



Report to the Senate Appropriations  
Subcommittee on Labor, Health and  
Human Services, Education, and  
Related Agencies

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October 2015

# K-12 EDUCATION

## Most Eighth Grade Students Are Not Proficient in Geography

# GAO Highlights

Highlights of [GAO-16-7](#), a report to the Senate Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies

## Why GAO Did This Study

Geography—the study of places and the relationship between people and their environment—is present across many facets of modern life, from tracking lost cell phones to monitoring disease outbreaks like Ebola. The growing use of geographic information and location-based technology across multiple sectors of the American economy has prompted questions about whether K-12 students’ skills and exposure to geography are adequate for current and future workforce needs. Senate Report 113-71 included a provision for GAO to report on the status of geography education and challenges elementary and secondary schools face in providing geography education with limited resources.

In this report, GAO examined (1) the extent that eighth grade students are proficient in geography; (2) the challenges selected school officials and teachers face in providing geography education; and (3) the role of the Department of Education with respect to geography education. GAO reviewed relevant federal laws; analyzed nationally representative Education data on student proficiency and instruction time in geography; interviewed education officials in four states selected, in part, for varying K-12 geography requirements; reviewed key studies and research reports, including a 50-state 2013 survey of geography requirements; and interviewed agency officials and researchers. We also leveraged a professional association to identify and interview 10 K-12 teachers.

GAO is not making recommendations in this report. Education provided technical comments, which we incorporated as appropriate.

View [GAO-16-7](#). For more information, contact Jacqueline M. Nowicki at (617) 788-0580 or [nowickij@gao.gov](mailto:nowickij@gao.gov)

October 2015

## K-12 EDUCATION

### Most Eighth Grade Students Are Not Proficient in Geography

#### What GAO Found

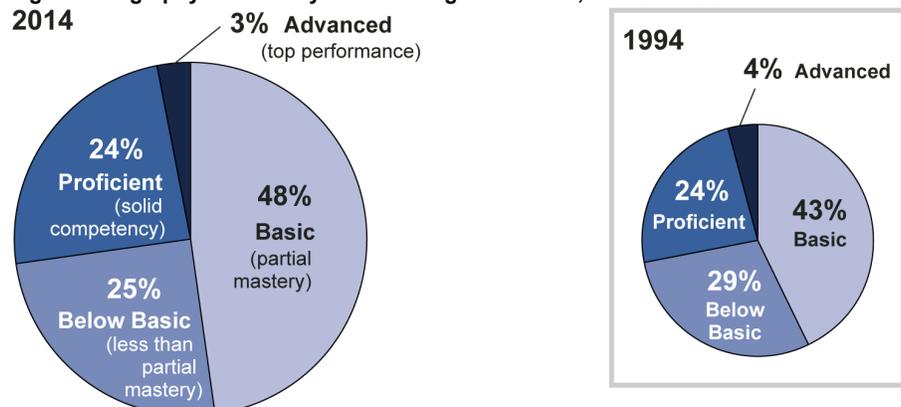
About three-quarters of eighth grade students—the only grade for which trend data are available—were not “proficient” in geography in 2014, according to GAO’s analysis of nationally representative data from the Department of Education (Education). Specifically, these students had not demonstrated solid competence in the subject, and the proficiency levels of eighth grade students have shown no improvement since 1994 (see figure). Geography is generally taught as part of social studies, but data show that more than half of eighth grade teachers reported spending a small portion (10 percent or less) of their social studies instruction time on geography. Further, according to a study by an academic organization, a majority of states do not require geography courses in middle school or high school.

A key challenge to providing geography education is the increased focus on other subjects, according to officials in selected states and K-12 teachers GAO interviewed. These officials and teachers said spending time and resources on geography education is difficult due to national and state focus on the tested subjects of reading, math, and science. GAO’s interviews and review of relevant reports identified a range of other challenges, as well, including:

- misconceptions about what geography education entails;
- lack of teacher preparation and professional development in geography;
- poor quality of geography instructional materials; and
- limited use of geographic technology in the classroom.

Education’s role with respect to geography education primarily involves assessing student performance in the subject, and providing data and the results of its analyses to the public. Education periodically assesses student achievement in geography, and other areas, but not with the same regularity as other subjects it is required by law to assess. Beyond assessments, Education officials said that absent funding specifically for geography-focused programs, the agency is hindered in its ability to support geography education.

Figure: Geography Proficiency Levels of Eighth Graders, 2014 and 1994



Source: GAO analysis of National Assessment of Educational Progress (NAEP) Geography Assessment data for 1994 and 2014. | GAO-16-7

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## Abbreviations

Education	Department of Education
ESEA	Elementary and Secondary Education Act
GIS	Geographic Information System
GPS	Global Positioning System
NAEP	National Assessment of Educational Progress
NCES	National Center for Education Statistics
STEM	Science, Technology, Engineering, and Mathematics

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October 15, 2015

The Honorable Roy Blunt  
Chairman  
The Honorable Patty Murray  
Ranking Member  
Subcommittee on Labor, Health and Human Services, Education, and  
Related Agencies  
Committee on Appropriations  
United States Senate

Geographic information and geospatial, or location-based, technologies are growing sectors of the American economy, influencing almost every facet of modern life, from tracking lost cell phones to monitoring disease outbreaks like Ebola. The emergence of these technologies has increased demand for workers who can analyze and interpret geographic information. Research suggests that K-12 education is critically important for learning the fundamentals of geography, which is the study of places and the relationship between people and their environment. However, throughout the country, states and local school districts are striving to balance limited resources against requirements to ensure students are proficient in reading, math, and science. These tensions have prompted concerns that schools may focus their resources on fewer subjects than in the past, and that K-12 students may not be acquiring adequate skills in and exposure to geography which are needed to meet workforce needs in geospatial and other geography-related industries.

The Senate report that accompanied the fiscal year 2014 appropriations act for the Departments of Labor, Health and Human Services, and Education includes a provision for us to review the status of geography education and challenges elementary and secondary schools face in providing geography education with limited resources.<sup>1</sup> In this report, we examined (1) the extent to which K-12 students are proficient in and have access to geography education; (2) the challenges selected school officials and teachers face in providing geography education; and (3) the

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<sup>1</sup>S. Rep. No. 113-71, at 204 (2013).

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role of the Department of Education (Education) with respect to geography education.

To perform this work, we used a variety of approaches. To determine the extent to which students are proficient in, and have access to, geography education, we analyzed nationally-representative data from Education's National Assessment of Educational Progress (NAEP). We determined that the data were sufficiently reliable for the purposes of this report. In addition, we reviewed relevant reports, including results from a 50-state survey of geography education standards and requirements published in 2013.<sup>2</sup> To obtain in-depth information on the challenges school officials face in providing geography education, we conducted interviews with officials in four states—Arkansas, California, Florida, and Virginia. These states were selected based on variations in state geography standards, curricula, and requirements at the K-12 level. We also worked with a national education organization specializing in social studies and geography education to identify and interview 10 K-12 social studies and geography teachers. While the responses were not generalizable, our interviews with state officials and K-12 teachers provided insights into a range of views on challenges in providing geography education. To determine the role of Education with respect to geography education, we reviewed relevant federal laws, regulations, policies, and guidance. We also interviewed Education officials from various offices and coordinated with the Office of Science and Technology Policy on other federal programs that may play a role in supporting K-12 geography education. For more information on our scope and methodology, see appendix I.

We conducted this performance audit from December 2014 to October 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>2</sup>*Social Studies and Geography Survey for Middle and High Schools*, Gilbert M. Grosvenor Center for Geographic Education, Texas State University, Fall 2013.

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## Background

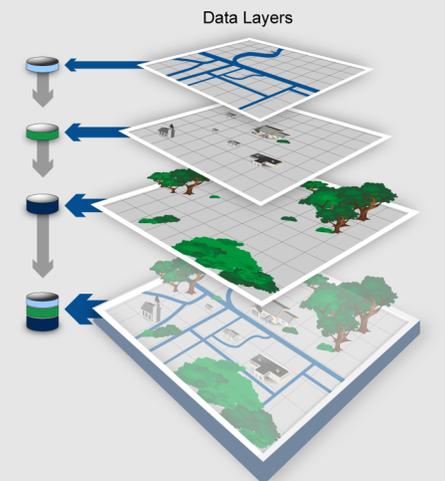
### Use of Geographic Technology

#### Global Positioning System (GPS)

A network of satellites and receiving devices to determine locations of things on Earth. Some GPS receivers are so accurate they can establish their location within 1 centimeter. Many people use GPS receivers when navigating in cars or using their cell phones.

#### Geographic Information System (GIS)

A computer system for capturing, storing, checking, and displaying data related to positions on Earth. GIS can show different layers of data on one map, enabling people to more easily analyze and understand patterns and relationships. Analyzing this layered information as an integrated whole can significantly aid decision makers in considering complex choices, such as where to locate a fire station building to best serve the greatest number of citizens.



Source: National Geographic Society and GAO. | GAO-16-7

Geography and geospatial or location-based technologies are ubiquitous in daily life, from the navigation units in cars to applications on smart phones. These technologies, which include global positioning systems (GPS) and geographic information systems (GIS), are used in a myriad of ways, from crisis mapping in Haitian earthquake relief efforts to deciding where to locate supermarkets in underserved communities in Philadelphia (see sidebar).

According to the Department of Labor, employment of specialists in geography, or geographers, is projected to grow 29 percent from 2012 to 2022—much faster than the average 11 percent growth for all occupations. As we recently reported, the federal government collects, maintains, and uses technology that depends on geography to support national security, law enforcement, health care, environmental protection, and natural resources conservation.<sup>3</sup> Among the many activities that can depend on analysis of geospatial data are maintaining roads and other critical transportation infrastructures, quickly responding to natural disasters, such as floods, hurricanes, and fires, and tracking endangered species (see fig. 1).

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<sup>3</sup>GAO, *Geospatial Data: Progress Needed on Identifying Expenditures, Building and Utilizing a Data Infrastructure, and Reducing Duplicative Efforts*, [GAO-15-193](#) (Washington, D.C.: Feb. 12, 2015).

**Figure 1: Examples of Geographic Technology Used to Track Incidences of Ebola Over Time and to Monitor Hurricane Katrina**

**Tracking cases of Ebola over time**

Year	1976	1979	1995	2000-2001	2007
Cases	318	0	315	425	264
Deaths	280	0	250	224	187

Year	1976	1976	1996	2001-2002	2007	2014
Cases	1	1	1	57	149	*27,000+
Deaths	0	0	1	43	37	*11,000+

**Monitoring landfall of Hurricane Katrina in 2005**



\* As of July 18, 2015

Sources: Centers for Disease Control and Prevention; NOAA's Environmental Visualization Laboratory. | GAO-16-7

## K-12 Geography Education

According to The National Geographic Society, the subject of geography can include a disproportionate focus on dates, events, and individuals.<sup>4</sup> However, geography—the study of places and the relationship between people and their environment—is an integral tool used to understand and make informed decisions about global problems. Currently in elementary and middle grades, geography content is often combined and taught with history, civics, and economics, under the umbrella of “social studies.” High schools can offer geography as a separate course or within the social studies curriculum. High schools can also offer the advanced placement exam in Human Geography to students in grades 9 through 12.<sup>5</sup>

<sup>4</sup>The National Geographic Society, *Geographic Awareness Week*, accessed September 1, 2015, <http://education.nationalgeographic.com/programs/geographyawarenessweek/>.

<sup>5</sup>In advanced placement Human Geography, students study the distribution, processes, and effects of the human population on the planet and learn how to use and interpret maps, data sets, geographic models, GIS, aerial photographs, and satellite images. Since its inception in 2001, the number of students taking advanced placement Human Geography has grown considerably, from 97,762 in 2002 to 191,773 in 2012, making it one of the fastest growing courses.

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Department of Education's  
Geography Framework

Although geography is taught as a part of social studies in most U.S. schools, it is an integrated discipline that can be taught with other subjects, such as science, technology, engineering, and mathematics (STEM).<sup>6</sup> Some stakeholder groups have stated that aspects of the discipline are, in fact, STEM-related, and several federal agencies include geography, GIS, or cartography as STEM disciplines. The Office of Science and Technology Policy, which coordinates federal investments in STEM education programs, also includes geographic sciences/geography and geographic technologies as part of the STEM disciplines. Although some STEM education programs may have components that support K-12 geography education, according to the Office of Science and Technology Policy there are no federal STEM education programs that directly support K-12 geography education.<sup>7</sup>

The National Center for Education Statistics (NCES) in Education tracks what students know and how well they understand and apply geography concepts as part of the National Assessment of Educational Progress (NAEP), a nationally-representative student assessment in various subject areas taken in grades 4, 8, and 12.<sup>8</sup> The NAEP geography assessment is built around a “geography framework” that determines the content assessed. The geography framework melds key physical science and social science aspects of geography, and contains a content dimension and a cognitive (or thinking) dimension (see fig. 2). The framework also includes achievement levels that describe what students should know and be able to do to reach basic, proficient, and advanced levels of achievement. NAEP defines three achievement levels applicable to each grade assessed in geography. “Basic” denotes partial mastery of the knowledge and thinking skills to perform adequate work in grades 4, 8, and 12. “Proficient” represents solid academic performance and competency over challenging subject matter. “Advanced” represents performance that is equal to that expected of top students in other

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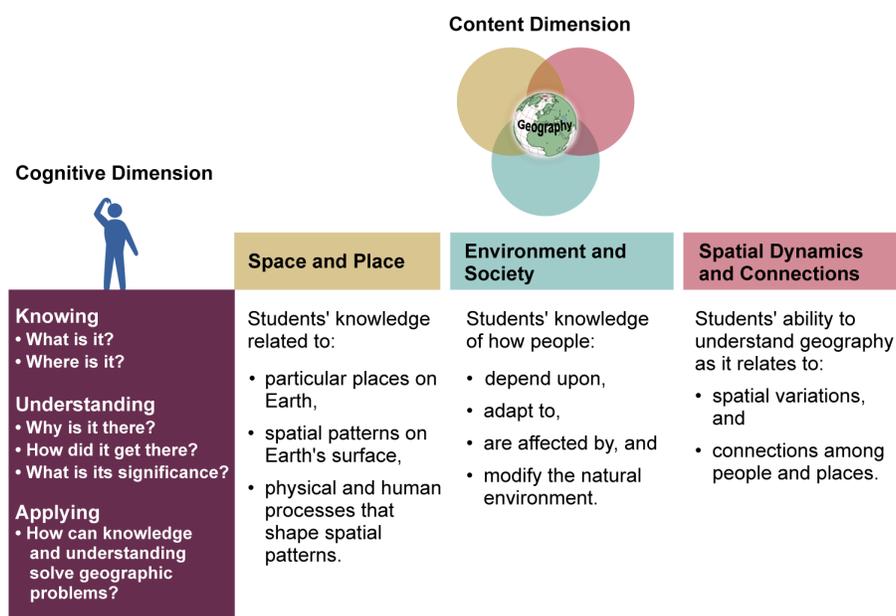
<sup>6</sup>GAO, *Science, Technology, Engineering, and Mathematics Education: Assessing the Relationship between Education and the Workforce*, [GAO-14-374](#) (Washington, D.C.: May 8, 2014).

<sup>7</sup>For this review, we did not compile an exhaustive list of federal activities and programs that may have components related to K-12 geography education as it was beyond the scope of our work.

<sup>8</sup>The NAEP assessments are unrelated to the assessments required under Title I, Part A, to measure student proficiency in meeting state academic achievement standards.

industrialized nations. The National Assessment Governing Board (Governing Board), established by law to set policy for NAEP<sup>9</sup>, believes, however, that all students should reach the proficient level; the basic level is not the desired goal, but rather represents partial mastery that is a step toward proficient.

**Figure 2: Example of Department of Education’s Framework Elements for Assessing K-12 Student Achievement in Geography**



Source: 2014 National Assessment of Educational Progress (NAEP) Geography Framework. | GAO-16-7

NCES is required by law to conduct national assessments in reading and mathematics at least once every two years in grades 4 and 8, and at “regularly scheduled intervals” in grade 12.<sup>10</sup> To the extent that time and

<sup>9</sup>20 U.S.C. § 9621. The Governing Board is designed to reflect regional, racial, gender, and cultural balance and diversity, as well as to exercise independent judgment, free from inappropriate influences and special interests. 20 U.S.C. § 9621(b)(3),(e).

<sup>10</sup>The Commissioner for Education Statistics is required to conduct NAEP, with the advice of the National Assessment Governing Board, by the National Assessment of Educational Progress Authorization Act, § 303, as added and amended by § 401(d), 116 Stat. 1940, 1984 (2002) (codified at 20 U.S.C. § 9622).

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Geography and the Elementary and Secondary Education Act

resources allow, Education may conduct assessments in grades 4, 8, and 12 at regularly scheduled intervals in additional subjects, including writing, science, history, geography, civics, economics, foreign language, and arts.<sup>11</sup> The Governing Board is responsible for determining the subjects and grades to be tested, in accordance with provisions in the NAEP statute.

Geography is one of 10 core academic subjects as defined in the Elementary and Secondary Education Act of 1965 (ESEA)<sup>12</sup>, but is not identified as a subject that states must test under the Act. ESEA requires states to demonstrate progress toward the goal of all students meeting academic achievement standards while closing achievement gaps among various groups of students, such as economically disadvantaged students.<sup>13</sup> To enable states to show progress, the law contains testing and reporting requirements for reading/language arts, math, and science.<sup>14</sup> However, states may still require assessments in other subject areas, such as geography.<sup>15</sup>

In addition, ESEA contains requirements related to NAEP. For example, in order to receive a subgrant under Title I, Part A of ESEA, a school district must have a plan on file with a state educational agency that includes, among other things, an assurance by the school district that the district will participate, if selected, in the NAEP fourth and eighth grade reading and math assessments.<sup>16</sup>

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<sup>11</sup>20 U.S.C. § 9622(b)(2)(D).

<sup>12</sup>20 U.S.C. § 7801(11). As of August 2015, the Senate ESEA reauthorization bill expands the current list of core academic subjects, retaining geography as one of the subjects. Every Child Achieves Act of 2015, S. 1177, 114<sup>th</sup> Cong. § 9101(4) (2015). The House ESEA reauthorization bill does not contain a definition of core academic subjects. Student Success Act, H.R. 5, 114<sup>th</sup> Cong. (2015).

<sup>13</sup>20 U.S.C. § 6311(b)(2)(B).

<sup>14</sup>20 U.S.C. § 6311(b)(3)(C).

<sup>15</sup>20 U.S.C. § 6311(b)(3)(C)(viii).

<sup>16</sup>20 U.S.C. § 6312(b)(1)(F).

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## Data Show Most Eighth Grade Students Are Not Proficient in Geography, and Little Time is Spent on Instruction

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### About Three-Quarters of Eighth Grade Students are Not Proficient in Geography

Most eighth grade students<sup>17</sup>—about three-quarters—in 2014 scored below the proficient level, indicating partial or less than partial mastery in geography,<sup>18</sup> according to our analysis of Education’s nationally representative NAEP data (see fig. 3).<sup>19</sup> This finding was consistent with fourth and 12th grade geography proficiency levels in prior assessments, according to Education’s 2010 publication on NAEP. For example, in 2010, only 21 percent of fourth graders and 20 percent of 12th graders performed at or above the proficient level. In 2014, certain groups of eighth grade students outperformed others. For example, students who were not eligible for the federal free or reduced-price lunch scored, on average, higher than students who were eligible, while students in private schools slightly outperformed students in public schools. However, average test scores for all of these student groups were below the proficient level.

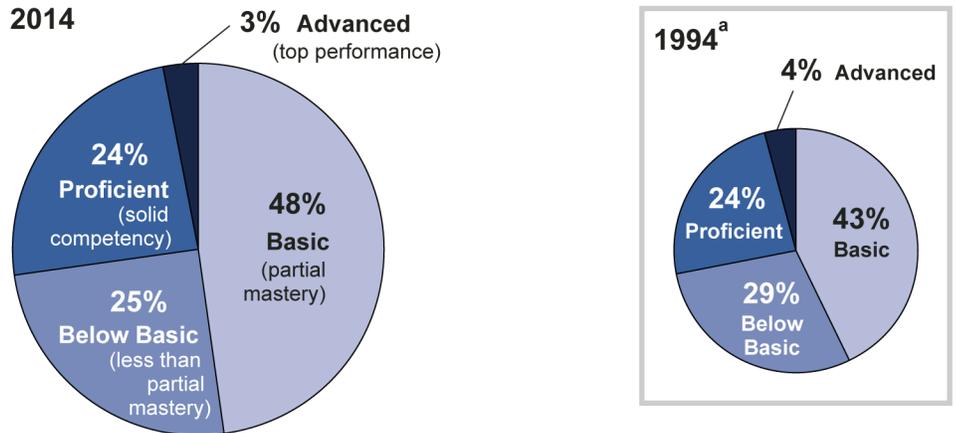
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<sup>17</sup>The 2014 NAEP geography assessment only tested eighth grade students. In contrast, NAEP geography assessments in 1994, 2001, and 2010 tested fourth, eighth, and 12th grade students. Therefore, we reported data on eighth grade students as it was the only grade that allowed us to analyze trends from 1994 to the most recent available data in 2014. According to NCES officials we interviewed, by eighth grade, most students have had exposure to geography in education, allowing for a more accurate assessment of proficiency in this grade.

<sup>18</sup>As stated in the 2014 NAEP Geography Framework, to score in the proficient level on the NAEP assessment, students would have learned enough geography to be competent students and productive citizens.

<sup>19</sup>The NAEP assessment is a sample so all estimates derived from it are subject to sampling error. Unless otherwise noted, all estimates of average test scores in this report have margins of error at the 95 percent confidence level of plus or minus 6 percent of the score. All percentage estimates in this report have margins of error at the 95 percent confidence level of plus or minus 8 percentage points, unless otherwise noted.

**Figure 3: Percentages of Eighth Grade Students at Different Achievement Levels in Geography, 2014 and 1994**



Source: GAO analysis of NAEP Geography Assessment data for 1994 and 2014. | GAO-16-7

<sup>a</sup>Testing accommodations (e.g., providing additional time to take the test), which allow for the inclusion of students with disabilities and English language learners, were not permitted for tests administered in 1994. NAEP was able to mitigate for this limitation, thus enabling a comparison of trend data, by incorporating additional studies of data trends between the non-accommodated sample in 1994 and the accommodated samples in 2001, 2010, and 2014.

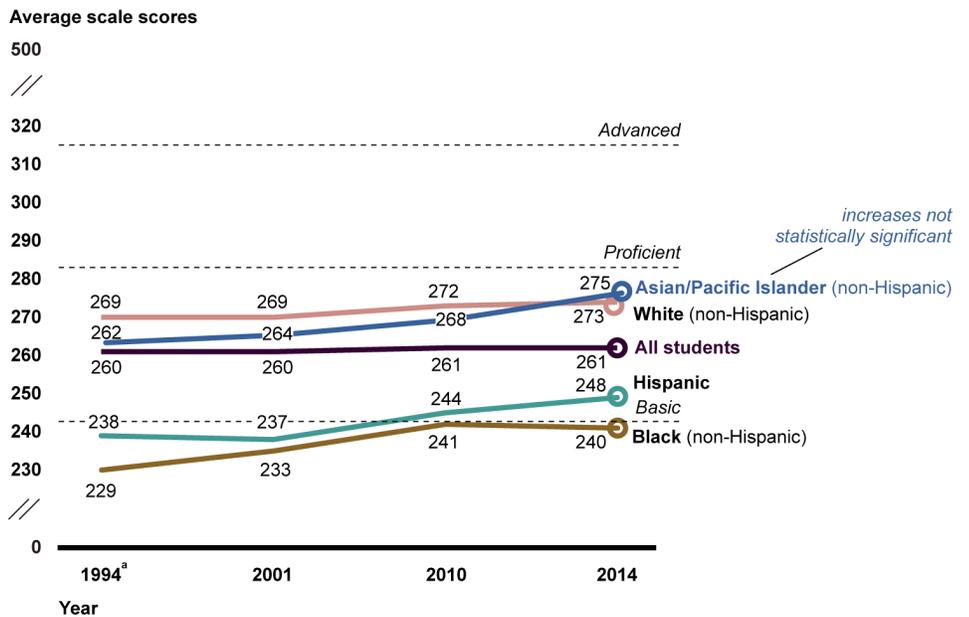
Since the geography assessment using the current framework was first administered in 1994, the average test scores among eighth grade students have shown no change, with average scores for all students nationwide remaining below proficient for 20 years.<sup>20</sup> However, certain student groups made modest gains in achievement. For example, average test scores in geography increased for White, Black, and Hispanic students since 1994 (see fig. 4).<sup>21</sup> Further, average test scores appeared to have increased among Asian/Pacific Islander students, but

<sup>20</sup>This finding was also consistent with trends in fourth and 12th grade geography scores from prior years, according to a NAEP publication. In fourth grade, the percentages of students at or above proficient in 2010 were not significantly different from the percentages in 2001 and 1994. In grade 12, the percentage of students at or above proficient was lower in 2010 than in earlier assessment years.

<sup>21</sup>Prior to 2011, students who identified with more than one racial/ethnic category were classified as other. In 2011, additional information was collected in compliance with new standards from the U.S. Office of Management and Budget so results could be reported separately for students identifying with two or more races. NAEP accounted for these changes in race/ethnicity categories to ensure consistency in reporting results across time. Students who identified as two or more races are not presented in figure 4.

unlike the increases for the other groups, these increases were not statistically significant. Additionally, the gap in average test scores between both White and Black students and White and Hispanic students narrowed slightly since the test was first administered.

**Figure 4: Average Eighth Grade Geography Test Scores by Race, 1994 – 2014**



Source: GAO analysis of National Assessment of Educational Progress (NAEP) Geography Assessment data for 1994, 2001, 2010, and 2014. | GAO-16-7

<sup>a</sup>Testing accommodations (e.g., providing additional time to take the test), which allow for the inclusion of students with disabilities and English language learners, were not permitted for tests administered in 1994. NAEP was able to mitigate for this limitation, thus enabling a comparison of trend data, by incorporating additional studies of data trends between the non-accommodated sample in 1994 and the accommodated samples in 2001, 2010, and 2014.

Note: NAEP test scores are weighted averages and reflect the proportion of different student groups within the sample. Changes over time in the proportion of a student group (e.g. race/ethnicity) in the overall sample has led to a statistical phenomenon in NAEP reporting through the years. This phenomenon, referred to as Simpson's Paradox, is present when the overall student sample (reflected in the 'all students' line graph) includes a higher proportion of lower performing students. Thus, any increases in test scores made by certain subgroups in the sample (reflected in the Hispanic line graph, for example) are masked in the overall student sample.

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## Teachers Reported Spending a Small Portion of Instruction Time on Geography

Data on student access to geography education showed that a small portion of instruction time is spent on the subject. Our analysis of 2014 teacher survey data,<sup>22</sup> a component of the NAEP geography assessment, showed that 50 percent of eighth grade teachers reported spending 3 to 5 hours per week of classroom instruction time on social studies—the vehicle through which geography is taught. Of those teachers spending 3 to 5 hours per week of classroom instruction time on social studies, more than half reported that “10 percent or less” of their social studies time was spent on geography.<sup>23</sup> In addition, half of all eighth grade students in 2014 reported learning about geography “a few times a year” or “hardly ever.” Further, NAEP’s data collection methodologies allow for analyses of geography instruction time by race/ethnicity, gender, school lunch program eligibility, and attendance at private or public school; generally we observed no significant differences in these areas among teachers who reported spending “10 percent or less” of their social studies time on geography (see fig. 5).<sup>24</sup> We also found that instruction time spent on geography has remained largely the same since 2010.<sup>25</sup>

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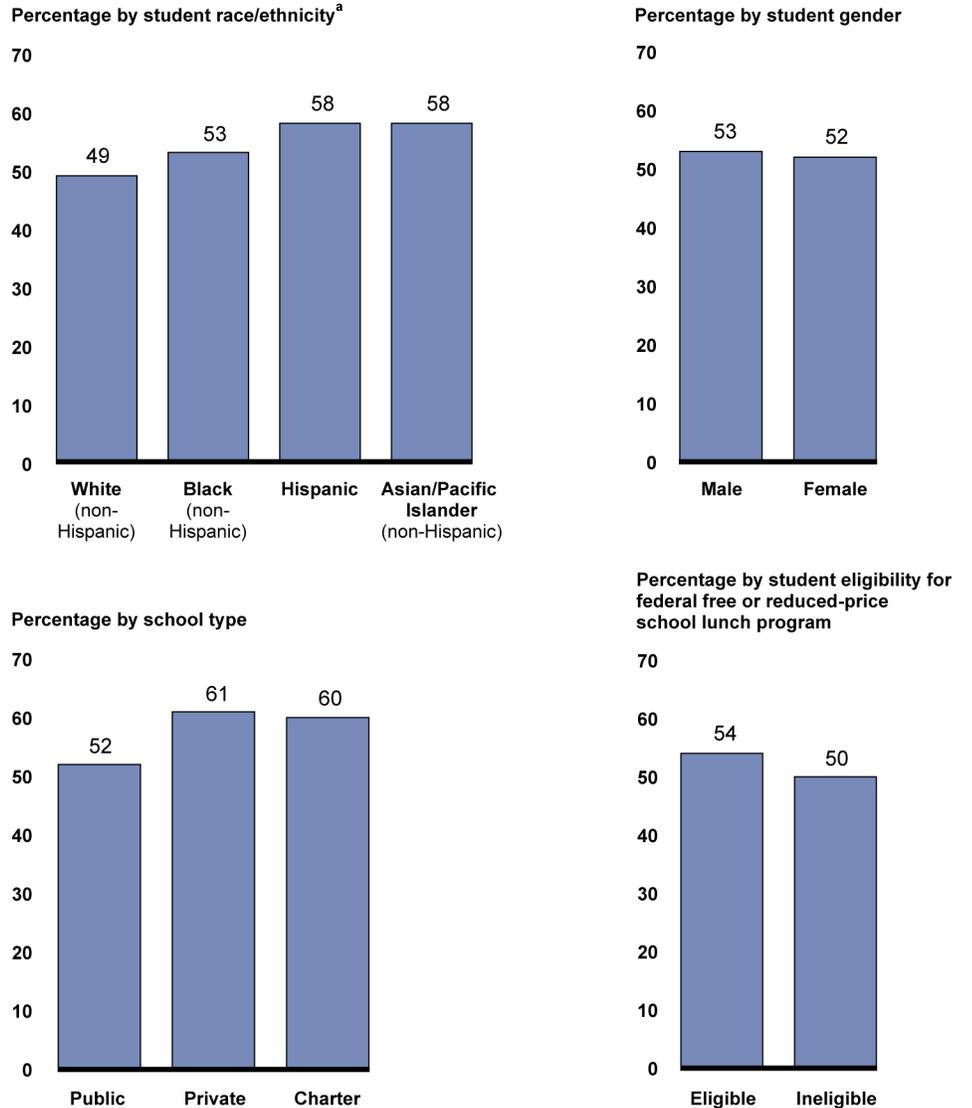
<sup>22</sup>Eighty-five percent of teachers who responded to the 2014 NAEP teacher questionnaire taught social studies exclusively while the remaining respondents taught all or most subjects or taught in teams.

<sup>23</sup>As noted previously, in the United States, geography is generally taught as a part of social studies. NAEP does not capture time (in hours) teachers specifically devote to geography.

<sup>24</sup>The exception was between Hispanic and White students, where a higher percentage of Hispanic students spent “10 percent or less” of instruction time on geography than the percentage of White students.

<sup>25</sup>Although the 2001 NAEP geography assessment collected some information on instruction time, the survey question changed in 2010 and 2014, making it difficult to compare teacher-reported instruction time in geography beyond 2010.

**Figure 5: Percentage of Eighth Grade Students Receiving “10 Percent or Less” of Social Studies Instruction Time on Geography, by Student Characteristics and School Type, 2014**



Source: GAO analysis of National Assessment of Educational Progress (NAEP) Geography Assessment data, 2014. | GAO-16-7

<sup>a</sup>Data on American Indian/Alaska Native students were not reported due to the small count of students. The percentage point error for the Black students receiving 10 percent or less of social studies instruction time in geography is 13 points of the reported estimate.

Note: The NAEP geography assessment survey of teachers allowed for reporting of instruction time by certain categories: none, 1-10 percent, 11-40 percent, 41-60 percent, 61-90 percent, and more than 90 percent. Apparent numerical differences are not statistically significant.

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As part of the 2014 NAEP teacher survey, teachers nationwide also reported varying degrees of frequency when teaching geography skills to eighth grade students and using technology. Teachers more often reported teaching geography skills—such as spatial dynamics and connections, use of maps and globes, and other countries and cultures—once or twice a month than more frequent intervals. In addition, as part of the 2014 NAEP survey, teachers reported using technology to teach geography to varying degrees. For example, when teaching geography, over half of teachers reported using computers to a “moderate or large extent” and one-third of teachers reported using computers to a “small extent” or “not at all.”

Variations in state requirements in geography can limit student access to geography education. According to one university research center’s 2013 survey of states’ geography education requirements, most states did not require geography courses in middle school and high school.<sup>26</sup> According to this survey, only 17 states required a geography course in middle school<sup>27</sup> and 10 states required a geography course for students to graduate from high school.<sup>28</sup> (See fig. 6)

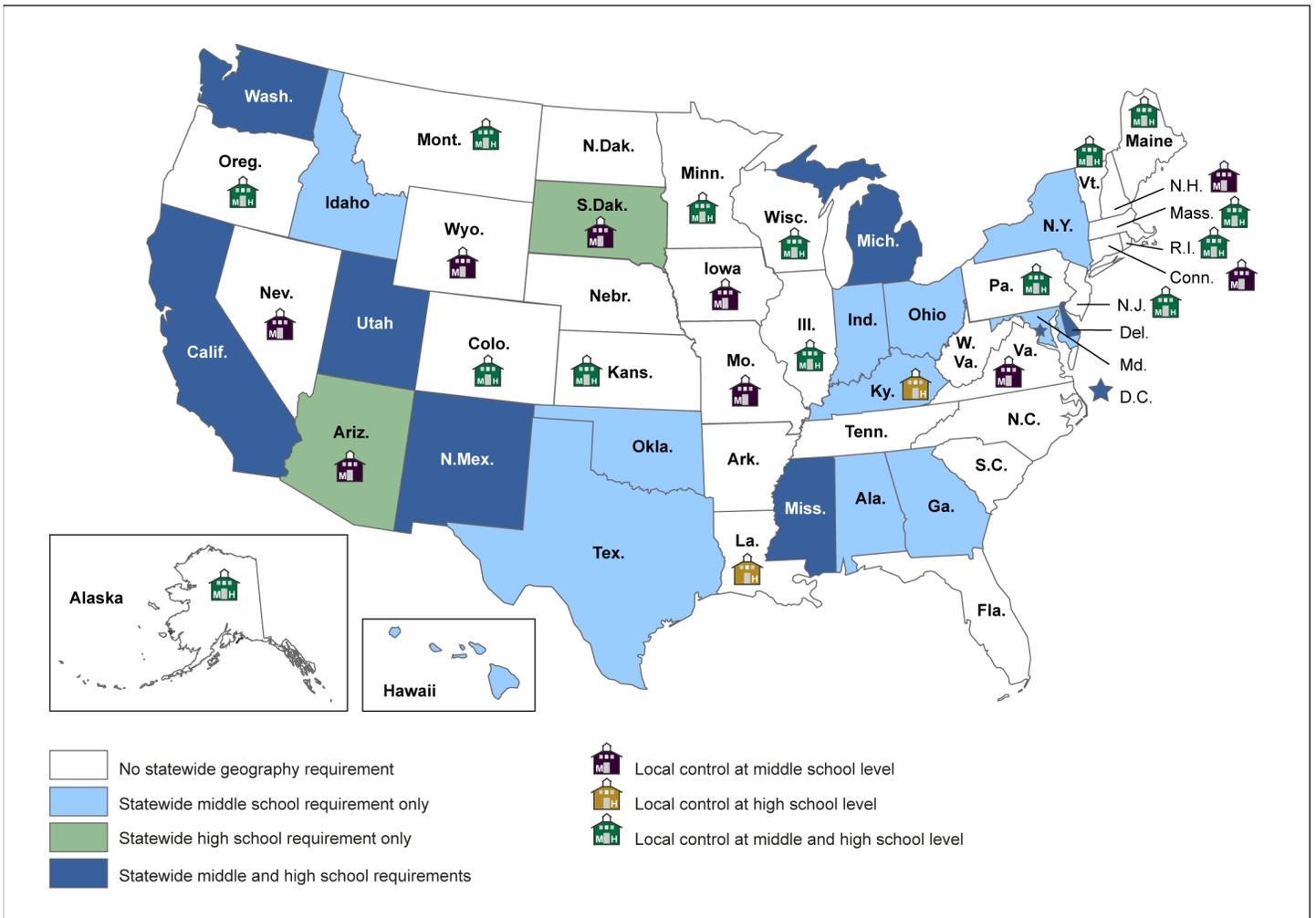
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<sup>26</sup>The report assessed geography education in the context of social studies standards and course requirements in the 50 states and the District of Columbia (D.C.). The report defines geography courses to include courses that combine geography with another social studies subject. *Social Studies and Geography Survey for Middle and High Schools*, Gilbert M. Grosvenor Center for Geographic Education, Texas State University, Fall 2013. GAO did not verify legal information pertaining to state requirements contained in this report.

<sup>27</sup>Five of the 17 states required a combined course that included geography and one other social studies subject.

<sup>28</sup>Seven of the 10 states required a combined geography and social studies course.

**Figure 6: State Geography Requirements for Middle School and High School, as of 2013**



Source: GAO presentation of information from The Gilbert Center for Geographic Education, Fall 2013. Map Resources (map). | GAO-16-7

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## States and Teachers Face Challenges Providing Geography Education Amid Focus on Other Subjects

As found in our previous work, states, schools, and teachers continue to focus instruction time on subjects other than geography. Specifically, as schools spend more time improving students' reading, math, and science skills to meet federal accountability requirements, there are concerns that other subjects might be reduced or eliminated.<sup>29</sup> Similarly, prior studies from Education show that instruction time in reading/English and math has increased over past decades, while instruction time in social studies—the vehicle through which geography is generally taught—has declined.<sup>30</sup> Officials from national organizations we interviewed also expressed concern that geography education has not been given the same national priority as reading, math, and science—subjects associated with federal testing requirements under Title I, Part A of ESEA.

State education officials and K-12 teachers we interviewed echoed this sentiment, stating that allocating resources for geography education was challenging in the face of greater national and state focus on tested subjects. Officials from all four state educational agencies with which we conducted interviews told us they faced challenges in ensuring that

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<sup>29</sup>Schools' efforts to improve student performance and the schools' status in achieving these goals can lead to changes in the amount of instruction time devoted to reading, math, and other subjects, such as geography. GAO, *Access To Arts Education: Inclusion of Additional Questions in Education's Planned Research Would Help Explain Why Instruction Time Has Decreased for Some Students*, [GAO-09-286](#) (Washington, D.C.: Feb. 27, 2009).

<sup>30</sup>Education's Schools and Staffing Survey (SASS) measured the average number of hours and percentage of the school week that first through fourth grade public school teachers spent on four subjects (English, mathematics, social studies, and science) from school years 1987-1988 to 2007-2008. U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, "Public Teacher Data File," 1987-88, 1990-91, 1993-94, 1999-2000, 2003-04, and 2007-08; "Public School Data File," 1987-88, 1990-91, 1993-94, 1999-2000, 2003-04, and 2007-08; "Charter Teacher Data File," 1999-2000; and "Charter School Data File," 1999-2000. Education's No Child Left Behind National Longitudinal Survey (NCLB-NLS) measured elementary school teacher-reported instruction time across two school years, 2004-2005 and 2006-2007, in several more subjects including art/music, physical education/health, social studies/history, science, mathematics, and reading/language arts. State and Local Implementation of No Child Left Behind Act Volume IX - Accountability Under NCLB: Final Report. A report from the National Longitudinal Study of No Child Left Behind (NLS-NCLB) and the Study of State Implementation of Accountability and Teacher Quality under No Child Left Behind (SSI-NCLB), Kerstin Carlson Le Floch, AIR, Scott Naftel, RAND, Jennifer O'Day, AIR, Brian Stecher, RAND, James Taylor, AIR. Prepared for: U.S. Department of Education Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service (2010).

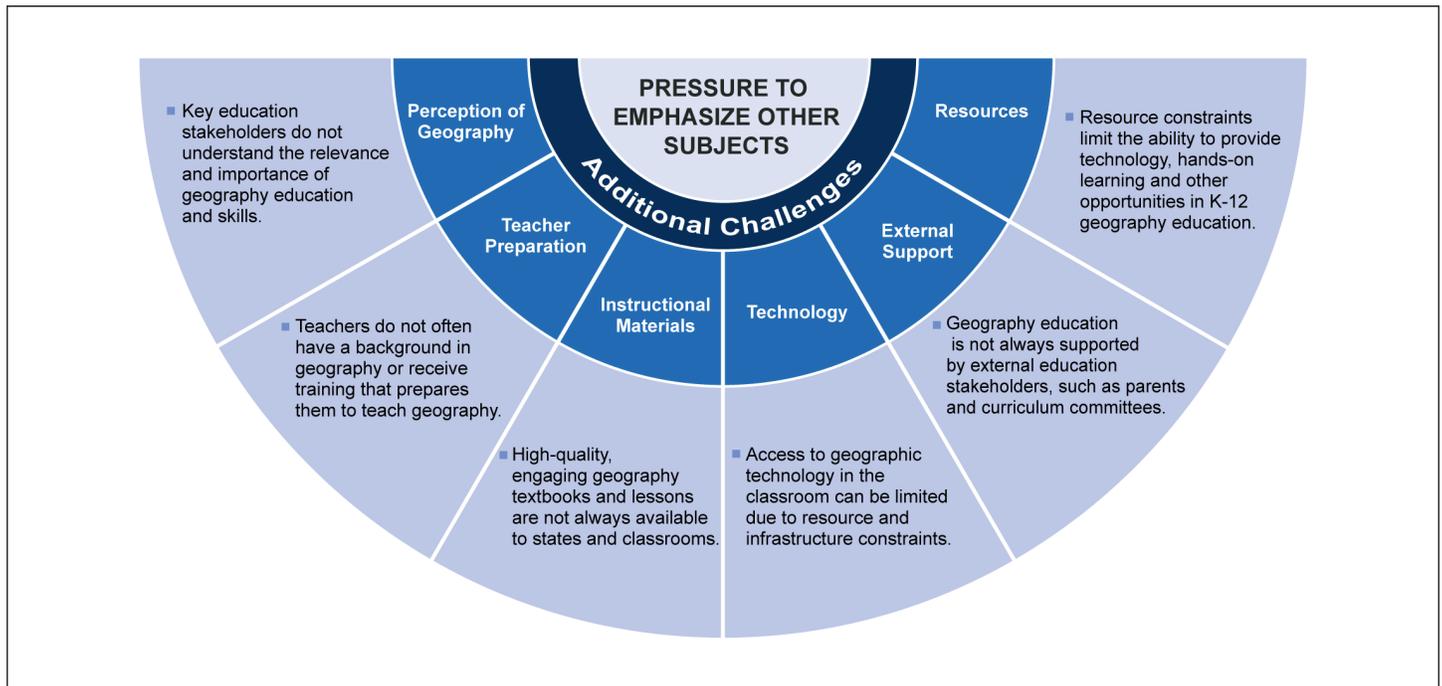
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geography standards remained an integral part of the state curriculum. For example, one state official told us how the state had eliminated geography from the curriculum for over a decade, and only recently added geography courses back amid concerns from the community that students were lacking essential geography skills. Similarly, all 10 teachers we spoke with reported that geography instruction has decreased in recent years due to a greater emphasis on teaching math and reading. Half of the 10 teachers described pressures to improve student test scores in reading and math, which hindered their ability to devote time to social studies and geography—subjects that generally do not have required tests. Among the 10 teachers we interviewed, almost all described not having sufficient time to teach geography as the top challenge to providing students with a geography education. Five of the 10 teachers also reported that teaching geography was not viewed as important in their district or school. For example, one teacher said she was told that her students’ test scores in geography did not “count” and two of the geography teachers expressed concern about losing their jobs because geography and social studies courses were likely being removed from the curriculum.

Additional Challenges to  
Providing Geography  
Education

As shown in figure 7, officials and stakeholders we interviewed, as well as key reports on the subject, cited other challenges to providing geography education.

**Figure 7: Reported Challenges in Providing K-12 Geography Instruction**



Source: GAO analysis of interviews with selected state department of education officials and K-12 social studies and geography teachers. | GAO-16-7

- Perception of Geography – There is a common misconception about what geography entails, according to officials we interviewed and relevant reports we reviewed. Even key education stakeholders such as teachers, principals, and parents mistakenly think geography education involves fact-based memorization, according to officials we interviewed from three of our selected national geography organizations. According to one report, this view has likely persisted because it was the stakeholders’ personal experience when they were students. Officials we interviewed from the three geography organizations reported that this limited view of geography has made the subject easier to dismiss or ignore. In addition, among the state officials and teachers we interviewed, several confirmed that this public perception of geography makes obtaining support and resources more difficult.
- Teacher Preparation – Many teachers who teach geography do not have an educational background in the subject and take few, if any, geography courses in college, according to a 2013 geography

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education report.<sup>31</sup> Teachers and state education officials we interviewed similarly stated that not enough professional development is devoted to the subject, and many teachers are not comfortable teaching geography. Our analysis of Education’s 2014 NAEP data shows variation in the amount and types of professional development activities that teachers reported participating in during the previous two years related to the teaching of civics, geography, history, or social studies.<sup>32</sup>

- **Instructional Materials** – Geography instructional materials do not often showcase the depth and breadth of the subject or offer hands-on learning opportunities for students, according to officials from national groups we interviewed. One report noted that K-12 geography instructional materials—which largely consist of textbooks, atlases, and ancillary materials, such as workbooks or teacher PowerPoint presentations—must move beyond activities that require students to solely label maps.<sup>33</sup> However, all of the state officials we interviewed said many districts do not have the resources to upgrade their instructional materials in geography. In addition, among the 10 K-12 teachers we interviewed, seven reported they do not have time to search for better lessons and materials in geography, although they acknowledged that there are many resources and materials available online at low or no cost. The report also noted that when teachers are not well-prepared to teach geography, instructional materials become especially important.
- **Technology** – While technology can present opportunities to better engage students, using technology to teach geography can also present challenges. Our analysis of Education’s NAEP data show that in 2014 more teachers reported using technology-based geography

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<sup>31</sup>Schell, E. M., Roth, K. J., & Mohan, A. (Eds.), *A Road Map for 21st Century Geography Education: Instructional Materials and Professional Development* (A report from the Instructional Materials and Professional Development Committee of the Road Map for 21st Century Geography Education Project) (Washington, DC: National Council for Geographic Education, 2013).

<sup>32</sup>Specifically, in 2014, a majority of teachers reported in the NAEP geography assessment that they had not engaged in professional development activities such as college courses, observational visits, or consultations related to civics, geography, or history in the last two years. However, most teachers responded that they had attended civics, geography, or history-related conferences and workshops in the last two years.

<sup>33</sup>Schell, Roth, and Mohan, *Road Map Report for Geography Education*.

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instruction than in 2010. One report notes that there are a growing number of K-12 geography lessons using geospatial technologies, such as GIS and remote sensing;<sup>34</sup> however, geography classrooms still largely depend on textbooks and lecture-based instruction.<sup>35</sup> Further, officials we interviewed from three of our selected states described wide variation in the use of technology across districts and schools and expressed concern that many teachers did not receive training on how to incorporate the technology into their lessons.<sup>36</sup> Among the 10 teachers we interviewed, seven reported frustrations with using technology to teach geography, such as outdated software, lack of technical support at their school, and poor internet connections.

- Other Challenges – State officials and teachers we interviewed also identified other challenges. For example, obtaining support from parents, state and local education leaders, and other external parties can prove difficult when revising geography standards or dedicating resources, according to officials we interviewed from two of our selected states. Five of the teachers we interviewed also described challenges trying to acquire resources for geography education, such as classroom materials, field trips, or technology.

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## Education’s Primary Role in Geography Education is Assessing Student Achievement

Education’s role with respect to geography education primarily involves assessing student performance in the subject, and providing data and the results of its analysis to the public. Education’s National Center for Education Statistics (NCES) periodically administers the NAEP geography assessment. NCES communicates the findings of NAEP to the public by publishing the Nation’s Report Card, which provides summary information on how well students are performing in geography based on a common test. NCES also provides restricted-use and public-use NAEP data and tools for running statistical analyses, and guidance on how researchers and other stakeholders can use these data for their own analyses. Along with the Nation’s Report Card, the NAEP frameworks, as

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<sup>34</sup>Remote sensing is the science of obtaining information about objects or areas from a distance, typically from aircraft or satellites.

<sup>35</sup>Schell, Roth, and Mohan. *Road Map Report for Geography Education*.

<sup>36</sup>However, NAEP geography data show that in 2014 more than 75 percent of teachers reported receiving training on integrating computers into their lessons or that they were already proficient.

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developed by the National Assessment Governing Board, outline the content and skills assessed in each NAEP subject. These NAEP frameworks are available to the public and can serve as guidelines for planning other assessments or revising curricula.<sup>37</sup> Officials we interviewed from two of our four selected states reported looking at the NAEP geography frameworks when revising state geography standards and curricula.

However, since its development in 1994, the NAEP geography assessment has not been administered as regularly as reading and mathematics because assessing achievement in geography is not required by law. Specifically, the NAEP geography assessment has been conducted in 1994, 2001, 2010, and 2014.<sup>38</sup> As a result of budget constraints, the 2014 NAEP geography assessment tested eighth grade students but not fourth and 12th grade students, as had been the case for previous assessments (see fig. 8). According to NCES officials we interviewed, the eighth grade was chosen because most students would have exposure to geography by that grade level. Officials said there was a risk that fourth graders may not have been exposed to geography and insufficient funding precluded them from assessing students in the 12th grade. Officials we interviewed from four of our selected national geography organizations reported that not assessing fourth and 12th grade students in geography will hinder research efforts related to K-12 geography education by making trend analyses for these grade levels impossible.

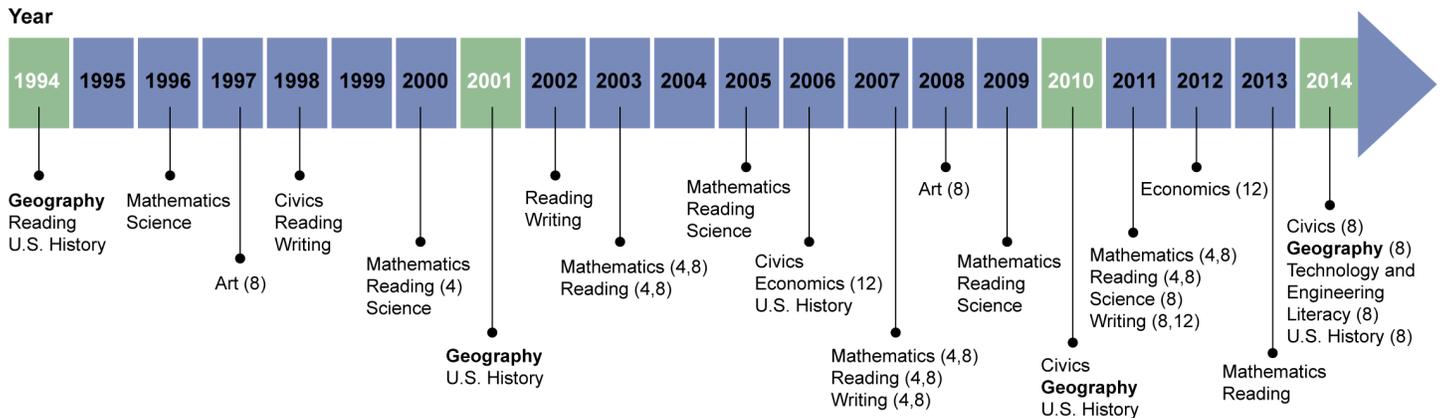
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<sup>37</sup>Governing Board staff told us that they make the frameworks available to the public but do not provide technical assistance on their use to states, districts, or others. The frameworks are developed through a national consensus process led by the Governing Board that involves participation by diverse groups such as teachers, curriculum specialists, local school administrators, parents, and members of the general public.

<sup>38</sup>In 1994, NAEP assessed geography learning in grades 4, 8, and 12 for the first time. The most reliable geography assessment prior to 1994 was carried out by NAEP in 1988 and only involved a sample of 3,000 high school seniors.

**Figure 8: Timeline of National Assessment of Educational Progress Assessments for 1994 through 2014**

Assessments were administered in grades 4, 8, and 12 unless otherwise indicated



Source: National Center for Education Statistics. | GAO-16-7

The Governing Board and NCES officials told us there are plans to bolster the 2018 NAEP in geography, contingent on funding. NCES plans to test 12th grade students in the next geography assessment, and officials told us it is important to assess the geography skills students have upon leaving high school. In addition, officials said if funding allows, that the 2018 geography NAEP will be digitally based and administered on tablets. NCES officials told us the geography assessment, and content in particular, can benefit from the digital format by allowing the use of more interactive maps and geographic technology.

Other than NAEP, Education has no initiatives or programs specific to K-12 geography education. Officials told us that although the agency previously supported some activities related to geography through a program focused on civics, funding for this program is no longer available. Similarly, Education funded a research grant involving the use of software in social studies and geography classrooms, but this project ended in 2011.<sup>39</sup> In addition, Education’s technology initiatives do not incorporate or include information about geography education or geographic technology in K-12 classrooms. As part of the President’s ConnectED Initiative, Education’s Office of Technology provides general guidance to

<sup>39</sup> Additional information on this grant can be found at the Institute of Education Statistics, *Harnessing Retrieval Practice to Enhance Learning in Diverse Domains*, accessed September 23, 2015, <http://ies.ed.gov/funding/grantsearch/details.asp?ID=480>.

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states, school districts, and schools on how existing federal funds can support digital learning. However, this office does not provide guidance specific to geographic technologies in the classroom.<sup>40</sup> Further, Education officials said they sometimes receive requests from external parties, including teachers and school districts, asking about resources for geography. In the absence of dedicated program funding for geography education, agency staff responds to such requests themselves and sometimes directs the parties to national geography groups, like the National Geographic Society.

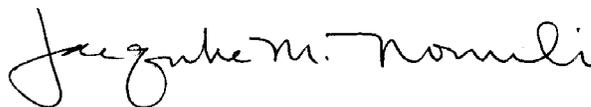
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## Agency Comments and Our Evaluation

We provided a draft of this report to the Department of Education for review and comment. Education provided technical comments, which we incorporated as appropriate.

We are sending copies to the Secretary of Education and appropriate congressional committees. The report will also be available at no charge on the GAO website at [www.gao.gov](http://www.gao.gov).

If you or your staff members have any questions, please contact me at (617) 788-0580 or [nowickij@gao.gov](mailto:nowickij@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix II.



Jacqueline M. Nowicki, Director  
Education, Workforce, and Income  
Security Issues

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<sup>40</sup>As part of the ConnectED initiative, the private sector has provided \$1 billion worth of free access to software for all K-12 schools to allow students to map and analyze data. However, Education officials stated that they have no plans to provide guidance or information specific to this aspect of the ConnectED program.

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# Appendix I: Objectives, Scope and Methodology

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This appendix discusses in detail our methodology for addressing three research questions for geography education: (1) To what extent do K-12 students have proficiency in and access to geography education? (2) What challenges do selected school officials and teachers face in providing geography education? and (3) What role does the Department of Education have with respect to geography education?

To address these questions, we relied on multiple methodologies. We reviewed relevant federal laws, policies, and guidance. We analyzed nationally representative Education data on student proficiency in and access to geography education. We determined that the data were sufficiently reliable for the purposes of this report by testing it for accuracy and completeness, reviewing documentation about systems used to produce the data, and interviewing agency officials. We conducted outreach with four states, which were selected to provide variation in geography requirements. In addition, we reviewed selected studies and research reports, including a report with results from a 50-state survey of geography requirements. We also conducted interviews with officials from the Department of Education, state officials, and a nonrepresentative group of K-12 social studies and geography teachers.

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## Review of Federal Laws, Policies, and Guidance

To determine the federal role with respect to geography education, we reviewed relevant federal laws, including the most recent reauthorization of the Elementary and Secondary Education Act of 1965 and the National Assessment of Educational Progress Authorization Act. We also reviewed relevant federal policies and guidance related to geography education.

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## Data on Student Proficiency and Access

To address the extent to which K-12 students are proficient in and have access to geography education, we analyzed Department of Education data from nationally representative samples of public and nonpublic school students in grades 4, 8, and 12 from the National Assessment of Educational Progress (NAEP) in geography for 1994, 2001, 2010, and 2014—the years in which the NAEP assessments in geography were administered. In this report, we presented data on eighth grade students as it was the only grade for which data were available from 1994 through 2014, the most recent NAEP assessment in geography. We compared differences in proficiency in and access to geography education across student demographics, including race, gender, and poverty measures. Our analysis was based on reported proficiency as determined by the national NAEP geography assessment scores as well as data collected from the NAEP student, teacher, and school survey questionnaires.

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Eighty-five percent of teachers who responded to the 2014 NAEP teacher questionnaire only taught social studies, while the remaining taught all or most subjects or taught in teams. To provide information on students' access to geography education, we analyzed and reported on access as measured by (1) teacher and student-reported instruction time spent on geography in the classroom as well as (2) exposure to other geography-related skills and topics, such as spatial dynamics and using maps and globes, as reported by teachers.

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## Outreach to Selected States

To gather more in-depth information on the challenges school officials face in providing geography education and state-level geography education requirements, we conducted interviews with officials in four states—Arkansas, California, Florida, and Virginia. States were selected to provide variation in geography education standards, curricula, and requirements at the K-12 level. For each of these states, we gathered information from officials at state departments of education. In addition, we reviewed key documents related to state K-12 education requirements, curricula, and standards in geography. Our findings associated with our outreach to these selected states cannot be generalized to all states' K-12 education population; rather, they provide insight into a range of views and experiences with K-12 geography education.

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## Relevant Studies and Research Reports

To supplement our analysis of nationally representative K-12 data on student proficiency in and access to geography education, we reviewed key reports, studies, and research related to K-12 geography education. These reports and studies were identified through online searches of relevant material and through recommendations from stakeholders who we interviewed. In addition, we also reviewed the results of several Education surveys on changes in access, or instruction time, across different subjects. These surveys were recommended by National Center for Education Statistics officials and included the Schools and Staffing Survey, a system of related questionnaires that provides descriptive data on the context of elementary and secondary education, and the National Longitudinal Study of No Child Left Behind, which collected nationally-representative data on changes in instruction time among elementary school teachers.

To gain a national picture of K-12 geography standards and requirements, we analyzed state-level information from a 2013 survey conducted by Texas State University's Gilbert M. Grosvenor Center for

Geographic Education. This survey collected self-reported information from 50 states and the District of Columbia on middle school and high school geography requirements. We reviewed the survey instrument and study methodology and interviewed officials responsible for administering the survey. We determined that these data were sufficiently reliable for the purposes of this report.

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### Interviews with Officials from Federal Agencies, Schools, and National Groups

To further understand the role the Department of Education plays with respect to geography education, we interviewed Education officials as well as relevant national groups. At Education, we interviewed officials from the Office of Elementary and Secondary Education, the Office of Educational Technology, the National Assessment Governing Board, and the National Center for Education Statistics. We also coordinated with officials from the Office of Science and Technology Policy to identify any science, technology, engineering, or mathematics initiatives that include geography education.

Further, to describe the challenges school officials face in providing geography education, we conducted interviews with 10 K-12 social studies and geography teachers. These teachers were identified with assistance from the National Council for Social Studies—an organization with a membership of approximately 15,000 teachers of history, civics, geography, and related subjects. In response to our request, staff at the National Council for Social Studies sent an interview request, prepared by GAO, to 1,150 of their members. These members received an email, at random, with equal proportions falling in the elementary, middle, and high school levels. We conducted a total of 10 interviews with teachers who responded to this email request. While teachers self-selected for our interviews provide some insight into the views and experiences of teachers, their responses are not generalizable to all teachers of geography.

We also coordinated with or interviewed representatives from a broad range of national groups in K-12 geography education and K-12 education, including: National Geographic Society, Association of American Geographers, National Council for Geographic Education, American Geographic Society, National Council for Social Studies, National Science Teachers Association, Council of Chief State School Officers, Grosvenor Center for Geographic Education, RAND, and ESRI.

We conducted this performance audit from December 2014 to October 2015 in accordance with generally accepted government auditing

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standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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# Appendix II: GAO Contact and Staff Acknowledgments

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## GAO Contact

Jacqueline M. Nowicki, (617) 788-0580 or [nowickij@gao.gov](mailto:nowickij@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, Sherri Doughty (Assistant Director), Alison Gerry Grantham (Analyst-in-Charge), Claudine Pauselli, and Josiah Williams made key contributions to this report. Also contributing to this report were James Ashley, Nabajyoti Barkakati, Deborah Bland, Holly Dye, Kirsten Lauber, John Mingus, Tom Moscovitch, Mimi Nguyen, Karen O'Connor, Gloria Proa, and James Rebbe.

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