initiation of the growth model pilot, there were only two variations in the required use of the status model that were allowed. One was the use of a provision in the original NCLB law called “safe harbor” under which a school or district may be considered to have made AYP if the percent of students who are not proficient or higher in a specific group declines by at least 10% [34 CFR 200.20(b)]. Secondly, some states were allowed to use an “index model” in which states assign a value to various levels of achievement, with the highest value assigned to students at the proficient/advanced level and progressively lower values for each level below that. As described by the Secretary in the growth model invitation letter to states, “this approach gives schools and districts ‘credit’ for improving the achievement of students who are ‘below proficient.’²

The NCLB Growth Model Pilot Program

A *growth model* measures accountability by using two or more years of assessment results for the same student to measure change over time. In the growth model pilot, the term applies to a variety of methods used to determine whether a student’s score represents growth within the restrictions of the approved federal approach. A recent publication produced by the Council of Chief State School Officers (CCSSO) Accountability Systems and Reporting State Collaborative (ASR SCASS) describes the U. S. Department of Education growth model pilot program from 2005 to 2008. The following description of the three types of growth models in the pilot program is a summary from that document:

1. *Growth to proficiency models* (also called growth to standards models and trajectory models) in which schools are allowed to count as proficient under AYP those students who have not yet reached proficiency, but who are on track to meet that standard in three or four years.
2. *Value tables and transition models* in which states subdivide performance levels in such a way that students will be expected to reach proficiency in a set number of years. Schools can get credit under AYP requirements for students who move into higher levels or sublevels of performance during the school year.
3. *Projection models* determine growth by statistical analysis of a student’s current status and the past typical average growth of a previous cohort that already reached the target.

Value-added models are another distinct form of growth model that first achieved prominence with the adoption of the *Tennessee Value Added Assessment System* in 1993. That model is more complex than other growth models. The original version involved the use of advanced statistical procedures related to student growth that were designed to control for student background effects on performance (such as socioeconomic status, demographics, etc.) and identify the amount of growth a student has achieved in the current year which can then be attributed to the instruction the child received in that year.

² See the final section of the Secretary’s letter at <http://www.ed.gov/news/pressreleases/2005/11/11182005.html>.

Other states, e.g. *Colorado*, *North Carolina*, *Pennsylvania*, also had a value-added growth component as part of their state testing program prior to the beginning of the federal AYP accountability requirements. Although the classical value-added model cannot be used for the federal pilot because it does not meet all the specific requirements, *Tennessee* and *Ohio* have received approval to use a version of that original model in their federal pilot.

On November 21, 2005, the Secretary of Education issued an invitation to a maximum of 10 states “to propose a growth model to be used for NCLB accountability purposes as a part of this new pilot project.”³ Certain conditions were applied and a guidance document that described how proposals would be approved through a system of “peer review” was issued in January 2006.⁴ Initially, only two states—*North Carolina* and *Tennessee*—were approved to implement a growth model for AYP purposes. In subsequent years, more states were added to the growth pilot and the original cap for the pilot of 10 states was lifted. By the time the pilot ended, a total of 15 states were approved to add a growth model to their accountability system.⁵ In order of their approval to use a growth model for AYP purposes, the final group of states in the pilot were:

2006: North Carolina and Tennessee;
 2007: Alaska, Arizona, Arkansas, Delaware, Florida, and Iowa;
 2008: Michigan, Missouri, and Ohio;
 2009: Colorado⁶, Minnesota, Pennsylvania, and Texas

In October 2008, the pilot ended with the publication of final revised NCLB Title I regulations that allow any state that meets certain criteria to apply to use a measure of individual student growth in AYP determinations.⁷ The regulations set the criteria that a state must meet to do so [34 CFR §200.20(h)]. In addition, a Non-Regulatory Guidance document providing further details on the implementation of growth models was released January 12, 2009.⁸

The summary of changes and the analysis of comments published with the revised NCLB regulations also address the following points:

- States may not measure the achievement of students with disabilities against goals in their individualized education programs (IEPs)—they must be assessed based on the state’s grade-level academic achievement standards.
- Students with disabilities who are assessed with an alternate assessment should, to the extent possible, be included in the state’s growth model, although that may not be possible.
- States must provide a justification for the exclusion of any students.
- A state’s proposal to use a growth model must be approved by the Department through its peer review process [Federal Register Vol. 73, No 210, p. 64464-64466].

³ See <http://www.ed.gov/policy/elsec/guid/secletter/051121.html> for a copy of that letter.

⁴ See <http://www.ed.gov/policy/elsec/guid/growthmodelguidance.pdf> for that document.

⁵ For a detailed description of the pilot program, see the report issued in March 2009 at <http://www.ccsso.org/publications/details.cfm?PublicationID=376>.

⁶ **Note:** Colorado has been approved to use a growth model for AYP purposes as of 2008-09, but has chosen not to use it because of the restrictions under which it can be applied. They will continue to work with the U. S. Department of Education towards the goal of aligning their federal and state accountability systems.

⁷ For a copy, see <http://www.ed.gov/legislation/FedRegister/finrule/2008-4/102908a.html>.

⁸ For a copy, see <http://www.ed.gov/admins/lead/account/growthmodel/0109gmguidance.doc>.

Evaluation of the Pilot Program

On January 15, 2009, the U.S. Department of Education released an internal evaluation of the first year (2005-06) of implementation of the growth model pilot program for the first two states approved to add a growth model to their accountability system for that year.⁹ The report concluded that applying the type of growth model used in those states had only a minimal impact on their accountability outcomes—no schools in *North Carolina* and only seven schools in *Tennessee* that did not make AYP through the NCLB status and safe harbor methods made AYP after the growth model was applied. The report notes that both states first applied all of the steps involved in the NCLB requirements (i.e., the 95% participation rate, the identification of student and subgroup achievement of the state's AMO or status model, and safe harbor) and then identified those schools that made AYP through the growth model. This procedure under-identified the total number of schools that met AYP under the growth model—if growth had been the only model used, 674 of the 889 *Tennessee* schools that made AYP and 364 of *North Carolina's* 780 schools that made AYP would have made AYP based solely on the growth model. The study concluded that “states can effectively manage longitudinal data and implement growth models” and that “growth models may produce reliable and valid accountability determinations of school performance” (p. 3). The Department of Education has arranged for an external evaluation of the growth pilot to be conducted by the National Opinion Research Center (NORC) and the University of Chicago.

One area mentioned in the evaluation as needing further study was the inclusion of all students. The remainder of this document is focused on the inclusion of students with disabilities in growth models.

METHODOLOGY

Project Forum conducted interviews in all 15 states that have approved growth models as part of their NCLB accountability system. Contact was made through the state director of special education and interviews also included various assessment/accountability personnel in some of the states. The interviews were transcribed and entered into Atlas.ti, a software program designed to aid in data analysis.

FINDINGS

Overview

As indicated in the background section, states vary on the length of time they have had a growth model as part of their state accountability system. The following summary of findings relates to the specific areas in the interview protocol as well as additional comments from some states.

Special Education Staff Involvement in the Development of Growth Models

State staff were asked about the involvement of their special education division staff in the decision to adopt a growth model and in the subsequent development process. Five states reported that the special education staff were not involved directly in this aspect of the growth model while 10 states described involvement at varying levels. Most commonly, the

⁹ For a copy, see <http://www.ed.gov/admins/lead/account/growthmodel/gmeval0109.doc>.

addition of a growth model was made at the state's administrative level with the assessment/accountability sections in the lead and the state special education director involved in the process as part of the state's leadership team. A few states mentioned more direct types of involvement for special education such as consultation about ways in which students with disabilities would be included or assistance in setting cut scores for students taking an alternate assessment.

How Students with Disabilities Are Included in Growth Models

Students with disabilities in the general assessment

All states mentioned that they include in their growth model all students who take the general assessment and that includes students with disabilities for whom their IEP teams decided they can participate in the general assessment with or without accommodations. The results from those students with disabilities are handled in growth model calculations in the same way as students without disabilities. However, including the assessment results of students who take an alternate assessment based on alternate achievement standards (AA-AAS) within growth model calculations has been particularly challenging.

Including students taking the AA-AAS in a growth model

The AA-AAS is different from a state's general assessment.¹⁰ It is designed for students with the most significant cognitive disabilities and is scored on a different scale from the general assessment. For that reason, 13 of the states that have growth models approved for use for AYP purposes do not include students who take the AA-AAS in the analyses used for their AYP growth model accountability. Two states, however, have developed means to include these students in their growth models although there are differences in the way the data are handled. Each state approaches it as follows:

Delaware uses a value table growth model with five performance levels on which proficiency is a score of 3 and a value (points) is assigned for students who move up a level. The general assessment yields scaled scores that are the basis for the model and the AA-AAS is a portfolio that is scored on a range from 4 to 20. To fit the AA-AAS scores into the growth model, breaks were identified and extra levels were created with specific cut scores labeled 1A, 1B, 2A and 2B. Students whose scores increase a level (e.g., from 1A to 1B) earn points for their school. All students then end up on the same results scale even though the analysis for students taking an AA-AAS is different.

Missouri's approved growth model is described in detail in a document entitled *Understanding Your Adequate Yearly Progress (AYP) Report* available on the state's website.¹¹ The state's growth model is based on determining if students in either the general assessment or the AA-AAS are on track to be proficient. A growth trajectory is set for each student using a baseline year score in grade three and all students have four years or by grade eight to become proficient. Growth targets are set for each of the four years. Then, if a student does not score proficient in subsequent

¹⁰ The AA-AAS may be a portfolio of student work based on specific skills or on a standards-based IEP, a type of performance assessment that most often is carried out one-to-one, or a checklist completed by a teacher who rates the student's performance in specific areas.

¹¹ See <http://www.dese.mo.gov/divimprove/sia/dar/UnderstandingYourAYP.pdf>.

years, a new growth target is set using the number of years that student has left to reach proficiency in the required number of years. The only difference from general education students is that AA-AAS students' cut points are based on raw scores rather than scaled scores. Students who are determined to be proficient or on track to become proficient are counted as proficient in determining AYP.

Other states are able either to partially include AA-AAS students in their AYP growth calculations or are considering ways to do that in the future. Information from those states and comments from other states on their issues related to this topic are as follows:

Arizona includes students on the AA-AAS who score proficient or go up a performance level, although they are analyzed separately. For students without consecutive scores, meeting the growth target means passing the test. This year, new scaled scores have been developed for the AA-AAS and, when there are two years of data using them, the state plans to reassess how these students are included.

Florida is working on a phase-in plan to include students who take the AA-AAS into the growth model in the 2010-11 school year. The state has had a type of growth model called "Learning Gains" within the state accountability system for a number of years. The state assigns a grade of A through F to each school and all students with disabilities are included in the Learning Gains section that describes student growth. Parents of students with disabilities have been receiving information about the Learning Gains portion of the school grade, so they are familiar with the meaning of growth models, although it is limited to a comparison of growth between a current and prior year and does not involve a projection of attaining proficiency.

Michigan is currently studying whether it is possible to include all students who take an alternate assessment in their growth model. The state currently has a unique alternate assessment model that involves three different AA-AAS tests for students with cognitive impairment—for those whose impairment is mild or moderate or severe. The state is also developing an alternate assessment based on modified achievement standards (AA-MAS) that will be operational next year. The current growth model includes only students who have a mild cognitive impairment because the psychometrics are comparable to the general assessment. There are three sets of extended standards and targeted training has been provided to IEP teams to help them decide which of the sets of standards matches a student's current instructional and functioning level in order to choose the correct assessment for that student. For students in the mild category who have taken the same test for two consecutive years, performance on the assessment is compared with the prior year using four performance levels (increased, significantly increased, decreased, or significantly decreased). The state then uses growth in two ways: 1) for reporting to teachers and parents on the state accreditation system (without using the restrictions such as the regulatory 1% cap on counting AA-AAS scores for proficiency in AYP calculations), and 2) for AYP that is subject to the constraints in the regulations. The state maintains that the level of improvement for students with mild impairment now included in that alternate assessment is appropriate for classifying the student's growth on a trajectory toward proficiency.

Pennsylvania developed their growth model as part of a value-added system that the state put in place in 2002. The approved growth model is based on a projection to

determine if students are on a trajectory to be proficient within two years. For students with disabilities in the general assessment, projections are made based on the scaled score for the test. However, the scores from students who take the AA-AAS are based on a different scale that does not have enough points to be used in the growth projection model. Students taking the AA-AAS are counted in the state's results, but there is no added benefit to them because they are not judged from a growth perspective.

Training on Growth Models

State reports on training related to growth models revealed a wide variety in terms of types and intensity. In some states, the contractor for the state assessment is responsible for staff training or assists state staff in this activity. In other states, information about growth models is added to regular accountability system training. Examples of specific growth model training described by respondents are as follows:

- *Alaska* described PowerPoint presentations and workshops with hands-on training that includes the use of data.
- *Arkansas* provides compressed interactive videos each year in conjunction with the University of Arkansas as part of the professional development about how the growth model is applied. They also include technical assistance about how the data are calculated and used in reporting.
- *Colorado* has made a significant investment in a new web application and the training needed for the new growth model. The growth model is currently being rolled out to district administrators who have control over student-level data in the district and schools. The public has access to a FERPA¹²-compliant version of a similar web application.
- *Michigan* conducts regional conferences in conjunction with the regional services agencies. In addition, the Michigan Testing Conference sponsored by the University of Michigan for the past 50 years now includes sessions on the state's growth model.
- *Ohio's* accountability office held a series of sessions to help state support teams prepare for providing training to districts.
- *North Carolina* sponsors regional workshops for the media to explain the accountability program and how it operates. While this is time-consuming, they find it valuable because it helps to avoid inaccurate reporting in the press.
- *Pennsylvania* created a targeted website following presentations made in 14 areas of the state. Just before the website was launched, the state provided four webinars assisted by the assessment contractor.

Reporting Growth Model Results¹³

States provide reports to parents about their children's results on state assessments, but that may or may not include information about the results of growth model calculations. For example, *Arizona* reports growth by school level and grade, but no student-level or classroom-level reporting has been done. Similarly, *Iowa* reports AYP results to parents, but does not include growth information. In addition, *Florida* reports item-level data to teachers to support targeted instructional planning and *Michigan* reports to teachers and parents on

¹² FERPA is the Family Educational Rights and Privacy Act, a federal law that protects the privacy of student education records.

¹³See Appendix A for a list of states' growth model websites for the 15 states in this study.

student academic growth regardless of the restrictions that must be applied when the state reports under federal regulations for AYP. In some states, results are communicated to parents through the local school system that also may hold meetings with parents to discuss the accountability system and the use of those test results.

Some states that have recently developed a growth model may not yet be reporting growth model results to the public. Other states do include growth model information on their reports and/or websites, e.g., *North Carolina's* and *Pennsylvania's* websites designate whether the school made AYP by the status, safe harbor or growth calculations.

As noted in the *CCSSO Guide to United States Department of Education Growth Model Pilot Program 2005-2008* (March 2009), many states find it challenging to explain to schools and parents how growth is defined and the many details related to growth models. The authors call for identifying the types of reporting mechanisms that communicate most successfully and sharing that information across states (p. 39).

Benefits of a Growth Model

In general, respondents commented that the general benefit from a growth model addition to the state accountability system is that schools can now receive credit for progress that could not be revealed by analysis under the status model alone. However, some commented on benefits that can accrue to teachers and individual students.

Making AYP through the Growth Model

In judging the results on their assessments, states apply the NCLB status model first. Then, for schools and districts that do not reach the annual AYP target, a state can apply other calculations in accordance with their approved accountability plan such as the safe harbor provision and a confidence interval, and then apply results of the growth model. Results have varied greatly from state to state under this type of analysis. Some states that have incorporated a growth model have realized varying levels of increase in the number of schools that can be counted as having made AYP. Examples of changes that resulted in the number of schools and/or districts making AYP from applying the growth model include:

- *Arkansas* (only 56 schools were added out of over 1,000 in the state);
- *Delaware* (only four schools that failed under the status analysis made AYP by the growth model, while 30 schools made AYP under the status model but failed under the growth model); and
- *Michigan* (increased the number of schools making AYP by 111).

However, such increases in the number of school making AYP have not been seen in some of the other states. For example:

- *Arizona*—out of 1,800 schools, only one school the first year of implementation and eight schools the second year have been helped to make AYP;
- *Florida*—Learning Gains results show a narrowing of gaps for students with disabilities, but that does not show up in AYP results; and
- *Minnesota*—as a state newly approved to use a growth model for AYP, they found in estimating expected results for their new growth model that only two schools were impacted by the first growth model data run and no schools were impacted in a re-run of the data.

Other benefits of growth models

Most respondents noted that the ways to use results from growth models are still evolving. Some of the state interviewees described the benefit of a growth model in terms of the added information it can provide to teachers. As one person put it, "Our growth model finally acknowledges the hard work that teachers have been doing with hard-to-reach kids. In the past with a status model, teachers who taught those kids would say that these kids are never going to be proficient and my work will never be acknowledged so why should I care? With the growth model, everybody's efforts can contribute to an AYP decision for the school and district." The growth model generates results that can demonstrate changes over time that a pass/fail status model cannot show.

As to students, one state respondent noted that the growth model allows for children who are not yet proficient, but who are making progress, to contribute to the accountability of their school in a positive way. Another state interviewee noted that information from the growth model will be a great new source of information at IEP meetings that has not been historically available to contribute to planning instruction and services.

Challenges in Using a Growth Model for Students with Disabilities

It is important, when discussing the merits of applying a growth model to scores earned by students with disabilities, to distinguish between scores obtained on general assessments and scores obtained on alternate assessments. There are difficult psychometric issues involved in including test results from an AA-AAS. One interviewee commented that "tests are really not fine-tuned enough—how do you say that a student with severe disabilities is on a trajectory for proficiency?" Referring to students who take the AA-AAS, another interviewee remarked that "we are sending out false messages by treating all kids the same."

Another challenge to including students with disabilities who take an AA-AAS is posed by the frequent change in alternate assessments since they were initiated. This type of assessment is still in a relatively early stage of development and use. As one state assessment director emphasized, administration of the same test for several years is necessary before the results can be incorporated into a growth model. The dilemma continues as to how to appropriately include students who do not take the general assessment in the calculations and predictions used in a growth model.

From another perspective, one interviewee noted concern on the part of high achieving districts that a growth model does not show progress for students who are already proficient nor those who have previously achieved an advanced level. These districts maintain that hard work is involved in keeping students at the advanced level from one year to another and this is not reflected as 'improvement.'

Many respondents noted the challenges posed by the technicalities involved in reporting the results of a growth model. For example, the 1% cap on students taking the AA-AAS who can be counted as proficient under AYP is a complex requirement that results in some students' scores being excluded if the number who score proficient exceeds the number that can be included for AYP purposes.

DISCUSSION

The addition of a growth model to a state's accountability and assessment system for purposes of calculating AYP achievement is a significant undertaking. The requirements are extensive and the criteria that must be met under a peer review process are demanding. All 15 states that currently have an approved model include students with disabilities who take the general assessment with or without accommodations. However, including students with disabilities who take an AA-AAS in the type of growth model that can be approved under NCLB is an almost insurmountable challenge: only two of the currently approved 15 state growth models have been able to include these students.

The main obstacle to including students who participate in an AA-AAS in growth models as they currently exist is that an AA-AAS is scored on a different scale from the general assessment. These assessments have been evolving since they were first required in the 1997 amendments to the IDEA. An AA-AAS¹⁴ by definition is a different type of assessment from large scale testing used for the calculation of AYP in that the AA-AAS is usually individually administered and yields data essentially different from test scores for a state's general assessment. The psychometric barriers to adding students who take an AA-AAS to calculations that are designed for large group assessment results are significant and attempts to make them fit into the schema now available under growth models hold little promise for yielding meaningful information about the academic development of these students.

There are other issues that were not discussed in the interviews for this document, but that are often raised in discussing the AA-AAS in relation to measuring growth. First, because of the limited nature of what is often covered on AA-AAS tests, growth can often not be measured in the same way for all students, either within the year or from year to year. In addition, there are higher than expected passing percentages on AA-AAS in most states, leaving little room to track improvement.

Some of the progress in both instruction and test development for students who participate in alternate assessments has focused on the potential for 'learning progressions' to provide direction for improvement. There are a number of definitions of learning progressions and the concept is still evolving. One definition is "Learning progressions are developmental sequences of content, proficiency, and/or learning experiences" (Gong, 2007). That is, learning progressions are frameworks that spell out how student understanding of concepts should grow over time. A more detailed explanation is available in the paper by Karin Hess (2008). This and other developments in the measurement field have the potential to bring changes in the way assessments are constructed that may lead to better connections among curriculum, instruction and assessment and thereby allow for the demonstration of academic growth for all students in a more accurate and meaningful way.

¹⁴ See footnote #10.

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APPENDIX A

Links to State Website Information on Growth Models

State	State Website Links
Alaska	http://www.eed.state.ak.us/tls/Assessment/akgrowthmodel.html
Arkansas	http://www.arkansased.org/smart_arkansas/pdf/appendixa_091608.pdf
Arizona	http://www.azed.gov/azlearns/GrowthProposalArizona070702.pdf
Colorado	http://www.schoolview.org
Delaware	http://www.doe.k12.de.us/aab/
Florida	http://www.fldoe.org/news/2006/2006_02_17/SummaryOfGrowthProposal.pdf
Iowa	http://www.iowa.gov/educate/index.php?option=com_docman&task=doc_download&gid=3817
Michigan	http://www.michigan.gov/mde/0,1607,7-140--195715--,00.html
Minnesota	http://education.state.mn.us/mde/index.html
Missouri	http://www.dese.mo.gov/divimprove/sia/dar/UnderstandingYourAYP.pdf
North Carolina	http://www.ncpublicschools.org/docs/accountability/reporting/abc/2005-06/ncaypgrowthproposal041606.pdf
Ohio	http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDefaultPage.aspx?page=1
Pennsylvania	http://www.pde.state.pa.us/a_and_t/cwp/view.asp?a=108&q=137518
Tennessee	http://www.state.tn.us/education/accountability/index.shtml
Texas	http://www.tea.state.tx.us/index3.aspx?id=3688&menu_id3=793