

Preparing for Drought

Background:

March 1, 2005, through September 10, 2006, was the driest period on record in Oklahoma. Rainfall was 19 inches below normal, according to precipitation records from the Oklahoma Mesonet. The drought wiped out more than half the state's wheat crop in 2005, the worst harvest in more than 50 years. The drought also provided Oklahoma its worst wildfire season on record.

The drought in Oklahoma was part of a severe worldwide drought affecting the central and eastern United States, Europe and the Horn of Africa. It caused severe food shortages in east Africa, the threat of wildfires in the Central and Eastern United States and abnormally dry conditions in Australia and Europe. Thirty-seven people died (seven in the United States and 30 in east Africa), and damage from food and water shortages, wildfires, etc., came to over \$1million. Between 40-50 million people were affected by the drought. Drought conditions also affected the Caribbean, central Europe and Asia.

Drought is defined as a period of time when there is not enough water to support agricultural, urban, human, or environmental water needs. Drought usually refers to an extended period of below-normal rainfall but can also be caused by anything that reduces the amount of liquid water available. Although what is considered "normal" varies from one region to another, drought is a recurring feature of nearly all the world's climatic regions.

Agricultural drought occurs when there is not enough moisture for crop or range production. This condition can arise even in times of normal precipitation, depending on soil conditions or agricultural techniques.

The effects of drought vary according to regional vulnerability. For example, subsistence farmers are more likely to migrate during drought because they do not have alternative food sources. Areas with populations that depend on subsistence farming as a major food source are more vulnerable to drought-triggered famine.

Background Sources: Oklahoma Climatological Survey; *Wikipedia, the Free Encyclopedia*; US Drought Monitor, University of Nebraska at Lincoln,

Activities

1. Read and discuss background. Use the following questions as the basis for discussion.
—What is drought? How is drought different from low average precipitation?

P.A.S.S.

GRADE 6

Reading—2.2; 5.1ac,2abcd

Writing—1.1,2; 2.2abcd

Oral Language—2.2

Social Studies—1.1; 2.1,3; 3.2

GRADE 7

Reading—2.2; 5.1abcd,2abcde

Writing—1.2,2; 2.2abcd

Oral Language—2.2

Social Studies—1.1,2; 2.2,4; 3.2,3;
4.2,5; 5.1,2; 6.1

GRADE 8

Reading—2.2; 5.1abc,2ace

Writing—1.1,2; 2.2abce

Oral Language—2.2

Social Studies—1.1,2; 2.1

Resources Needed

computer access

reference books

world map

Subsistence Farming

Subsistence farming usually refers to farming which produces enough to feed the family that works a piece of land but not enough for the family to trade at a market.

In the early days of American history, nearly every family practiced subsistence agriculture, with each family growing just enough to feed itself. With advances in agricultural technology over the years, one American farmer can now feed nearly 130 people. Advanced methods also help modern American farmers survive adverse conditions such as drought and flooding.

Subsistence agriculture is frequently organic, often simply for lack of money to buy industrial inputs such as fertilizer, pesticides, farm machinery, and genetically modified seeds. It is not necessarily beneficial for the environment.

One form of subsistence agriculture is shifting cultivation, a practice common in the tropics. In this agricultural system, farmers typically abandon a given plot when soil fertility wanes and move on to more fertile land, often using slash and burn techniques. A considerable fallow period follows on the abandoned land. This was a technique also used by native Americans and in early American history, when land was considered plentiful.

Subsistence farming persists today in sub-Saharan Africa and other developing parts of the world.

Source: "Subsistence Agriculture,"
Wikipedia, The Free Encyclopedia.

—What is a subsistence farmer? Where do subsistence farmers live? Why are subsistence farmers more vulnerable to the effects of drought than those with alternative resources?

—What are some effects of drought on agriculture? (Crops dry up. No feed for animals. Cattlemen sell their cattle because they can't feed them. Farmers go out of business.) How does that affect you? (less food in grocery stores, higher food prices, limited variety of food, lower quality of food)

2. Explain to students they have been appointed to serve on an international task force to help farmers around the world deal with drought.

—Divide the class into four groups.

—Give each group one of the task cards included with this lesson and a copy of the chart for recording information about websites.

—Review "How Reliable Are Your Sources?" included with this lesson.

—Students online search engines to find the information needed to complete the tasks. If computer access is not available, students may use encyclopedias and other library references.

—Students outline their research findings and provide a table of contents which organizes notes into user-friendly categories.

—Groups complete their subcommittee reports and present their findings to the class.

—Each student will write a 1-2 page report on the topic researched by his/her group.

3. Using an online search engine, students research to identify five areas around the world where drought has occurred in the past 25 years
4. Oklahoma's most recent drought in 2005-2006 occurred at the same time as a drought on the Horn of Africa. Identify countries in the horn of Africa. (Djibouti, Ethiopia, Eritrea Somalia)
 - Find the latitudes and longitudes of these countries and compare them with Oklahoma's latitude and longitude.
 - Is the climate in these countries normally similar or different from that in Oklahoma?
 - Look in an encyclopedia to find what crops normally grow in these countries. How are the crops grown there similar or different from those grown in Oklahoma?

Extra Reading

Allaby, Michael, and Richard Garrett, *Droughts*, Facts on File, 2003.

Gifford, Clive, *Flooding and Drought*, Evans Brothers, 2005.

Gifford, Clive, *The Kingfisher Geography Encyclopedia*, Kingfisher, 2003.

Kerley, Barbra, *A Cool Drink of Water*, National Geographic Children's, 2006.

Vocabulary

developing country— a country with a relatively low standard of living and an undeveloped industrial base. In developing countries, there is low per capita income, widespread poverty, and low capital formation.

drought—A long period of unusually dry weather.

drought tolerant—something (a plant) that will survive in the typical or somewhat less than typical amount of rainfall in a region.

famine—an extreme general shortage of food

fallow—land for crops allowed to lie idle during the growing season

genetically-modified seeds—seeds whose genetic material has been altered using techniques which transfer molecules from one plant to another to allow the expression of certain traits, such as resistance to pests, herbicides or harsh environmental conditions; improved shelf life; increased nutritional value, etc.

organic—of, relating to, or obtained from living things

precipitation—water or the amount of water that falls to the earth as hail, mist, rain, sleet, or snow

slash-and-burn—the cutting and burning of forests or woodlands to create fields for agriculture or pasture for livestock, or for a variety of other purposes

subsistence—the minimum (as of food and shelter) necessary to support life

vulnerable—open to attack or damage

Sub Committee 1: Drought Impact

Your task is to research and report on the following topic:

What are the effects of drought on farm production?

Search: drought farming effects

Web Search Reminders:

1. Make sure your site is reliable.
 - Sites with “edu,” “gov,” or “org” in the url.
 - Websites affiliated with states (e.g., state.ok.us) or countries (e.g., co.nz, co.za)
2. Use headings to find information relevant to your topic. Don’t wander. Stay focused on your topic.
3. Use at least 2-3 sites to compare information.

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Sub Committee 2: Farming Practices

Your task is to research and report on the following topic:

What are some good farming practices to use to conserve water?

Search: conservation farming

Web Search Reminders:

1. Make sure your site is reliable.
 - Sites with “edu,” “gov,” or “org” in the url.
 - Websites affiliated with states (e.g., state.ok.us) or countries (e.g., co.nz, co.za)
2. Use headings to find information relevant to your topic. Don’t wander. Stay focused on your topic.
3. Use at least 2-3 sites to compare information.

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Sub Committee 3: Drought-Tolerant Crops

Your task is to research and report on the following topic:

What are some crops that can survive during drought?

Search: drought-tolerant crops

Web Search Reminders:

1. Make sure your site is reliable.
 - Sites with “edu,” “gov,” or “org” in the url.
 - Websites affiliated with states (e.g., state.ok.us) or countries (e.g., co.nz, co.za)
2. Use headings to find information relevant to your topic. Don’t wander. Stay focused on your topic.
3. Use at least 2-3 sites to compare information.

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Sub Committee 4: Livestock

Your task is to research and report on the following topics:

How does drought impact farm animals?

Search: drought farming livestock

Web Search Reminders:

1. Make sure your site is reliable.
 - Sites with “edu,” “gov,” or “org” in the url.
 - Websites affiliated with states (e.g., state.ok.us) or countries (e.g., co.nz, co.za)
2. Use headings to find information relevant to your topic. Don’t wander. Stay focused on your topic.
3. Use at least 2-3 sites to compare information.

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How Reliable Are Your Sources?

When conducting research, make sure you use reliable information from legitimate sources. Reliable information is well-researched from sources that are well-respected and as objective, or neutral, as possible. The best way to find legitimate sources is to go to the library and use scholarly journals, reference books and other well-researched sources.

Another place to find information is the Internet. Conducting research on the Internet is convenient, but it can also be tricky. There are many thousands of Web pages that have little actual content and are mainly links to other pages, which may be links to other pages, and so on. Anyone can post anything to the Internet. To make sure you have found a reliable source of information, ask yourself these questions:

1. Who is responsible for the Web site? Is the Web page associated with a reliable organization, such as a university or a government agency? What interest does the organization responsible have in the information presented. For example, will the organization profit from the information presented?
2. Who wrote the information? If the author is not listed or has no credentials, it may not be a credible source. Pay attention to the author's credentials or experience. Is the source really an authority on this particular matter or someone with an impressive title that has no connection to the subject matter?
3. When was the information written? Is it current? Is it still relevant?
4. Are there other sources that agree with statements made on the site, or do other sources contradict this source? In that case you may need to search further. It's always a good idea to gather more than one source.
5. Are any sources cited? If the author does not document anything, then the information may simply be someone's opinion. If statistics used come from a survey, how was the data gathered? Who conducted the survey or poll? Was the sample representative of the population? How many were surveyed? What percent of the population?

When choosing between the library and the Internet keep in mind that up to 90 percent of the contents of college library collections are not on the Internet. Because of copyright laws it is too expensive to put all scholarly work on the Internet. This means that the most comprehensive source of information is still the library.

