

**LEVEL:** Grades 4-8 (Can be an extension for 3rd grade, "Eat a Rock")

**SUBJECTS:** Consumer Education, Geography, Science, Art, Language Arts.

**PROCESS:** Through gathering data on uses and sites for mining and comparing uses of minerals mined all over the United States, students will explore the value of mining to our lifestyles and to the economy.

**OBJECTIVES:** The student will:

1. List ten of the original sources of ten common consumer products found in their daily lives.
2. Match these products to resources mined from the ground.
3. Identify mineral production in every state of the United States.
4. Evaluate the value of these minerals to their current lifestyles.

**TIMEFRAME:** Three 50-minute sessions.

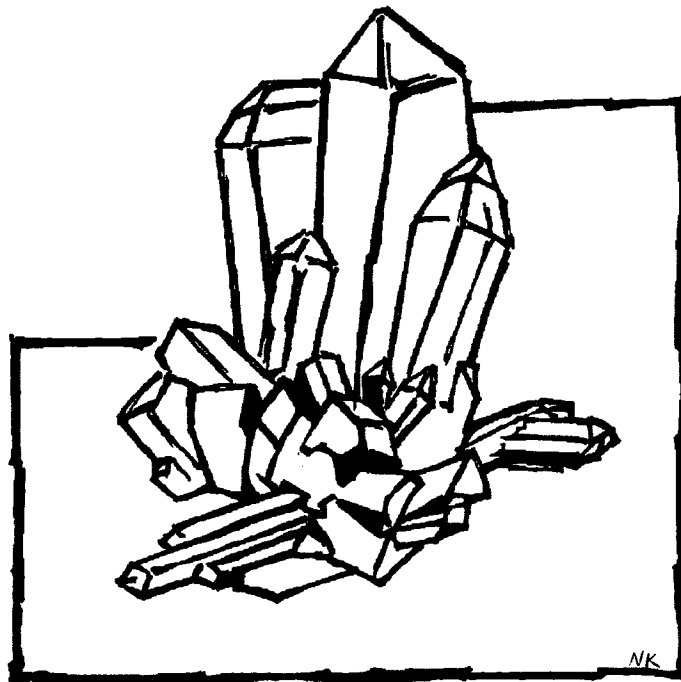
**SKILLS:** Analyzing, applying, discussing, generalizing and predicting, inferring, listing, mapping, problem solving, reading, reporting.

**MATERIALS:** United States map, 50 small paper slips, library references and encyclopedia, poster board or large construction paper, art supplies (colorful markers, crayons, colored pencils, watercolor and/or poster paints, magazines, glue, etc.), computer (optional), samples of mineral objects: such as copper pipe or wire, plastic pipe, kitty litter, baby powder-talc, clay plant pot, silver, plastic, gold, copper jewelry, pennies, aluminum foil, tin cans, "State Minerals List" (attached), "Mining for Words" (attached).

**VOCABULARY:** Consumers, minerals, mining, resources.

**EXTRA:**

Click [HERE](#) for a list of  State Geologists and  Geology web sites.



## HOME OF MINE STATE OF MINE

**OVERVIEW:** You wake up each morning, turn on the light and radio, wash your face, brush your teeth, get dressed, eat breakfast, pick up your homework, lunch box, and daypack, and catch the bus to go to school. Almost everything you have done so far would be impossible without minerals that have been mined from the ground. The alarm clock contains petroleum products, copper, and silver; the water pipes are made of copper, lead, or petroleum products; the light bulb contains tungsten filaments; the toothpaste may be in an aluminum tube and the brush is made from petroleum products. Almost everything you touch throughout the day, at home, at school, and at your friends' houses is made with resources removed from the ground. If the objects weren't made from a mined resource, they were most likely manufactured in a way that used mined resources. For example, consider how a tree (not a mined resource) is turned into paper.

You can bet it has come in contact with metals of many types. It has been transported on trucks made of metal and fueled by petroleum products, for example.

Like the food webs found in nature, we have a close bond to the earth through our dependence upon minerals. We could live without many of these, but our lifestyles would change drastically.

We use minerals in the amounts of billions of tons of sand and gravel each year, and approximately ten tons of minerals a year for every man, woman, and child in the United States. We also need mineral nutrients to keep healthy. Foods we eat supply us with calcium, copper, iron, phosphorus, and much more. Just look on the side of a box of cereal or vitamin bottle label. Minerals are found in fertilizers that grow our foods. Farmers use metal tractors, and grocers use petroleum-fueled metal trucks to bring foods to consumers.

The walls of our houses, made of bricks, stones, and concrete, are nailed together with nails of steel and other metals. Inside walls are often of gypsum wallboard. Copper wire and pipes running between the walls provide us with water and electricity for cooking our meals.

Minerals also provide the materials for people to express themselves artistically. Minerals are found in paints, and in the clays and marbles used by sculptors. Even soap sculptures are dependent upon minerals since salt is used to manufacture soap.

Scientists would be unable to perform their highly technical research without the aid of computers. Each computer is reported to contain more than 42 different minerals, all mined somewhere.

Like the food we buy in the grocery store, many minerals come from other parts of the country or the world. Minerals come from private property and public lands all across the country including farms, ranches, national forests, and Bureau of Land Management property, especially in the western states. Steel comes from iron ores and blends of metals mined from the ground in places like Pennsylvania, Michigan, and Minnesota. Salt doesn't start at the store, but from places in the earth where there was once sea water like Utah, Louisiana, and Nevada. Coal that is used to generate electricity may come from Wyoming, Montana, and West Virginia; and petroleum used to create plastics and fuel our cars often come from Texas, Colorado, and California. We depend on these resources, yet do we really understand that they come from within the ground and from all over the country and the world?

Mined resources are found in every state within the United States, but not all mined resources are found in every state. For example, copper is found in some states and not in others. Copper is an important mineral in Arizona, Montana, and New Mexico, but not in North Dakota. It might be present, but not in enough quantity that it is worth the cost to mine it. Yet, North Dakota offers other minerals not found in Arizona, Montana, or New Mexico.

## **PROCEDURE:**

### *PRE-ACTIVITY:*

1. Photocopy "State Minerals List" and the U.S. map for each student.
2. Set up a display of items from the materials list and "pretest" students by discussing the sources for these items. Number (1 to 50) and fold 50 small slips of paper and place them in a box or hat for later use.
3. Provide each student with the State Minerals List and U.S. map. This handout provides a list of common minerals from each state. (Note: These are not the only minerals found in the state--just two of the most important ones.) Also included on the list is a common use of each mineral. These manufactured products are not necessarily made in the state, but are made with the minerals mined in that state.

### *ACTIVITY:*

1. On the U.S. map, have the students locate each state and write on that state the two minerals mined there.
2. Ask students to place their initials on states that they have been to or where they have relatives.
3. Create a color key and color in one shade for states with the same mineral. For example, states producing copper could be colored in orange and states producing iron ore could be grey. Select only one duplication per state since there could be many. Identify the climatic and geographic differences in these states. For example, copper is mined in Michigan and in Arizona. Michigan is wet, cool and not a desert while Arizona is hot, dry and definitely a desert. Use travel and family experiences of students to help determine these characteristics.
4. Tell students: 50 slips of paper are numbered 1 - 50 in this box (or hat). As you finish your maps, pull two slips of paper from the hat. Each number will match a state on the "State Minerals List." Number two will be Alaska, three is Arizona, and so on. You are to select the two minerals from the list for each state to report on. Using library resources, including encyclopedias, you need to report

back with three facts about each mineral and two uses for each not shown on the list. Work in pairs, if you wish, to report on four states instead of two states. The report can be bound in a cover with a map of the United States that shows locations of minerals. [Optional--If there's a computer in the classroom, students can enter their researched information into a computer file that can later be printed out at the conclusion of everyone's activities. A printout of the reports can be presented to the school librarian. The report should contain each state in the United States in alphabetical order, with two minerals including three facts and two uses for each.]

5. Evaluate and discuss the display set up at the start of this activity to determine what minerals make up each item and where items might have been mined.

6. Have everyone list ten different manufactured items in their homes that have come from mineral products. Petroleum products are found in plastics; many metals contain iron ores. Bring the lists to school and try to determine, using the maps and other resources, where it might have been mined. Discuss with students their dependence upon mineral resources--especially petroleum.

7. Conclude "Home of Mine, State of Mine" by having students produce a product poster that shows uses for minerals found in their daily lives. They should use facts discovered in their combined reports on common household uses and the uses provided in the "State Mineral List." Each poster should contain a minimum of ten mined resources. Each item should be identified either in the poster or labeled and identified below it. An example of a poster is a person on rollerblades wearing all of the appropriate safety equipment. Students need to identify the raw resource, i.e. petroleum and steel. Posters can be constructed as collages from drawings found in magazines; from free-hand drawings using markers, paints, pencils, and/or crayons; or from multimedia assemblies.

8. What would happen if the states that produce copper no longer produced copper? Consider the products made from copper and consider the economy of the state. Discuss how each state benefits from the money earned from

the sale of the copper.

### **ASSESSMENT:**

Ask students to:

1. Identify two minerals from two states.
2. List ten items found in the classroom and identify the resource origin.
3. Evaluate their needs for natural resources as they apply to their current lifestyles and report on this in two to three paragraphs.

### **EXTENSIONS:**

1. If the same minerals are found in very different locations around the United States, what predictions can you make about climate conditions when the mineral was forming? (Possible answers can involve geologic history and climatic changes over time.) Is there a relationship?
2. Have students imagine a world without metals. Look around the room, compare everyone's mineral lists from home and classroom activities, and determine non-metal, non-mineral substitutes that would allow us to maintain our current lifestyles. (Would you be able to make these changes in our lives? Try to make these changes for a day in the classroom.) Remember that even pencils and papers come in contact with mined resources.
3. People all over the country work in mining and in the manufacturing processes that change raw resources into consumer items. Have students interview family members (uncles, aunts, grandparents, cousins, etc.) and friends to find out who works where and what they do. The United States economy is very dependent upon mining and manufacturing. Without them, we couldn't have restaurants, doctors, clothing stores, or anything as we currently know it. Encourage students to share interview findings in class. What would happen if these jobs disappeared? What would happen if the minerals disappeared or were no longer available? Why might they no longer be available? What could happen? (There are no wrong answers.) Extend this idea to shopping at Christmas, buying school supplies, and into all levels of the economy. Have students invite some of their relatives/friends in to talk to the class about their

jobs. Invite a geologist from a local college, university, or state geology office to talk about the mining industry.

4. "Mining for Words" contains many of the minerals found in the "State Minerals List." This is a vocabulary enrichment activity that can be completed when students finish their reports.

#### **RESOURCES:**

This Ouachita National Forest Website provides lots of useful information on minerals, rockhounding and mining in the National Forests as well as links to many other National Forest and other minerals related sites. If you are connected to the internet, you can click here now:

<http://www.fs.fed.us/oonf/minerals/>

For a [listing of State Geologists and web addresses](#), see the table at the end of this activity.

Hawaii: Hawaii Geological Survey, Division of Water and Land Development, P.O. Box 373, Honolulu, HI 96809, (808) 587-0230

Idaho: Director and State Geologist, University of Idaho, Morrill Hall, Room 332, Moscow, ID 83843, (208) 885-7991

# STATE MINERALS LIST

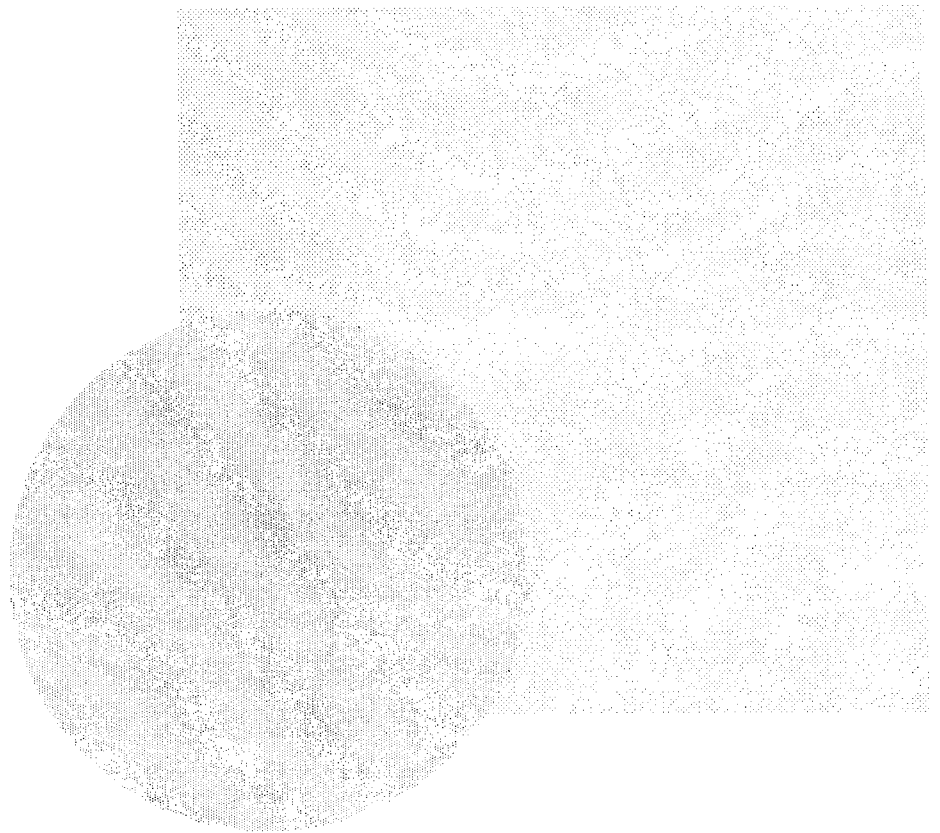
Number/State	Mineral Resource*	Consumer Use**
1. Alabama	salt iron ore	soap iron pipes
2. Alaska	gold petroleum	dental fillings telephones
3. Arizona	copper silver	electric wire radios
4. Arkansas	diamonds aluminum/bauxite	jewelry cooking foil
5. California	asbestos tungsten	roofing material light bulbs
6. Colorado	gypsum copper	wallboards plumbing pipes
7. Connecticut	clay gravel	glossy paper sidewalks
8. Delaware	calcium magnesium	fertilizer lightweight metal alloys
9. Florida	gravel titanium	cement rocket engines
10. Georgia	iron ore talc	highrise buildings baby powder
11. Hawaii	clay volcanic ash	cat litter glass
12. Idaho	cobalt gold	jet engines jewelry
13. Illinois	coal lead	electricity television tubes
14. Indiana	gypsum limestone	plaster buildings
15. Iowa	coal gypsum	electricity cement
16. Kansas	lead salt	batteries food seasoning
17. Kentucky	fluorspar petroleum	toothpaste toys
18. Louisiana	salt sulfur	food seasoning fabric dyes
19. Maine	clay mica	paper coating roofing
20. Maryland	limestone natural gas	caulking cooking
21. Massachusetts	granite limestone	buildings sidewalks
22. Michigan	copper peat	pans houseplants
23. Minnesota	manganese iron ore	pans tractors
24. Mississippi	clay iron ore	dishes airplanes

25. Missouri	barite zinc	petroleum medicine
26. Montana	silver petroleum	wire dishes
27. Nebraska	clay natural gas	cat litter cooking
28. Nevada	lithium mercury	rockets thermometers
29. New Hampshire	beryl mica	jewelry glass
30. New Jersey	titanium zinc	jet engines fuses
31. New Mexico	molybdenum vanadium	kitchen tools X-rays
32. New York	slate talc	chalkboards glass bowls
33. North Carolina	asbestos lithium	oven mitts batteries
34. North Dakota	lignite salt	electricity ice cream
35. Ohio	salt sandstone	cheese sidewalks
36. Oklahoma	limestone petroleum	roofing grocery bags
37. Oregon	mercury uranium	mirrors submarines
38. Pennsylvania	iron ore coal	school buses trains
39. Rhode Island	sand gravel	cement roads
40. South Carolina	clay mica	statues oven door windows
41. South Dakota	uranium vanadium	energy fabric dyes
42. Tennessee	marble copper	counter tops electric cables
43. Texas	asphalt petroleum	driveways cassettes
44. Utah	salt vanadium	preserving food rockets
45. Vermont	asbestos marble	insulation fudge boards
46. Virginia	coal soapstone	electricity insecticide
47. Washington	lead tungsten	batteries light bulbs
48. West Virginia	coal salt	electricity ice cream
49. Wisconsin	iron ore zinc	food cans car engines
50. Wyoming	diamonds phosphate	stereos fertilizer

# MINING FOR WORDS

M T I W E L E A D F Z M L C I F P G D B  
O E Z P V R A Z V C S F L X T Q F K Y A  
Y E W V C G Y P S U M L E I F I S E A R  
Y P E P V E W T Q I G T V I M A W Z N I  
H E C B C P V K O R D I A M O N D S S T  
Q T B S L G A S K E U D R K E Y U W J E  
I J R E E A G J G U V E F G F I Q A Q K S  
D O N R T K S H L L K P C O A L S M I N  
Q L O D B T B K U I D D T T F E B D N Y  
D E T B P J W W U S U E V L O N E C Y P  
A U S G O L D F Y C K U T A W P S S K T  
Y M E E M C O W T J K W L S I C T M S L  
D O M T M I F R Q J R I A Y G Q O U Y D  
U T I V U R K E A F U X B P F S S N H R  
A T L E I R F P I M F K O M Q H Z I J E  
J P Q T N T T P V I L N C R Y O F M V T  
O V F D A A S O Q C U K Z X I G U U H L  
J O Z O T G J C T A S B X G Y J J L V P  
I S V P I V E L U I R O N O R E E A C Z  
W O D C T Y Q X S T A V S B D J G F S S  
T R K U R A N I U M A T E L B R A M Q W

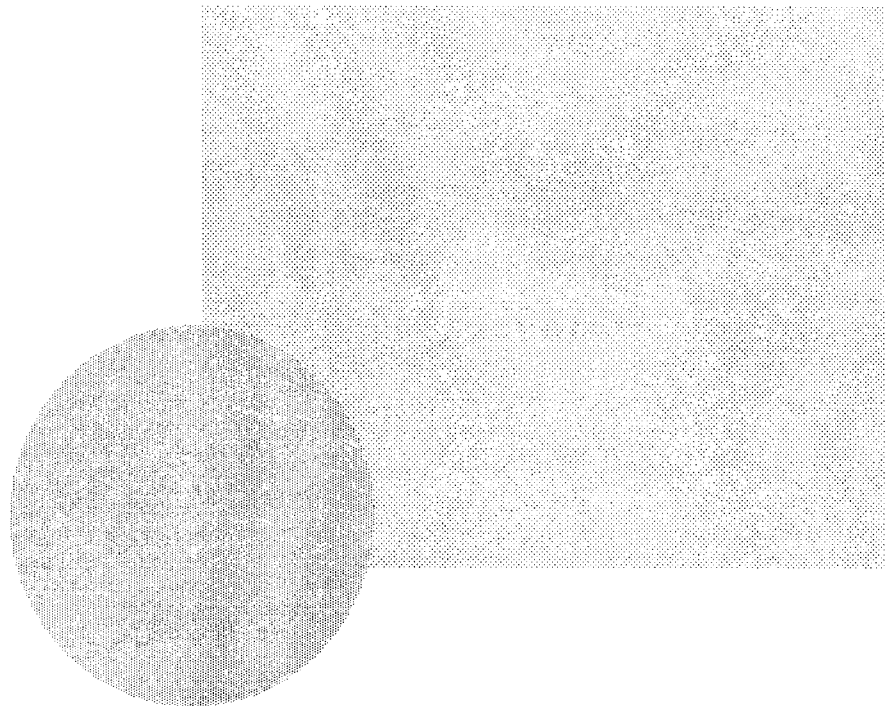
SALT  
IRON ORE  
GOLD  
PETROLEUM  
COPPER  
SILVER  
DIAMONDS  
ALUMINUM  
ASBESTOS  
GYPSUM  
GRAVEL  
TITANIUM  
TALC  
COBALT  
COAL  
LEAD  
LIMESTONE  
SULFUR  
MICA  
BARITE  
URANIUM  
MARBLE



# MINING FOR WORDS (SOLUTION)

M T I W E L E A D F Z M L C I F P G D B  
O E Z P V R A Z V C S F L X T Q F K Y A  
Y E W V C G Y P S U M L E I F I S E A R  
Y P E P V E W T Q I G T V I M A W Z N I  
H E C B C P V K O R D I A M O N D S S T  
Q T B S L G A S K E U D R K E Y U W J E  
U R E E A G J G U V E F G F I Q A Q K S  
D O N R T K S H L L K P C O A L S M I N  
Q L O D B T B K U I D D T T F E B D N Y  
D E T B P J W W U S U E V L O N E C Y P  
A U S G O L D F Y C K U T A W P S S K T  
Y M E E M C O W T J K W L S I C T M S L  
D O M T M I F R Q J R I A Y G Q O U Y D  
U T I V U R K E A F U X B P F S S N H R  
A T L E I R F P I M F K O M Q H Z I J E  
J P Q T N T T P V I L N C R Y O F M V T  
O V F D A A S O Q C U K Z X I G U U H L  
J O Z O T G J C T A S B X G Y J J L V P  
I S V P I V E L U I R O N O R E E A C Z  
W O D C T Y Q X S T A V S B D J G F S S  
T R K U R A N I U M A T E L B R A M Q W

SALT  
IRON ORE  
GOLD  
PETROLEUM  
COPPER  
SILVER  
DIAMONDS  
ALUMINUM  
ASBESTOS  
GYPSUM  
GRAVEL  
TITANIUM  
TALC  
COBALT  
COAL  
LEAD  
LIMESTONE  
SULFUR  
MICA  
BARITE  
URANIUM  
MARBLE





## Directory of State Geologists

State	State Geologists
<b>1. Alabama</b>	<p>State Geologist                      Geological Survey of Alabama                      P.O. Box 869999                      Tuscaloosa, AL 35486-6999                      Telephone: (205) 349-2852                      Fax: (202) 349-2861                      Internet: <a href="http://www.gsa.state.al.us/">http://www.gsa.state.al.us/</a></p>
<b>2. Alaska</b>	<p>Director and State Geologist                      Division of Geological and Geophysical Surveys                      Alaska Department of Natural Resources                      794 University Avenue, Suite 200                      Fairbanks, AK 99709-3645                      Telephone: (907) 451-5005                      Fax: (907) 451-5050                      Internet: <a href="http://www.dggs.dnr.state.ak.us/">http://www.dggs.dnr.state.ak.us/</a></p>
<b>3. Arizona</b>	<p>State Geologist and Director                      Arizona Geological Survey                      416 West Congress Street, Suite 100                      Tucson, AZ 85701-1315                      Telephone: (520) 770-3500                      Fax: (520) 770-3505                      Internet: <a href="http://www.azgs.state.az.us/">http://www.azgs.state.az.us/</a></p>
<b>4. Arkansas</b>	<p>Director and State Geologist                      Arkansas Geological Commission                      Vardelle Parham Geology Center                      3815 West Roosevelt Rd.                      Little Rock, AR 72204                      Telephone: (501) 296-1877                      Fax: (501) 663-7360                      E-mail: <a href="mailto:agc@mail.state.ar.us">agc@mail.state.ar.us</a>                      Internet: <a href="http://www.state.ar.us/agc/">http://www.state.ar.us/agc/</a></p>
<b>5. California</b>	<p>State Geologist                      California Division of Mines and Geology                      Department of Conservation                      801 K St. MS 12-30                      Sacramento, CA 95814-3531                      Telephone (916) 445-1825                      Fax: (916) 445-5718                      Internet: <a href="http://www.consrv.ca.gov/dmg/index.htm">http://www.consrv.ca.gov/dmg/index.htm</a></p>
<b>6. Colorado</b>	<p>State Geologist and Director                      Colorado Geological Survey                      Division of Minerals and Geology                      Department of Natural Resources                      1313 Sherman St., R. 715                      Denver, CO 80203                      Telephone (303) 866-2611                      Fax: (303) 866-2461                      Internet: <a href="http://geosurvey.state.co.us/">http://geosurvey.state.co.us/</a></p>

## Directory of State Geologists

<p><b>7. Connecticut</b></p>	<p><b>State Geologist</b>  <b>Connecticut Geological and Natural History Survey</b>  <b>Department of Environmental Protection</b>  <b>79 Elm St.</b>  <b>Hartford, CT 06106-5127</b>  <b>Telephone: (860) 424-3540</b>  <b>Fax: (860) 424-4058</b>  <b>Internet: <a href="http://dep.state.ct.us/cgnhs/index.htm">http://dep.state.ct.us/cgnhs/index.htm</a></b></p>
<p><b>8. Delaware</b></p>	<p><b>Director and State Geologist</b>  <b>Delaware Geological Survey/University of Delaware</b>  <b>Delaware Geological Survey Bldg.</b>  <b>Newark, DE 19716-7501</b>  <b>Telephone: (302) 831-2833</b>  <b>Fax: (302) 831-3579</b>  <b>E-mail: <a href="mailto:dgs@mvs.udel.edu">dgs@mvs.udel.edu</a></b>  <b>Internet: <a href="http://www.udel.edu/dgs/dgs.html">http://www.udel.edu/dgs/dgs.html</a></b></p>
<p><b>9. Florida</b></p>	<p><b>State Geologist</b>  <b>Florida Geological Survey</b>  <b>Department of Environmental Protection</b>  <b>903 West Tennessee St./Gunter Building</b>  <b>Tallahassee, FL 32304-7700</b>  <b>Telephone: (850) 488-4191</b>  <b>Fax: (850) 488-8086</b>  <b>Internet: <a href="http://www.dep.state.fl.us/geology/">http://www.dep.state.fl.us/geology/</a></b></p>
<p><b>10. Georgia</b></p>	<p><b>State Geologist</b>  <b>Georgia Geologic Survey</b>  <b>Department of Natural Resources</b>  <b>19 Martin Luther King, Jr., Dr., SW, Rm. 400</b>  <b>Atlanta, GA 30334</b>  <b>Telephone: (404) 656-3214</b>  <b>Fax: (404) 657-8379</b>  <b>Internet: <a href="http://www.dnr.state.ga.us/dnr/environ/">http://www.dnr.state.ga.us/dnr/environ/</a></b></p>
<p><b>11. Hawaii</b></p>	<p><b>Hawaii Department of Land and Natural Resources</b>  <b>Division of Water and Land Development</b>  <b>P.O. Box 373</b>  <b>Honolulu, HI 96809</b>  <b>Telephone: (808) 587-0230</b>  <b>Fax: (808) 587-0283</b>  <b>Internet: <a href="http://kumu.icsd.hawaii.gov/dlnr/Welcome.html">http://kumu.icsd.hawaii.gov/dlnr/Welcome.html</a></b></p>
<p><b>12. Idaho</b></p>	<p><b>State Geologist</b>  <b>College of Mines</b>  <b>University of Idaho</b>  <b>Moscow, ID 83844-3025</b>  <b>Telephone: (208) 885-6195</b>  <b>Fax: (208) 885-5724</b>  <b>Internet: <a href="http://www.idahogeology.org">http://www.idahogeology.org</a>.</b></p>

## Directory of State Geologists

<p><b>13. Illinois</b></p>	<p>Illinois State Geological Survey            Department of Natural Resources            121 Natural Resources Bldg.            615 East Peabody Dr.            Champaign, IL 61820-6964            E-mail: <a href="mailto:isgs@isgs.uiuc.edu">isgs@isgs.uiuc.edu</a>            Internet: <a href="http://www.isgs.uiuc.edu/isgshome.html">http://www.isgs.uiuc.edu/isgshome.html</a></p>
<p><b>14. Indiana</b></p>	<p>Director and State Geologist            Mineral Resources Section            Indiana Geological Survey            Indiana University            611 North Walnut Grove            Bloomington, IN 47405-2208            Telephone: (812) 855-5067            Fax: (812) 855-2862            Internet: <a href="http://adamite.igs.indiana.edu/">http://adamite.igs.indiana.edu/</a></p>
<p><b>15. Iowa</b></p>	<p>Geological Survey Bureau            Iowa Department of Natural Resources            109 Trowbridge Hall            Iowa City, IA 52242-1319            Telephone: (319) 335-1575            Fax: (319) 335-2754            Internet: <a href="http://www.igsb.uiowa.edu/">http://www.igsb.uiowa.edu/</a></p>
<p><b>16. Kansas</b></p>	<p>Director and State Geologist            Kansas Geological Survey            University of Kansas            1930 Constant Ave., Campus West            Lawrence, KS 66047-3726            Telephone: (785) 864-3965            Fax: (785) 864-5317            Internet: <a href="http://www.kgs.ukans.edu/">http://www.kgs.ukans.edu/</a></p>
<p><b>17. Kentucky</b></p>	<p>State Geologist and Director            Kentucky Geological Survey            University of Kentucky            228 Mining and Mineral Resources Bldg.            Lexington, KY 40506-0107            Telephone: (859) 257-5500            Fax: (859) 257-1147            Internet: <a href="http://www.uky.edu/KGS/home.htm">http://www.uky.edu/KGS/home.htm</a></p>
<p><b>18. Louisiana</b></p>	<p>Director and State Geologist            Louisiana State University            University Station, P.O. Box G            Baton Rouge, LA 70893-4107            Telephone: (225) 578-5320            Fax: (225) 578-3662            Internet: <a href="http://www.dnr.state.la.us/CONS/Conserv.ssi">http://www.dnr.state.la.us/CONS/Conserv.ssi</a></p>

## Directory of State Geologists

<b>19. Maine</b>	<b>Director and State Geologist</b> <b>Maine Geological Survey</b> <b>Department of Conservation</b> <b>22 State House Station, 184 State St.</b> <b>Augusta, ME 04333-0022</b> <b>Telephone: (207) 287-2801</b> <b>Fax: (207) 287-2353</b> <b>E-mail: <a href="mailto:nrimc@state.me.us">nrimc@state.me.us</a></b> <b>Internet: <a href="http://www.state.me.us/doc/nrimc/nrimc.htm">http://www.state.me.us/doc/nrimc/nrimc.htm</a></b>
<b>20. Maryland</b>	<b>State Geologist and Director</b> <b>Maryland Geological Survey</b> <b>2300 St. Paul St.</b> <b>Baltimore, MD 21218-5210</b> <b>Telephone: (410) 554-5559</b> <b>Fax: (410) 554-5502</b> <b>Internet: <a href="http://mgs.dnr.md.gov/">http://mgs.dnr.md.gov/</a></b>
<b>21. Massachusetts</b>	<b>State Geologist</b> <b>Massachusetts Executive Office of Environmental Affairs</b> <b>Office of the State Geologist</b> <b>251 Causeway Street, Suite 900 (9<sup>th</sup> floor)</b> <b>Boston, MA 02114-2150</b> <b>Telephone: (617) 626-1026</b> <b>Fax: (617) 626-1181</b> <b>Internet: <a href="http://www.state.ma.us/envir/eoea.htm">http://www.state.ma.us/envir/eoea.htm</a></b> <b>Choose MEPA</b>
<b>22. Michigan</b>	<b>Geological Survey Division</b> <b>Michigan Department of Environmental Quality</b> <b>P.O. Box 30256, 735 East Hazel St.</b> <b>Lansing, MI 48909-7756</b> <b>Telephone: (517) 334-6907</b> <b>Fax: (517) 334-6038</b> <b>Internet: <a href="http://www.deq.state.mi.us/gsd/">http://www.deq.state.mi.us/gsd/</a></b>
<b>23. Minnesota</b>	<b>State Geologist</b> <b>Minnesota Geological Survey</b> <b>University of Minnesota</b> <b>2642 University Ave. W.</b> <b>St. Paul, MN 55114-1057</b> <b>Telephone: (612) 627-4780</b> <b>Fax: (612) 627-4778</b> <b>E-mail: <a href="mailto:mgs@gold.tc.umn.edu">mgs@gold.tc.umn.edu</a></b> <b>Internet: <a href="http://www.geo.umn.edu/mgs/">http://www.geo.umn.edu/mgs/</a></b>

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24. Mississippi	<p>State Geologist Office of Geology Mississippi Department of Environmental Quality P.O. Box 20307 Jackson, MS 39289-1307 Telephone: (601) 961-5500 Fax: (601) 961-5521 Internet: <a href="http://www.deq.state.ms.us/newweb/homepages.nsf">http://www.deq.state.ms.us/newweb/homepages.nsf</a></p>
25. Missouri	<p>Director and State Geologist Division of Geology and Land Survey Missouri Department of Natural Resources P.O. Box 250, 111 Fairgrounds Rd. Rolla, MO 65401-0250 Telephone: (573) 368-2100 Fax: (573) 368-2111 TDD: 1-800-379-2419 E-mail: <a href="mailto:dnrdgls@mail.dnr.state.mo.us">dnrdgls@mail.dnr.state.mo.us</a> Internet: <a href="http://www.dnr.state.mo.us/geology.htm">http://www.dnr.state.mo.us/geology.htm</a></p>
26. Montana	<p>Director and State Geologist Montana Bureau of Mines and Geology Montana Tech of the University of Montana 1300 West Park St. Butte, MT 59701-8997 Telephone: (406) 496-4180 Fax: (406) 496-4451 E-mail: <a href="mailto:pubsales@mbmgsun.mtech.edu">pubsales@mbmgsun.mtech.edu</a> Internet: <a href="http://www.mbmgsun.mtech.edu/">http://www.mbmgsun.mtech.edu/</a></p>
27. Nebraska	<p>Nebraska Geological Survey Nebraska Conservation and Survey Division Institute of Agriculture and Natural Resources University of Nebraska-Lincoln 901 North 17<sup>th</sup> St., 113 Nebraska Hall Lincoln, NE 68588-0517 Telephone: (402) 472-3471 Fax: (402) 472-2410 Internet: <a href="http://csd.unl.edu/csd.html">http://csd.unl.edu/csd.html</a></p>
28. Nevada	<p>Director and State Geologist Nevada Bureau of Mines and Geology University of Nevada-Reno, MS 178 Reno, NV 89557-0088 Telephone: (775) 784-6691 Fax: (775) 784-1709 Internet: <a href="http://www.nbmgsunr.edu/">http://www.nbmgsunr.edu/</a></p>

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<p><b>29. New Hampshire</b></p>	<p>State Geologist  New Hampshire Department of Environmental Services  64 Hazen Drive, P.O. Box 95  Concord, NH 03302-0095  Telephone: (603) 271-3503  Fax: (603) 271-2867  E-mail: <a href="mailto:geology@des.state.nh.us">geology@des.state.nh.us</a>  Internet: <a href="http://www.des.state.nh.us/comm_intro.htm#geology">http://www.des.state.nh.us/comm_intro.htm#geology</a></p>
<p><b>30. New Jersey</b></p>	<p>State Geologist  New Jersey Department of Environmental Services  64 Hazen Drive, P.O. Box 95  Concord, NH 03302-0095  Telephone: (603) 271-3503  Fax: (603) 271-2867  E-mail: <a href="mailto:geology@des.state.nh.us">geology@des.state.nh.us</a>  Internet: <a href="http://www.state.nj.us/dep/njgs/">http://www.state.nj.us/dep/njgs/</a></p>
<p><b>31. New Mexico</b></p>	<p>Director and State Geologist  New Mexico Bureau of Mines and Mineral Resources  801 Leroy Pl.  Socorro, NM 87801-4796  Telephone: (505) 835-5302  Fax: (505) 835-6333  Internet: <a href="http://geoinfo.nmt.edu/">http://geoinfo.nmt.edu/</a></p>
<p><b>32. New York</b></p>	<p>New York State Geological  New York State Museum  Room 3140 Cultural Education Center  Albany, NY 12230  Telephone: (518) 474-5816  Fax: (518) 486-3696  Internet: <a href="http://www.nysm.nysed.gov/geology.html">http://www.nysm.nysed.gov/geology.html</a></p>
<p><b>33. North Carolina</b></p>	<p>Director and State Geologist  North Carolina Geological Survey  Division of Land Resources  1613 Mail Service Center  Raleigh, NC 27699-1612  Telephone: (919) 733-2423  Fax: (919) 733-0900  Internet: <a href="http://www.geology.enr.state.nc.us/">http://www.geology.enr.state.nc.us/</a></p>
<p><b>34. North Dakota</b></p>	<p>State Geologist and Director  North Dakota Geological Survey  600 East Boulevard Ave.  Bismarck, ND 58505-0840  Telephone: (701) 328-8000  Fax: (701) 328-8010  Internet: <a href="http://www.state.nd.us/ndgs/">http://www.state.nd.us/ndgs/</a></p>

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<p><b>35. Ohio</b></p>	<p>State Geologist  Division of Geological Survey  Ohio Department of Natural Resources  4383 Fountain Square Dr., Bldg. B  Columbus, OH 43224-1362  Telephone: (614) 265-6988  Fax: (614) 447-1918  E-mail: <a href="mailto:geo.survey@dnr.state.oh.us">geo.survey@dnr.state.oh.us</a>  Internet: <a href="http://www.dnr.state.oh.us/odnr/geo_survey">http://www.dnr.state.oh.us/odnr/geo_survey</a></p>
<p><b>36. Oklahoma</b></p>	<p>Oklahoma Geological Survey—Energy Center  The University of Oklahoma  100 East Boyd, Rm. N-131  Norman, OK 73019-0628  Telephone: (405) 325-3031; (800) 330-3996  Fax: (405) 325-706  Internet: <a href="http://www.ou.edu/special/ogs-pttc/">http://www.ou.edu/special/ogs-pttc/</a></p>
<p><b>37. Oregon</b></p>	<p>State Geologist  Oregon Department of Geology &amp; Mineral Industries  800 NE Oregon St. #28, Suite 965  Portland, OR 97232-2162  Telephone: (503) 731-4000  Fax: (503) 731-4066  FTP: open:sarvis.dogami.state.or.us; user:anonymous  Password: (enter E-mail address or name and FAX number)  E-mail: <a href="mailto:Nature.of.NW@state.or.us">Nature.of.NW@state.or.us</a>  Internet: <a href="http://sarvis.dogami.state.or.us/">http://sarvis.dogami.state.or.us/</a></p>
<p><b>38. Pennsylvania</b></p>	<p>Pennsylvania Geological  Bureau of Topographic and Geologic Survey  Department of Conservation and Natural Resources  P.O. Box 8453  Harrisburg, PA 17105-8453  Telephone: (717) 787-2169, 783-7257  Fax: (717) 783-7267  Internet: <a href="http://www.dcnr.state.pa.us/topogeo/indexbig.htm">http://www.dcnr.state.pa.us/topogeo/indexbig.htm</a></p>
<p><b>39. Puerto Rico</b></p>	<p>Puerto Rico Bureau of Geology  Department of Natural and Environmental Resources  P.O. Box 9066600  Puerta de Tierra, PR 00906-6600  Telephone: (787) 722-2526  Fax: (787) 723-4255</p>

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<p><b>40. Rhode Island</b></p>	<p>Office of Rhode Island State Geologist            Department of Geology            The University of Rhode Island            Kingston, RI 02881            Telephone: (401) 874-2191            Fax: (401) 874-2190            Internet: <a href="http://www.uri.edu/cels/gel/ri_geological_survey.htm">http://www.uri.edu/cels/gel/ri_geological_survey.htm</a></p>
<p><b>41. South Carolina</b></p>	<p>Director and State Geologist            South Carolina Geological Survey            5 Geology Rd.            Columbia, SC 29212            Telephone: (803) 896-7708            Fax: (803) 896-7695            Internet: <a href="http://water.dnr.state.sc.us/geology/">http://water.dnr.state.sc.us/geology/</a></p>
<p><b>42. South Dakota</b></p>	<p>State Geologist            South Dakota Geological Survey            University of South Dakota, Akeley Science Center            414 East Clark St.            Vermillion, SD 57069-2390            Telephone: (605) 677-5227            Fax: (605) 677-5895            Internet: <a href="http://www.sdgs.usd.edu/">http://www.sdgs.usd.edu/</a></p>
<p><b>43. Tennessee</b></p>	<p>State Geologist and Director            Tennessee Department of Environment and Conservation            Division of Geology            13<sup>th</sup> Fl., L and C Tower            401 Church St.            Nashville, TN 37243-0445            Telephone: (615) 532-1500            Fax: (615) 532-0231            Internet: <a href="http://www.state.tn.us/environment/tdg/">http://www.state.tn.us/environment/tdg/</a></p>
<p><b>44. Texas</b></p>	<p>Director and State Geologist            Bureau of Economic Geology            The University of Texas at Austin            University Station, Box X            Austin, TX 78713-8924            Telephone: (512) 471-1534            Fax: (512) 471-0140            E-mail: <a href="mailto:begmail@beg.utexas.edu">begmail@beg.utexas.edu</a>            Internet: <a href="http://www.beg.utexas.edu/">http://www.beg.utexas.edu/</a></p>
<p><b>45. Utah</b></p>	<p>Director and State Geologist            Utah Geological Survey            Utah Department of Natural Resources            P.O. Box 146100            1594 West North Temple, Suite 3110            Salt Lake City, UT 84114-6100            Telephone: (801) 537-3300            Fax: (801) 537-3400            Internet: <a href="http://www.ugs.state.ut.us/">http://www.ugs.state.ut.us/</a></p>



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<p><b>46. Vermont</b></p>	<p><b>State Geologist</b>  <b>Vermont Geological Survey</b>  <b>Department of Conservation</b>  <b>103 South Main St., The Laundry Bldg.</b>  <b>Waterbury, VT 05671-0301</b>  <b>Telephone: (802) 241-3608</b>  <b>Fax: (802) 241-3273</b>  <b>Internet: <a href="http://www.anr.state.vt.us/geology/vgshmpg.htm">http://www.anr.state.vt.us/geology/vgshmpg.htm</a></b></p>
<p><b>47. Virginia</b></p>	<p><b>State Geologist</b>  <b>Virginia Department of Mines, Minerals and Energy</b>  <b>Division of Mineral Resources</b>  <b>900 Natural Resources Ave.</b>  <b>P.O. Box 3667</b>  <b>Charlottesville, VA 22903</b>  <b>Telephone: (804) 951-6340</b>  <b>Fax: (804) 951-6365</b>  <b>Internet: <a href="http://www.mme.state.va.us/DMR/home.dmr.html">http://www.mme.state.va.us/DMR/home.dmr.html</a></b></p>
<p><b>48. Washington</b></p>	<p><b>Washington State Department of Natural Resources</b>  <b>Division of Geology and Earth Resources</b>  <b>1111 Washington Street, SE, Room 148</b>  <b>P.O. Box 47007</b>  <b>Olympia, WA 98504-7007</b>  <b>Telephone: (360) 902-1450</b>  <b>Fax: (360) 902-1782</b>  <b>E-mail: <a href="mailto:geology@wadnr.gov">geology@wadnr.gov</a></b>  <b>Internet: <a href="http://www.wa.gov/dnr/htdocs/ger/index.html">http://www.wa.gov/dnr/htdocs/ger/index.html</a></b></p>
<p><b>49. West Virginia</b></p>	<p><b>Director and State Geologist</b>  <b>West Virginia Geological and Economic Survey</b>  <b>Mont Chateau Research Center</b>  <b>P.O. Box 879</b>  <b>Morgantown, WV 26507-0879</b>  <b>Telephone: (304) 594-2331</b>  <b>Fax: (304) 594-2575</b>  <b>Internet: <a href="http://www.wvgs.wvnet.edu/">http://www.wvgs.wvnet.edu/</a></b></p>
<p><b>50. Wisconsin</b></p>	<p><b>Director and State Geologist</b>  <b>Wisconsin Geological and Natural History Survey</b>  <b>3817 Mineral Point Rd.</b>  <b>Madison, WI 53705-5100</b>  <b>Telephone: (608) 262-1705</b>  <b>Fax: (608) 262-8086</b>  <b>Internet: <a href="http://www.uwex.edu/wgnhs/">http://www.uwex.edu/wgnhs/</a></b></p>
<p><b>51. Wyoming</b></p>	<p><b>State Geologist</b>  <b>Wyoming State Geological survey</b>  <b>P.O. Box 3008</b>  <b>Laramie, WY 82071-3008</b>  <b>Telephone: (307) 766-2286</b>  <b>Fax: (307) 766-2605</b>  <b>E-mail: <a href="mailto:wsgs@wsgs.uwyo.edu">wsgs@wsgs.uwyo.edu</a></b>  <b>Internet: <a href="http://www.wsgsweb.uwyo.edu/">http://www.wsgsweb.uwyo.edu/</a></b></p>