

Standards and Suggestions



Social Studies Standards for Climate Change Education

In this section of the report, we analyze educational standards developed by national professional groups for social studies classrooms.

The social studies standards analyzed and organizations producing them were as follows:

- National Standards for Civics and Government (Center for Civic Education)
- National Curriculum Standards for Social Studies (National Council for the Social Studies, NCSS)
- National Geography Standards (National Council for Geographic Education, NCGE)

Late in our process, another national level set of standards relevant to social studies was released, the C3 Framework. While we did not have time to conduct a thorough analysis of these standards, we did a quick analysis for references to climate or climate change. Because of time limitations, our study does not include an analysis of economics or psychology standards (*Voluntary National Content Standards in Economics, 2010* or *National Standards for High School Psychology Curricula, 2011*). These subjects are often included in high school social studies course offerings.

We should note that with the exception of civics and government, we only examined standards at the middle and secondary levels due to time constraints.

We examined standards on two levels. First, we looked for explicit references to climate, climate change, and global change. Secondly, we looked for standards that could be met by using climate change content.

Summary of Findings

Of the three sets of standards we examined, civics and government standards had the fewest references to climate change terms with zero explicit references. Social

studies standards featured only one explicit reference to climate change terms, although notably, the term “climate change” did not appear at all in the standards document. Finally, geography standards included the greatest number of explicit references to climate change terms. It should be noted, however, that geography is an interdisciplinary subject that includes material from both the natural sciences and the social sciences, so not all standards would be relevant to social studies classrooms. Therefore, we separated out standards more likely to be used in social studies classrooms and standards less likely to be used in social studies classrooms.

The information is presented in a way that will facilitate their use in the classroom to teach about climate change. For each of the three sets of standards, you will find a specific standard in the left column. Then, in the corresponding right-hand column, you will find a suggested teaching activity or strategy that will help you teach this standard in your classroom.

You will find the standards and activities in the following order:

1. National Standards for Civics and Government
2. National Curriculum Standards for Social Studies
3. Geography for Life: National Geography Standards
4. A Brief Note regarding the C3 Framework



Civics and Government

We have reviewed the *National Civics and Government Standards* (2010) and have listed below content that is important in climate change education. The Civics and Government content standards highlighted in this document are important for students to understand and develop as they learn about environmental issues and policies, how government is involved, and how we as citizens can be an active participant in the democratic process and contribute to our communities.

Source

National Standards for Civics and Government. Calabasas, CA: Center for Civic Education, 2010. Address: 5145 Douglas Fir Road, Calabasas, CA, 91302, (818) 591-9321, www.civiced.org (2010). Available at <http://new.civiced.org/resources/publications/resource-materials/national-standards-for-civics-and-government>

Summary

The *National Civics and Government Standards* are divided into five organizing questions, which spiral up in complexity through grade bands: K-4, 5-8, and 9-12.

- What are civic life, politics, and government?
- What are the foundations of the American political system?
- How does the government established by the Constitution embody the purposes, values, and principles of American democracy?
- What is the relationship of the United States to other nations and to world affairs?
- What are the roles of the citizen in American democracy?

The standards do not explicitly mention climate, climate change, or global change. Standards where climate change may be used, but are not specifically referenced, are listed below.

K-4 Standards

K-4 STANDARD II: WHAT ARE THE BASIC VALUES AND PRINCIPLES OF AMERICAN DEMOCRACY?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
A1. Fundamental Values and principles (pg. 52)	People exercise their authority directly by voting for or against certain rules, laws, or candidates as well as by voting in community or town meetings. People exercise their authority indirectly through representatives they elect to make, apply, and enforce laws and to manage disputes about them.
B. Important beliefs Americans have about themselves and their government. 1. Distinctive Characteristics (pg. 55-58)	This part of content standard may be important to a discussion of policies and views: Another important purpose of government is to promote the common good: <ul style="list-style-type: none">• individuals have the right to differ about politics, religion, or any other matter• individuals have the right to express their views without fear of being punished by their peers or their government• everyone should be concerned about the well-being of his/her school, community, state, and nation• people should try to improve the quality of life in their schools, communities, states, and nation

K-4 STANDARD III: HOW DOES THE GOVERNMENT ESTABLISHED BY THE CONSTITUTION EMBODY THE PURPOSES, VALUES, AND PRINCIPLES OF AMERICAN DEMOCRACY?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>E. Who represents you in the legislative and executive branches of your local, state, and national governments? (pg. 77)</p>	<p>A discussion about who in government citizens could talk to about the effects of climate change on the environment. Learning about which government agency oversees issues that affect the environment.</p> <ul style="list-style-type: none"> • explain which level of government they should contact to express their opinions or to get help on specific problems, e.g., the environment.

K-4 Standard V: WHAT ARE THE ROLES OF THE CITIZEN IN AMERICAN DEMOCRACY?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>E. What dispositions or traits of character are important to the preservation and improvement of American Democracy? Pg. 87 E1. Individual responsibility, respect for rights, open mindedness, civic mindedness, compassion. (pg. 89)</p>	<p>The standard focuses on understanding the importance of individual dispositions. These include being willing to listen to other points of view with respect, willingness to consider other points of view, and concern for the well-being of one’s community and nation.</p> <ul style="list-style-type: none"> • The meaning of citizenship • Responsibilities of individuals • Dispositions that enhance citizen effectiveness and promote the healthy functioning of American democracy • Forms of participation

5-8 Standards

5-8 STANDARD I: WHAT ARE CIVIC LIFE, POLITICS, AND GOVERNMENT?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>A. What is civic life? What is politics? What is government?A1. A1. What is civic life? What is politics? (pg. 99)</p>	<p>Student understanding of civic life and what role they have in helping to find solutions to problems. Civic life: concerns taking part in the governance of the school, community, tribe, state, or nation, e.g. helping to find solutions to problems, helping to make rules and laws.</p>

5-8 STANDARD II: WHAT ARE THE FOUNDATIONS OF THE AMERICAN POLITICAL SYSTEM?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>B. What are the distinctive characteristics of American society? B2. The role of voluntarism in American life (pg. 118)</p>	<p>Identifying opportunities for individuals to volunteer in their own schools and communities to better the environment.</p>
<p>D What value and principles are basic to American constitutional democracy? D3. Disparities between ideals and reality in American political and social life (pg. 127).</p>	<p>Students will be able to describe historical and contemporary efforts to reduce discrepancies between ideals and the reality of American public life including environmental protection movements.</p>

5-8 STANDARD III: HOW DOES THE GOVERNMENT ESTABLISHED BY THE CONSTITUTION EMBODY THE PURPOSES, VALUES, AND PRINCIPLES OF AMERICAN DEMOCRACY?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>B What does the national government do? B1. Major responsibilities for domestic and foreign policy (pg. 133-134).</p>	<p>Students will identify historical and contemporary examples of important domestic policies including National Environmental Policy Act of 1970.</p>
<p>F. How does the American political system provide for choice and opportunities for participation? F1. The public agenda (pg. 143-144).</p>	<p>Students will be able to explain that the public agenda consists of those matters that occupy public attention at any particular time, e.g. environmental protection.</p>
<p>F2. Political communication (pg. 144-145).</p>	<p>Students will be able to evaluate, take, and defend positions on the influence of the media on American political life. Evaluate the influence of television, radio, the press, newspapers, etc. on American politics. Media provide individuals with ways to communicate their concerns and positions on current issues.</p>

F4. Associations and groups (pg. 145-146)	Students will be able to explain how interest groups, unions, and professional organizations provide opportunities for citizens to participate in the political process.
F5. Forming and carrying out public policy (pg. 146)	Students will be able to define public policy, describe how they are formed and implemented, how citizens can monitor and influence the formation and implementation of the policies. Explain why conflicts about values, principles, and interests may make agreement difficult or impossible on certain issues of public policy, e.g., environmental protection.

5-8 STANDARD IV: WHAT IS THE RELATIONSHIP OF THE UNITED STATES TO OTHER NATIONS AND TO WORLD AFFAIRS?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
B What are the rights of citizens? B2. Political, demographic, and environmental developments (pg. 153).	Students will explain the effects of significant political, demographic, and environmental trends in the world. Describe environmental conditions that affect the United States, such as air pollution.

5-8 STANDARD V: WHAT ARE THE ROLES OF THE CITIZEN IN AMERICAN DEMOCRACY?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
C What are the responsibilities of citizens? C2. Civic Responsibilities (pg. 164).	Being informed and attentive to public issues, identify and evaluate contemporary issues that involve civic responsibilities.
D What dispositions or traits of character are important to the preservation and improvement of American constitutional democracy? D1. Dispositions that enhance citizen effectiveness and promote the healthy functioning of American constitutional democracy (pg. 166-167).	Critical mindedness—Inclination to question the validity of various positions, including one’s own. Civic mindedness—paying attention to and having concern for public affairs.

<p>E How can citizens take part in civic life? E1. Participation in civic and political life and the attainment of individual and public goals (pg. 169-170).</p>	<p>Students will identify examples of their own individual goals and explain how their participation in civic and political life can help to attain them, e.g., living in a healthy environment.</p>
<p>E2. The difference between political and social participation (pg 170).</p>	<p>Students will explain what distinguishes political from social participation, e.g. participating in a campaign to change law as opposed to volunteering. Identify opportunities in their own community for both political and social participation.</p>

9-12 Standards

9-12 STANDARD I: WHAT ARE CIVIC LIFE, POLITICS, AND GOVERNMENT?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>A What is civic life? What is politics? What is government: What government and politics necessary? What purposes should government serve? A1 Defining civic life, politics, and government (pg. 177).</p>	<p>Students will describe politics as the process by which a group of people, whose opinions or interests might be divergent, reach collective decisions that are generally regarded as binding on the group and enforced as common policy.</p>
<p>A2 Necessity of politics and government (pg. 179).</p>	<p>Students will explain the major arguments advanced for the necessity of politics and government. Working collectively can accomplish goals and solve problems they could not achieve alone.</p>

9-12 STANDARD II: WHAT ARE THE FOUNDATIONS OF THE AMERICAN POLITICAL SYSTEM?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>B What are the distinctive characteristics of American society? B2 The role of voluntarism in American life (pg. 203).</p>	<p>Examine how citizens have volunteered to participate in environmental protection, such as by supporting legislation like the passage of the Wilderness Act of 1964.</p>
<p>B3 The role of organized groups in political life (pg. 204)</p>	<p>Examine how conservation groups Wilderness Society and the Sierra Club have played a role in focusing public attention on environmental issues.</p>

9-12 STANDARD III: HOW DOES THE GOVERNMENT ESTABLISHED BY THE CONSTITUTION EMBODY THE PURPOSES, VALUES, AND PRINCIPLES OF AMERICAN DEMOCRACY?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>B How is the national government organized and what does it do? B2 Major responsibilities of the national government in domestic and foreign policy (pg. 223).</p>	<p>Students should be able to explain the major responsibilities of the national government for domestic policy and how domestic policies affect their everyday lives and their community. Evaluate competing arguments about the proper role of government in major areas of domestic and foreign policy.</p>
<p>E How does the American political system provide for choice and opportunities for participation? E1 The public agenda (pg. 233).</p>	<p>Students explain that the “public agenda” consists of those matters that occupy public attention at any particular time, such as environmental protection. Describe how the public agenda is shaped by political leaders, political institutions, political parties, interest groups, the media, and individual citizens. Explain how individuals can help to shape the public agenda.</p>
<p>E2 Public opinion and behavior of the electorate (pg. 234)</p>	<p>Students should be able to evaluate, take, and defend positions about the role of public opinion in American politics.</p>
<p>E3 Political communication: television, radio, the press, and political persuasion (pg. 235).</p>	<p>Students should be able to evaluate, take, and defend positions on the influence of the media on American political life.</p>
<p>E5 Associations and groups (pg. 237).</p>	<p>Students should be able to evaluate, take, and defend positions about the contemporary roles of associations and groups in American politics. Describe the contemporary roles of associations and groups in local, state, and national politics.</p>
<p>E6 Forming and carrying out public policy (pg. 238).</p>	<p>Students should be able to evaluate, take, and defend positions about the formation and implementation of public policy. Describe a current issue of public policy at local, state, or national level. Explain why conflicts about values, principles, and interests may make agreement difficult or impossible on certain issues of public policy, e.g., environment.</p>

9-12 STANDARD IV: WHAT IS THE RELATIONSHIP OF THE UNITED STATES TO OTHER NATIONS AND TO WORLD AFFAIRS?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>C How has the United States influenced other nations, and how have other nations influenced American politics and society? C4 Demographic and environmental developments (pg. 249).</p>	<p>Students should be able to evaluate, take, and defend positions about what the response of American governments at all levels should be to world demographic and environmental developments. Describe principal environmental conditions that affect the United States, e.g., air pollution. Evaluate historical and contemporary responses of the American government to demographic and environmental changes.</p>
<p>C5 United States and International organizations (pg. 249).</p>	<p>Evaluate, take, and defend positions about what the relationship of the United States should be to international organizations. Identify some important bilateral and multilateral agreements to which the United States has been involved. Evaluate the role of the United States in international organizations. The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) is an international treaty.</p>

9-12 STANDARD V: WHAT ARE THE ROLES OF THE CITIZEN IN AMERICAN DEMOCRACY?

Content Standards	Example of How Teacher Might Use Standard in Climate Change Education
<p>B What are the rights of citizens? B4 Relationship among personal, political, and economic rights.</p>	<p>Students should be able to evaluate, take, and defend positions on the relationships among personal, political, and economic rights.</p>
<p>D What civic dispositions or traits of private and public character are important to the preservation and improvement of American constitutional democracy? D4 Dispositions that facilitate thoughtful and effective participation in public affairs (pg. 264-265).</p>	<p>Evaluate the usefulness of the following traits in facilitating thoughtful and effective participation in public affairs: Persistence, or the willingness to attempt again and again to accomplish worthwhile goals. Civic mindedness—paying attention to and having concern for public affairs. Courage—the strength to stand up for one’s convictions, when conscience demands.</p>

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National Curriculum Standards for Social Studies

In 2010, the National Council for the Social Studies (NCSS) issued its revised curriculum standards titled *National Curriculum Standards for Social Studies: A Framework for Teaching, Learning, and Assessment*. The standards encompass history, geography, government, sociology, psychology, and other disciplines in the social studies.

Source

National Curriculum Standards for Social Studies: A Framework for Teaching, Learning and Assessment. Silver Spring, MD: National Council for the Social Studies, 2010. Address: 8555 Sixteenth Street, Suite 500, Silver Spring, Maryland 20910.

Summary

The table below includes both middle school (MS) and high school (HS) standards of two different types:

- Knowledge: Learners will understand...
- Processes: Learners will be able to...

For both knowledge and skills, the table provides suggestions for how to connect the standard to climate, climate change, and global change.

Standards with Explicit Mention of Climate, Climate Change, or Global Change

Strand/standard that connects to climate change (include number or other ID used in document)

Standard 3 – People, Places and Environments

MS – Knowledge:

*The theme of people, places, and environments involves the study of relationships between human populations in different locations and geographic phenomena such as climate, vegetation, and natural resources.

*Past and present changes in physical systems, such as seasons, climate, and weather, and the water cycle, in both nation and global contexts.

MS – Processes:

- >Acquire, organize, and analyze information and use geographic tools to draw conclusions about historic or current national and global environmental change.
- >Calculate distance, scale, and area, to inform study of historic or current national and global environments.
- >Evaluate the consequences of human actions in environmental terms.

HS – Knowledge

- *The theme of people, places, and environments involves the study of relationships between human populations in different locations and regional and global geographic phenomena such as landforms, soils, climate, vegetation, and natural resources.
- *Consequences of changes in regional and global physical systems, such as seasons, climate, weather, and the water cycle.
- *The causes and impact of resource management, as reflected in land use, settlement patterns, ecosystem changes.
- *The social and economic effects of environmental changes and crises resulting from phenomena such as floods, storms and droughts.

HS – Processes:

- >Evaluate the consequences of human actions in environmental terms.

Standard 9: Global Connections

HS – Knowledge:

- *The actions of people, communities, and nations have both short- and long-term effects on the biosphere and its ability to sustain life

Standards in Which Climate Change Concepts May Be Used but Are Not Specifically Referenced

<p>Strand/standard that connects to climate change (include number or other ID used in document)</p> <p><u>Knowledge:</u> Learners will understand...</p> <p><u>Processes:</u> Learners will be able to...</p>	<p>Example of How Teacher Might Use Climate Change to Meet Standard</p> <p>Learners might demonstrate understanding by...</p>
<p>Standard 1 - Culture:</p> <p><u>MS - Knowledge:</u></p> <p>*How culture influences the ways in which human groups solve the problems of daily living.</p>	<p>Example of How Teacher Might Use Climate Change to Meet Standard</p> <p>Researching and writing a paper about how the impacts of climate change have changed aspects (behaviors, beliefs, values, traditions, institutions, etc) of a particular culture.</p>

*Culture may change in response to changing needs, concerns social, political, and geographic conditions.

HS – Knowledge:

*How culture develops and changes in ways that allow human societies to address their needs and concerns.

*That the cultural values and beliefs of societies influence their analysis of challenges, and their responses to these challenges.

Evaluating how two (or more) different cultures address the issues related to climate change. How are they responding? How are their responses similar, how are they different?

MS – Processes:

>Evaluate how data and experiences may be interpreted differently by people from diverse cultural perspectives and frames of reference.

>Draw inferences from data about the ways in which given cultures respond to persistent human issues, and how culture influences those responses.

HS – Processes:

>Ask questions related to culture and find, select, organize, and interpret data from research to address research questions.

>Compare and analyze behaviors for preserving and transmitting culture even while adapting to environmental or social change.

>Evaluate how data and experiences may be interpreted differently by people from diverse cultural perspectives and frames of reference.

>Analyze data from various cultural perspectives and evaluate the consequences of interpretations associated with the world views of different cultures

>Analyze historic and current issues to determine the role that culture has played.

Researching and presenting a position paper on a current or past problem related to climate change (water shortages, flooding, forced migrations, wars over resources) through the analysis of the cultural patterns of the groups involved and the ways in which these contribute or present obstacles to finding solutions.

Interviewing a number of sub-cultures to which they have access (e.g. student sub-groups, workplace groups, or community groups) to present the group's point of view on an issue of importance in an editorial to the local newspaper.

Preparing a podcast highlighting the role of cultural unity and diversity in a past or present example of conflict or cooperation related to climate change ((water shortages, flooding, forced migrations, wars over resources)

>Explain and apply ideas, theories, and modes of inquiry from anthropology, sociology, history, geography, and economics in the examination of persistent issues and social problems.

Standard 2 – Time, Continuity, and Change

Example of How Teacher Might Use Climate Change to Meet Standard

MS – Knowledge

*Concepts such as: chronology, causality, change, conflict, complexity, multiple perspectives, primary and secondary sources, and cause and effect.

*The influences of social, geographic, economic, and cultural factors on the history of local areas, states, nations and the world.

HS – Knowledge

*Concepts such as: era, chronology, causality, change, continuity, conflict, historiography, historical method, complexity, multiple perspectives, primary and secondary sources, and cause and effect.

*The impact across time and place of key historical forces, such as nationalism, imperialism, globalization, leadership, revolution, wars, concepts of rights and responsibilities, and religion.

*The contributions of philosophies, ideologies, individuals, institutions, and key events and turning points in shaping history.

*Different interpretations of the influences of social geographic, economic, and cultural factors on the history of local areas, states, nations, and the world.

Developing an illustrated timeline of a sequence of events that are a result of events associated with climate change. (changing coastline, rising water lines, mass migrations, pandemics)

Researching the impact of a variety of historical forces throughout history. Creating a “What would happen if” scenario addressing the potential for climate change to be recognized as a historical force.

*The importance of knowledge of the past to an understanding of the present and to informed decision-making about the future.

MS – Processes

- >Research and analyze past periods, events, and issues, using a variety of primary sources (e.g. documents, letters, artifacts, and testimony) as well as secondary sources; validate and weigh evidence for claims and evaluate the usefulness and degree of reliability of sources to develop a supportable interpretation.
- >Evaluate the impact of the values, beliefs, and institutions of people in the past on important historical decisions and developments of their times.
- >Use methods of historical inquiry to make informed decisions as responsible citizens to propose policies and take action on an issue of importance today.

HS - Processes

- >Formulate research questions to investigate topics in history, identify possible answers, and use historical methods of inquiry and literacy skills to select, organize, analyze, synthesize, and interpret sources, and present findings.
- >Research and analyze past periods, events, and issues, using a variety of primary sources (e.g. documents, letters, artifacts, and testimony) as well as secondary sources; validate and weigh evidence for claims, check the usefulness and degree of reliability of sources, and evaluate different interpretations in order to develop their own interpretation supported by the evidence.
- >Evaluate the impact of the values, beliefs, and institutions of people in the past on important historical decisions

Identifying and researching issues that were considered contentious during the particular time in history they arose. Analyzing what eventually happened with regard to the issue. Identifying potential alternative responses and analyzing what would have happened if responses to the issue had been different. Identifying an issue within the climate change discussion, then predicting the outcomes. Then examining alternative reactions/actions to the current issue and making predictions as to what might occur. (Futures thinking with solution seeking)

decisions and developments, and compare different interpretations of the causes and consequences of these decisions and developments.

>Use historical facts, concepts, and methods to evaluate an issue of importance today, and make informed decisions as responsible citizens to propose policies, and take action on it.

Standard 3 – People, Places and Environments

MS – Knowledge:

- *Concept such as: location, region, place, and migration, as well as human and physical systems.
- *The concept of regions identifies links between people in different locations according to specific criteria (e.g. physical, economic, social, cultural, or religious).
- *Patterns of demographic and political change, and cultural diffusion in the past and present (e.g. changing national boundaries, migration, and settlement, and the diffusion of and changes in customs and ideas).
- *Human modifications of the environment
- *Factors that contribute to cooperation and conflict among peoples of the nation and world, including language, religion, and political beliefs.
- *The use of a variety of maps, globes, graphic representations, and geospatial technologies to help investigate the relationships among people, places and environments.
- *The theme of people, places, and environments involves the study of relationships between human populations in different locations and geographic phenomena such as climate, vegetation, and natural resources.*
- *Past and present changes in physical systems, such as seasons, climate, and weather, and the water cycle, in both nation and global contexts.*

HS - Knowledge

- *Concept such as: location, physical and human characteristics of national and global regions in

Example of How Teacher Might Use Climate Change to Meet Standard

Identifying past, present, and future migration patterns based upon significant changes in the geographic characteristics of a region.

Creating visual representations of the immediate and long-term impact of natural disasters on the land and peoples living in affected areas.

Interviewing members of the community about their position on a climate change/environmental issue that has/is affecting the local/regional community.

the past and present, and the interactions of humans with the environment.

*Factors that contribute to cooperation and conflict among peoples of the nation and world, including language, religion, and political beliefs.

*The use of a variety of maps, globes, graphic representations, and geospatial technologies to help investigate spatial relations, resources and population density and distribution, and changes in phenomena over time.

*The theme of people, places, and *environments involves the study of relationships between human populations in different locations and regional and global geographic phenomena such as landforms, soils, climate, vegetation, and natural resources.*

**Consequences of changes in regional and global physical systems, such as seasons, climate, weather, and the water cycle.*

**The causes and impact of resource management, as reflected in land use, settlement patterns, ecosystem changes.*

**The social and economic effects of environmental changes and crises resulting from phenomena such as floods, storms and droughts*

Constructing a series of maps depicting changes in the relationships among people, places and environments over time in a given location.

Researching, analyzing, synthesizing, and evaluating information from atlases, data bases, grid systems, charts, GIS, graphs, and maps to create a model illustrating the impact of rising water along coastlines in various regions of the world.

MS – Processes

>Ask and find answers to geographic questions related to regions, nations, and the world in past and present.

>Research, organize, analyze, synthesize, and evaluate information from atlases, data bases, grid systems, charts, graphs, maps, geospatial technologies, and other tools to interpret relationships among geographic factors and historic events.

>Identify and interpret “push” and “pull” factors involved in the migrations of people in this nation and other parts of the world.

>*Evaluate the consequences of human actions in environmental terms.*

>*Acquire, organize, and analyze information and use geographic tools to draw conclusions about historic or current national and global environmental change.*

Evaluate the consequences of past and/or present human actions on various aspects of the environment.

>Calculate distance, scale, and area, to inform study of historic or current national and global environments.

HS – Processes

>Ask and find answers to geographic questions related to regions, nations, and the world in past and present.

>Research, organize, analyze, synthesize, and evaluate information from atlases, data bases, grid systems, statistical presentations, charts, graphs, and maps to interpret relationships among geographic factors and events at the local, regional, national, and global levels, and assess policy options.

>Acquire, organize, and analyze geographic information from data sources, geographic tools and geospatial technologies such as aerial photographs, satellite images, and geographic information systems (GIS) to determine patterns.

>Analyze different interpretations of the causes and effects of migrations of people in various times and places on the globe.

>Calculate distance, scale, area, and density, and construct maps and models of geographic information.

>Evaluate the consequences of human actions in environmental terms.

Estimating the social and economic effects/consequences of the changes in regional and global physical systems, such as seasons, climate, weather and the water cycle.

Standard 5 – Individuals, Groups, and Institutions

MS – Knowledge

*Concepts such as: mores, norms, status, role, socialization, ethnocentrism, cultural diffusion, competition, cooperation, conflict, race, ethnicity, and gender.

*That when two or more groups with differing norms and beliefs interact, accommodation or conflict may result.

*That groups and institutions influence culture in a variety of ways.

HS – Knowledge:

*Concepts such as: mores, norms, status, role, socialization, ethnocentrism, cultural diffusion,

Example of How Teacher Might Use Climate Change to Meet Standard

Researching and evaluating two opposing viewpoints on a particular climate change issue.

Analyzing the concept of environmental justice and how it relates to social justice.

competition, cooperation, conflict, assimilation, race, ethnicity, and gender.

- *The influence of individuals, groups, and institutions on people and events in historical and contemporary settings.
- *The impact of tensions and examples of cooperation between individuals, groups, and institutions, with their different belief systems.
- *How the beliefs of dominant groups tend to become norms in a society.
- *How groups and institutions work to meet individual needs, and can promote the common good and address persistent social issues.

MS – Processes:

- >Ask and find answers to questions about the various forms and roles of individuals, groups and institutions.
- >Analyze the effects of interactions between and among individuals, groups and institutions.
- > Identify and analyze the impact of tensions between and among individuals, groups and institutions.
- >Understand examples of tensions between belief systems and governmental actions and policies.
- >Analyze the role of institutions in furthering both continuity and change.
- >Evaluate how groups and institutions work to meet individual needs and promote or fail to promote the common good.
- >Gather information about groups and institutions, using such tools as surveys and interviews.

HS – Processes:

- >Ask and find answers to questions about the various forms that institutions take, their impact, the role of individuals within them, and how they change over time.



Discussing real-world problems and the implications and solutions for individuals, groups, and institutions.

Using computer-based technology and media/ communication research and presenting finding in illustrations or essays about environmental justice.

- >Evaluate different interpretations of the influence of groups and institutions on people and events in historical and contemporary settings.
- >Understand examples of tensions between belief systems and governmental actions and policies.
- >Examine the belief systems of specific contemporary and historical movements that have caused them to advocate public policies.
- >Understand the role of institutions in furthering both continuity and change.
- >Investigate how groups and institutions work to meet individual needs, promote or fail to promote the common good, and address persistent social issues.

Standard 6: Power, Authority, and Governance

Example of How Teacher Might Use Climate Change to Meet Standard

MS – Knowledge:

*The ways in which governments meet the needs and wants of citizens, manage conflict, and establish order and security

HS – Knowledge:

*The need for respect for the rule of law, as well as recognition of times when civil disobedience has been justified.

*Fundamental values of constitutional democracy (e.g. the common good, liberty, justice, and individual dignity)

*Mechanisms by which governments meet the needs of the wants of citizens, regulate territory, manage conflict, establish order and security, and balance competing conceptions of a just society.

Examine ways in which citizens have lawfully supported legislation and governmental actions, such as raising mileage standards for automobiles.

MS – Processes:

- *Examine persistent issues involving the rights of individuals and groups in relation to general welfare.
- *Analyze and evaluate conditions and actions, and motivations that contribute to conflict and cooperation between groups and nations.

HS- Processes:

- * Examine persistent issues involving the rights, responsibilities, roles, and status of individuals and groups in relation to general welfare.
- *Analyze and evaluate conditions and actions, and motivations that contribute to conflict and cooperation among groups and nations.
- *Evaluate the extent to which governments achieve their stated ideals and policies at home and abroad.

By addressing concerns such as nonrenewable resource depletion and management. Nations (between) and individual states (within) are beginning to have disputes over such issues as water rights, fracking, waste management, etc.

Fracking/Energy company/industry versus farmers/landowners.

Environmental protests

Climate Change/Environmental protection/regulation for the common good.

Examine the mechanisms involved in creating legislation/regulations that seek to address CC

Environmental justice, whose voices are not being heard/honored

Carbon reduction, Kyoto Protocol

Standard 7: Production, Distribution, and Consumption

Example of How Teacher Might Use Climate Change to Meet Standard

MS – Knowledge:

- *Individuals, government, and society experience scarcity because human wants and needs exceed what can be produced from available resources.
- *How choices involve trading off the expected value of one opportunity gained against the expected value of the best alternative.
- *The economic choices that people make have both present and future consequences.
- *Economic incentives affect people’s behavior’s behavior and may be regulated by rules or laws.
- *How markets bring buyers and sellers together to exchange goods and services.
- *How goods and services are allocated in a market economy through the influence of prices on decisions about production and consumption.

Discussing and evaluating topics such as water scarcity, climate change impacts on food production/distribution..

Examining alternative incentives such as charging more for garbage going to an incinerator in order to encourage recycling and reuse.

HS – Knowledge:

- *Scarcity and the uneven distribution of resources result in economic decisions, and foster consequences that may support cooperation or conflict.
- *That regulations and laws (for example, on property rights and contract enforcement) affect incentives for people to produce and exchange goods and services;
- *Entrepreneurial decisions are influenced by factors such supply and demand, government regulatory policy, and the economic climate;

MS – Processes:

- *Compare their own economic decisions with those of others, and consider the wider consequences of those decisions for groups, communities, the nation and beyond;
- *Analyze various methods for allocating scarce goods and services at the state, national and global levels, describing the possible impacts of these choices;

HS – Processes:

- *Ask and find answers to questions about the production and distribution of goods and services in the state and nation, and in a global context;
- *Analyze complex aspects of production, distribution, and consumption, and evaluate the market forces and government policies that affect these aspects;
- *Evaluate the possible economic consequences of proposed government policies;
- *Gather and analyze data and use critical thinking in making recommendations for economic policies.

Compare the economics and environmental benefits and costs of different forms of energy: coal, oil, natural gas, wind, solar, nuclear, and hydropower.

Standard 8: Science, Technology, and Society

Example of How Teacher Might Use Climate Change to Meet Standard

MS- Knowledge:

- *Science is the result of empirical study of the natural world, and technology is the application of knowledge to accomplish tasks.
- *Society often turns to science and technology to solve problems;
- *Science and technology have changed people’s perceptions of the social and natural world, as well as their relationship to the land, economy and trade, their concept of security, and their major daily activities;
- *Values, beliefs, and attitudes that have been influenced by new scientific and technological knowledge;
- *Science and technology sometimes create ethical issues that test our standards and values;
- *Science and technology have had both positive and negative impacts upon individuals, societies, and the environment in the past and present*

HS – Knowledge:

- *Science is based upon the empirical study of the natural world, and technology is the application of knowledge to accomplish tasks.
- *Science and technology have had both positive and negative impacts upon individuals, societies, and the environment in the past and present;
- *Consequences of science and technology for individuals and societies;
- *Prediction, modeling and planning are used to focus advances in science and technology for positive ends;
- *Findings in science and technology sometimes create ethical issues that test our standards and values;

Examine how scientific knowledge of alternative forms of energy, such as wind and solar, have changed energy production in the United States over the past 20 years.

*Science, technology and their consequences are unevenly available across the globe;

*Science and technology have contributed to making the world increasingly interdependent;

*That achievements in science and technology are increasing at a rapid pace and can have both planned and unanticipated consequences

*Developments in science and technology may help address global issues

**Science and technology have had both positive and negative impacts upon individuals, societies, and the environment in the past and present*

MS – Processes:

*Use diverse types of media technology to read, write, create, and review variety of messages;

*Seek and evaluate varied perspectives when weighing how specific applications of science and technology have impacted individuals and society;

*Review sources to identify the purposes, points of view, biases, and intended audiences of reports and discussions of science and technology;

*Select, organize, evaluate, and communicate information about the impact of science or technology on a society today or in the past;

*Use scientific findings and forms of technology to formulate possible solutions to real-life issues and problems.

HS – Processes:

*Ask and find answers to questions about the impact of science and technology in the past and present, and in different places and societies;

*Use diverse types of media technology to read, write, create, and review variety of messages;

Examine television commercials regarding energy use, both for their content and for the persuasive techniques used. Reach conclusions about the point of view represented in a television commercial.

Seek and evaluate varied perspectives when weighing how specific applications of science and technology have impacted individuals and societies in an interdependent world;

- *Identify the purposes, points of view, biases, and intended audience of reports and discussions related to issues involving science and technology
- * Select, organize, analyze, and evaluate information, and communicate findings regarding the impact of science or technology on a society today or in the past;
- *Identify and analyze reactions to science and technology from the past or present, and predict ongoing effects in economic geographical, social, political, and cultural areas of life;
- *Formulate possible solutions that utilize technology, address real-life issues and problems, weigh alternatives, and provide reasons for preferred choices and plans of action.

Standard 9: Global Connections

Example of How Teacher Might Use Climate Change to Meet Standard

MS – Knowledge:

- *Global connections have existed in the past and increased rapidly in current times;
- *Global factors such as cultural, economic, (*should include environmental) and political connections are changing the places in which people live (through trade, migration, increased travel, and communication);
- *Spatial relationships that relate to ongoing global issues (e.g. pollution, poverty, disease, and conflict) affect the health and well-being of Earth and its inhabitants;
- *Global problems and possibilities are not generally caused or developed by any one nation;

Create a behavior over time graph that addresses these connections as they relate to both natural and man-made processes

HS – Knowledge:

- *Global connections are rapidly accelerating across cultures and nations and can have both positive and negative effects on nations and individuals;
- *The solutions to global issues may involve individual decisions and actions, but also require national and international approaches (e.g. agreements, negotiations, policies, or laws);
- *Conflict and cooperation among the peoples of the earth influence the division and control of the earth’s surface;
- *The actions of people, communities, and nations have both short- and long-term effects on the biosphere and its ability to sustain life;
- *Individuals, organizations, nations and international entities can work to increase the positive effects of global connections, and address the negative impacts of global issues.
- *The actions of people, communities, and nations have both short- and long-term effects on the biosphere and its ability to sustain life*

Millennium Development Goals

Where people will migrate to as a result of natural disasters, lack of water, infertile land, etc.

Identify potential areas of conflict

Kyoto Protocol
350.org

Use of cloud seeding

MS – Processes:

- *Ask and find answers to questions about the ways in which people and societies are connected globally today and were connected in the past;
- *Use maps, charts, and databases to explore patterns and predict trends regarding global connections at the community, state, or national level;
- *Analyze examples of conflict, cooperation, and interdependence among groups, communities, regions, societies, and nations;
- *Explore the causes, consequences, and possible solutions related to persistent, current, and emerging

Find and analyze graphs showing the amount of oil that the United States has imported year by year in the past 50 years.

issues, such as health, resource allocation, economic development, and environmental quality;

*Describe and explain the relationships and tensions between national sovereignty and global interests in such matters as territorial rights, natural resources, trade, the different uses of technology, and the welfare of people

HS – Processes:

*Ask and find answers to questions about the ways in which people and societies are connected globally today and were connected in the past;

*Use maps, charts, and databases to explore patterns and predict trends regarding global connections at the community, state, or national level;

*Describe and explain conditions and motivations that contribute to conflict, cooperation, and interdependence among groups, societies and nations;

*Analyze and evaluate the effects of changing technologies on the global community;

*Analyze the causes and consequences of persistent, contemporary, and emerging global issues, and evaluate possible solutions;

*Analyze the relationships and tensions between national sovereignty and global interests in such matters as territorial rights, economic development, the use of natural resources, and human rights;

*Describe and evaluate the role of international and multinational organizations in the global arena;

*Illustrate how individual behaviors and decisions connect with global issues

*Identify concerns, issues, conflicts, and possible resolutions related to issues involving universal human rights

*Identify the roles of international and multinational organizations.

Standard 10: Civic Ideals and Practices

Example of How Teacher Might Use Climate Change to Meet Standard

MS – Knowledge:

- *The theme of civic ideals and practices helps us to learn about and know how to work for the betterment of society;
- *Concepts and ideals such as: individual dignity, liberty, justice, equality, individual rights, responsibility, majority and minority rights, and civil dissent;
- *Key practices involving the rights and responsibilities of citizenship and the exercise of citizenship (e.g. respecting the rule of law and due process, voting, serving on a jury, researching issues, making informed judgments, expressing views on issues, and collaborating with other to take civic action.);
- *The common good and the rule of law;
- *Key past and present issues involving democratic ideals and practices, as well as the perspectives of various stakeholders in proposing possible solutions to these issues;
- *The importance of becoming informed in order to make positive civic contributions

HS – Knowledge:

- *The theme of civic ideals and practices helps us recognize where gaps between ideals and practices exist, and prepares us to work for social justice;
- *Concepts and ideals such as: human dignity, social justice, liberty, equality, inalienable rights, responsibilities, majority and minority rights, citizenship, the common good, civil dissent and the rule of law;

How can/do these ideas both hinder and help efforts to bring attention to and to mitigate climate change

U.S. Department of State position on climate change

*Key practices involving the rights and responsibilities of citizenship and the exercise of citizenship (e.g. respecting the rule of law and due process, voting, serving on a jury, researching issues, making informed judgments, expressing views on issues, and collaborating with other to take civic action.);

*That seeking multiple perspectives is required in order to effectively grasp the complexity of issues involving civic ideals and practices.

MS – Processes:

*Ask and find answers to questions about how to become informed and take civic action;

*Analyze and evaluate the effectiveness of various forms of civic action influencing public policy decisions that address the realization of civic ideals;

*Build background through research in primary and secondary sources, make decisions, and propose solutions to address problems;

*Identify assumptions, misconceptions, and bias in sources, evidence, and arguments used in presenting issues and positions;

*Identify, seek, describe, and evaluate multiple points of view about selected issues, noting the strengths, weaknesses, and consequences associated with holding each position;

*Develop a position on a public policy issue, and defend it with evidence

*Evaluate the significance of public opinion and positions of policymakers in influencing public policy development and decision-making;

*Evaluate the degree to which public policies and citizen behaviors reflect or foster their stated democratic ideals;

Write a white paper addressing a national, state, local policy regarding climate change. Send it to your state/local representative Invite a public policy speaker, pollster, etc. to address the process

*Participate in the process of persuading, compromising, debating, and negotiating in the resolution of conflicts and differences.

HS – Processes:

*Ask and find answers to questions about how to become informed and take civic action;

*Identify examples of civic ideals and practices throughout history and in a variety of cultural settings;

*Research primary and secondary sources to make decisions and propose solutions to selected civic issues in the past and present;

*Identify assumptions, misconceptions, and biases in sources, evidence, and arguments used in presenting issues and positions;

*Identify, seek, describe, and evaluate multiple points of view about selected issues, noting the strengths, weaknesses, and consequences associated with hold each position;

*Develop a position on a public policy issue and defend it with evidence;

*Evaluate the effectiveness and importance of public opinion in influencing and shaping public policy development and decision-making;

*Evaluate the degree to which public policies, and citizen behaviors reflect or foster their stated civic ideals;

*Participate in the process of persuading, compromising, debating, and negotiating in the resolution of conflicts and differences.

invite a public policy speaker, pollster, etc. to address the process

National Curriculum Standards for Social Studies: A Framework for Teaching, Learning and Assessment. Silver Spring, MD: National Council for the Social Studies, 2010. Address: 8555 Sixteenth Street, Suite 500, Silver Spring, Maryland 20910.

National Geography Standards

The National Geography Standards were developed by a consortium of organizations involved in geographic education: the American Geographical Society, the Association of American Geographers, the National Council for Geographic Education, and the National Geographic Society. The standards were first issued in 1994 and revised in 2012. They are available in a publication titled *Geography for Life: National Geography Standards*. They are organized around three grade bands: K-4, 5-8, and 9-12. Due to time constraints, we have analyzed only Grades 5-8 and Grades 9-12.



Source

Heffron, Susan Gallagher and Roger M. Downs, eds. *Geography for Life: National Geography Standards, Second Edition*. Washington, DC: National Council for Geographic Education, 2012. Address: 1145 Seventeenth Street, N.W., Room 7620, Washington, DC 20036.

Summary

The tables that follow show Geography Standards in the left column. In the right column are knowledge statements and examples of what students can do to show their knowledge. You will find eight tables, four for each grade band, organized as follows.

- A. Standards with *Explicit* Mention of Climate, Climate Change, or Global Change and May Apply to Social Studies Classes
- B. Standards in Which Climate Change Concepts May Be Used but Are Not Specifically Referenced and May Apply to Social Studies Classes
- C. Standards with *Explicit* Mention of Climate, Climate Change, or Global Change and Are More Likely to Be Taught in Science Classes Rather Than Social Studies Classes
- D. Standards in Which Climate Change Concepts May Be Used but Are Not Specifically Referenced and Are More Likely To Be taught in Science Classes Rather Than Social Studies Classes

Grades 5-8

A. Standards with *Explicit* Mention of Climate, Climate Change, or Global Change and May Apply to Social Studies Classes

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
Standard 3: How to analyze the spatial organization of people, places, and environments on Earth's surface	<p>2. Processes shape the spatial patterns of people, places, and environments over time</p> <p>Therefore, the student is able to:</p> <p>A. Describe and compare the processes that influence the distribution of human and physical phenomena, as exemplified by being able to</p> <p>Describe and compare the changes in environmental systems that cause changes in cultural, political, or economic conditions (e.g., a species becoming endangered leads to protected locations and conservation management, climate change influences emissions control legislation, depletion of a natural resource results in higher costs and affects new technologies).</p>

B. Standards in Which Climate Change Concepts May Be Used but Are Not Specifically Referenced and May Apply to Social Studies Classes

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
Standard 1: How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information.	<p>3. Geospatial technologies—Internet-based mapping applications, GIS, GPS, geovisualization, and remote sensing—can be used to construct geographic representations using geospatial data.</p> <p>Therefore, the student is able to:</p> <p>A. Construct and analyze geographic representations using data acquired from a variety of sources (e.g., student-generated data such as surveys, observations, fieldwork, etc., or existing data files) and formats (e.g., digital databases, text, tables, images), as exemplified by being able to:</p>

	<p>Analyze environmental change by annotating a series of remotely sensed images of the same location taken at different dates.</p> <p>4. The use of geographic representations to ask and answer geographic questions Therefore, the student is able to:</p> <p>A. Analyze geographic representations to ask and answer questions about spatial distributions and patterns, as exemplified by being able to</p> <p>Analyze choropleth maps to examine spatial relationships (e.g., between the number of doctors and mortality rates, between corn production and hog production, between global energy production and consumption).</p>
<p>Standard 4: The physical and human characteristics of places</p>	<p>1. Personal, community, and national identities are rooted in and attached to places</p> <p>Therefore, the student is able to:</p> <p>A. Explain how personal, community, or national identities are based on places, as exemplified by being able to</p> <p>Explain how a place-based identity results from the characteristics of a place (e.g., environmentally conscious Inuit of Northwest Canada, seafaring traditions of Gloucester Harbor, Massachusetts, nomadic herders in the eastern steppes of Mongolia).</p> <p>2. Physical and human characteristics of places change</p> <p>B. Explain the ways that human processes change places, as exemplified by being able to Describe and explain how the introduction of a new industry or the closing of an existing industry could change the characteristics of a place.</p>
<p>Standard 9: The characteristics, distribution, and migration of human populations on Earth's surface.</p>	<p>3. There are multiple causes and effects of migration</p>

	<p><i>Therefore, the student is able to:</i></p> <p>B. Identify and explain push and pull factors influencing decisions to migrate, as exemplified by being able to</p> <p>Identify and explain the role of push factors (e.g., political unrest or war, famine, loss of jobs) as reasons for migration.</p>
<p>Standard 11: The patterns and networks of economic interdependence on Earth's surface</p>	<p>1. The functions of different types of economic activities</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Describe and analyze the functions of economic activities in the primary, secondary, tertiary, and quaternary sectors, as exemplified by being able to</p> <p>Identify a range of everyday items and describe the sequence of routes and steps that are followed as they are converted to a secondary and then a tertiary product (e.g., Canadian forests become lumber that is used to build housing in US communities, Australian copper becomes circuits in wireless telephones made in China that provide a communications service, fish caught in the North Atlantic Ocean are processed into fish fillets that are prepared and served in restaurants).</p>
<p>Standard 16: The changes that occur in the meaning, use, distribution, and importance of resources</p>	<p>1. People can have different viewpoints regarding the meaning and use of resources</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Describe examples of how cultures differ in their definition and use of resources, as exemplified by being able to</p> <p>Describe how cultures value things differently in terms of resource use (e.g., Old Order Amish choose not to use petroleum and electricity, Muslims and Jews choose not to use pork as a food source, many cultures around the world choose not to use insects as food source).</p> <p>2. The formation and spatial distribution of types of resources</p>

Therefore, the student is able to:

A. Describe the physical processes that influence the formation and therefore spatial distribution of renewable, nonrenewable, and flow resources, as exemplified by being able to:

Explain how physical processes played a role in the formation and location of nonrenewable resources such as coal, petroleum, and diamonds.

B. Explain the location and uses of major resources in the world, as exemplified by being able to:

Identify countries in which resources (e.g., fossil fuels, minerals, agricultural products) are the primary source of export earnings and describe the advantages and disadvantages of this interdependency.

3. Humans can manage resources to sustain or prolong their use

Therefore, the student is able to:

A. Explain how renewable resources can be continuously replenished through sustainable use, as exemplified by being able to

Explain how petroleum-based consumer products can be replaced by renewable resources (e.g., plastic bags, eating utensils, diapers replaced by corn- or bamboo-based materials).

B. Explain how humans can use technology to prolong the supply of nonrenewable resources and utilize flow resources, as exemplified by being able to:

- Explain how the development and use of technological advances, such as hybrid engines in cars, can extend the supply of nonrenewable resources.

	<ul style="list-style-type: none"> Explain how the development of new technologies can maintain or prolong the supply of nonrenewable resources (e.g., deep-water ocean drilling platforms, advanced oil recovery techniques for oil-shale deposits).
Standard 18: How to apply geography to interpret the present and plan for the future	<p>1. Geographic contexts (the human and physical characteristics of places and environments) provide the basis for problem solving and planning</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Describe and analyze the influences of geographic contexts on current events and issues, as exemplified by being able to</p> <p>Explain the role of the geographic context in a current global conflict (e.g., boundary dispute, resource allocation, land-use issues) and identify strategies that might be used to settle the conflict.</p> <p>B. Describe and analyze the influences of geographic contexts on the process of planning for the future, as exemplified by being able</p> <p>Analyze areas of a community most prone to potential flooding from rivers, thunderstorms, and storm surges and suggest possible</p>

C. Standards with *Explicit* Mention of Climate, Climate Change, or Global Change and Are More Likely to Be Taught in Science Classes Rather Than Social Studies Classes

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
Standard 4: The physical and human characteristics of places	<p>2. Physical and human characteristics of places change</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Explain the ways that physical processes change places, as exemplified by being able to</p>

	<p>Explain how changes in climate may result in changes to places (e.g., drought and stressed vegetation, more precipitation and increased vegetation, warmer temperatures and longer growing seasons at higher latitudes).</p>
<p>Standard 7: The physical processes that shape the patterns of Earth's surface.</p>	<p>1. The four components of Earth's physical systems (the atmosphere, biosphere, hydrosphere, and lithosphere) are interdependent</p> <p>A. Identify and describe patterns in the environment that result from the interaction of Earth's physical processes, as exemplified by being able to</p> <ul style="list-style-type: none"> • Identify and describe the connections between ocean circulation system and climate (e.g., North Atlantic Drift and the mild climate of Western Europe, the climatic effects of El Niño or La Niña). • Identify and describe the patterns that result from the connections between climate and vegetation (e.g., examples of patterns of ecosystems and biomes).
<p>Standard 8: The characteristics and spatial distribution of ecosystems and biomes on Earth's surface.</p>	<p>3. Climate primarily determines the characteristics and geographic distribution of biomes</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Describe and explain how climate (temperature and rainfall) primarily determines the characteristics and geographic distribution of biomes, as exemplified by being able to</p> <p>Construct climographs (using temperature and precipitation data) for several different biomes to explain the distribution of biomes.</p>
<p>Standard 15: How physical systems affect human systems</p>	<p>2. The types, causes, and characteristics of environmental hazards occur at a variety of scales from local to global</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Describe and explain the types and characteristics of hazards, as exemplified by being able to</p>

Construct a table of climate-related and tectonic-related hazards and explain the characteristics of each type of hazard.

D. Standards in Which Climate Change Concepts May Be Used but Are Not Specifically Referenced and Are More Likely To Be taught in Science

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
Standard 7: The physical processes that shape the patterns of Earth's surface.	<p>1. The four components of Earth's physical systems (the atmosphere, biosphere, hydrosphere, and lithosphere) are interdependent</p> <p><i>Therefore, the student is able to:</i></p> <p>B. Analyze and explain patterns of physical features resulting from the interactions of Earth's physical processes, as exemplified by being able to</p> <ul style="list-style-type: none">• Analyze the pattern of glacial features as a result of glacial retreat (e.g., moraines, kettle lakes, cirques).• Analyze and explain factors influencing precipitation patterns and predict where the patterns will occur (e.g., convectonal, orographic, frontal). <p>2. Earth-Sun relationship drives physical processes that follow an annual cycle and create patterns on Earth.</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Explain how Earth-Sun relationships drive Earth's physical processes and create annual patterns, as exemplified by being able to:</p>

	<p>Explain the occurrences of weather phenomena in different locations due to annual changes in the Earth-Sun relationship (e.g., hurricanes in the fall in subtropical areas, monsoon rainfall, tornadoes in the mid-latitudes during the spring and summer).</p>
<p>Standard 8: The characteristics and spatial distribution of ecosystems and biomes on Earth's surface</p>	<p>1. Components of ecosystems are interdependent</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Describe how the components of ecosystems are connected and contribute to the energy of their own cycles, as exemplified by being able to:</p> <p>Identify and describe how carbon can be absorbed and stored in Earth's physical systems (e.g., oceans, tropical forests, vegetation).</p> <p>B. Construct a model to explain how an ecosystem works, as exemplified by being able to:</p> <p>Construct a flow chart to explain the interactions of components within an ecosystem (e.g., water cycle, oxygen and carbon dioxide exchange, producers, consumers, and decomposers).</p> <p>2. Physical processes determine the characteristics of ecosystems</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Describe and explain how physical processes determine the characteristics of ecosystems, as exemplified by being able to:</p> <p>Explain how ocean currents influence the characteristics of ecosystems (e.g., the Peru current and the Atacama Desert, the Benguela current and Namib Desert, East Indian current in the Bay of Bengal and monsoon season in India).</p>

Standard 14: How human actions modify the physical environment

1. Human modifications of the physical environment in one place often lead to changes in other places

Therefore, the student is able to:

A. Describe and explain how human-induced changes in one place can affect the physical environment in other places, as exemplified by being able to:

Explain how industrial activities (e.g., factories, electric power generating plants) affect other locations (e.g., acid rain downwind, thermal inversions, smog).

2. The use of technology has changed the scale at which people can modify the physical environment.

Therefore, the student is able to:

A. Describe and explain the ways in which technology has expanded the scale of human modification of the physical environment, as exemplified by being able to:

Describe how changes in technology have altered the methods and amount of travel and therefore the effects on the physical environment (e.g., car emissions, road building, airplane jet exhaust and noise).

3. The physical environment can both accommodate and be endangered by human activities.

Therefore, the student is able to:

A. Analyze the positive and negative consequences of humans changing the physical environment, as exemplified by being able to:

Analyze the ways humans can have positive effects on the physical environment (e.g., open green space protection, wetland restoration, sustainable forestry).

<p>Standard 15: How physical systems affect human systems</p>	<p>1. The characteristics of a physical environment provide opportunities for and impose constraints on human activities</p> <p>B. Explain how the characteristics of different physical environments place constraints on human activities, as exemplified by being able to</p> <p>Explain how environmental characteristics (e.g., rainfall, length of growing season, temperatures, soil) restrict the range of crops that can be grown successfully in an area.</p> <p>2. The types, causes, and characteristics of environmental hazards occur at a variety of scales from local to global</p> <p><i>Therefore, the student is able to:</i></p> <p>B. Explain the causes and locations of various types of environmental hazards, as exemplified by being able to</p> <p>Describe the physical environmental conditions that create or result in different environmental hazards (e.g., plate tectonics causing earthquakes, sea surface temperatures contributing to hurricane development in the Atlantic, strong frontal systems in thunderstorms spawning tornadoes).</p>
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Grades 9-12

A. Standards with *Explicit* Mention of Climate, Climate Change, or Global Change and May Apply to Social Studies Classes

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
<p>Standard 9: The characteristics, distribution, and migration of human populations on Earth’s surface.</p>	<p>2. Population distribution and density are a function of historical, environmental, economic, political, and technological factors.</p> <p>Therefore, the student is able to:</p>

	<p>B. Analyze demographic data and identify trends in the spatial distribution of population, as exemplified by being able to: Analyze the possible effects of climate change on the growth and distribution of people in areas such as the Sahel, Pakistan, China, etc.</p>
<p>Standard 13: How the forces of cooperation and conflict among people influence the division and control of Earth's surface</p>	<p>2. Cooperation between countries and organizations may have lasting influences on past, present, and future global issues.</p> <p>Therefore, the student is able to:</p> <p>A. Evaluate how countries and organizations cooperate to address global issues, as exemplified by being able to: Evaluate the success of United Nations (UN) agencies in dealing with global issues (e.g. peacekeeping and prevention of terrorist activities, disease prevention, emergency aid, climate change, education).</p> <p>Identify and describe the potential results of recommendations generated by international efforts to address global climate change (e.g., the series of agreements at Montreal, Kyoto, and Copenhagen).</p>
<p>Standard 15: How physical systems affect human systems</p>	<p>2: Humans perceive and react to environmental hazards in different ways.</p> <p>Therefore, the student is able to:</p> <p>B. Explain how environmental hazards affect human systems and why people may have different ways of reacting to them, as exemplified by being able to:</p> <p>Compare the human responses to the potential predicted effects of climate change on different regions of Earth (e.g., people living in coastal versus landlocked areas, high- versus low-latitude areas, Northern versus Southern Hemisphere areas).</p>
<p>Standard 18: How to apply geography to interpret the present and plan for the future</p>	<p>1. Geographic contexts (the human and physical characteristics of places and environments) provide the basis for analyzing current events and making predictions about future issues.</p>

	<p><i>Therefore, the student is able to:</i></p> <p>B. Analyze and evaluate the connections between the geographic contexts of current events and possible future issues, as exemplified by being able to:</p> <p>Evaluate the feasibility and long-range impacts in a series of scenarios for dealing with social and environmental issues (e.g., absorbing and dispersing refugees, responding to threats from global warming, managing the future of Antarctica).</p> <p>3. Multiple and diverse perceptions of the world must be taken into account to understand contemporary and future issues.</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Evaluate how perceptions vary and affect people’s views of contemporary issues and strategies for addressing them, as exemplified by being able to:</p> <p>Identify and compare different perspectives about international climate change agreements regarding carbon emissions from the points of view of the developed countries and the less-developed countries.</p>
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B. Standards in Which Climate Change Concepts May Be Used but Are Not Specifically Referenced and May Apply to Social Studies Classes

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
Standard 6: How culture and experience influence people’s perceptions of places and regions	<p>2. Changing perceptions of places and regions have significant economic, political, and cultural consequences in an increasingly globalized and complex world.</p> <p>Therefore, the student is able to:</p>

	<p>A. Explain the possible consequences of people’s changing perceptions of places and regions in a globalized and fractured world, as exemplified by being able to:</p> <p>Analyze the changes in the US perceptions of increasing consumer demand and consumption in emerging national economics, especially in such Asian nations as China, India, Singapore, and South Korea.</p>
<p>Standard 9: The characteristics, distribution, and migration of human populations on Earth’s surface.</p>	<p>3. Migration is one of the driving forces for shaping and reshaping the cultural and physical landscape of places and regions.</p> <p><i>Therefore, the student is able to:</i></p> <p>C. Compare and explain the ways in which different groups and governments adjust to the departure and arrival of migrants, as exemplified by being able to:</p> <p>Describe the benefits and challenges migrants face in bridging cultures and adjusting to a new place (e.g., resolving conflicts between old and new traditions, resolving differences between rates of adjustment when children may learn the language and adjust faster than parents, resolving differences in access to food items and traditional cooking methods in a new place.</p>
<p>Standard 10: The characteristics, distribution, and complexity of Earth’s cultural mosaics</p>	<p>1. Cultural systems provide contexts for living in and viewing the world</p> <p><i>Therefore, the student is able to:</i></p> <p>B. Explain how different cultures provide contexts from which people may view the world differently, as exemplified by being able to:</p> <p>“Describe and explain how a current event might be viewed differently from the context of different cultures (e.g., the results of a US presidential election, the impact of a natural disaster such as Hurricane Katrina or a tsunami in the Indian Ocean, the global spread of US companies such as Wal-Mart, Starbucks, or McDonalds).</p>

	<p>2. Cultural landscapes exist at multiple scales</p> <p><i>Therefore, the student is able to:</i></p> <p>B. Explain differences in the human imprints on the physical environment of different cultures, as exemplified by being able to:</p> <p>“Explain how predominant agricultural practices in different cultures result in different imprints on the physical environment (e.g., forest removal for cattle ranches in the Amazon, terrace construction for rice farming in China, changes in land use patterns as a result of center pivot irrigation in the western United States).</p>
<p>Standard 12: The processes, patterns, and functions of human settlement</p>	<p>1. The numbers, types, and range of the functions of settlements change over space and time.</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Explain how and why the number and range of functions of settlements have changed and may change in the future, as exemplified by being able to:</p> <p>Analyze the reasons for and results of policies of municipal governments on the internal structure of cities (e.g., zoning ordinances to determine the location and characteristics of residential, commercial, and industrial sectors, incentives to encourage development, legislation of flood-plain regions restricting development).</p>
<p>Standard 15: How physical systems affect human systems</p>	<p>2. Humans perceive and react to environmental hazards in different ways.</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Explain and compare how people in different environments think about and respond to environmental hazards, as exemplified by being able to:</p>

Construct a list of environmental hazards and compare and contrast how people in developed and developing world regions prepare for and cope with the aftermath of these disasters.

Explain how environmental hazards affect human systems and why people may have different ways of reacting to them, as exemplified by being able to:

Describe and explain the short- and long-term effects of hurricanes in the Gulf of Mexico and Atlantic coast on beaches, buildings, and human activities (e.g., insurance rates, zoning, building codes, beach replenishment, displaced populations).

3. Societies use a variety of strategies to adapt to changes in the physical environment.

Therefore, the student is able to:

A. Explain how societies adapt to reduced capacity in the physical environment, as exemplified by being able to:

Explain how societies historically adapted to reduced capacity in the physical environment (e.g. migration, limiting population growth, building aqueducts and cisterns) and predict locations where adaptation strategies might be required in the future.

Explain how societies use technology in dealing with resource shortages amidst growing human populations (e.g., recycling used water, recycling paper products, converting to drip irrigation systems, development of new alternative energy sources).

Describe and explain how societies may change their use of building materials in response to changes in the physical environment.

B. Analyze the concept of "limits to growth" to explain adaptation strategies in response to the restrictions imposed on human systems by

	<p>physical systems, as exemplified by being able to:</p> <p>Analyze how people have adapted to physical environments that vary in carrying capacity (e.g., slash-and-burn agriculture practices, nomadic herding or hunting, importation of needed products).</p> <p>Analyze the lifestyles of humans in extreme or island environments and explain strategies inhabitants use to survive and not overwhelm the limits of their environments (e.g., water collection and rationing in arid climates, Inuit seasonal seal hunting and fishing practices, Antarctic researchers using sustainable living practices).</p> <p>Identify world locations that have vulnerable environmental conditions (e.g., extreme temperatures, limited access to water, steep topography) and high population density and explain adaptation strategies used in these locations that address the limits to growth.</p>
<p>Standard 16: The changes that occur in the meaning, use, distribution, and importance of resources</p>	<p>1. The meaning and use of resources change over time.</p> <p><i>Therefore, the student is able to:</i></p> <p>B. Explain how globalization and higher standards of living affect the meaning and use of resources, as exemplified by being able to:</p> <p>Explain how and why per-capita consumption of resources (e.g. petroleum, coal, electricity, steel, water, food) differs between developed and developing countries now and in the past.</p> <p>2. The spatial distribution of resources affects patterns of human settlement and trade.</p> <p><i>Therefore, the student is able to:</i></p> <p>B. Analyze and evaluate patterns of trade in resources, as exemplified by being able to:</p>

Identify countries that lead the world in petroleum production and explain how petroleum wealth influences international economic and political relationships.

3. Policies and programs that promote the sustainable use and management of resources impact people and the environment.

Therefore, the student is able to:

A. Explain and compare the costs and benefits of using various types of renewable, nonrenewable, and flow resources as exemplified by being able to:

Analyze the efforts of countries with emerging global economies (e.g., China, India, Brazil) to develop and use renewable and flow energy resources and evaluate the economic and environmental costs and benefits of these efforts.

B. Evaluate policy decisions regarding the sustainable use of resources in different regions and at different spatial scales in the world, as exemplified by being able to:

Compare government policies and programs to promote sustainability (e.g., reducing fossil-fuel dependency, recycling, conserving water) in developed and developing countries.

Standard 17: how to apply geography to interpret the past

3. Historical events must be interpreted in the contexts of people's past perceptions of places, regions, and environments

Therefore, the student is able to:

A. Analyze and evaluate the role that people's past perceptions of places, regions, and environments played as historical events unfolded, as exemplified as being able to:

Describe the changes in perceptions about a group, place, or geographic feature and analyze the effects of those changes

	<p>(e.g., opinions about the role of fires in national forests and parks, attitudes towards and therefore treatment of wetlands in the United States from 1700 to today, changes in attitudes about the characteristics of the Great Plains from the idea of the Great American Desert to the Dustbowl to the Breadbasket).</p> <p>Analyze and compare the changing perceptions of the tropical Latin American rainforests on the development policies towards their use (e.g., as a source of rubber and timber, as a barrier to transcontinental travel, as a home to indigenous populations, as a source of raw materials, as areas rich in biodiversity and in need of preservation, as a carbon sink).</p>
<p>Standard 18: How to apply geography to interpret the present and plan for the future</p>	<p>1. Geographic contexts (the human and physical characteristics of places and environments) provide the basis for analyzing current events and making predictions about future issues.</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Explain and evaluate the influences of the geographic context on current events and issues to make informed decisions and predictions about the future, as exemplified by being able to:</p> <p>Identify different views regarding contemporary social and environmental challenges and analyze the geographic factors influencing the stakeholders and their preferred policies (e.g. visions from local citizens about the relative importance of privacy versus security, opinions from residents of multiple states about a shared resource and about mechanisms for seeking resolution, viewpoints from around the world about relationships between economic development, resource consumptions, population, and environmental alteration).</p> <p>2. The current and possible future causes and processes of change in the geographic characteristics and spatial organization of places, regions, and environments.</p>

	<p><i>Therefore, the student is able to:</i></p> <p>A. Identify and explain the causes and processes of current and possible future changes in the geographic characteristics and spatial organization of places, regions, and environments, as exemplified by being able to:</p> <p>Describe and explain the possible effects of new routes and technologies on world trade patterns (e.g., the effects of increasing the size of the Panama Canal, opening the route through the Arctic Ocean, the development of increasingly larger supertankers and cargo ships).</p>
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C. Standards with *Explicit* Mention of Climate, Climate Change, or Global Change and Are More Likely to Be Taught in Science Classes Rather Than Social Studies Classes

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
Standard 7: The physical processes that shape the patterns of Earth’s surface.	<p>1. The interactions of Earth’s physical systems (the atmosphere, biosphere, hydrosphere, and lithosphere) vary across space and time.</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Explain how the effects of physical processes vary across regions of the world and over time, as exemplified by being able to:</p> <p>Explain the changing relationships among climate, vegetation, and landforms (e.g., desertification and soil degradation, glacial advances and retreats).</p> <p>Analyze and explain the differential effects on the climate of the relationship between water and wind at different latitudes (e.g. cold currents influence the creation of deserts at 20 and 30 degrees north and south latitudes, the formation of hurricanes and tropical storms).</p>

Analyze and explain the relationships between physical processes and the location of land features (e.g., river valleys, canyons, deltas, glaciated lakes and moraines, limestone deposits, caves, alluvial fans, canyons).

B. Explain the ways in which Earth's physical processes are dynamic and interactive, as exemplified by being able to:

Explain how volcanic eruptions and forest fires change atmospheric conditions and disrupt the nitrogen and carbon cycles.

Explain how increasing surface temperatures result in melting ice sheets and rising sea levels.

Construct a diagram illustrating how El Niño and La Niña form and how these influence weather in different locations on earth.

2. Earth-Sun relationships are variable over long periods of time resulting in changes in physical processes and patterns on Earth.

Therefore, the student is able to:

A. Explain how variability in Earth-Sun relationships affect Earth's physical processes over time, as exemplified by being able to:

Explain how cyclic changes (e.g., precession or Milankovich cycle) in Earth's orbit are responsible for changes in heating that results in climatic changes such as an ice age and glaciation of Earth's surface.

Describe the variability in climate over historic periods of time (e.g., over the last 1500 years or during epochs such as the Pleistocene).

Explain how changes in sea coral (including current observations and fossil records) are due to sea level rise or fall as a result of climate variability.

Standard 8: The characteristics and spatial distribution of ecosystems and biomes on Earth's surface.

1. Ecosystems are dynamic and respond to changes in environmental conditions

Therefore, the student is able to:

A. Explain how there are short-term and long-term changes in ecosystems, as exemplified by being able to:

Explain how ecosystems respond to long-term changes in the physical environment (e.g., glacial retreat, volcanic eruptions, sea-level rise, increases in sea temperatures).

B. Explain how local and global changes influence ecosystems, as exemplified by being able to:

Explain how global climate change could influence the location and extent of existing ecosystems and the formation of new ones.

2. The characteristics and geographic distribution of ecosystems

Therefore, the student is able to:

A. Explain the geographic distribution of ecosystems, as exemplified by being able to:

Analyze the impact of rising sea temperatures on the distribution and survival of coral reef ecosystems.

3. The distribution and characteristics of biomes change over time

Therefore, the student is able to:

A. Explain how climate can influence and change the characteristics and geographic distribution of biomes, as exemplified by being able to:

Explain how rising global temperatures can cause changes in various biomes (e.g., melting

	<p>permafrost in tundra, changes in the location of deserts, increases in the length of growing seasons).</p> <p>Analyze the changes in the biomes of a particular region over time (e.g., the change of the Sahara from a grassland to a desert) and describe the climatic changes that caused these changes to occur.</p>
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D. Standards in Which Climate Change Concepts May Be Used but Are Not Specifically Referenced and Are More Likely To Be taught in Science Classes Rather Than Social Studies Classes

Strand/standard that connects to climate change (include number or other ID used in document)	Knowledge statement and example of what student is able to do
Standard 1: How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information.	<p>4. The uses of geographic representations and geospatial technologies to investigate and analyze geographic questions and to communicate geographic answers.</p> <p><i>Therefore, the student is able to:</i></p> <p>A. Analyze geographic representations and suggest solutions to geographic questions at local to global scales using geographic representations and geospatial technologies, as exemplified by being able to:</p> <p>Analyze the possible relationships between global human and physical changes using GIS (e.g. the relationship between global climate change, sea level rise, and population distribution)</p>
Standard 14: How human actions modify the physical environment	<p>2. The use of technology can have both intended and unintended impacts on the physical environment that may be positive or negative.</p> <p><i>Therefore, the student is able to:</i></p>

A. Evaluate the intended and unintended impacts of using technology to modify the physical environment, as exemplified by being able to:

Evaluate various types of contemporary agricultural techniques (e.g., no-till farming, herbicides, pesticides, center-pivot application of chemicals, crop rotation, irrigation, increased acreage in production), and compare the positive and negative implications of using these techniques.

3. People can either mitigate and/or adapt to the consequences of human modifications of the physical environment.

Therefore, the student is able to:

A. Describe and evaluate scenarios for mitigating and/or adapting to environmental changes caused by human modifications, as exemplified by being able to:

“Compare the costs and benefits of alternative solutions for a human-caused environmental problem, such as acid rain (e.g., coal with lower sulfur content, scrubbers on smokestacks, nuclear waste disposal, use of alternative energies) or urban heat islands (e.g., green roof construction, increased public transportation, energy efficient buildings).

Heffron, Susan Gallagher and Roger M. Downs, eds. *Geography for Life: National Geography Standards, Second Edition*. Washington, DC: National Council for Geographic Education, 2012. Address: 1145 Seventeenth Street, NW, Room 7620, Washington, DC 20036. Excerpts reprinted with permission.

College, Career & Civic Life (C3) Framework: A Note

The new C3 Framework was released while we were in the process of standards analysis. We therefore had time to conduct only a brief analysis. The C3 Framework has four dimensions, of which disciplinary concepts are one. Civics, Economics, Geography, and History are the four disciplines that comprise this

dimension of the framework, and professional organizations affiliated with each discipline assisted in developing the framework.

Source

National Council for the Social Studies. *The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History*. Silver Spring, MD: 2013. Address: 8555 Sixteenth Street, Suite 500, Silver Spring, MD 20910.



Summary

Of the four disciplines within the C3 Framework, only geography includes content containing the words “climate” or “climate change.” They are:

- “By the end of grade 2, individually and with others, students...explain how weather, climate, and other environmental characteristics affect people’s lives in a place or region.” (*C3 Framework*, 42)
- “By the end of grade 12, individually and with others, students...evaluate the influence of long-term climate variability on human migration and settlement patterns, resource use, and land uses at local-to-global scales” (*C3 Framework*, 43)

Additionally, the Framework’s glossary includes several references to climate and climate change. Each term in the glossary includes an example. For six of the terms, *climate* or *climate change* appears within the example. These terms are *adapt to an environment*, *complex causal reasoning*, *economic globalization*, *environmental characteristics*, *geography*, and *natural hazard*. In addition, the terms *climate change* and *climate variability* are included and explained within the glossary.