

Great Plains – Ogallala Aquifer

QUEST Nebraska Education Guide: A resource for using QUEST Nebraska stories in the classroom
 Check it out online: <http://netnebraska.org/quest>

QUEST NEBRASKA SUBJECTS

Science
 Technology
 Engineering
 Mathematics

NEBRASKA SCIENCE STANDARDS

Grade 6 - 8

Life Science

SC83.3.d *Determine the biotic and abiotic factors that impact the number of organisms an ecosystem can support.*

Earth and Space

SC8.4.2.g *Describe the water cycle*

Grades 9-12

Life Science

SC12.3.3.c *Explain how distribution and abundance of different organisms in ecosystems are limited by the availability of matter and energy and the ability of the ecosystem to recycle materials*

Earth and Space Science

SC12.4.2.c *Evaluate the impact of human activity and natural causes on Earth's resources (groundwater, rivers, land, fossil fuels)*

PROGRAM NOTES

Mike Forsberg is a nationally respected conservationist, author and photographer. His latest book, *Great Plains: America's Lingerin Wild*, is a portrait of the often overlooked and under-appreciated species and habitats of what many think of as "flyover country." To create the images for his award winning book, Mike travelled hundreds of thousands of miles and spent four years in every state in the Great Plains. By returning to Blue Creek, a small Sandhills stream that flows south out of Crescent Lake, and its unique hydrology, Mike hopes to add to his images of unique wildlife and local foliage.

Mike and his friend, Jim Goeke, a hydro geologist with the University of Nebraska and one of the region's most knowledgeable water scientists are studying the relationship between the Ogallala Aquifer and its impact on the environment.

In the Sandhills, the aquifer is very near the surface and in many places reaches the surface sprouting up as lakes and springs. The relationship between the ground water and the surface water is highly visible along Blue Creek. The creek was formed in the past tens of thousands of years when windblown sand moved into and choked off the south flowing river that was precursor to today's stream. The resulting sand dam blocked the free flow of water southward and created the string of lakes above it that are now the Crescent Lake Wildlife Refuge.

Blue Creek, like many Sandhills' rivers and streams, is fed primarily by the Ogallala Aquifer, the vast underground reservoir of water that is buried under the Great Plains. While parts of the aquifer, particularly in the southern plains, have been pumped dry for irrigation, the central portion is one of the nation's largest reservoirs of groundwater.

Focus Questions

- Why is the Ogallala Aquifer important?
- How is an aquifer formed?
- Identify some wildlife that may share the Blue Creek area?
- What are some of the threats to this fragile ecosystem?
- How does an ecosystem "recycle materials?"
- Why is this issue important to me? How does this story affect me?

RESOURCES from PBS, NPR and MORE

VOCABULARY

Define the following (the first 2 have been done for you):

Organism - an individual form of life that has various parts and systems that all work together to maintain life, such as a plant, animal or bacterium

Watershed – the geographic area of land that drains water to a shared destination

Habitat

Wildlife Refuge

Ecosystem

Aquifer

Ogallala Aquifer

Abiotic Factors

<http://springcreekprairie.audubon.org/> - For more information on the Great Plains and Mike Forsberg's work

Additional program background resources:

<http://outdoornebraska.ne.gov/blogs/2011/03/michael-forsbergs-great-plains-blog-after-midnight/>

<http://ne.water.usgs.gov/>

Type "Blue Creek Nebraska" or "Crescent Lake Nebraska": find water quality data, ecosystem information and more!

Maps & Images:

<http://maps.google.com/maps?q=Blue+creek+nebraska&oe=utf-8&client=firefox-a&ie=UTF8&hq=&hnear=Blue+Creek,+Garden,+Nebraska&gl=us&z=9>

<http://www.satelliteviews.net/cgi-bin/g.cgi?fid=827498&state=NE&ftype=stream>

Nebraska History

http://www.nebraskahistory.org/publish/markers/texts/battle_of_blue_water.html

Geological Information

<http://geology.com/lakes-rivers-water/nebraska.shtml>

This link provides world-wide water/hydrological information. Search through Nebraska related stories.

Human Impact on Water Quality

NOTE: Resources from the Teachers' Domain collection require a fast and free registration.

http://www.teachersdomain.org/resource/ess05.sci.ess.watcyc.lp_waterquality/

How do human activities affect our water supplies? In this lesson, students will examine The causes of water pollution in their watershed and consider ways to avoid further pollution.

Build Your Own Aquifer:

http://water.epa.gov/learn/kids/drinkingwater/upload/2009_04_29_kids_activity_grades_9-12_buildingamodelaquifer.pdf

Group Debate Activity:

http://www.plt.org/cms/pages/21_21_178.html: A really neat activity where students take on different roles to investigate & debate the depletion of the Ogallala Aquifer

For additional classroom instructional resources, please check out:

- Segment Summary Student Sheet
http://www.kqed.org/quest/downloads/QUEST_SegSum_StudentSheet.pdf
- Personal Response Student Sheet
http://www.kqed.org/quest/downloads/QUEST_PersResp_StudentSheet.pdf

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www.education.ne.gov

Omaha Public Schools

www.ops.org

Lincoln Public Schools

www.lps.org

Nebraska Academy of Sciences

www.neacadsci.org

Nebraska Association of Teachers of Science

www.neacadsci.org/nats/index.htm

Omaha's Henry Doorly Zoo

www.omahazoo.com

University of Nebraska State Museum

www-museum.unl.edu

Boys/Girls Club of the Midlands

www.bgcomaha.org

Girls Inc. of Omaha

www.girlsinomaha.org

MORE EDUCATIONAL RESOURCES FOR USING QUEST MULTIMEDIA TO ENHANCE 21st CENTURY SKILLS IN TEACHING AND LEARNING

Why Use Multimedia in Science Education?

<http://www.kqed.org/quest/downloads/QUESTWhyMedia.pdf>

- Read about the importance of using multimedia in the 21st century science classroom.

How to Use Science Media for Teaching and Learning

<http://www.kqed.org/quest/downloads/QUESTMediaTips.pdf>

- A collection of tips, activities and handouts to actively engage students with multimedia.

Science Multimedia Analysis

<http://www.kqed.org/quest/downloads/QUESTMediaAnalysis.pdf>

- Give your students the tools to recognize the purposes and messages of science multimedia.

Create Online Science Hikes with Google Maps

http://www.kqed.org/quest/files/download/52/QUEST_ExplorationCreation.pdf

- Do you like the science hike Explorations on the QUEST site? Use this place-based educational guide to create similar science-based maps with youth.

Media-Making Toolkit for Science Education

<http://www.kqed.org/quest/education>

- Are you interested in integrating media making into your classroom or science education program? Find instructions, worksheets and rubrics for implementing simple media-making projects with students.

MORE QUEST



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