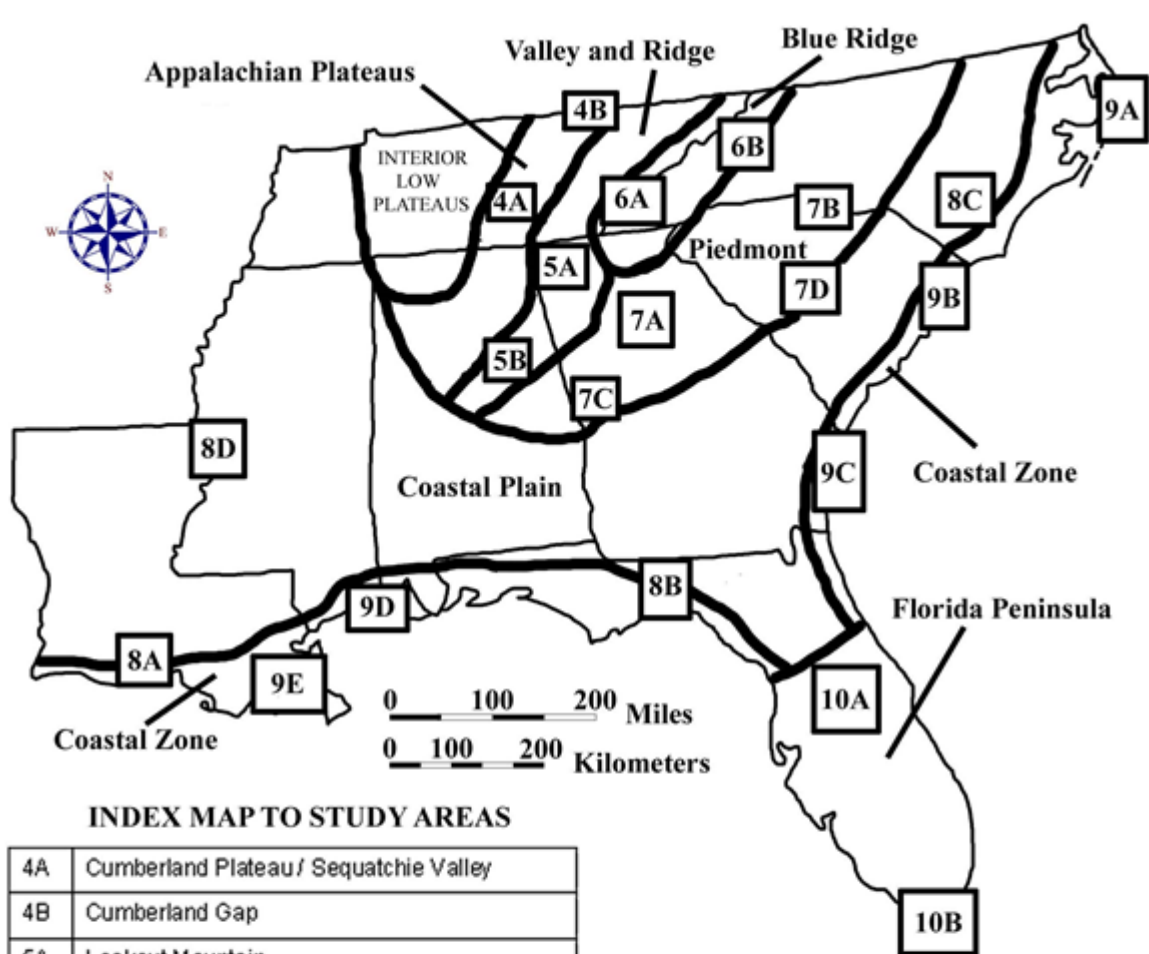


CHAPTER 1
HOW TO USE SE MAPS



INDEX MAP TO STUDY AREAS

4A	Cumberland Plateau / Sequatchie Valley		
4B	Cumberland Gap		
5A	Lookout Mountain		
5B	Birmingham	8C	Carolina Bays
6A	Great Smoky Mountains	8D	Mississippi River Alluvial Plain
6B	Blue Ridge Front	9A	Outer Banks
7A	Metropolitan Atlanta	9B	Grand Strand
7B	Kings Mountain Belt	9C	Georgia Coastal Corridor
7C	Pine Mountain Belt	9D	Mississippi Gulf Coast
7D	Columbia	9E	New Orleans to the Gulf of Mexico
8A	Louisiana Salt Domes	10A	Central Peninsula
8B	Woodville Karst Plain	10B	South Florida

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GLOSSARY

THE SE MAPS CONCEPT

A Conceptual Understanding

SouthEastern Maps and Aerial Photographic Systems (SE MAPS) is specifically designed to create an awareness among students of the diversity of our region's landforms, natural vegetation, abundant wildlife, recreational facilities, lakes and river systems, and land usage. The materials provide a framework based on the geological setting so that students can perceive the relationships among our historical developments, economic trends, environmental concerns, cultural diversity, and current land use policy. Ultimately it is hoped that using SE MAPS will lead students to the realization that they must assume responsibility for proper conservation practices which will allow for future use and enjoyment of our nation's resources. The inherent natural and cultural variety within the Southeastern United States makes this region an intriguing place to live, a place which, if its resources are wisely used, will be enjoyed for generations to come.

The Southeastern United States contains majestic mountain chains, rolling hills and wide valleys, extensive river deltas, waterfalls, swamps and other wetlands, sandy beaches and barrier islands, and rocks over a billion years old as well as land that was once part of another continent. The area's cultural heritage embraces Native American legends, short-lived Spanish settlements, land grants from kings, pirating escapades along the coastline, Scotch-Irish and Cajun ballads reminiscent of their homeland, stories and traditions brought to this country by African Americans, and the ravaging impact of two major wars. Economic progress in the area has been influenced by the rise and fall of the rice empire, alteration of landscapes by hurricanes, the demise of 'King Cotton' as the dominant agricultural crop, the recent shift from textiles to other industries, and an invasion of summer tourists along the coast. Such diversity in landforms, historical development and culture is hard to match anywhere in the world. To fully understand and appreciate how the landscape has helped shape historical events, customs, folklore, land use, economic trends, and environmental concerns, all students growing up in the Southeastern United States should be able to make connections among the following:

- Geologic events that have produced the seven major landform regions;
- Economic trends that have resulted in land use diversity in relation to the region's industries, agriculture, and tourism;
- Historical events, regional customs, stories, and folk tales that have reflected the region's cultural diversity;
- Mathematical applications that have been used to solve problems involving the organization of data, graphic representation of numerical facts, and estimation;
- Environmental concerns that have been the focus of national efforts to encourage citizens to appreciate, use wisely, and preserve the region's unique resources.

It is with this premise in mind that SE MAPS was developed for our future lawmakers, business executives, farmers, factory workers, educators, builders,

industrialists, homemakers, and all other citizens who need to develop an appreciation and understanding of the land on which they live and work.

Interdisciplinary Objectives

The study of landscapes and landforms naturally lends itself to discussions of the peoples and cultures that inhabit those regions. Infrared aerial photographs, satellite imagery, and topographic maps all show cultural as well as physical features. One objective of SE MAPS is to provide a common framework, through use of shared cartographic products, by which students can use different disciplinary approaches to investigate topics in regional studies under a common theme. For example, a unit of study focusing on the Gulf Coast of the United States could involve scientific topics of hurricanes and delta formation; historical topics of early exploration and settlement; language arts concepts of folklore and literature (*e.g.* Longfellow’s “Evangeline”); and mathematical topics of measurement, estimation, and statistical analysis.

SE MAPS seeks to bridge the gap between subjects or disciplines while recognizing the fact that teachers in all disciplines are assigned certain curriculum standards they have to meet. By cross-referencing individual concepts to specific content standards, SE MAPS activities enable students in different classes to meet their individual curriculum requirements while engaging in an integrated approach to problem solving and critical thinking using a common set of instructional materials.

Performance Task Objectives

Each SE MAPS thematic activity consists of several related performance tasks, or questions, for students to answer. These tasks are designed to be age appropriate, hands-on, inquiry exercises in which students utilize the indicated cartographic products to answer both factual and open ended questions. Many of the tasks require drawing lines or tracing features on laminated maps or images with a wipe-off pen. Such visually oriented activity helps reinforce concepts that have been presented to the class verbally or in other learning formats. Enrichment questions require students to use additional sources of information not usually available in the classroom. Such activity strengthens the research objectives of all disciplines as expressed in published curriculum standards documents.

Many of the performance tasks contain multiple questions or parts. Some suggest dividing classes into several different groups, several of which may be asked to solve a problem using a different strategy or approach. Question segments are usually sequenced in order of difficulty, so that every level of student is able to complete their assigned portion of the task successfully. Almost all performance tasks are independent of others to provide maximum flexibility for classroom use.

Importance of Cartographic Products

The study of landscapes and landforms can easily deteriorate into a memorization marathon of different categorizations and classifications of geographic features. Students may end up with a wealth of descriptive terminology, but very little else. The use of remotely sensed images not only provides a new perspective regarding the earth's surface, but also provides a vehicle by which students can construct a much more accurate mental image of the world in which they live. An aerial view allows students to observe entire stream drainage networks rather than a single meander bend and trace the geometric patterns of characteristic features such as faults and land use regions.

SE MAPS utilizes a diverse collection of aerial photographic and satellite imagery, other remotely sensed data, topographic maps, and computerized special purpose mapping products gleaned from a variety of sources. Special 3-D anaglyph maps add a new perspective to the interpretation of topographic maps and contour lines. The cartographic products were carefully chosen to provide different spatial perspectives, in a variety of map scales, featuring unique geological and geographical features focusing on the seven designated major landform regions, Appalachian Plateaus, Valley and Ridge, Blue Ridge, Piedmont, Coastal Plain, Coastal Zone, and Florida Peninsula.

All maps and images used in SE MAPS have been mosaiced, cropped, or otherwise customized in order to correspond more closely to the stated objectives of the student activities. Labels and special features have been added and/or subtracted to make the products easier to read and use. Many activities call for students to identify patterns on maps and images and relate form to function. Others focus on inquiry strategies by introducing questions that can be addressed using first-hand observational data and scientific reasoning skills. The maps and images used in SE MAPS are visually attractive and appealing to students, providing additional motivation for increased classroom effort.

Performance Based Assessment

Assessment of classroom learning is no longer concerned primarily with success in memorizing facts and regurgitating definitions. Modern performance based assessment techniques focus on demonstrating student competency in actually doing real science, or real math, or real work in any other subject. Alternative evaluation instruments such as portfolios, interviews, open-ended responses, concept maps, Venn Diagrams, and computer simulations all can play an important role in providing detailed information about student progress in meeting the assigned science curriculum standards for that course. The SE MAPS performance tasks incorporate all of these variations. Many of these new formats cannot be machine-scored, but must be personally evaluated by teachers, or other real people, using strict scoring criteria or rubrics. It is important that students be able to demonstrate their knowledge and skills in multiple ways to create their own answers and solutions to problems.

Good assessment instruments strike a balance between testing higher order thinking skills and testing basic knowledge and comprehension. Literacy requires the ability to communicate personal experiences to others. Unless there is a shared vocabulary, true

communication is impossible. Unless there is discovery and experience to report, communication will serve no purpose. SE MAPS lists performance objectives for each study area and includes sample assessment rubrics to aid teachers in designing testing instruments that are truly performance based. The number of scientific terms is kept to a minimum, but fundamental vocabulary is incorporated into the text whenever possible. Many of the SE MAPS performance tasks are intentionally similar in style and context to questions found on many state standardized achievement tests.

Connections with Curriculum Initiatives

Various state curriculum standards and subject area frameworks were reviewed by development teams in several Southeastern states as they designed student activities for their assigned study areas. Published national curriculum standards in science, social studies, and geography were also consulted. The ultimate goal of all of these initiatives is to stress the unifying concepts in all disciplines that can place individual topics and processes into a common frame of reference associating form and function or cause and effect. The common emphasis on depth as opposed to breadth of content coverage is likewise reflected in SE MAPS activities.

Research has shown that inquiry based hands-on activities are the most effective approach to conveying to students the basic concepts promoted by the various content standards documents. Such activities are also instrumental in nourishing the development of critical thinking and problem solving skills as well as fostering the development of abstract reasoning. SE MAPS can serve as a stand-alone unit addressing content and process standards in several disciplines. It can also be integrated with other programs or textbooks to complement existing curriculum emphases and standards. Either way, the SE MAPS materials serve to enhance classroom studies by providing opportunities to apply thematic concepts to local geographic areas which are familiar to students.

DESIGN OF SE MAPS

Major Organizing Themes (Facets)

Chapter 3 of the SE MAPS Teaching Manual provides a regional overview of the Southeastern United States. It introduces such basic concepts as drainage basins, transportation routes, and land use patterns that are common to all landform regions. Performance tasks in this chapter involve work with large-format regional base maps and other specialty maps. The overview chapter also focuses on comparing and contrasting characteristic landscape features and natural resource distributions among different landform regions. The remaining chapters each highlight one of the seven major geographic divisions referred to as physiographic provinces by most geologists and geographers. For the purposes of SE MAPS, these provinces are defined as Appalachian Plateaus, Valley and Ridge, Blue Ridge, Piedmont, Coastal Plain, Coastal Zone, and Florida Peninsula.

Within each of these chapters, from two to five individual study areas were selected to be the focal points for detailed student activities. A total of 21 of these local study areas are distributed throughout the eight Southeastern states that participated in the development of SE MAPS. Each study area emphasizes from two to four conceptual themes that provide a framework for both the background information as well as the student activities assigned to that section. Some of these themes address historical concerns, others focus more on science. All of the themes promote in-depth study of the interactions between geographic diversity and human activity.

Each of the local study areas was chosen not only for its unique landscape features or historical significance, but also for its statewide renown and its accessibility for student field trips. It was also required that an area's outstanding features be clearly visible from an infrared aerial photograph or other similar product of remote sensing technology, so that students could locate features and perform spatial analyses in and around the site.

Finding the Lessons You Want

Each chapter contains a detailed Table of Contents that lists by page number all topics covered in the background information sections and the student activities. The page numbering system indicates the chapter number, followed by a hyphen, followed by the individual page of interest, *e.g.* page 1-5, representing the fifth page of the first chapter. Within the sections dealing with local study area information and activities, designations include both the chapter and the letter corresponding to that study site, *e.g.* page 4A-6. Figures are labeled in sequence. For example, Figure 4B-3 is the third figure found in Section 4B, the section featuring Cumberland Gap.






Locating specific background information, or student activity performance tasks that relate to a particular curriculum standard or topic, requires the use of the correlation

matrices embodied in the first chapter. Although more detailed correlations may be, or may become, available at the state level, these matrices provide a quick reference for matching SE MAPS topics to specific national curriculum standards. It was not feasible to include references to specific state standards in this publication because the eight different states mandate such different content coverage at different grade levels. A one-to-one correspondence between individual standards and SE MAPS activities is neither intended or implied. Several activities may cover the same standard, while other standards are not linked at all. The following table indicates which important instructional themes are assigned to each study area.

STUDY AREA	IMPORTANT INSTRUCTIONAL THEMES
3A	major landform regions; drainage basins and watersheds
3B	geological history; distribution of geological resources
3C	erosion and deposition; structural geology and topography
3D	elevation patterns and landscapes; climate and agriculture
3E	transportation systems; establishment of political boundary lines
3F	place names and geography; ethnic diversity and settlement patterns
4A	karst topography; structural control on topography; pumped storage
4B	Cumberland Escarpment; Middlesboro Basin; Wilderness Road
5A	valley and ridge topography; De Soto's travels
5B	mining activities and environmental consequences; steel industry
6A	windows and thrust sheets, historic landslides and floods; pollution
6B	faults, peneplains, and escarpments; Blue Ridge Parkway
7A	exfoliation domes; urbanization; Soapstone Ridge archeology
7B	transportation corridor; battlefield site; mining and land restoration
7C	structural geology; land use changes; Warm Springs and FDR
7D	Fall Line zone; Civil War battlefield; mill village life; urbanization
8A	petroleum geology; salinity and vegetation; cultural land divisions
8B	karst topography; springs and the groundwater table; paleoindians
8C	origin of Carolina Bays; soils, land use, and environmental issues
8D	river and floodplain features; settlements and agriculture, Civil War
9A	inlet migration; beach ridges; historical settlements and land use
9B	ancient beach ridges; seafloor bathymetry; tourism and land use
9C	sea island geology; rice culture; commerce in port of Savannah
9D	barrier island geology; effects of hurricanes
9E	geology on the delta; New Orleans history and culture; water issues
10A	comparison of Gulf and Atlantic coast; phosphate industry; tourism
10B	Florida Keys; Everglades water management; history and land use

Use of Icons

All performance tasks in SE MAPS are labeled by icons representing five categories:

-  the sun represents 'science',
-  the computer represents 'mathematics',
-  the book represents 'social studies',
-  the pen-in-hand represents 'language arts', and
-  the airplane represents an 'overview' or 'interdisciplinary' task.

These icons, covering all four major middle school academic disciplines, are used to identify the main emphasis area reflected in each performance task question. Overview icons indicate general tasks which relate primarily to locating landscape features or sites of historically significant events on maps and/or lithograph images. Overview tasks set the stage for the discipline-specific questions that follow in the activity. Each activity in SE MAPS consists of one power thinking question, five different performance tasks, and two enrichment tasks. Some enrichment questions have more than one icon assigned to them, indicating that the task has components based on two or more academic disciplines. Teachers should decide ahead of time in which subject class that task will be assigned. Multi-icon questions should not be broken up for use in different classes. In general, overview questions should be assigned prior to any discipline-specific exercises.

Using Activities to Make Regional Connections

The study and interpretation of various cartographic products can provide a unique perspective on both nature and human society. Cartography is concerned with exploring the spatial dimension of the human experience. An understanding of both geological and geographical processes and patterns and their implications for human use of the land is critical if society is to solve its present and future environmental problems. SE MAPS contains student activities highlighting many of today's most important and complex environmental issues, not only in the Southeast, but nationwide. Some of these issues appear time and time again in many different study area activities, and include:

- over-commercialization and over-development versus wilderness preservation
- pros and cons of constructing reservoirs, dams, and power projects
- prevention of erosion as land is developed or farmed or mined
- remediation of contamination from point source and non-point source pollution
- water treatment and waste disposal problems of urbanized areas
- groundwater pollution and collapse features in Karst Topography areas
- dredging of harbors and causes and effects of increased sediment load in rivers
- pros and cons of constructing groins, jetties, and seawalls along beaches
- conservation of natural resources, clearcutting, petroleum and coal availability
- acid rain, acid mine drainage and environmental restoration of mining areas
- wetlands depletion, loss of habitat for threatened and endangered species

Section Organization and Layout of Teaching Manual

INDEX MAP: A regional map shows the locations of the study areas and highlights sites covered in the chapter.

TABLE OF CONTENTS: The sequence of topics, figures, and activities, along with page numbers, is listed in table form.

BACKGROUND INFORMATION: A summary of interesting geological, historical, cultural, economic, and environmental information is provided for each landform region. Although this material is written specifically for the teacher, as a resource, selected portions of the material may be presented to students to stimulate greater interest, comprehension, and appreciation for a particular study area. Figures and diagrams enrich the narrative while stories, history vignettes, and folk tales are boxed for emphasis. Words that appear in the glossary are printed in bold type. The background material has been subdivided into three categories: Description of Landforms, Drainage Patterns, and Geological Processes; Influence of Topography on Historical Events and Cultural Trends; and Natural Resources, Land Use, and Environmental Concerns.

GLOSSARY TERMS: The first occurrence of each glossary word is bolded in each chapter of the text. A full glossary of important terms is located at the end of Chapter 1.

PLACES TO VISIT: Field trip suggestions for enhancing and personalizing study area objectives are outlined, including a listing of phone numbers, websites, and other contact information. Many of these places offer educational programs and/or guided tours.

REFERENCES AND RESOURCES: A listing of various print references and other media resources, including videotapes, websites, and computer software is provided.

RATIONALE: Reasons are outlined for selecting each study area and justifying the significance of that location to the region.

PERFORMANCE OBJECTIVES: Major learning outcomes are stated in behavioral terms. Performance Objectives reflect the themes and subject content of each study area.

ASSESSMENT RUBRICS: Examples of ways to assess student mastery of the concepts covered in this section of SE MAPS are presented.

NEWSPAPER ARTICLE: Each study area includes a recent newspaper article which highlights important features of the site in unique ways. This adds timely human interest as well as providing additional information about landscape and other features.

STUDY AREA DESCRIPTION: Additional information is provided about the specific locales represented by the various cartographic products assigned to the local study area.

ACTIVITIES: A grouping of student inquiry questions having a common theme or topic. Each activity contains a power thinking exercise, materials list, five performance task questions and two enrichment questions.

POWER THINKING ACTIVITY: An open ended problem solving scenario, which requires the use of one or more cartographic products, that is introduced at the beginning of each student activity section. This hands-on activity is designed to focus on the specific geographical setting of the study area thereby stimulating student interest and awareness of the unique features of this region.

MATERIALS: Cartographic products and other supplies needed for the activities are listed in table format.

PERFORMANCE TASKS: Questions grounded in a variety of instructional inquiry strategies that direct students through focused exercises related to the specific landform region and study area. All performance tasks require the use of one or more of the cartographic products assigned to that study area and each is coded by icon for a particular academic discipline. Most tasks are subdivided into individual questions which are appropriate for cooperative learning groups to perform. Activities may be either teacher-directed or self-paced depending on the student's level of competence and the teacher's lesson objectives.

ENRICHMENT: Additional follow-up studies challenge students to reach beyond the original performance tasks and use of cartographic products by focusing on extended concepts related to the study area. These questions stress continued application of newly learned concepts in a problem solving format. Processes of analysis and synthesis are emphasized in both individual and group research projects.

Matrices connecting SE MAPS to National Standards

SE MAPS curriculum materials reflect the major emphases set forth by recent national and state curriculum initiatives. The following five matrices outline connections between each of the four discipline-based national standards documents and SE MAPS themes. The fifth matrix correlates SE MAPS with the National Geography Standards.

Many states have recently adopted their own local standards and curriculum frameworks to guide the local teaching process. While many of those state standards documents were consulted during the development of the SE MAPS curriculum materials, a strict alignment with all of those standards was considered beyond the scope of this project. In some states, SE MAPS themes fit more closely with ninth grade standards, in others they align better with eighth grade standards. Individual teachers must take responsibility for choosing topics and activities that best match the curriculum they are required to follow within their own school district and state.

MATRIX #1 – SE MAPS CORRELATION TO SCIENCE STANDARDS

CONTENT STANDARDS 5-8 SE MAPS CHAPTER 1 2 3 4 5 6 7 8 9 10

CONTENT STANDARDS 5-8	1	2	3	4	5	6	7	8	9	10
A: SCIENCE AS INQUIRY										
- abilities necessary to do scientific inquiry										
- identify questions answered through investigation										
- design and conduct a scientific investigation										
- use appropriate tools and techniques to analyze data										
- develop descriptions and models using evidence										
- think critically and logically to make relationships										
- recognize and analyze alternative explanations										
- communicate scientific procedures and explanations										
- use mathematics in all aspects of scientific inquiry										
- understandings about scientific inquiry										
B: PHYSICAL SCIENCE										
- properties and changes of properties in matter										
- motions and forces										
- transfer of energy										
C: LIFE SCIENCE										
- structure and function in living systems										
- reproduction and heredity										
- regulation and behavior										
- populations and ecosystems										
- diversity and adaptations of organisms										
D: EARTH SCIENCE										
- structure of earth system										
- earth's history										
- earth in the solar system										
E: SCIENCE AND TECHNOLOGY										
- abilities of technological design										
- identify appropriate problems for technological design										
- design a solution or product										
- implement a proposed design										
- evaluate completed technological designs or products										
- communicate process of technological design										
- understanding about science and technology										
F: SCIENCE IN PERSONAL / SOCIAL PERSPECTIVE										
- personal health										
- populations, resources and environment										
- natural hazards										
- risks and benefits										
- science and technology in society										
G: HISTORY AND NATURE OF SCIENCE										
- science as a human endeavor										
- nature of science										
- history of science										

Standards paraphrased from "National Science Education Standards" NRC, 1996

MATRIX #2 – SE MAPS CORRELATION TO MATHEMATICS STANDARDS

CONTENT STANDARDS 6-8 SE MAPS CHAPTER 1 2 3 4 5 6 7 8 9 10

CONTENT STANDARDS 6-8	1	2	3	4	5	6	7	8	9	10
A: NUMBERS AND OPERATIONS										
- understand numbers, ways of representing numbers										
- understand meanings of operations										
- compute fluently and make reasonable estimates										
B: ALGEBRA										
- understand patterns, relations, and functions										
- represent and analyze mathematical situations										
- use mathematical models to represent relationships										
- analyze change in various contexts										
C: GEOMETRY										
- analyze characteristics & properties of geometric shape										
- specify locations and describe spatial relationships										
- apply transformations and use symmetry to analyze										
- use visualization, spatial reasoning, and modeling										
D: MEASUREMENT										
- understand measurable attributes of objects and units										
- apply appropriate techniques, tools, and formulas										
E: DATA ANALYSIS AND PROBABILITY										
- formulate questions that can be addressed with data										
- select and use appropriate statistical measures										
- develop and evaluate inferences and predictions										
- understand and apply basic concepts of probability										
F: PROBLEM SOLVING										
- build new mathematical knowledge by problem solving										
- solve problems in mathematics and in other contexts										
- apply and adapt a variety of appropriate strategies										
- monitor and reflect on the process of problem solving										
G: REASONING AND PROOF										
- recognize reasoning and proof as fundamental aspects										
- make and investigate mathematical conjectures										
- develop & evaluate mathematical arguments and proofs										
- select and use various types of reasoning and proofs										
H: COMMUNICATION										
- organize and consolidate mathematical thinking										
- communicate mathematical thinking coherently										
- analyze and evaluate mathematical thinking & strategy										
- use language of mathematics to express ideas precisely										
I: CONNECTIONS										
- recognize & use connections among mathematical ideas										
- understand how mathematical ideas interconnect										
- recognize and apply mathematics in [other] contexts										
J: REPRESENTATION										
- create and use representations to organize [and] record										
- select, apply, and translate to solve problems										
- use representations to model and interpret phenomena										

Standards paraphrased from "Principles and Standards for School Mathematics" NCTM, 2000

MATRIX #3 – SE MAPS CORRELATION TO LANGUAGE ARTS STANDARDS

CONTENT STANDARDS

SE MAPS CHAPTER 1 2 3 4 5 6 7 8 9 10

A: READING											
1. students read wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world											
2. students read a wide range of literature from many periods in many genres to build an understanding of the many dimensions of human experience											
B: LANGUAGE USE, VARIATION & CONVENTION											
3. students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts											
4. students adjust their use of spoken, written, and visual language to communicate effectively with a variety of audiences and for different purposes											
C: CREATING TEXTS											
5. students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different groups											
6. students apply knowledge of language structure, language conventions, media techniques, figurative language and genre to create, critique and discuss text											
D: RESEARCH AND INQUIRY											
7. students conduct research on issues and interests by generating ideas and questions, and by posing problems; they gather, evaluate, and synthesize data											
8. students use a variety of technological and informational resources to gather and synthesize information and create and communicate knowledge											
E: MULTI-CULTURAL RESOURCES											
9. students develop an understanding of and respect for diversity in language use, patterns, and dialects across cultures, ethnic groups, and geographic regions											
10. students whose first language is not English make use of their first language to develop competency in the English language arts and other content areas											
F: LITERACY HAS SOCIAL & PERSONAL ASPECTS											
11. students participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities											
12. students use spoken, written, and visual language to accomplish their own purposes (learning, enjoyment)											

Standards paraphrased from "Standards for the English Language Arts" NCTE & IRA, 1996

MATRIX #4 – SE MAPS CORRELATION TO SOCIAL STUDIES STANDARDS

EXPECTATIONS (middle grades)	SE MAPS CHAPTER									
	1	2	3	4	5	6	7	8	9	10
I: CULTURE										
a. compare similarities and differences in group actions										
b. explain how experiences are interpreted differently										
d. explain why groups respond differently to change										
II: TIME, CONTINUITY, AND CHANGE										
b. identify and use concepts of chronology, causality										
c. describe historical periods & patterns of change										
d. use processes important to reconstructing the past										
f. use facts and concepts to inform decision-making										
III: PEOPLE, PLACES, AND ENVIRONMENTS										
a. elaborate mental maps of locales, regions, and world										
b. interpret and use maps, globes, and photographs										
c. use tools such as aerial photographs, satellite images										
d. estimate distance, calculate scale, determine patterns										
e. describe varying landforms and geographic features										
f. describe physical system changes and patterns										
h. analyze physical and cultural patterns & interactions										
i. describe way historical events affected by geography										
IV: INDIVIDUAL DEVELOPMENT AND IDENTITY										
b. describe personal connections to place										
e. describe way regional & ethnic culture influence life										
h. work independently & cooperatively to achieve goal										
V: INDIVIDUALS, GROUPS, AND INSTITUTIONS										
c. describe interactions of people with institutions										
VI: POWER, AUTHORITY, AND GOVERNANCE										
f. explain conditions contribute to conflict, cooperation										
VII: PRODUCTION, DISTRIBUTION, AND USE										
b. describe role of supply & demand to production										
i. use economic concepts to explain development										
VIII: SCIENCE, TECHNOLOGY, AND SOCIETY										
a. describe influence of culture on technological choice										
c. describe how values influenced by new technology										
IX: GLOBAL CONNECTIONS										
b. analyze conflict and cooperation among groups										
d. explore causes and consequences of global issues										
X: CIVIC IDEALS AND PRACTICES										
c. analyze and apply information about public issues										
g. analyze influence of diverse public opinion on policy										

Standards paraphrased from "Curriculum Standards for Social Studies" NCSS Bulletin 89, 1994

MATRIX #5 – SE MAPS CORRELATION TO GEOGRAPHY STANDARDS

GEOGRAPHY STANDARDS 5-8 SE MAPS CHAPTER 1 2 3 4 5 6 7 8 9 10

A: THE WORLD IN SPATIAL TERMS											
1. use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective											
2. use mental maps to organize information about people, places, and environments in a spatial context											
3. analyze the spatial organization of people, places, and environments on earth's surface											
B: PLACES AND REGIONS											
4. the physical and human characteristics of places											
5. that people create regions to interpret earth's complexity											
6. culture and experience influence people's perception of places and regions											
C: PHYSICAL SYSTEMS											
7. the physical processes that shape the patterns of earth's surface											
8. the characteristics and spatial distribution of ecosystems on earth's surface											
D: HUMAN SYSTEMS											
9. the characteristics, distribution, and migration of human populations on earth's surface											
10. the characteristics, distribution, and complexity of earth's cultural mosaics											
11. the patterns and networks of economic interdependence on earth's surface											
12. the processes, patterns, and functions of human settlement											
13. the forces of cooperation and conflict among people influence the division and control of earth's surface											
E: ENVIRONMENT AND SOCIETY											
14. human actions modify the physical environment											
15. physical systems affect human systems											
16. the changes that occur in the meaning, use, distribution, and importance of resources											
F: THE USES OF GEOGRAPHY											
17. apply geography to interpret the past											
18. apply geography to interpret the present and plan for the future											

Standards paraphrased from "National Geography Standards" Geog. Ed. Stand. Proj. 1994

INSTRUCTIONAL STRATEGIES

Teaching Level, Time, and Scheduling Suggestions

The SE MAPS curriculum materials were developed as a middle school project, yet the scope of the materials is flexible enough to be useful at many other levels of a school's instructional program. Middle school teachers will find the SE MAPS materials particularly valuable as part of an interdisciplinary program that lends itself readily to team teaching across the curriculum. Using this model for the team teaching approach, where science, mathematics, social studies, and language arts teachers plan their lessons together with a common theme; students easily recognize the connections that interrelate these disciplines. Upper elementary level teachers in self-contained classrooms also find this approach useful. Student activities are diverse enough in coverage and difficulty to provide adequate levels of success for remedial students as well as gifted classes.

While depth of understanding is critical to student learning, it is important not to overwhelm your students with too many new materials or concepts all at once. Keep coverage simple at first, until everyone is familiar with the map products and has developed the appropriate map reading skills. A few overview activities widely spaced will allow students to become acclimated to the precepts of SE MAPS before an in-depth study is begun. Use the Power Thinking Activities to introduce different topics or sections of the curriculum. These activities will give students a "big picture" of the region and will give them the opportunity to become comfortable with the cartographic products which go with that area. Make sure students are successful with basic concepts and procedures before moving on to in-depth studies or other lessons.

Recall that the heart and soul of the SE MAPS program are the cartographic products. The more the students work directly with the maps and imagery, the more involved they will become with the materials and the more they will realize the goals of the curriculum. Try to use the maps as often as possible when working with regional stories, Southeastern history and geography, and various environmental concepts in science and math. At first, it may be helpful to make a special effort to focus on study areas or features located close to your school, so that students will be able to connect these features and concepts with their own lives.

Some schools incorporate large portions of SE MAPS into their course of study and may spend several weeks to months concentrating on various study areas and themes. Other teachers use the materials more as an extension to existing unit plans and insert selected activities several times during the year for only one or two days at a time. SE MAPS covers far more material than could ever be completed in any one class, so most performance tasks were designed to be used effectively as stand-alone activities. Each performance task is able to be completed in one fifty-minute class period or less.

Prior Content Knowledge and Skills Requirements

Prior Earth Science Content Knowledge Requirements

A basic knowledge of the principles of geography and cartography is required for students to receive the full benefit of the SE MAPS curriculum materials. Some science teachers do not stress these concepts because they think it is not science. And conversely, many social studies teachers do not cover map interpretation because they think it is too "scientifically" oriented. It is important to know why certain land uses are connected to certain landform regions, and what environmental implications accompany that land use.

In many school systems, earth science is taught in the eighth grade. In others, earth science is part of an integrated science approach which covers the middle school years. An understanding of certain fundamental earth science principles will provide the student a much more enriching experience when working with the map and imagery products. Students should have at least a rudimentary understanding of the following concepts:

- Effect of weather and water in causing the disintegration of rocks to form soil
- Rock cycle
- Theory of plate tectonics and its application to continental drift
- Rates of various geologic processes and their relation to geologic time
- Major landscape features produced by various surficial processes
- Hydrologic cycle
- Causes of folding and faulting in the earth's crust
- Causes of earthquakes, volcanoes, landslides, and other natural disasters
- Dimensions, shape and behavior of the earth as a planet
- Effects of pollution on natural ecosystems

Most middle school earth science units contain a laboratory component. Without prior experience in "doing" science through laboratory work, students will likely have difficulty using their map observations to solve the investigative problems which are included in the SE MAPS activities. Students should be able to read topographic and highway maps, identify precise locations using latitude and longitude coordinates, and construct topographic profiles. They should master these three skills before beginning work on any of the SE MAPS units.

In addition to the specific skills listed above, students should have also developed some experience in the basic science process skills, such as observing, classifying, measuring, inferring, predicting, designing, and communicating. Familiarity with the Scientific Method of inquiry is important, including practice in formulating and testing hypotheses. Students will be presented with significant quantities of data from a variety of activities in SE MAPS. Prior laboratory experience will help them determine which data are relevant to the problem at hand and which are not.

Prior Social Studies Content Knowledge Requirements

To be able to effectively use the SE MAPS curriculum, social studies students need to have some basic knowledge of the geography of the United States and a command of basic map skills. They need to know the major river systems and mountain ranges of the Southeast, the major geographic landform regions and their characteristics, the location and significance of the Fall Line Zone, and the major cities of the region. If this information has not been previously introduced, it is suggested that the students be assigned the geography chapter in their United States history text, or other equivalent reading, prior to using SE MAPS. Once those basic concepts are mastered, the performance tasks and other activities provide sufficient historical information for students to complete them without requiring additional resources.

Social Studies Skills Used in SE MAPS

Map Skills

- Orient a map and identify direction
- Interpret meanings of infrared coloration on aerial photographs
- Use scale and estimate distance
- Compare maps and make inferences from them
- Identify specific locations and physical features
- Use latitude and longitude
- Interpret information from a contour map
- Interpret map symbols

Library Skills

- Use reference indexes to locate information
- Use the card catalog and/or a web-based catalog service

Social Studies Reasoning Skills

SE MAPS can be effectively utilized to increase students' ability to classify, interpret, summarize, synthesize, and evaluate information obtained from the aerial photographs, contour maps, and historical information that is provided in the Teaching Manual. Historical vignettes can be effectively utilized to motivate and stimulate interest in the SE MAPS study areas.

Teaching the Venn diagram for Comparing and Contrasting

There are four basic steps in using Venn diagrams to compare and contrast:

1. Determine what items you want to compare.
2. Select the characteristics of items on which you want to base your comparison.
3. Explain how items are similar and different based on the characteristics chosen.
4. Summarize how the items are different and how they are alike.

Prior Mathematical Content Knowledge Requirements

A basic knowledge of arithmetic operations is essential to the working of most of the mathematics activities in SE MAPS. Number sense, set theory, quantitative literacy, elementary geometry, and some problem solving experience are sufficient background for almost all performance tasks. Students are expected to use fractional and decimal numbers and to understand the concept of percentage. A few questions require simple algebraic manipulations. Questions requiring trigonometry and higher level algebra are designated as enrichment problems. Students must also have the ability to work with fractional and verbal scales, and be able to convert units of measure, for example from square feet or square miles to acres. A working knowledge of the principles of organizing data and representing it graphically should be attained before attempting most SE MAPS performance tasks.

Mathematics plays a pervasive role in the home, the workplace, and the world of everyday living. Problems in SE MAPS are real problems with real world applications: problems which help students understand the relevance of mathematical thinking to their own lives. Mathematical literacy enables a student to use exploration, conjecture, and logical reasoning to solve a variety of problems. From an interdisciplinary perspective, it also gives students practical experience in evaluating the cost effectiveness of projects and business activities related to other fields.

Basic

- Estimating values using a variety of techniques
- Practicing arithmetic skills
- Substituting numbers into formulae
- Using metric and English measurements and conversions
- Enhancing calculator skills
- Communicating mathematical information to others

Statistical

- Enhancing graphing skills (line graphs, circle graphs, bar graphs, etc.)
- Organizing data tables
- Determining measures of variability
- Estimating probabilities relative to sample size

Geometry

- Labeling coordinates using radial and Cartesian coordinate systems
- Estimating measurements of area, perimeter, volume, etc.
- Calculating dimensions of shapes using formulae
- Comparison of lines and other geometric shapes

Algebra

- Determining slope of lines or line segments
- Applying time, distance, and speed formulas

Prior Language Arts Content Knowledge Requirements

The performance tasks and other questions used in SE MAPS are written at a middle school level. Students should have a sufficient language arts background in vocabulary, spelling, sentence construction, and reading comprehension to function at that level. Students should have some experience in storytelling and developing their listening skills. They should have enough library experience to know how to recognize different genres of writing and speaking, and to be able to examine setting, plot, theme, and character in folktales, historical fiction, and fiction. Students should also be able to compare and contrast information and opinions from different sources.

Storytelling is one of the easiest and most natural ways to recount events and to access our common history. We do it all the time--every day. It's a shame that we don't use it more in the classroom. Embedded in storytelling are many features that, as teachers, we know to be critical to the development of language and the understanding of print. However, there are wider, and perhaps more important consequences of language that storytelling embraces. Story functions as a binding element in our culture. It brings people together for a shared purpose. In any community, a family or a classroom, stories are told and retold and events are related in many different ways. Virginia Hamilton, author of The People Could Fly, (American Black Folktales, New York: Alfred A. Knopf, 1985) says:


that we all live in a present-day America made up of polyethnic, culturally diverse communities. We live in parallel cultures. Certainly this is true of both our local communities and our classroom communities. Many of us teach in classrooms where three or four languages and numerous dialects are spoken. What better way to learn about the members of our classroom community and of our local community than through story?

The stories in SE MAPS are a sampling of what's in your own back yard. Many of our folktales are based on fact but flavored with fiction. These tales are not meant to substitute for history but illuminate documented facts by demonstrating how people personalized events around them. The activities that accompany each story can be used as is, but don't hesitate to experiment, swap activities among stories, and best of all, let your students take the lead. If you've never had students tell stories before--take heart! Use this opportunity as an excellent excuse to try a little risk taking along with your students. We promise, you'll be glad that you did!

Learning a Story

1. Select a story that really appeals to you.
2. Read or listen to it several times.
3. Keep a note card with information about title, source, characters, story sequence, etc.
4. Don't try to memorize the story, just tell it from your heart by thinking of the pictures that the story creates in your mind. It's like learning to sing a song.

Recommended Formats for Interdisciplinary Instruction

When team teaching the materials, it is advisable to construct a flow chart ahead of time so each teacher in the team will know when and what topics other teachers are covering. Several of the pilot teachers for SE MAPS suggested having the science and social studies classes begin work with the maps using the overview activities identified by the symbol , then have the language arts and math classes follow with their designated activities. Once the groundwork has been laid, the math and language arts teachers will have an easier time introducing their topics. Also, other lesson materials should be interspersed with SE MAPS activities because students may tire of looking at maps all day long if all discipline groups work on them at the same time.

Schools not using the team approach will find certain SE MAPS activities appropriate for insertion into the traditional curriculum for content classes in science, math, language arts, and social studies, depending on the grade level and the specific curriculum standards that need to be addressed. Even if only one teacher in a school chooses to use the materials, students will pick up on the interdisciplinary character of the program and will be able to relate it to concepts studied in other classes. Most of the SE MAPS activities can be used as stand-alone exercises. As many or as few of these can be used as best fits the teacher's lesson plan. One or several of the twenty-one study areas and/or regional activities can be used either in whole or in part. Most performance tasks are designed to be completed in a traditional fifty minute class period, but these exercises can be easily modified to fit a block schedule as well.

Teaching Students with Diverse Backgrounds

The SE MAPS materials are particularly valuable to students who learn better visually than verbally. The ability to actually draw on the cartographic products with wipe-off pens lets even students with poor verbal and reading skills take a full part in the investigation. It is helpful to start out at a concrete, less abstract level until you are sure that all students in the class have grasped the fundamental concepts of the activity. Economically disadvantaged students, who may not have had the opportunity to travel widely, can gain important perspectives on the world outside their local neighborhood through close study of the aerial photographs, satellite images, and other remotely sensed data contained in SE MAPS.

Cultural diversity is a feature of American society which should be celebrated. SE MAPS includes a significant amount of material documenting Native American and African American contributions to the historical development of the Southeast, as well as highlighting cultural contributions of a variety of other immigrant groups, such as Scotch-Irish, Hispanic, and Cajun, which have had a significant impact in the development of local customs and traditions. Students investigate a variety of cultural dimensions to discover the patchwork of different traditions that make up their own ancestral heritage.

Constructivism and SE MAPS

The study of landscapes is primarily an attempt to answer questions about why different landform features are located where they are and how they interact with both natural and cultural settings. Most of these answers can be studied within the realm of science, but only if science is recognized as a process, not just a body of facts. The domains of science include the knowledge of science, the nature of science, and the process skills used to perform science. Concepts should be learned through active involvement with the subject matter. Hands-on, investigative learning is the best way for students to gain both confidence and competence in the pursuit of scientific inquiry. Success at problem solving also strengthens students' understanding and retention of concepts in other fields of study as well. Knowledge gained through direct student intellectual and conceptual involvement in the learning process will last longer and will lend itself to building a more useful mental construct about how the world really works.

All inquiry-based learning relies on the operation of constructivist principles, the fact that students, in the process of investigating natural phenomena, will create mental frameworks to explain what they observe. The ability to see things from a different perspective is an especially valuable component not only to scientific reasoning, but also to logical discourse in general and is useful in breaking down misconceptions that may have arisen from incomplete or misleading data. Remotely sensed images invite investigation into concepts of scale, patterns of change and other common themes that students need to internalize in order to make sense of the world around them. Such unifying concepts often provide a common framework relating form and function.

Research has shown that experiential learning provides the best pathway to conceptual understanding. Students who have flown frequently in commercial airplanes tend to have a much greater appreciation and understanding of spatial relationships on the ground because they have experienced this perspective first hand. The use of remotely sensed images provides a way for all students in a classroom to gain this same viewpoint to help them place and recognize landforms within a larger context.

Many national science curriculum initiatives include suggestions about how science should be taught. These include "making connections to other disciplines," "talking, writing, and communicating," and "making effective use of technology." The SE MAPS curriculum stresses all three of those recommendations. The interdisciplinary nature of the activities and performance tasks presents real world problems with real world solutions, rather than contrived questions, and invites collaboration among many subject areas. Both oral and written communication extends across the entire curriculum, not just in language arts performance tasks, but with most activities. Sharing results with other groups or other classes is standard procedure in most SE MAPS performance tasks. The cartographic products offer classes a chance to use state-of-the-art materials produced by sophisticated technology. Many activities and performance tasks relate directly to the technological aspects of these products, as well as to their analysis and interpretation.

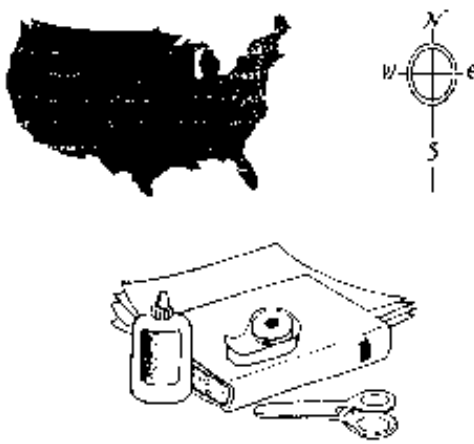
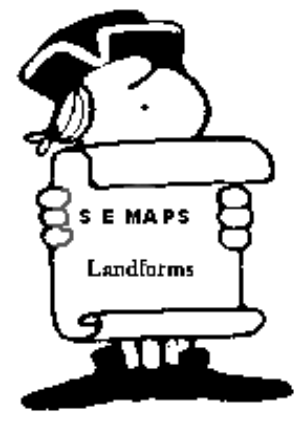
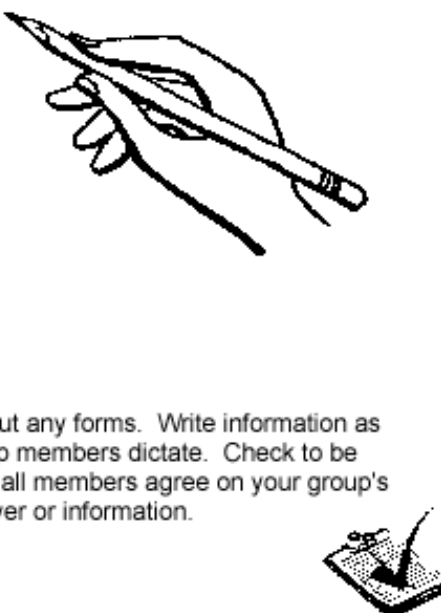

Cooperative Learning Techniques with SE MAPS

Many of the performance tasks contained in the SE MAPS curriculum are designed for students working in cooperative learning groups. Teachers may structure positive interdependence by establishing mutual goals, joint rewards, shared resources, and assigned roles. When working well, students promote each other's learning by helping, sharing, and encouraging efforts to learn. Students explain, discuss, and teach what they know to their classmates. However, individual accountability is still important. Teachers may invoke this structure by giving individual tests to students or randomly selecting one group member to give the answer to a question. Social skills such as leadership, decision-making, trust-building, communication, and conflict management are an integral part of the success of the cooperative learning model. Teachers should monitor groups and give feedback to individual groups as well as to the class as a whole. There are many possible ways of assigning task roles to students. One of these is presented in Figure 1-1.

1. What you need to implement cooperative learning techniques.
 - Classroom seating should be arranged so students can work in Groups of 3-5
 - Students should be sitting around a table or desk
 - Every student must be able to face the front of the classroom when necessary
 - Students must have sufficient physical space between adjacent groups
 - Materials and activities must be suitable for cooperative learning techniques
 - Students' roles in their group must be clearly outlined
 - Teachers should become a **Guide on the Side**, instead of a **Sage on the Stage!**
2. Working in Cooperative Learning Groups: Students read materials together and answer the questions. In the typical model, one person is the **READER**, another the **RECORDER**, another the **REPORTER**, and the fourth student is the **RUNNER**. If there are five students in the group, that person may assume the role of **CHECKER**.
 - **READER** reads the group's material out loud to the group, carefully with expression, so that the group members can understand and remember it.
 - **RECORDER** writes answers in a legible form and records results of discussion.
 - **REPORTER** presents group's conclusion to the class after completion of activity.
 - **RUNNER** gets the materials or equipment needed by the group, keeps track of them and puts them carefully away at the end of the activity.
 - **CHECKER** (if needed) checks comprehension or learning of group members by asking them to explain or summarize concepts learned or discussed.
3. Jigsaw Approach: Each person reads and studies part of a selection, then teaches what he or she has learned to the other members of the group. Each then quizzes the group members until satisfied that everyone knows his or her part thoroughly.
4. Resource: (Johnson, David W., Johnson, Roger T., & Holubec, Edythe Johnson. (1991). Cooperation in the Classroom. Edina MN: Interaction Book Company.)

Figure 1-1: Suggested Cooperative Group Assignments

SE MAPS - Cooperative Group Job Cards

<p>Maps & Materials Manager</p>  <p>Gathers all maps needed and also other supplies.</p>	<p>Reader</p>  <p>Read information from resources aloud to the group. Check to be sure everyone is listening.</p>
<p>Recorder & Checker</p>  <p>Fill out any forms. Write information as group members dictate. Check to be sure all members agree on your group's answer or information.</p>	<p>Map Marker</p>  <p>Use a wipe-off pen to mark locations, trace areas, identify features, etc. as instructed in the activities. Clean off the map when activity is completed.</p>

SE MAPS and Learning Cycles

Most published learning cycle models consist of an exploration phase, a concept development phase, and a concept application phase. Some learning cycles document more than three stages, but all reflect the basic premise that students first must become engaged with the topic at hand by experimenting with or otherwise investigating real world phenomena. Once students have recorded their observations or collected experimental data, they are ready to analyze their results and begin to develop an understanding of the concepts that describe the behavior of the natural world. Teacher-led discussion should link vocabulary and additional content coverage to previously established concepts as well as expanding student comprehension in new directions. Finally, student assignments should encourage reflection and consideration of ways to implement or apply these newly learned concepts to different situations or circumstances.

All SE MAPS activities begin with open-ended “power thinking” exercises that encourage students to explore and become familiar with specific cartographic products. The goal is to gain the students’ attention, motivate them to make observations or collect data, and provide the tools necessary for them to conduct an investigation of their own design based on the application of science process skills or other critical thinking strategies. The remaining performance task questions build on the knowledge gained from the power thinking exercise and reinforce concepts related to the designated content theme for that study area. Many of these tasks also require the application of concepts and skills covered in previous student activities. Enrichment Activities provide an additional avenue to apply these newly learned concepts within a broader perspective.

Authentic Assessment Strategies

Authentic Assessment, also known as performance-based assessment, encompasses one of the most profound paradigm shifts ever to affect the teaching profession. Of course the primary goal of any assessment instrument is to “test what has been taught,” to determine if students have learned the content at a satisfactory level, but performance-based assessment goes one step further by requiring students to demonstrate proficiency in the process of learning, not just the end result. No longer will recall-oriented multiple choice exams at the end of a unit provide sufficient data to evaluate students’ mastery of course objectives and curriculum standards. Students now must not only document that they know the answer, but also that they are capable of analyzing the problem and carrying out the observation and application skills that lead to that answer.

The SE MAPS performance tasks in themselves can be treated as a type of formative assessment instrument. Students can self-assess their own level of understanding based on how well they are able to answer the questions contained in each Activity. Test questions modeled after these performance tasks should be able to adequately evaluate students’ mastery of skills and concepts that have been covered in the unit lessons. Questions that require the student to perform a task using a map or other product are best.

Science

The best assessment strategies for science involve students actually performing tasks using the cartographic products. For example, in the Blue Ridge Front Study Area, one performance task asks students to locate and mark a county boundary line on an aerial photograph. That boundary line is not shown on the photograph. To answer this question, the student must refer to a topographic map and realize that the county boundary in this part of the Blue Ridge Front was placed along a major drainage divide. They must then analyze the photograph, using their knowledge of how to interpret infrared aerial photography, to determine the location of the ridgeline which acts as the drainage divide. The student can then trace this line on the photograph thereby demonstrating the ability to interpret map and photographic information to solve a problem. Test questions should use map and lithograph data whenever possible.

Open ended questions are another excellent method for assessing student comprehension. Although taking longer to grade, such questions allow students to demonstrate their ability to think through a problem, hypothesize, and design a strategy to solve the problem. By asking students to document their progress throughout their answer, it is possible to ascertain what misconceptions, if any, the student has developed about the topic and to evaluate the logical structure of their reasoning.

Mathematics

There are a variety of ways to assess the mathematics skills taught through the SE MAPS curriculum. Some general examples include: extended projects, with periodic checkpoints; direct problem solving, where students would show their work and explain each step they took; student designed mathematical problems developed from the cartographic products, in which students model their own questions after performance tasks in SE MAPS; teacher prepared pretest/posttest questions which directly tie mathematical skills to the maps and images; portfolio assessment, in which students would prepare samples of mathematical work done with the cartographic products, and examinations with clearly defined scoring rubrics, in which several steps of student mathematical reasoning are compared with predetermined criteria.

Some examples of criteria for use with scoring rubrics for a question involving the concept of perimeter of a field might include:

- Shows understanding of concept of perimeter
- Use of appropriate strategies to solve the problem
- Correctness of computations
- Clarity of written explanations
- All requirements of problem are satisfied or addressed

This list of criteria may be graded on the basis of superior, satisfactory, marginal, or unsatisfactory answers.

Social Studies

Specific assessment techniques are best left to the teacher and the school system. It should also be noted that many of the books listed in the References and Resources section are excellent sources for historical vignettes. SE MAPS assessment could involve any number of assessment techniques including:

- Teacher prepared pretest to determine what students know about Southeastern history and geography before the use of SE MAPS materials followed later by a teacher made posttest
- Checklist where teacher assesses student accomplishment of unit objectives
- Portfolio assessment in which a variety of student work is included
- Use of projects developed and presented by students which reflect objectives of SE MAPS activities *e.g.*, maps showing transportation systems
- Written reports on themes of topics introduced in SE MAPS activities

Language Arts

Assessment strategies for measuring student growth and change are as varied as the storytelling and other activities themselves. The following vignette incorporates an assessment strategy into an SE MAPS activity and can be used as an example to assist teachers in generating their own strategies.

After investigating, reading about, and telling local stories, a class of middle school students wants to investigate the particular stories that relate to a cave that is located outside of their town. Then, they want to retell their favorite tales about the cave and compose original ones. In small groups, the students design a long list of requirements for evaluating their oral and written story products. They rank order the requirements, listing the most important first. After researching old newspaper articles, interviewing folks living near the cave, and obtaining a local park ranger or interpreter as a guest speaker, the students decide to create group stories of different types.

For example, one group wants to create a story to explain the origin of a cave; another a story that describes bats incubating their babies in a cave; a third wants to explain groundwater flow by telling about the trip of a golf ball through a cave; and so forth. The class decides to revise their evaluation list, shortening it and making it specific for each story type. Two weeks later, the students are ready to tell their stories. After the first couple of tales, the class decides to eliminate any ratings on their evaluation requirements having to do with actual storytelling performance and to instead give points for amount and accuracy of research and for the creative ways that each group has incorporated the factual information. Each group scores and discusses the other groups' work. Then, each student writes a personal reflection discussing their individual progress within their group and identifies things that they might like to try differently next time as well as ideas for future explorations.

This scenario allows the teacher to assess what students initially know about story composition and to assess what they are learning as the groups progress. It also incorporates an assessment of the final product and the process, and provides for group

and individual evaluations. Most importantly, it involves students in an authentic, purposeful, and useful self-assessment throughout the investigation.

Culminating Assessment Activity

At the end of the SE MAPS portion of the yearly course of study, pilot teachers have found it useful to achieve closure on the topic of Southeastern map studies by arranging a culminating group activity involving all of the cartographic products. Each group is assigned two study areas to investigate. The sites are selected to be as different as possible although all sites have certain basic categories of features which can be compared. Instructions to groups include describing the following three items for each area and preparing a report to the class highlighting similarities and differences between their two sites.

- A. The natural landforms and diversity of the landscape
- B. Human interference with the landscape including alterations and use of land
- C. Ways that culture was affected by the landscape in this region

The following study area pairs are suggested as examples:

- Cumberland Plateau vs. Carolina Bays
- Blue Ridge Front vs. Mississippi River Alluvial Plain
- Birmingham vs. Columbia
- Outer Banks vs. New Orleans to the Gulf of Mexico
- Pine Mountain Belt vs. Cumberland Gap
- Mississippi Gulf Coast vs. Grand Strand
- Cumberland Plateau vs. South Florida

GLOSSARY

A

Abney Level - An instrument used in surveying which consists of a fixed sighting tube, a movable spirit level connected to a pointing arm, and a protractor scale. An internal mirror allows users to see the bubble in the level while sighting a target.

Abolitionist - In Western Europe and the Americas, a participant in an historic movement that sought to end the Atlantic slave trade and set slaves free.

Aboriginal - Inhabiting or existing in a land from the earliest times or in particular before the arrival of colonists; indigenous to the area.

Acadian - Descendant of French settlers, and sometimes Indigenous peoples, of parts of Maritime Canada, especially Nova Scotia, who were exiled from English Canada in the mid 1700s. Many found their way to the Louisiana Territory.

Acid mine drainage - The outflow of acidic water from surface or underground mines that exposes toxic minerals to chemical weathering; especially in coal mines.

Aggregate - As used in the mining and construction industries, the mineral materials, such as sand, gravel, or crushed stone, typically used in making concrete.

Alloy - A metal made by combining two or more metallic elements, especially to give greater strength or resistance to corrosion.

Alluvial plain - Flat region adjacent to a river channel, underlain by floodplain deposits.

Alluvium - Clay, silt, sand, gravel, or similar detrital material deposited by running water.

American patriots - Faction favoring independence from England for the American colonies during the Revolutionary War.

Aneroid barometer - A device for measuring atmospheric pressure without the use of fluids. It consists of a partially evacuated metal chamber, the thin corrugated lid of which is displaced by variations in the external air pressure.

Animal husbandry - The science of breeding and caring for farm animals.

Antecedent river - A river or stream that maintains its original course and pattern despite the changes in underlying rock topography over time.

Anthracite coal - A very high-rank coal that has been subjected to the highest grade of metamorphism. It is shiny black, hard and brittle and has a very high carbon content

Anticline - A ridge-shaped fold composed of stratified rock in which the strata slope downward away from the ridge crest.

Aquifer - A body of permeable rock or soil which can contain or transmit groundwater.

Arcuate - Shaped like a bow; a narrow curved feature.

Arpent - An old French unit of land area equivalent to 3,420 square meters (~ 1 acre); the standard measure of land in areas settled by the French, especially in Louisiana.

Artesian - Relating to a well that is bored perpendicularly into water-bearing strata, so that natural pressure produces a supply of water with little or no pumping.

Artisan - A worker in a skilled trade, especially one that involves making things by hand.

B

Bald - A mountain top devoid of trees or large shrubs: often grassy or showing bare rock.

Ballast - Heavy material, such as gravel, sand, or iron, placed low in a vessel to improve its stability; or gravel or coarse stone used to form the bed of a railroad track.

Barrier island - Coastal landform composed mostly of sand that forms by wave and tidal action parallel to the mainland coast; usually occur in narrow linear chains.

Base map - A map of an area showing both physical and human-made features that can be overlain with more details using Geographic Information Systems software.

Batholith - A large mass of igneous rock formed deep within the earth's crust when liquid magma rises and cools, but does not erupt onto the earth's surface.

Bathymetry - The measurement of water depth in oceans, seas, or lakes.

Bayonet - A sharp blade that may be fixed to the muzzle of a rifle and used to stab an opponent in hand-to-hand fighting.

Bayou - A body of water typically found in a low flat area, that can be either an extremely slow-moving stream or river, or a marshy lake or wetland.

Beach renourishment – Replacing eroded beach sediment, usually sand, lost through longshore drift or storms, with sand from other sources, usually offshore.

Bedrock - The solid rock substructure either exposed or buried at the earth's surface; if exposed it is often referred to as an outcrop.

Bellows - A device constructed to furnish a strong blast of air, typically used to help heat a blast furnace to higher temperatures.

Beltline - A highway network encircling a city intended to divert traffic away from the city center and permit through traffic to bypass the city and avoid travel delays.

Benchmark - A stable object placed in the ground by the U.S. Geological Survey that marks a point of known elevation with respect to a datum (usually sea-level).

Benthic - Relating to or occurring at the bottom of a lake or the ocean.

Bight - A large-scale inward bend or curve in a coastline, creating a typically broad, open, shallow and somewhat protected expanse of water.

Biodiversity - A term referring to the variety of life that exists in a particular habitat, or sometimes the entire Earth (includes plants, animals, fungi and micro-organisms).

Bituminous coal - A relatively soft coal containing a tarlike substance called bitumen or asphalt; burns less cleanly than anthracite coal and forms under lower pressure.

Blast furnace - A type of metallurgical furnace used for smelting to produce industrial metals, generally pig iron, but also others such as lead or copper. Blast refers to the combustion air being "forced" into the furnace at above atmospheric pressure.

Blues - A music genre and musical form which originated in the Deep South of the United States around the 1860s by African-Americans from roots in African musical traditions, African-American work songs, and spirituals.

Bluff - A steep cliff, bank, or promontory of land, usually located adjacent to a river or other body of water.

Bog - A wetland that typically accumulates peat, a deposit of dead plant material - often mosses, and in a majority of cases, specifically sphagnum moss.

Bottomland - Agriculturally fertile, low-lying flat land, typically adjacent to a river and subject to inundation during flooding events.

Breached anticline - An anticline that has been deeply eroded in its center (along its axis), usually incised by stream erosion, forming a long, linear valley along the axis.

Breech-loading rifle - A firearm in which the user loads the ammunition (cartridge or shell) via the rear (*breech*) end of its barrel, as opposed to a muzzleloader, which loads ammunition via the front (muzzle) end.

British Loyalists - Faction favoring continued English rule of the American colonies during the Revolutionary War.

Broker - A person or firm who arranges transactions between a buyer and a seller for a commission when the deal is executed.

C

Cajun - An ethnic group mainly living in Louisiana and Texas, consisting in part of the descendants of the original French-speaking Acadian exiles from Canada.

Cantilever - A rigid structural element, like a road, attached to and extending horizontally from a flat vertical surface such as a wall and supported at only one end.

Canyon - A gorge or a deep cleft between escarpments or cliffs resulting from weathering and the erosive activity of a river over geologic time scales.

Cap rock - A harder or more resistant rock layer overlying a weaker or less resistant rock layer that prevents the upward passage of oil, water, or other fluids.

Cape - A headland or a promontory extending into a body of water, usually the sea; usually representing a marked change in trend of the coastline.

Carbon-14 dating - A method for determining the age of an object containing organic material by using the properties of radiocarbon, a radioactive isotope of carbon.

Carbonate - Any mineral or rock whose chemical composition is dominated by the carbonate ion, CO_3^{2-} ; most commonly CaCO_3 , the chief constituent of limestone.

Carolina bay - Elliptical shallow depressions within the Atlantic Coastal Plain that often exhibit ponding of water or wetland habitat; named for the bay trees found there.

Catalyst - A substance that increases the rate of a chemical reaction without itself undergoing any permanent chemical change.

Census - The procedure of systematically counting, and acquiring and recording information about, the members of a given population.

Chemical weathering - The non-mechanical disintegration of rocks or minerals, caused by chemical reactions (primarily involving water and substances dissolved in it).

Chenier - A sandy or shelly beach ridge that is part of a strand plain, often separated by intervening mud-flat deposits covered with marsh and swamp vegetation.

Clastic - Composed of variable-sized fragments of pre-existing minerals and rock.

Clearcut - A forestry/logging practice where most or all of the trees in an area are cut.

Climate - Generalized conditions of temperature, humidity, rainfall, etc. in a large, homogeneous region of the Earth's surface over long periods of time.

Climax forest - A relatively stable plant community dominated by trees representing the culminating stage of natural succession for that specific locality and environment.

Coke - A grey, hard fuel with a high carbon content and few impurities, made by heating coal in the absence of air, used primarily in iron-ore smelting furnaces.

Colluvium - Loose, unconsolidated sediments deposited at the base of hillslopes by either rainwash, slow downslope creep, or a combination of these processes.

Concordant - Corresponding in direction with the planes of adjacent or underlying layers.

Conestoga - A heavy covered wagon used during the late eighteenth century, and the early nineteenth century; large enough to transport loads up to 3 tons (2.7 metric tons), and usually drawn by horses, mules, or oxen.

Continental crust - The layers of igneous, sedimentary, and metamorphic rocks that form the geological continents and the areas of shallow seabed close to their shores.

Continental drift - The hypothesis that the Earth's continents have moved over geologic time relative to each other, thus appearing to have "drifted" across the ocean bed.

Continental shelf - The portion of the edge of a continent that is submerged under an area of relatively shallow ocean water known as a shelf sea.

Continental slope - The slope connecting the outer edge of the shallow continental shelf to the deep ocean floor.

Coquina - A carbonate sedimentary rock, composed either wholly or almost entirely of the transported, abraded, and mechanically sorted fragments of seashells.

Coral reef - An underwater ecosystem characterized by reef-building corals; formed of the hard parts of colonies of coral polyps held together by calcium carbonate.

Corduroy road - A timber trackway made by placing logs, perpendicular to the direction of the road over a low or swampy area; an improvement over impassable mud or dirt roads, yet rough in the best of conditions and a tripping hazard to horses.

Corsair - A pirate or privateer. Also can refer to a ship used by pirates.

Cove - A small valley between two ridge lines that is closed at one or both ends. Commonly refers to protected valleys in the Appalachian Mountains.

Creole - A person of mixed European and black descent, especially in reference to French cultures in Louisiana and the Caribbean Islands. Can also refer to their language.

Crevasse splay - A sedimentary fluvial deposit which forms when a stream breaks through its natural or artificial levees and deposits sediment on a floodplain.

Cuspate – Triangular in shape; usually referring to an accretionary geographical feature made of sand, found on coastlines and lakeshores created by longshore drift.

Cypress knee - A distinctive woody projection extending vertically above the roots of a cypress tree in a swamp and reaching above the normal water level.

D

Debris flow - A moving mass of loose mud, soil, rock, water and air that travels down a slope under the influence of gravity; particles mostly sand-size or larger.

Debris slide - A mass of unconsolidated and incoherent soil and rock fragments that has slid or rolled rapidly down a steep slope when comparatively dry.

Delta - A constructive landform created by deposition of sediment carried by a river as the flow leaves its mouth and enters slower-moving or stagnant water.

Dendritic – A common stream drainage pattern having a branched form like a tree.

Depositional basin - Region where long-term subsidence permits a large accumulation of sediments; which are then subject to increasing pressure resulting in compaction and lithification that transforms the sediments into sedimentary rock.

Detritus - Accumulation of dead particulate organic material, typically including the bodies or fragments of bodies of dead organisms, plant debris, and fecal material.

Differential erosion - Irregular or varying rates of erosion caused by differences in the resistance and hardness of surface materials; softer and weaker rocks are rapidly worn away, whereas harder and more resistant rocks remain to form hills.

Differential weathering - Weathering occurring at different rates, as a result of variations in composition and resistance of a rock, usually resulting in an uneven surface.

Digital elevation model - A computer-generated map or image that plots elevation data from the land surface onto a three-dimensional digital representation.

Dike - An intrusion of igneous rock that cuts across existing strata or rock layers.

Dimension stone - Natural rock material quarried to obtain blocks or slabs that meet size specifications for construction purposes, especially for walls of large buildings.

Dip - The angle a rock layer or stratum makes with the horizontal.

Disappearing stream - A stream or river that loses water as it flows downstream because of it infiltrating into the ground recharging the local groundwater system.

Discharge - The volume of water moving down a stream or river per unit of time, commonly expressed in units of cubic feet per second or gallons per day.

Discordant - Any rock layer or unit that cuts across the pre-existing rock bed or unit.

Distributary channel - A stream channel that branches off and flows away from a main stream channel, particularly common in a delta environment.

Downfaulted basin - A linear valley bounded on one or both sides by active faults that have uplifted the adjacent land.

Drainage basin - Any area of land, or watershed, where precipitation collects and drains off into a common outlet, such as into a river, bay, or other body of water.

Drainage divide - Any dividing line, typically a ridgeline, that separates one drainage basin or watershed area from adjacent drainage basins or watersheds.

Dredge - To clean out the bottom of a harbor, river, or other area of water by scooping out mud, weeds, and rubbish with a machine that can dump the debris elsewhere.

Dripstone - Rock, usually limestone, deposited by precipitation from dripping water, such as that which forms stalactites and stalagmites in caves.

E

Eastern Continental Divide - The drainage divide separating watersheds flowing into the Atlantic Ocean from watersheds flowing into the Gulf of Mexico.

Ebb tidal delta - An accumulation of sand on the seaward side of an inlet formed by ebb tidal currents.

Electric-arc furnace - A furnace that heats material by means of an electric arc, used in foundries for producing cast iron and also in industrial steel mills.

Electromagnetic spectrum - The range of frequencies of electromagnetic radiation (x-rays, ultraviolet, visible light, infrared, radio, etc.), their energy and wavelengths.

Entrenched - A river or stream flowing in a narrow valley cut into a plain or relatively level upland that is powerful enough to downcut through a rising land surface.

Escarpment - A steep slope or long cliff forming as a result of faulting or erosion and separating two relatively level areas of different elevations. Also called a scarp.

Estuary - A partially enclosed coastal body of brackish water with one or more rivers or streams flowing into it, and with a free connection to the open sea.

Evaporite mineral - Any water-soluble mineral (like gypsum or rock salt) that precipitates after being concentrated and crystallized by evaporation from solution.

Exfoliation - The process of forming cracks, running parallel to the land surface, in a rock mass, at or near the earth's surface, that is subjected to progressively lower pressure of overlying rocks as it is unearthed, which leads to internal tension.

Exhalative - Sedimentary ore deposits formed by release of ore-bearing hydrothermal fluids into a water reservoir, resulting in the precipitation of the ore.

Exotic terrane - A landmass that has become connected to another landmass that usually has had a separate and entirely different rock composition and/or geologic history.

F

Fall Line Zone - The boundary area where an upland region and a coastal plain meet; especially noticeable where rivers cross, resulting in rapids and/or waterfalls.

False-color image - Representation of an image created using color ranges other than visible red, green and blue; most commonly infrared, but others are possible.

Farm-to-market road - A state road or county road that connects rural or agricultural areas to market towns. These are better quality roads, usually a highway, that farmers and ranchers use to transport products to market towns or distribution centers.

Fathom - A unit of length equal to six feet (approximately 1.8 m), chiefly used in reference to the depth of water.

Fault - A fracture or zone between blocks of rock along which movement has occurred.

Flood tidal delta - An accumulation of sand on the shoreward side of an inlet, initially formed during storm surges and maintained by flood currents.

Floodplain - An area of land adjacent to a stream or river which stretches from the banks of its channel to the base of the enclosing valley walls, and which experiences flooding during periods of high water discharge.

Fluvial - Related to rivers and streams and the deposits and landforms created by them.

Flux - A metallurgical term referring to a chemical cleansing agent, or purifying agent that is added to the ore in a furnace during the smelting process.

Fold axis - The line marking the location of the greatest curvature of a fold where the dip angle changes direction from one side to the other.

Formation - A rock unit having a consistent mineral composition or a set of physical properties that distinguishes it from adjacent bodies of rock, and which occupies a particular position in the layers of rock exposed in a geographical region.

Fossil assemblage - A group of fossils found together in in the same rock strata.

Foundation stone - An aggregate material used as base material under roads and railroads to provide a predictable, uniform foundation to prevent differential settling.

French Huguenots - A religious group of French Protestants in the 16th and 17th centuries who were persecuted by the Catholic government in France and forced to leave the country. Many settled in the American colonies.

G

Gap - A low point along a ridgeline where erosion has cut through the mountain either partially or completely; often found where a stream has cut through the ridge.

Geomorphology - The scientific study of the origin and evolution of topographic and bathymetric features created by physical, chemical or biological processes.

Gley - A sticky waterlogged soil lacking in oxygen, typically gray to blue in color.

Global Positioning System - A satellite-based radionavigation system owned by the government and operated by the United States Space Force; also known as GPS.

Gorge - A deep cleft between escarpments or cliffs usually resulting from weathering and the erosive activity of a river over geologic time scales.

Gradient - The slope or grade measured by the ratio of drop in elevation of a stream per unit horizontal distance, expressed as meters per kilometer or feet per mile.

Grand Strand - An arc of mostly uninterrupted beach land on the Atlantic Ocean in South Carolina, extending more than 60 miles from Little River to Winyah Bay.

Gringo - A Spanish term referring to a foreigner who seems to be out-of-place in the region where they are observed; someone unaware of local customs or traditions.

Grist mill - Grist is cereal grain that has been separated from its chaff in preparation for grinding it into flour. The mill is the building where the grinding occurs.

Groin - Any type of linear structure perpendicular to the coastline that is used to restrict longshore sediment transport and prevent the beach sand from eroding away.

Ground resolution - A measure of the dimensions of the smallest object that can be resolved by an airborne sensor, or satellite system, typically the size of a pixel.

Groundwater table - The upper surface of the underground zone of saturation below which the pores and fractures of the ground are saturated with water.

Gulf stream - A warm swift Atlantic ocean current that originates in the Gulf of Mexico, curves around the tip of Florida, and flows northward along the eastern coast.

Gullah - A unique African American culture and/or language, based on African traditions, primarily found along the coastal sea islands in the Southeastern states.

Gully – A large-scale landform, resembling a ditch, usually many feet wide and deep, created by running water, eroding sharply into soil, typically on a hillside.

H

Hammock - A term used in the Southeast for stands of trees, usually hardwood, that form an ecological island in a contrasting ecosystem. They tend to grow on elevated areas surrounded by wetlands that are too wet to support such growth.

Hardbottom - An ocean floor region close to shore where underlying rock is exposed because wave action prevents the accumulation of sediment in that particular area.

Headward erosion - Erosion at the origin of a stream channel causing it to migrate away from the direction of stream flow, and so causes the stream channel to lengthen.

Hydroelectric power - Electricity generated by the flow of water through turbines. Generating facilities usually input water flow from rivers, canals, or reservoirs.

I

Igneous intrusion - A body of igneous rock formed by crystallization of liquid magma that slowly cooled beneath the surface of the Earth.

Impermeable - Property of any material, typically a rock or soil layer, that prevents passage of water or other liquid through it.

Indigenous - Native peoples, or aboriginal peoples, belonging to ethnic groups who are native to a particular place or location.

Industrial park – Any area zoned and planned for the purpose of industrial development, usually heavy industry and factories as opposed to just business offices.

Infrastructure - The set of fundamental facilities and systems necessary for an economy to function, including roads, power grids, and sewer lines, that support the sustainable functionality of households and business firms.

Insectivorous plants - Plants that derive some or most of their nutrients from trapping and consuming animals or protozoans, typically insects and other arthropods.

Interdistributary channel - One of several outlet channels for water entering a delta through a river system; carrying river water and sediment into the ocean.

Interstate highway - A limited access multi-lane highway that is part of a network of freeways that was authorized by the Federal Aid Highway Act of 1956.

Interstream divide - A summit area or tract of high ground, either broad or narrow, that creates a watershed boundary between adjacent drainage basins.

Intrabasinal network - A drainage system in which all streamflow in a particular area is directed to a central low point from which it evaporates or seeps into the ground.

Intracoastal Waterway - A 3,000-mile long inland waterway along the Atlantic and Gulf of Mexico coasts of the United States providing a protected passageway for boats.

Island arc - A long chain of active volcanoes with intense seismic activity usually found along convergent tectonic plate boundaries; generally originate on oceanic crust.

Isostatic rebound - The slow rise over time of land masses of lower density after the removal of overlying layers of rock, soil, or ice.

J

Jackson's Military Road - A 19th-century route connecting Nashville, Tennessee with New Orleans, Louisiana; authorized by Congress in 1816.

Jetty - A structure of wood or stone that projects from land out into the water to protect a harbor from wave activity or tidal currents.

Jim Crow laws - A set of state and local laws that enforced racial segregation in the Southern United States, especially during the early to middle twentieth century.

K

Karst Topography - A landscape formed by the dissolution of soluble rocks, primarily limestone and dolomite; featuring underground drainage, sinkholes, and caves.

Kiln - A furnace or oven used for burning, baking, or drying, used especially for producing lime or firing pottery.

Knot - A unit of speed equal to one nautical mile per hour.

Ku Klux Klan - A white supremacist hate group primarily targeting African Americans.

L

Lagoon - A large body of water separated from larger bodies of water by a natural barrier; typically a sandbar or barrier island, barrier reef, or coral reef.

Landsat - Refers to the NASA/USGS remote sensing program that used orbiting satellites to acquire imagery of the earth's surface at several different wavelengths.

Landslide - Any movement of rock, earth, or debris down a sloped section of land; usually caused by rain, earthquakes, or other factors that make the slope unstable.

Leaching - The naturally occurring process of detaching soluble minerals from their substrate by means of a solvent, usually water; commonly in the A soil horizon.

League - A European unit of measurement ranging from 2.4 to 4.6 statute miles (3.9 to 7.4 km). In the US the land league generally represents 3 statute miles (4.83 km).

Leeward - Refers to the drier side of an island protected by the elevation of the land from the prevailing winds and storms and is therefore a significant weather factor.

Levee - An elongated naturally occurring ridge or artificially constructed wall that runs parallel to the course of a river and regulates water levels along it.

Lignite coal - A soft, brown, combustible, sedimentary rock formed from naturally compressed peat; considered the lowest rank of coal due to its low heat content.

Lime - A substance used primarily for making mortar needed for bricklaying work in building construction. It is produced by heating limestone in a kiln. The chemical equation for this reaction is $\text{CaCO}_3 + \text{heat} \rightarrow \text{CaO} + \text{CO}_2$.

Lineament - A linear feature in a landscape that is an expression of an underlying geological structure such as a fault, fracture, or joint.

Loam - A type of soil consisting of approximately equal amounts of sand, silt, and clay. This combination creates the perfect soil texture for plant growth.

Lock - A device used for raising and lowering boats between stretches of water of different levels on a canal or waterway by raising or lowering water levels.

Loess - A clastic, predominantly silt-sized sediment deposit that is formed by the accumulation of wind-blown dust.

Longshore current - An ocean current moving parallel to the shoreline; caused by large swells hitting the shoreline at an angle, and capable of moving beach sand.

Longshore drift - A geological process, caused by oblique angled incoming waves, that transports sediments along a coast in a direction parallel to the shoreline.

Lords Proprietors - Eight Englishmen to whom the English King Charles II granted, in 1663 and 1665, joint ownership of a tract of American land called "Carolina."

Loyalist - A member of the faction favoring continued English rule of the American colonies during the Revolutionary War.

M

Macadam - A type of road construction, pioneered by Scottish engineer John Loudon McAdam around 1820, in which single-sized crushed and compacted stone layers make up the base of the road and are covered by smaller stone particles or asphalt.

Magma - The underground molten or semi-molten natural material which, when cooled, crystallizes into igneous rocks.

Magnetometer - A device that measures the direction, strength, or relative change of a magnetic field at a particular location.

Mantle - The mostly solid bulk of Earth's interior lying between the dense, super-heated core and the thin outer crust; about 2,900 kilometers (1,802 miles) thick.

Maritime forests - An ocean coastal wooded habitat found on higher ground than the dune areas, but still within range of salt spray.

Marl - A calcium carbonate or lime-rich mud or mudstone, usually dominated by the mineral calcite, which also contains variable amounts of clays and silt.

Marsh - A type of treeless wetland ecosystem dominated by herbaceous plants, such as grasses and reeds, where water covers the ground for long periods of time.

Mass movement - (also known as slope movement or mass wasting), is the geomorphic process by which soil, sand, regolith, and rock move downslope typically as a solid, continuous or discontinuous mass, largely under the force of gravity.

Mean sea level - The average surface level of one or more of Earth's oceans; often used as a base level from which heights such as land elevation may be measured.

Meander - One of a series of regular sinuous curves, bends, loops, or windings in the channel of a river, stream, or other watercourse, produced by the current swinging from side to side as it flows across its floodplain or shifts its channel.

Meander cut-off - A straight channel, connecting the two closest parts of a meander loop, forming when water cuts through the narrow land and abandons the meander.

Meander scar - A curved-shaped feature on the landscape that marks the former position of a now abandoned stream meander.

Metallurgy - The part of materials science that studies the physical and chemical behavior of metallic elements, their compounds, and their mixtures, called alloys.

Metamorphism - Any process that substantially changes the texture of pre-existing rocks through the application of high heat, high pressure, or hot mineral-rich fluids.

Microclimate - A local set of atmospheric conditions that differ from those in the surrounding areas, often with a slight difference but sometimes substantially.

Microcontinent - A continental crustal fragment broken off from a main continental mass to form distinct islands, often a great distance from its place of origin.

Midden - An old dump for domestic waste which may consist of animal bone, botanical material, shells, and other artifacts associated with past human occupation.

Militia - An army or some other fighting organization of non-professional soldiers, citizens of a country, or subjects of a state, who may perform military service.

Mill village - A self-contained community, usually owned and operated by the mill, that developed around a cotton mill or a factory producing textiles.

Monadnock - A prominent mountain or hill that stands alone; usually surrounded by landscape areas of a more uniform lower elevation.

Muckland - Fertile farmland characterized by soil (muck soil) that contains a high percentage (between 20 percent and 50 percent) of organic matter.

Multi-modal transit - The transportation of goods or people under a single contract; but performed with at least two different modes of transport as part of the same trip.

Musket - An infantryman's light gun with a long barrel, typically smooth-bored, muzzle-loading, and fired from the shoulder. First appeared in the early 16th century.

Muster - A process or event of accounting for members in a military unit, such as calling troops together for inspection. When a unit is created, it is "mustered in."

Myakka soil - The official state soil of Florida; consists of very deep, dark grayish-brown, poorly drained to very poorly drained permeable soils that formed in sandy marine deposits.

N

Natchez Trace - An historic forest trail, later a main highway, which extends roughly 440 miles from Nashville, Tennessee, to Natchez, Mississippi.

Natural bridge - A distinctive landscape feature, usually occurring in massive, horizontally bedded sandstone or limestone, in which erosion has cut a hole through the bottom of a rock ridge without removing the overlying layers of rock.

Nautical mile - A unit of measurement used in air, marine, and space navigation, equal to approximately 2,025 yards (1,852 m) or 1.1508 statute miles. Historically, it was defined as one minute of latitude along any line of longitude.

Naval stores - Products traditionally used in the ship-building industry derived from pine tree resin, used to manufacture soap, paint, varnish, lubricants, and other items.

New Deal - A series of government programs, public work projects, financial reforms, and regulations enacted by President Roosevelt between 1933 and 1939.

Non-point source pollution - A situation in which contaminants enter the environment from a multitude of diffuse sources over a wide area rather than from easily identified sites.

Nuclear waste - Any materials associated with the mining of uranium ores or the generation of nuclear power that become contaminated with radioactivity. The vast majority (90%) of waste is composed of only lightly contaminated items, such as tools and work clothing.

O

Oceanic crust - The top layer of the oceanic portion of a tectonic plate, composed of an upper basalt layer and a lower layer, composed of gabbro and ultramafic rocks.

Oolite - A shallow marine sedimentary rock formed from ooids, spherical grains composed of concentric layers of calcium carbonate.

Ooze - Deposit of soft mud on the ocean floor; far from land so that the slow steady deposition of dead microorganisms is not obscured by sediments washed in.

Ore - Natural rock or sediment that contains one or more valuable minerals, typically metallic, that can be mined, refined (often by smelting), and sold at a profit.

Outcrop pattern - Geometric relationship of surface exposures of various rock units and structures shown on geologic maps with landscape topography.

Overthrust fault - A break in the Earth's crust, usually intersecting the surface at a low angle, across which older rocks are pushed above younger rocks.

Oxbow lake - A U-shaped lake that forms when a wide meander of a river is cut off, creating a free-standing body of water.

Ozone - An inorganic molecule with the chemical formula O_3 . It is a pale blue gas with a pungent smell. It is fairly unstable, breaking down in the lower atmosphere to O_2 .

Ozone Hole - A region of marked thinning of the protective stratospheric ozone layer in high latitudes, chiefly in winter, attributed to chemical action of pollutants.

P

Paleogeography - The study of geographic changes over geologic time, especially in physical landscapes, continental positions, drainage patterns, and climates.

Pangea - A supercontinent that existed during the late Paleozoic and early Mesozoic eras, 335 million years ago. It began to break apart 175 million years ago.

Parish - Term used in the state of Louisiana to designate county jurisdictions.

Particulate matter - Sum of all solid and liquid particles suspended in air; many of which are hazardous, including both organic and inorganic particles, varying in size, composition, and origin, such as dust, pollen, soot, smoke, and liquid droplets.

Patriot - A member of the faction favoring independence and the overthrow of English rule of the American colonies during the Revolutionary War.

Peat - A brown deposit resembling soil, formed by partial decomposition of vegetable matter in the wet acidic conditions of bogs, sometimes cut and dried for fuel.

Pegmatite - An igneous rock, formed underground, usually containing the minerals quartz and feldspar, featuring a texture of interlocking crystals larger than 2.5 cm in size.

Peninsula - A piece of land almost surrounded by water or projecting out into the ocean. .

Perennial - Permanent; lasting or existing for a long or sometimes infinite time; enduring or continually recurring, often on an annual basis.

Permeable - Attribute of a material that allows liquids or gases to pass through it.

Phoenix - A legendary bird from ancient Greek folklore that cyclically regenerates itself and thereby obtains new life by arising from the ashes of its predecessor.

Physical weathering - A geological activity by which rocks are broken apart into smaller fragments without changing their chemical composition.

Physiography - The study of physical patterns and processes of the Earth in order to understand the forces that produce and change rocks, oceans, and surface features.

Phytoplankton - The microscopic or nearly microscopic plant components of the plankton community that are a key part of ocean and freshwater ecosystems.

Piedmont - A relatively flat land area running along the base of a mountain range.

Pig iron - An intermediate product, also known as crude iron, generated by the iron industry and used in the production of steel; obtained by smelting iron ore.

Pillow lava – Underwater volcanic flow containing characteristic pillow-shaped structures, up to one meter in size, attributed to the rapid cooling of lava.

Pixel - In digital imaging, a picture element or a physical point in a raster image, or the smallest resolvable element in a remotely sensed image display.

Plate tectonics - A scientific theory describing the large-scale motion and interaction over time of seven large plates and other smaller plates composing Earth's lithosphere.

Plateau - A high plain or a tableland, consisting of flat terrain, raised sharply above the surrounding area on at least one side; one or more sides may have steep slopes.

Pluff mud - An oozy, viscous, dark-brown, organic-rich deposit commonly found in salt marshes that hosts a variety of burrowing organisms.

Plunging fold - A fold that has been tilted by tectonic forces and now displays a hinge line that is not horizontal.

Pluton - A large igneous intrusion that forms by crystallization of magma slowly cooling below the surface of the earth.

Pocosin - A wetland with deep, acidic, sandy, nutrient-deficient peat soils typically saturated with groundwater except during seasonal dry spells and droughts.

Point bar - A depositional feature made of alluvial sediment that accumulates on the inside bend of meandering stream and river channels.

Point source pollution - Any single identifiable source from which pollutants are discharged, such as a pipe, ditch, factory smokestack or sewage treatment plant.

Porosity - A measure of the void spaces in a material, calculated as a fraction of the volume of voids over the total volume, or as a percentage between 0% and 100%.

Porquoi Tale - A fictional origin story or etiological tale explaining why something is the way it is, for example why a snake has no legs, or why a tiger has stripes.

Prairie - An ecosystem that is part of the temperate grasslands - savannas biome, based on similar temperate climates, moderate rainfall, and a lack of trees.

Pullboat - A heavy flatboat provided with a winch used to pull logs to the water's edge.

Pulpwood - Timber, especially from loblolly and slash pine trees, principally used for making wood pulp for paper production.

Pumped storage power plant - A power generation system that uses a higher elevation reservoir to provide water to flow through turbines to generate electricity, but also allows those turbines to pump water from a lower reservoir back up for re-use.

Q

Quarry - A type of mine, also called an open-pit mine, because it is open to the Earth's surface; most commonly used to extract stone for building materials.

R

Radar - A detection system, developed for military use, using radio waves to determine the range, angle, or velocity of objects, and terrain patterns of landscapes.

Radial drainage pattern - An arrangement of streams that radiate or diverge outward from a higher central point, like the spokes of a wheel diverging from the hub.

Radiocarbon - An unstable radioactive isotope of carbon, usually Carbon-14, with an atomic nucleus with 6 protons and 8 neutrons and a half-life of $5,730 \pm 40$ years.

Rain shadow - A dry area on the leeward side of a mountain range produced by the higher elevations blocking the passage of rain-producing weather systems.

Rapids - A section of a river where the river bed has a relatively steep gradient, often exposing underlying rocks, causing an increase in water velocity and turbulence.

Ravine - A type of large gully that is narrower than a canyon and smaller in extent than a valley; often the product of streambank erosion.

Recharge capacity - The ability of a groundwater aquifer to receive additional water through the unsaturated zone after infiltration following a storm event.

Reconstruction Period - The turbulent era following the Civil War when efforts were made to bring the Southern states and newly-freed slaves back into the union.

Rectangular drainage pattern - An set of streams following sets of fracture lines in the underlying rock; typically featuring straight-line segments and right-angle bends.

Reef - An underwater ridge of material at or near sea level composed of rocks or reef-building corals that are held together by calcium carbonate deposits.

Refractory material - Any material that is resistant to decomposition by heat, pressure, or chemical attack, and retains strength and form at high temperatures.

Refusal depth - The depth below which well or borehole drilling cannot continue due to hitting a layer with properties or conditions that make further drilling difficult.

Regional metamorphism - Major changes in rock texture caused by the tectonic effects of high heat and/or pressure that affects an extensive area.

Relict - Anything that survives or remains or is left over from a previous set of circumstances.

Relief - The amount of elevation change within a particular area; the difference between the highest point and the lowest point in a given area.

Reservoir - An enlarged natural or artificial lake, pond, or impoundment created by using a dam to block the flow of a river and store water upstream from the dam.

Residual soil - The material resulting from the in-place weathering of parent rock.

Resin - A solid or highly viscous substance of plant or synthetic origin, usually involving a mixture of organic compounds, that is typically convertible into polymers.

Rift zone - A location where a tectonic lithospheric plate splits apart into separate plates; characterized by normal fault valleys, tilted block mountains, and volcanism.

Row crop farming - A planting of crops, such as soybeans and cotton, in rows wide enough to allow it to be tilled or otherwise cultivated by agricultural machinery.

Rural Rehabilitation Program - Part of the Emergency Relief Act of 1933, initiated by President Roosevelt to provide emergency relief programs for farmers.

S

Salt dome - A type of structural dome formed when a thick bed of evaporite minerals at depth intrudes vertically into surrounding rock strata, causing them to bulge up.

Salt marsh - Also known as a tidal marsh, is a coastal ecosystem between land and open saltwater or brackish water that is flooded by the tides once or twice each day.

Saltwater incursion - The upward movement of denser salt water into freshwater aquifers or wells from which excessive amounts of fresh water have been removed.

Saprolite - A chemically weathered rock that is found in the lower zones of soil profiles that have experienced deep weathering of the bedrock surface.

Savanna - Any large area covered with extensive grasslands with few trees.

Scarp - A linear feature, often with a steep slope, that forms as a result of faulting or differential erosion; often used interchangeably with 'escarpment'.

Scrub-shrub wetland - Ecosystem dominated by woody vegetation less than 6 m (20 feet) tall including shrubs, and trees stunted because of environmental conditions.

Sea floor spreading - A process occurring at mid-ocean ridges, where new oceanic crust forms through volcanic activity and then gradually migrates away from the rift.

Sea level - The average level of the surface of one or more of Earth's oceans from which heights such as land elevation may be measured.

Seawall - A structure for coastal defense built along the shoreline to protect areas of human habitation from the action of tides, waves, or tsunamis.

Seismic profiling - A geophysical method of gathering data about underground rock structures at well-drilling sites by setting off explosions and recording reflections.

Seismic survey - A geophysical method that uses reflected sound waves to produce a scan of the structure of rock layers in the Earth's subsurface.

Sharecropping - A legal arrangement for agricultural land in which a landowner allows a tenant to use the land in return for a share of the crops produced on that land.

Shear zone - A tabular to sheetlike planar structure, associated with a fault, composed of rocks that are more highly strained or deformed than rocks adjacent to the zone.

Shell mound - A prehistoric refuse heap consisting chiefly of the shells of edible mollusks intermingled with other evidence of human occupancy.

Shoal - A natural submerged ridge or mound that consists of, or is covered by, sand or other material, rising from the bed of a body of water to near the surface.

Side-scan sonar - A geophysical technique that uses sound waves to detect and identify underwater objects and can create an image or map of large areas of the seafloor.

Siliciclastic - A category of sediments or sedimentary rocks that are dominated by quartz and other silica-rich minerals.

Sill - A tabular sheet of igneous rock that was originally intruded in a molten state between pre-existing layers of sedimentary rock, beds of volcanic lava, or tuff.

Sinkhole - A depression or hole in the ground caused by some form of collapse of the surface layer; also known as a cenote, sinkhole, swallet, swallow hole, or doline.

Sinkhole lake - A depression whose lowest point is at an elevation below the local groundwater table; allowing that bottom part of the sinkhole to fill with water.

Slag - The glass-like by-product left over after a desired metal has been separated from its raw ore, usually consists of a mixture of metal oxides and silicon dioxide.

Slope - A mathematical calculation of the steepness of the landscape, usually expressed as a percentage calculated by dividing the vertical change in elevation between two points by the horizontal distance between those same two points.

Slough - A small wetland, similar to a swamp or shallow lake, often a backwater to a larger body of water, where water tends to be stagnant or may only flow slowly.

Sluice - A water channel controlled by a gate, also known as a mill race, flume, or penstock, built for controlling the flow rate of water into or out of a facility.

Smelting - The process of applying heat to metallic ore to extract a metal, like iron.

Soil horizon - A layer parallel to the soil surface, defined by physical features like color and texture, whose characteristics differ from the layers above and beneath.

Soil profile - The characteristic sequence of natural layers, or horizons, exhibited by a specific soil category in a particular environment.

Solution valley - A mostly linear feature of low elevation resulting from the coalescing of a line of sinkholes or the collapse or dissolution of overlying rock layers.

Sonar - A system for detecting objects under water, and for measuring the water's depth by emitting sound pulses and detecting or measuring their return after reflection.

Sound - A large arm of the sea or ocean inlet, separated from the main part of the ocean by a large island or chain of islands, deeper than a bight and wider than a fjord.

Sourceland - The area of origin for sediments that have been transported to and deposited in a sedimentary basin.

Spatial coordinate - A regional or global reference system used to locate geographical features on a map, usually connected to a specific projection grid.

Speleology - The scientific study of caves and other karst features, as well as their life-forms, history, structure, physical properties, and processes by which they form.

Spillway - A structure used to provide the controlled release of flows from a dam or levee into a downstream area, typically the riverbed of the dammed river itself.

Spit - An elongated depositional bar or beach landform off ocean coasts or lake shores that forms by the action of longshore drift caused by longshore currents

Splay - A sedimentary fluvial deposit which forms when a stream breaks its natural or artificial levees and deposits sediment on a floodplain.

Spodosol - Coarse-textured acid soil characterized by a subsurface accumulation of humus that is chemically bound with abundant Aluminum and Iron compounds.

Spoil bank - Pile of unconsolidated, randomly mixed sediments composed of rock, soil, or shell materials extracted and deposited during dredging and dumping activities.

Spring - An opening in the ground from which water flows, continually or intermittently, because the aquifer has filled to the point that the water overflows onto the land.

Stalactite - A type of cave dripstone formation that hangs down from the cave ceiling.

Stalagmite - A type of cave dripstone formation that projects upward from the cave floor.

Stockade - A military enclosure consisting of palisades and tall walls, made of logs placed side by side vertically, with the tops sharpened to form a defensive barrier.

Storm surge - A coastal flood of rising water, well above normal high tide levels, commonly associated with extreme low-pressure storms, such as hurricanes.

Stream capture - A diversion of stream flow that occurs when an actively eroding lower elevation stream encroaches on the drainage of a nearby higher elevation stream.

Strike-slip fault - Vertical or nearly vertical fracture or fault along which the blocks on either side have mostly moved horizontally relative to each other.

Strip mine - An extensive plot of land where the overlying vegetation, soil, and rock have been removed to permit access to underlying economically valuable materials.

Subaqueous - Existing, formed, or taking place underwater.

Subduction zone - A location where denser oceanic lithosphere dips below the less dense continental plate and is recycled into the mantle at convergent plate boundaries.

Submergent coastline - Area along the coast that have been inundated by the sea by a relative rise in sea level compared to land elevations.

Subsistence farming - A system of agriculture in which farmers grow food crops solely to meet the needs of themselves and their families with little or no surplus to sell.

Subsoil - The layer of soil under the topsoil that is composed of a mixture of small particles such as sand, silt and clay, but with a lower percentage of organic matter.

Sugarcane - Any of several species and hybrids of tall perennial grass in the genus *Saccharum*, that grow two to six meters tall and are used for sugar production.

Sulfaquent - The soil commonly found at the surface of a salt marsh; mostly silt and clay with large amounts of organic debris; supports a dense vegetation cover.

Superposed stream - A powerful stream formed over horizontal rock layers which overlie folded and faulted rock with varying resistances; after having cut down through the horizontal beds, retains its course and pattern as it erodes underlying rocks.

Suture zone - A linear belt of intense deformation, where distinct terranes, or tectonic units with different plate tectonic and paleogeographic histories, join together.

Swale - A sunken or marshy place, often a shallow channel with gently sloping sides; natural or artificial, that serves as an infiltration basin, designed to hold runoff.

Swallet - A depression or hole in the ground into which surface water sinks; essentially a sinkhole into which a stream flows.

Swamp - A forested wetland that is a transition zone between land and water. The water of a swamp may be fresh water, brackish water, or seawater.

Syncline - A structural fold with the youngest rock layers exposed on the land surface above the center of the structure.

T

Talus - A collection of broken rock fragments at the base of crags, cliffs, or valley shoulders that has accumulated from periodic rockfall from adjacent cliff faces.

Tangent - A mathematical term used to calculate the slope of a landscape; determined by dividing the length of the vertical rise by the length of the horizontal run.

Tectonic - Relating to the structure of the earth's crust and the large-scale dynamic processes which take place within and around it.

Tennessee Valley Authority - A federal agency, created in 1933, to provide navigation, flood control, and electricity along the Tennessee River and its tributaries.

Tennessee-Tombigbee project - A long waterway cut from the Tennessee River to the Tombigbee River in Mississippi to provide a shortcut to the Gulf of Mexico.

Terrace - An elongated relatively level plain composed of sediment that flanks the sides of floodplains and river valleys.

Terrane - A fragment of crustal material formed on, or broken off from, one tectonic plate and accreted or "sutured" to crust lying on a different tectonic plate.

Thermal infrared - A portion of the electromagnetic spectrum that exhibits wavelengths longer than those of visible light, but shorter than those of microwave radiation.

Thermal pollution - A sudden increase or decrease in the temperature of a natural body of water as a result of human influence; often associated with nuclear power plants.

Threshing - The process of loosening the edible part of grain from the straw to which it is attached; accomplished by beating the grain using a flail on a threshing floor.

Thrust fault - A low-angle break in the Earth's crust, across which older rocks are pushed above younger rocks.

Tidal channel - The portion of a stream located on a tidal flat and discharging into an ocean, whose water level and flow is affected by the ebb and flow of ocean tides.

Tidal flat - Coastal wetlands with or without vegetation that form in intertidal areas where sediments have been carried in and deposited by the action of tides.

Tidal inlet - A channel, typically cutting through barrier islands or spits, maintained by tidal flow, connecting the ocean with a bay, lagoon, marsh or tidal creek system.

Tidewater - A generally flat region near the ocean affected by tidal flow; characterized by low flooded river plains, tidal marshes and large expanses of swamp land.

Topographic lineament - A large-scale straight-line pattern on the ground surface that is expressed topographically and is visible on aerial photographs or satellite images.

Topographic map - Any map that uses elevation contour lines to represent the shape of the Earth's surface and covers an area defined by a standard grid system.

Topography - The study of the shape and characteristics of the Earth's surface.

Topsoil - The upper, outermost layer of soil, composed of mineral particles, humus, water, and air; that is where the highest concentration of organic matter and microorganisms occurs.

Touroid - A tourist who by dress or actions stands out as not being in conformity with local customs, or who looks and acts very differently than the local inhabitants.

Towfish - An object used in sonar profiling activities that is towed behind a vessel in the water, and carries the sonar equipment.

Towpath - A road or trail on the bank of a river, canal, or other waterway used to allow a land vehicle, beasts of burden, or a team of human pullers to tow a boat or barge.

Transformer - An electrical apparatus designed to convert alternating current from one voltage on a particular circuit to a different voltage on a different circuit.

Transgressive coastline - A coastline that experiences a rising sea level that floods coastal beaches and other landforms causing the shoreline position to migrate landward.

Transpiration - The process of water movement through a vascular plant and its evaporation from aerial parts, such as leaves, stems and flowers.

Transported soil - Soil formed from sediment that originated elsewhere but had been brought to its present location by water or wind transport.

Transverse range - A mountain range that runs in a direction different from the prevailing regional trends.

Trap - A geological feature, stratigraphic or structural, involving the reservoir rock and caprock of a petroleum system letting hydrocarbons accumulate in a reservoir.

Tree island - A small patch of woody vegetation located within a freshwater wetland ecosystem dominated by non-woody species.

Trellis drainage pattern - A stream system in which smaller tributaries enter the main river channel at right angles from the slopes of mountain sides.

Triangulation - A surveying technique for determining the location of a point by measuring angles to it from other known points at either end of a fixed baseline.

Tributary - A stream or river that flows into a larger stream or river or a lake.

Trickster tale - A type of folktale that usually features an animal who has human traits; like being able to talk. These stories are used to entertain and often to teach lessons about how to behave and treat other people.

Troy weight - A system of units of mass that originated in 15th-century England and is primarily used in the precious metals industry.

Truck farming - The production of crops, typically garden vegetables, on an extensive scale primarily for shipment to distant markets rather than for local or home use.

Trunk channel - The primary downstream segment of a river in a drainage basin, as contrasted to its tributaries.

U

Unconformity - A buried or exposed erosional or non-depositional surface between two rock layers of different age, indicating deposition in the area was not continuous.

Underground Railroad - A network of secret routes and safe houses established during the mid-19th century; used by enslaved African-Americans to escape into free states and Canada.

Urbanization - The population shift from rural to urban areas causing land-use changes in suburban regions, and the ways in which societies adapt to these changes.

V

Vertical exaggeration - The practice of using a different vertical scale (compared to the horizontal scale) when drawing a topographic profile diagram in order to emphasize the elevation differences that would be very hard to see if the scales were identical.

Vibracore - A sampling technique used for collecting a core of unconsolidated saturated sediments where deeper penetration is assisted by mechanical vibration.

W

Ward - A political subdivision of a city or town established for administrative purposes.

Warrior's Path - A game trail originally blazed by Native Americans through Cumberland Gap, Tennessee, that later became part of what was known as the Wilderness Road.

Washover deposit - Ocean sediment deposited on the beach, dunes, or even as far as the back-barrier bay, salt marsh, or lagoon during major coastal storm events.

Water gap - A low point in a ridge that running water has carved through a mountain range and that still carries water today.

Water table - The upper surface of the zone of saturation in which the pores and fractures of the ground are saturated with water.

Watershed - A drainage basin on the earth's surface where precipitation collects and drains off into a common outlet, such as into a river, bay, or other body of water.

Weir - A low barrier placed across the width of a river to change the water height and control the flow characteristics of water into outlets like lakes and reservoirs.

Wildcat mining - A form of high-risk exploratory mining or drilling in unproven or already fully exploited areas that have no concrete historic production records.

Wilderness Road - Early path through Cumberland Gap, Tennessee, that was one of the principal routes used by colonial and early national era settlers to reach Kentucky from the Eastern states.

Wind gap - A low point in a ridge that running water has carved through a mountain range but that no longer carries water and is therefore left high and dry.

Window - A geologic structure formed by erosion on a thrust fault system in which underlying younger rocks are visible at the surface after overlying older rocks have eroded away.

Windward - The location or direction upwind from the point of reference; for example the side of an island that faces, and is most affected by, winds and storms.

Winnowing - An agricultural procedure developed by ancient cultures for separating grain from chaff by throwing the mixture into the air so that the wind blows away the lighter chaff.

Wood pulp - A lignocellulosic fibrous material produced by chemically or mechanically separating cellulose fibers from wood; used as a source material in most paper products.

Works Progress Administration - A New Deal agency set up during the Depression to employ unskilled laborers on public works projects, including public buildings and roads.

Z

Zooplankton - Organisms, usually considered very small animals, drifting in oceans, seas, and bodies of fresh water, that are unable to manufacture their own food.

Zydeco - A music genre associated with French Creole culture in southwest Louisiana, which blends blues, rhythm and blues.