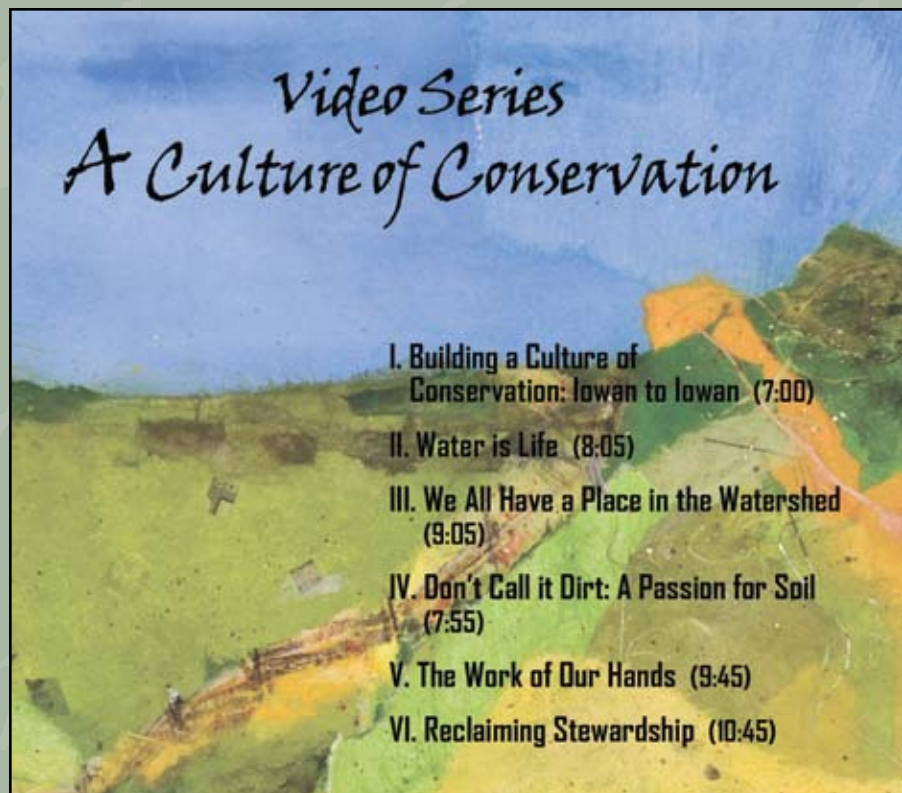


Building a Culture of Conservation – It All Begins with You!

Enhancement activities for high school/junior college students
to accompany the video series “A Culture of Conservation”



The Iowa Learning Farm

The Iowa Learning Farm, initiated in 2005, is a unique partnership of farmers, state and federal agencies, conservation groups, the research community and the general public.

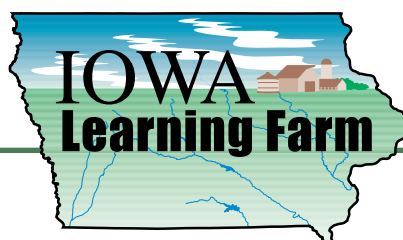
The Iowa Learning Farm is building a Culture of Conservation, taking a grassroots approach to develop innovative ways in which all Iowans have an active role in keeping our natural resources healthy.

For more information about the Iowa Learning Farm, visit our web site:

www.extension.iastate.edu/ilf

Check the web site periodically for additional resource information.

The Culture of Conservation video series was developed for the Soil and Water Conservation Districts of Iowa and is based on ideas expressed by farmers, resource staff and other Iowans during listening sessions conducted across the state by the Iowa Learning Farm in 2008.



Enhancement activities for 6-9th grades compiled by Mary Swalla Holmes.
Enhancement activities for High school/junior college compiled by Karla Stevens.

6/2009



Building a Culture of Conservation – It All Begins with You!

Enhancement Activities for High School/Junior College Students

This six-part enhancement activity links the social concepts of Connection, Reciprocity, Responsibility, Resilience, and Respect to the interacting environmental systems that support all life on earth.

This video series and curriculum enhancement is rooted specifically in Iowa, emphasizing the near environment.

Each activity begins with a 7-10 minute video and includes:

- Issue-oriented research and discussion activities – students are required to think critically about environmental problems, research information to better understand issues, and link appropriate social behaviors.
- Fieldwork exercises – students learn the important skill of observation and other skills to research environmental issues.

The videos in this series explore the importance, the history and the relationships we have with soil and water. These activities further develop the themes of the videos and deepen the learning experience for your students.

- Video I. Building a Culture of Conservation: Iowan to Iowan (7:00) – Overview
- Video II. Water is Life (8:05) – Connection & Water Cycle
- Video III. We All Have a Place in the Watershed (9:05) – Responsibility
- Video IV. Don't Call it Dirt: A Passion for Soil (7:55) – Respect & Soil System
- Video V. The Work of Our Hands (9:45) – Resilience, Diversity & Flexibility
- Video VI. Reclaiming Stewardship (10:45) – Reciprocity & Conservation Practices

Video I. Building a Culture of Conservation: Iowan to Iowan

A Culture of Conservation encourages us to not take our environment or our resources for granted. The the adoption of refined conservation practices – on our farms and in our cities – are shown to improve soil and water quality and reduce nonpoint source pollution in Iowa. Protecting our fertile soil and clean water are essential for sustaining life and the quality of life in Iowa.

PAPER ASSIGNMENT AND/OR GROUP DISCUSSION IDEAS:

Personal History and the Land: Have students consider their history with the land. Students will research the cultural and natural history of where they currently live or a place they have lived in the past. Encourage them to utilize libraries, Internet, historical societies, etc. to gain understanding of how and why the land has changed over time.

Questions to consider:

How has your identity been shaped by where you've lived and/or currently reside?

What kind of influence have you had on the land in return?

Assign a 1-2 page paper and/or facilitate group discussion about findings and ideas. Highlight differences between experiences (e.g., growing up in urban vs. rural areas).

A Leaky System: The video talks about today's farming practices in Iowa as a "leaky system." Start a discussion on what this means and the personal impact it has.



“Corn and soybeans use little water in the spring and fall; reduced crop water usage during these high precipitation periods increases the chance that water leaks out of the system as either surface water runoff or subsurface drainage...

The result is loss of soil and natural fertility, and impaired waters – from our small creeks flowing through the major tributaries to the Gulf of Mexico. Today's dominant row crop system is a leaky system compared to the more perennial vegetation system of the past.”

—Building a Culture of Conservation video



Photo courtesy of the Greater Des Moines Convention & Visitors Bureau



Video II. Water is Life

All the water that will ever be exists right now in the Earth's biosystem. The Earth's water is in constant motion-the process known as the hydrologic cycle. How much are we willing to change our lives to ensure the water we use is clean, pure and readily available and affordable to all?

PAPER ASSIGNMENT AND/OR GROUP DISCUSSION IDEAS:

Water and Quality of Life. Discuss the connection between the lack of safe water, hunger, disease, and poverty throughout the world.

Questions to consider:

How does the abundance of clean water enhance your life here in Iowa?

What mechanisms are in place to provide water and ensure its safety?

Encourage/assign research in water monitoring and treatment practices via online or site visit at local water treatment facility.

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.

ADDITIONAL READINGS & Resources

Alexander et al: *Differences in phosphorus and nitrogen delivery to the Gulf of Mexico from the Mississippi River Basin.*

Galusha, D.: *Groundwater use in Iowa*

Heartland Regional Water Coordination Initiative publications:
www.heartlandwq.iastate.edu/regionalpubs.htm

Water Use and Conservation. Have students consider how much water they use on a daily, weekly, monthly basis by completing questionnaire on the United States Geological Survey web site at: <http://ga.water.usgs.gov/edu/sq3.html>.

Water Science Questionnaire #3: Water use at home

USGS
science for a changing world

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Water Science for Schools
Water Basics • Earth's Water • Water Cycle • Special Topics • Water Use • Activity Center • Water Q&A • Galleries • Search this site • Help • Water glossary • Site map • Contact us • Back • Home

Questionnaire #3
How much water do you use at home?

How much water do you use when you take a shower? Wash a load of clothes? Flush a toilet? Even brush your teeth? One important measurement of water use is how much water one person uses in one day, or **per-capita** water use (per is Latin for by and capita is Latin for head). The number is usually expressed as **gallons of water used per person per day**.

Fill in this form about your home water-use activities. An estimate of how much water you used, on a per capita basis, will be calculated.

To make things consistent, let's take a rainy and cold Saturday when you happen to stay home all day. Think of the water-using activities you do: take a shower, brush your teeth, maybe wash dishes and clothes, etc. In the form below, fill in the boxes with your water-use activities, choose the submit button, and we'll give you an estimate of how many gallons of water you used.

Enter your answers in the boxes below

Baths Taken: No baths taken	Showers: None	Average shower length: 10 minutes
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They should also consider other uses that add to their consumption (e.g., lawn/garden, livestock/pet care, cleaning home/auto.)

Questions to consider:

How much water do you use daily on average?

How much for a week and month?

Next, have them consider how much water everyone consumes in their town. Are there personal changes you could make to conserve water? For what reasons should you?

Have students discuss ideas or write 1-2 page paper with thoughts and findings.



Video III. We All Have a Place in the Watershed

No matter where you are, you are standing in a watershed. Our homes, work, where we grow our food and where we play, all exist in watersheds.

A watershed is an area of land that drains to a common point such as a lake, river or marsh.

PAPER ASSIGNMENT AND/OR GROUP DISCUSSION IDEAS:

Know the Flow. Discuss watershed with students. Have them utilize the EPA web site: <http://cfpub.epa.gov/surf/locate/index.cfm> to locate and learn more about the watershed in which they live. At the site they can learn about bodies of water deemed “impaired” by EPA within their watershed and why.

Questions to consider:

- What is a watershed?
- What is the name of your watershed?
- What are the major bodies of water within it that are close to where you live?
- What impairments, if any, are present within any of the water sources?
- What are potential causes?
- In what condition do you predict these water bodies to be in 20 years? Why?

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.

Consider inviting a Soil and Water Conservation District supervisor to talk with your class. See the Conservation Districts of Iowa (CDI) web site for contact information of a commissioner in your county. <http://www.cdiowa.org/>

Water Pollution. Lead class discussion and/or assign research and 1-2 paper on causes and effects of water pollution in local watershed.

Questions to consider:

- What are point and non-point sources of water pollution?
- What practices threaten the safety of your water?
- How can you know the safety level of the water you drink?
- What practices can you do to help ensure quality of water?



Slow the flow. Examine and discuss a watershed illustration.

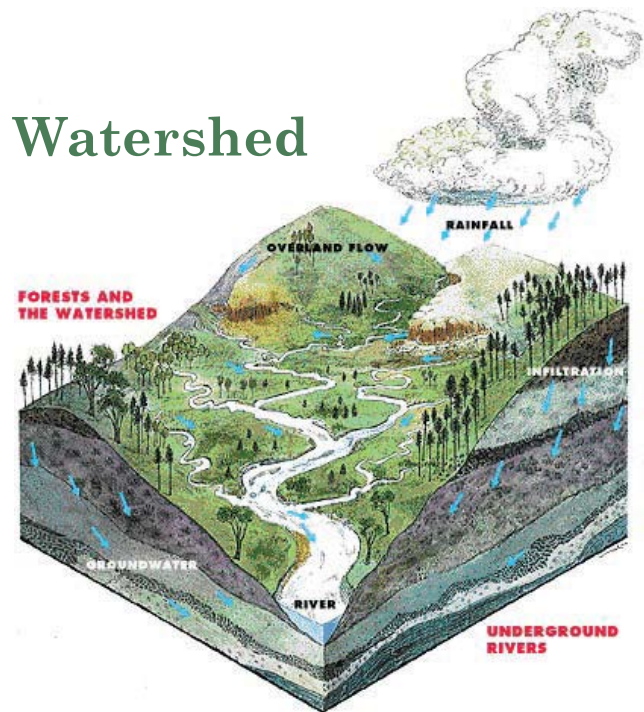
Questions to consider:

What are roles of wetlands, grassy borders and waterways within a watershed?

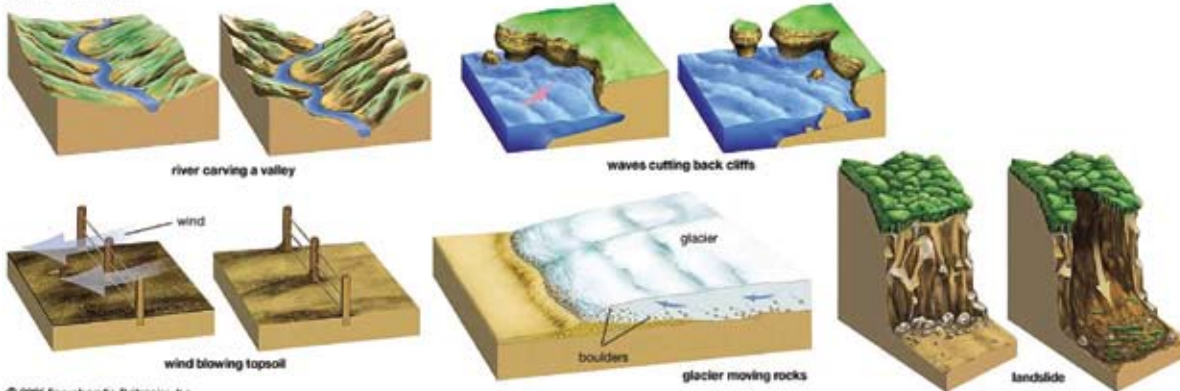
How can some farming practices and the urbanization of Iowa land impact the flow of water and contribute to the potential of flooding?

Are there any changes you can make in your life impacting water flow?

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.



Types of Erosion



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ADDITIONAL READINGS & RESOURCES

Ritter, W.F. 2000. *Agricultural nonpoint source pollution: watershed management and hydrology*. CRC Press, Boca Raton, FL, USA.

University of Wisconsin Extension publication GWQ009: *Rethinking yard care*
<http://www.uwex.edu/>

Iowa Watershed map on page 16

Iowa Learning Farm handout: Iowa Watersheds

NRCS site with additional information about many of Iowa's watersheds:
<http://www.ia.nrcs.usda.gov/technical/RWA.html>

ISU extension water quality information:
<http://www.extension.iastate.edu/ag/wq.html>



Video IV. Don't Call it Dirt: A Passion for Soil

It takes thousands of years for rock to develop into soil and hundreds of years for rich organic layers to build up. Keeping soil in place is only the beginning of soil conservation.

Analyzing soil health: Healthy soil is approximately 50 percent solid material (minerals and organic matter) and 50 percent pore space (water and air), thus allowing roots to easily penetrate and water to drain well. This 50/50 structure also allows the soil to better supply plants with the nutrients they need for growth and productivity. Maintaining organic matter is essential for good soil structure and health.

Organic matter enhances water and nutrient holding capacity and improves soil structure. Managing soil to increase organic matter can enhance productivity and quality, reducing the severity and costs of natural phenomena, such as drought, flood, and disease. In

addition, increasing levels of organic matter can increase soil carbon and carbon storage and can reduce atmospheric CO₂ levels that contribute to climate change.

PAPER ASSIGNMENTS AND/OR GROUP DISCUSSION IDEAS:

Types of soil. Discuss different types of soil: sand (large particles feeling gritty); silt (medium particles feeling silky); and clay (smallest particles feeling sticky). Loam is an equal mixture of the three.

Questions to consider:

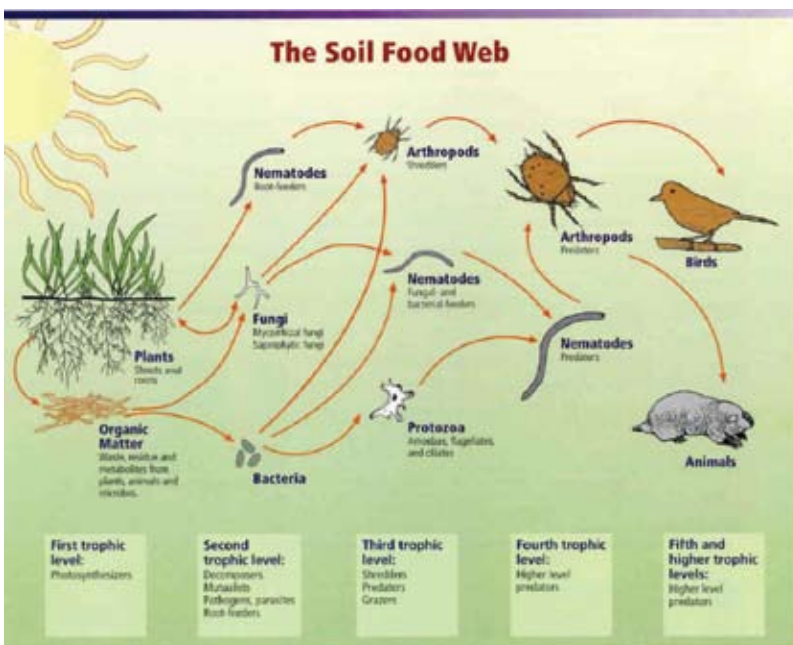
What is the function of each type of soil?

Why is loam the best for plant growth?

Consider the different types of soil in different parts of the world. How does each type support plant growth and human life (give examples)?

Which type is mostly found in your watershed?

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.



From the National Resource Conservation Service's Soil Biology Web site
http://soils.usda.gov/sqi/concepts/soil_biology/soil_food_web.html

Erosion. Discuss the impact of soil type, soil health, and groundcover on erosion. Research different types and examples of erosion and erosion prevention. Ask students to walk/drive around local area looking for erosion as well as examples of conservation practices in place.

Questions to consider:

What is an example of erosion happening around your neighborhood or local area?

What agent or force is causing the erosion to happen?

Where is the eroded material going?

What can be done in order to reduce the amount of erosion?

What is an example of conservation in your area?

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.

Compost and Mulch. Consider ways we can conserve and improve soil. Discuss benefits of composting, mulching, and planting groundcover. Invite a local member of Master Gardeners or Iowa State University Extension to speak to class about topic.



“The nation that destroys its soil destroys itself.”

—Franklin Delano Roosevelt



ADDITIONAL READINGS AND RESOURCES

Morgan, R.P.C., 2005. *Soil erosion and conservation*, 3rd edition. Wiley-Blackwell Publishing, Malden, MA, USA.

ISU Agronomy Extension:
<http://www.agronext.iastate.edu/>

Master Gardeners' web site:
http://www.ahs.org/master_gardeners/

USDA-Natural Resource Conservation Service Soil Quality web page: <http://soils.usda.gov/sqi/>



Video V. The Work of Our Hands

Ecosystem services are defined as “the benefits provided by ecosystems to humans.” Many key ecosystem services provided by biodiversity, such as nutrient cycling, pest regulation and pollination, sustain agricultural productivity. Promoting the healthy functioning of ecosystems ensures the resilience of agriculture as it intensifies to meet the stress of growing demands for food production.

PAPER ASSIGNMENTS AND/OR GROUP DISCUSSION IDEAS:

Ecosystems. Research and investigate the importance and relationship of ecosystems to farming.

Questions to consider:

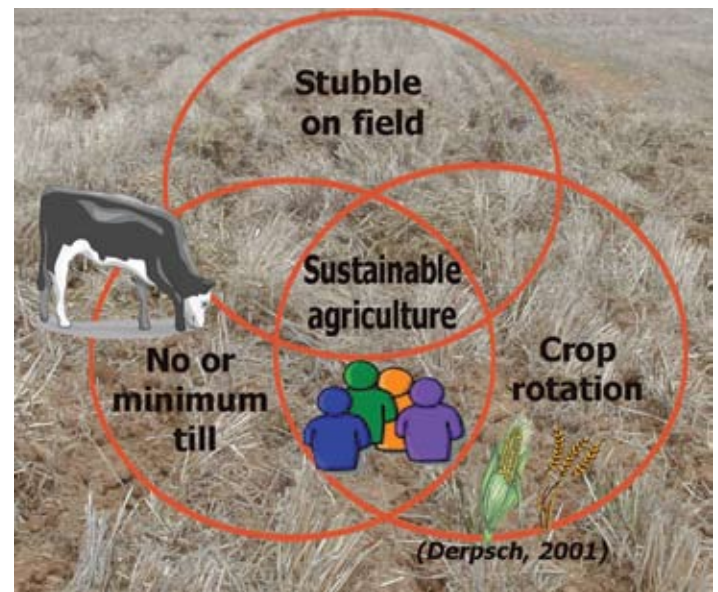
What is an ecosystem?

How does an ecosystem impact and relate to agriculture?

How does agriculture affect the ecosystem?
Give specific examples of each.

Why is it important to sustain and support resilience in ecosystems?

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.



Change. Research the occurrence and ramifications of 1930s drought.

Questions to consider:

What were consequences on the land due to the drought?

What was farming like in 1930s?

How did farming practices contribute to drought and dust storms?

What changes to agriculture resulted due to lessons of dust bowl?

Consider sustainability and resilience in discussions.

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.

Sustainability and Resilience. Have students research the concepts of resiliency and sustainability as they apply to agriculture.

Questions to consider:

What is 'sustainable agriculture'?

What is 'resilient agriculture'?

What is biodiversity?

How are the three related?

Give examples of sustainable and resilient agricultural practices.

Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.



“Sustainable agriculture addresses the ecological, economic and social aspects of agriculture. To be sustainable, agriculture can operate only when the environment, its caretakers and surrounding communities are healthy.”

–Leopold Center for Sustainable Agriculture

ADDITIONAL READINGS & RESOURCES

Resilience Thinking: Sustaining Ecosystems and People in a Changing World. By Brian Walker and David Salt

The Resilience Alliance: <http://www.resalliance.org/2963.php>

Designing an Ecologically Sound City:
http://www.eduref.org/Virtual/Lessons/Science/Environmental_Education/ENV0019.html

The Leopold Center for Sustainable Agriculture:
www.leopold.iastate.edu

Sustainable Agriculture Research and Education:
www.sare.org



Video VI. Reclaiming Stewardship

PAPER ASSIGNMENTS AND/OR GROUP DISCUSSION IDEAS:

Conservationists. One of the speakers in the video described a good conservationist as having three important traits: Being caring, creative, and curious.

Questions to consider:

Do you agree with the speaker that these are the traits of a good conservationist?

What makes a good conservationist?

Think about and discuss your thoughts on the matter. Give specific examples to support your opinion. (Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.)

Culture of Conservation. Creating a culture of conservation requires making conservation a part of our every day lives.

Questions to consider:

How would you rate yourself as a conservationist today?

What things do you do that fit in a culture of conservation?

Are there choices you make that are counterproductive in a culture of conservation?

Are there any changes you are willing and ready to make today toward a culture of conservation? (Assign 1-2 page paper and/or facilitate group discussion about findings and ideas.)

The Future. Have students consider the history and current condition of the “fertile crescent.” Compare what land looks like and is like for agriculture now compared to when it was first cultivated. Have students consider the amount of topsoil lost in Iowa since the mid 1800s.

Questions to consider:

What will Iowa land look like in another 100-300 years? Why?

What does ‘stewardship’ mean and how does the concept of stewardship come into play when thinking about the future?

Compare and discuss student opinions. Encourage them to consider knowledge they’ve gained from videos and research they’ve done related to videos.

ADDITIONAL READINGS

Our common ground: understanding Iowa’s geology. DNR Geological Survey web site:
<http://www.igsb.uiowa.edu>

Final Project Ideas

Help students utilize knowledge gained from video series to better understand their natural environment and/or help others better understand it. Below is a list of activities from which students may choose for final project:

Watershed/Ecosystem Observations.

Complete three 20-minute observations within different areas of watershed. Consider where water would go during rain or ice/snow thaw. What animals are noted? What vegetation is noted? Is any erosion or pollution observed? Share what is observed and learned from the experience via class presentation (10 minute). Include slide presentation or other visual aides. Tie information to knowledge gained from video series.

Conservation. Research the history of land, water, atmosphere, and energy conservation practices in this country. Compare to conservation practices worldwide. Share findings in report (3-5 pages). Include time lines, graphs, and other helpful visual aides.

Personal Change. Carefully consider personal influence upon natural resources. Observe and/or measure personal use of water, energy, soil, and/or atmosphere. Be as objective as possible. Devise personal plan for improved culture of conservation via specific behavioral changes. Write up plan, implement plan, and monitor behavioral changes as well as resulting changes in use of resources. Continue plan for specified number of weeks. Share plan and results in report (3-5 pages) and/or class presentation (10 min).

Outreach. Create a pamphlet to share with friends and neighbors highlighting A Culture of Conservation and knowledge gained from video series. Include environmental concerns as well as solutions. Share pamphlet with at least five different people and ask for feedback. Turn in pamphlet along with written description of sharing experience.

Farming. Interview farmer(s) who utilizes conservation farming practices. Ask them to talk about and show areas on farm where conservation techniques are in use. Share information in class presentation (8-12 min) with slide presentation or other visual aides. Highlight benefits of conservation and compare to farming practices that are not conservation-minded.



Butler County no-till field of soybeans planted into last seasons's corn residue.

ADDITIONAL RESOURCES

Iowa DNR Watershed Improvement:
<http://www.iowadnr.gov/water/watershed/index.html>

Iowa DNR Interactive Mapping:
<http://www.iowadnr.gov/mapping/index.html>

Iowa Online Soil Survey Manuscripts:
http://soils.usda.gov/survey/online_surveys/iowa/

Interactive Web Soil Survey:
[http://websoilsurvey.nrcs.usda.gov/app/
WebSoilSurvey.aspx](http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)

Conservation Districts of Iowa:
<http://www.cdiowa.org/>

Backyard and Urban Conservation:
<http://www.ia.nrcs.usda.gov/features/Backyard.html>

Iowa Watersheds

