



A Delicate Balance: Geo-History of Wildfire in the American West

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Grade Level High School
Duration 3-5 periods

National Standards

GEOGRAPHY

Element 3: Physical Systems

8: The characteristics and spatial distribution of ecosystems and biomes on Earth's surface.

Element 5: Environment and Society

14. How human actions modify the physical environment

15. How physical systems affect human systems

16. The changes that occur in the meaning, use, distribution, and importance of resources

Element 6: The Uses of Geography

17. How to apply geography to interpret the past

18. How to apply geography to interpret the present and plan for the future

HISTORY (NCHS)

Historical Thinking Standard 1

The student thinks chronologically:

Therefore, the student is able to:

Interpret data presented in time lines and create time lines by designating appropriate equidistant intervals of time and recording events according to the temporal order in which they occurred.

AZ Standards

ELA

Reading

Key Ideas and Details

11-12.RI.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

11-12.RI.2 Determine and analyze the development and interaction of two or more central ideas over the course of a text to provide a complex analysis or objective summary.

Writing

Text Types and Purposes

11-12.W.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence.

b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases.

c. Use words, phrases, and clauses as well as varied syntax

Arizona Social Science Standards

GEOGRAPHY

Human-environment interactions are essential aspects of human life in all societies.

HS.G2.1 Analyze interactions within and between human and physical systems.

HS.G2.2 Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.

HS.G2.3 Evaluate the impact of human settlement on the environment and culture of specific places and regions.

HS.G2.4 Evaluate the use and sustainability of natural resources.

Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface.

HS.G3.2 Evaluate the impact of economic activities and political decisions on spatial patterns within and among urban, suburban, and rural regions.

HS.G3.3 Evaluate the influence of long-term climate variability on human migration and settlement patterns, resource use, and land uses at local-to-global scales.

HS.G3.4 Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration settlement.

HS.G3.5 Evaluate the impact of social, political, and economic decisions that have caused conflict or promoted cooperation throughout time.

Global interconnections and spatial patterns are a necessary part of geographic reasoning.

Reconstruct patterns of historical succession and duration in which historical developments have unfolded and apply them to explain historical continuity and change.

Historical Thinking Standard 3

The student engages in historical analysis and interpretation: Therefore, the student is able to:

Consider multiple perspectives of various peoples in the past by demonstrating their differing motives, beliefs, interests, hopes, and fears.

Draw comparisons across eras and regions in order to define enduring issues as well as large-scale or long-term developments that transcend regional and temporal boundaries.

to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

d. Establish and maintain a style and tone appropriate to the norms and conventions of the discipline in which they are writing.

e. Provide a concluding statement or section that follows from and supports the argument presented.

SCIENCE

Life Science

Essential HS.L2U3.18 Obtain, evaluate, and communicate about the positive and negative ethical, social, economic, and political implications of human activity on the biodiversity of an ecosystem. Plus HS+B.L4U1.2 Engage in argument from evidence that changes in environmental conditions or human interventions may change species diversity in an ecosystem.

HS.G4.1 Take an active stance on a geographic issue reflecting its scale (local, regional, state, national, or global)

Overview

Wildfires have been a part of earth's history since time immemorial. For the greater part of the 20th century, the U.S. Forest Service practiced a type of fire management called suppression. Other, often contentious, models of ecosystem restoration and forest sustainability now challenge that policy.

Purpose

In this lesson, students critically examine and analyze, from multiple perspectives, the geography and history of wildfire in America and a century of U.S. Forest Service policies and practices of suppression and management

Materials

- Arizona's Topography and Rivers map https://geoalliance.asu.edu/sites/default/files/maps/SouthwestTopo_BW.pdf
- Arizona Relief map <https://geoalliance.asu.edu/sites/default/files/maps/ArizonaRelief.gif>
- Southwestern U.S. Topography and Rivers (b/w and color) https://geoalliance.asu.edu/sites/default/files/maps/SouthwestTopo_Color.pdf
- 1873 Map of U.S. http://memory.loc.gov/cgi-bin/map_item.pl?data=/home/www/data/gmd/gmd370m/g3701m/g3701gm/gct00008/ca000055.jp2&style=setlmap&itemLink=r?ammem/gmd:@fied%28NUMBER%2B@band%28g3701gm%2Bgct00008%29%29&title=Statistical%2batlas%2bof%2bthe%2bUnited%2bStates%2b
- *The Greatest Good* DVD or access to Internet video programs on 1910 Fires, i.e., YouTube https://www.youtube.com/watch?v=_0qWjXBIZHE&t=18s (30 min)
- Key Issue and Vocabulary T-Chart and Vocabulary Answer Key
- The 1910 Fires Worksheet and reading <https://foresthistor.org/research-explore/us-forest-service-history/policy-and-law/fire-u-s-forest-service/famous-fires/the-1910-fires/>
- Internet-based Resources
- Pens, colored pencils, drawing paper for political cartoons

- “A Clash of Titans” reading
<http://toyfj40.freeshell.org/Stories/Fire1910p4.html>
- *Forest Firefighting Policy* sequence graphic organizer (timeline)
- *Southwest Fire Science Consortium* “Managing Fire for Multiple Objectives: Blazing the Trail in the Southwest.” reading
http://swfireconsortium.org/wp-content/uploads/2012/06/Fire-Policy-Final_WEB.pdf
- *Reconciling Frictions in Policy to Sustain Fire-Dependent Ecosystems* graphic organizer and reading
https://www.frames.gov/documents/usfs/fmt/fmt_65-4.pdf

Objectives

The student will be able to:

6. Define key vocabulary terms, concepts, and issues related to wildfires and fire policy.
7. Describe the process of plant succession in a forest ecosystem.
8. Diagram a chronology of wildfire policies from the early 20th century to the present.
9. Evaluate the process by which the policy of fire suppression came to be the standard approach to wildfire.
10. Analyze the historical and contemporary impact of the role wildfire suppression and management policies have played in the maintenance, preservation, restoration, and stewardship of America’s forests.
11. Compose a well-constructed argument.

Procedures

Prerequisite Skills/Prior Knowledge: *Students should have basic understanding of conservationism as one aspect of the Progressive era in American history through the late 19th and early 20th centuries, including the establishment of the nation’s national parks, the preservation of forest land by Presidents Harrison, Cleveland, and Roosevelt, and the establishment of the United States Forest Service with Gifford Pinchot as its first administrator.*

Students have a background in what is climate change and what are its causes and effects.

SESSION ONE

1. Introduce the set of lessons by projecting a map of the U.S. showing federal lands and ask students what they notice about the location of the national parks, forests, and monuments.

2. Have students pair up and compose on paper a response to the question: “For what purpose do we have or need national forests and grasslands and how do you define a *healthy forest*?” Give them 5 minutes to complete this and then conduct a class discussion on this question. From this sharing, develop a class-wide definition of what a healthy forest is and compare this definition with others you might find on the Internet.
https://fhm.fs.fed.us/pubs/fhncs/chapter1/a_healthy_forest.htm
3. Project the 1873 map from the Library of Congress. Impress upon them the significance of the decrease in wooded forests, and especially the changes in the amount and location of virgin forests from 1620 through the 20th century.
http://memory.loc.gov/cgi-bin/map_item.pl?data=/home/www/data/gmd/gmd370m/g3701m/g3701gm/gct00008/ca000055.jp2&style=setlmap&itemLink=r?ammem/gmd:@fied%28NUMBER%2B@band%28g3701gm%2Bgct00008%29%29&title=Statistical%2batlas%2bof%2bthe%2bUnited%2bStates%2b
4. Have students view the program segment “The Big Blowup” from the 2nd DVD *The Greatest Good* (approx. 3 mins). This is an excellent introduction to the early days of the U.S. Forest Service and the catastrophic wildfires that destroyed millions of acres in the Rockies and the Pacific Northwest. You can also find several other online video programs about the 1910 fires.
<https://www.youtube.com/watch?v=OqWjXBizHE&t=18s> (30 min)
<https://www.youtube.com/watch?v=RzEaoTZ3MX4> (2 min)
https://www.youtube.com/watch?v=uUj_KoGXruY (5 min)
5. Distribute copies of the Key Issues, Terms or Concept Vocabulary T-Chart and instruct students to provide definitions, explanations and/or examples. Have students finish vocabulary work as homework if necessary.

SESSION TWO

1. Begin class by reviewing the Vocabulary homework from the day before.
2. Project the online maps or have students visit the websites being referenced in the list of Internet Resources (Esri, NOAA, NASA, GeoMAC, Google@Earth, etc.). Provide an overview of some of these resources and lead students through a review of the fundamentals of biogeography, ecosystems, and forest ecology.

3. Discuss the impact that this series of fires had on the American *psyche* and that it took place in the context of large wildfires that summer in other parts of the country as well.
4. Distribute The 1910 Fires Worksheet and copies of the reading. <https://foresthistor.org/research-explore/us-forest-service-history/policy-and-law/fire-u-s-forest-service/famous-fires/the-1910-fires/>
5. Instruct students to read the brief history and respond in writing to each of the questions. (This assignment will provide students with the necessary understanding of why wildfire suppression became the standard policy for the federal government.)
6. Conclude class by discussing the questions and answers.

SESSION THREE

Prior to this class: Locate online political cartoons dealing with wildfires and climate change to find ones suitable for your community/school population.

1. Begin class by projecting some contemporary political cartoons on forest fires and climate change. Briefly discuss the meaning, impact, and controversial political nature of some of the cartoons.
2. Review with students the value of political cartoons in studying and understanding historic events. If needed, project on a screen some of the political cartoons from the early 20th century and discuss briefly what issue each cartoon is representing or addressing.
3. Distribute copies of the article “A Clash of Titans.” <http://toyfj40.freeshell.org/Stories/Fire1910p4.html>
4. Instruct students to read it carefully to identify key ideas such as important issues, differences of opinion on policy, conflicts or problems, historical events, significant decisions, or interesting points of view.
5. Have them use the drawing paper and pencils or pens to create an original political cartoon focused on ideas in the Clash of Titans. Remind students of the general requirements for a good political cartoon [borrowed from the PBS NewsHour political cartoon lesson plan website]: The cartoon must have a foundation in truth, its wit/humor is exaggerated not just to get a laugh, but to make a point about the character or subject of the cartoon, and it should have a moral purpose (giving the viewer something to think about, either supporting or refuting the message).
6. Post or project the cartoons in the classroom and have students discuss their work and ideas.

7. Remind students again of the importance of recognizing in what ways more than one interpretation of factual materials is valid.

SESSION THREE

1. Begin class with reminding students of the meaning and importance of *thinking spatially* in the study of geography and history. One way to think spatially is through a chronological list of events (timeline)
2. During the upcoming timeline assignment, they should identify possible (and potentially conflicting) reasons the policy of wildfire suppression came to be the standard response. They should consider the occurrence of wildfire in America throughout the century in the context of other events taking place in the world. They should think about the nature of wildfire and where it has often been situated in the continental U.S. in the past century, and especially in the past few decades? Finally, they should evaluate the fire suppression model in the light of what we have learned from science about fire, the environment and climate?
3. Review with students the skills needed to create a graphic timeline (clear titles, dates, and comprehensible illustrations). Distribute copies of the “Forest Firefighting Policy Sequence Graphic Organizer” to the students. Project or have students access this National Parks Service website: <https://www.nps.gov/subjects/fire/wildfire-history-timeline.htm>
4. Instruct students to work in pairs and read through the NPS Wildland Fire Timeline (1736 to 2017). They are to select the 10 most important events (in their opinion) and write the title of the event, its date, and illustrate the event. Even though they are working in pairs, they should each be doing their own timelines.
5. Note: The Timeline has clickable events on the left and some of the dots on the timeline have many events connected to it. You may want to limit the scope to just a few years. This may become a homework assignment if not completed in class.

SESSION FOUR

1. Have students share their 10 most important events with a student they did not partner with in Session Three. If time permits, see if the class can arrive at 10 events that truly seem the best choices.
2. Distribute paper copies of or have students access the article from the *Southwest Fire Science Consortium* “Managing Fire for Multiple

Objectives: Blazing the Trail in the Southwest.”

http://swfireconsortium.org/wp-content/uploads/2012/06/Fire-Policy-Final_WEB.pdf (This reading assignment that will help students clarify post-2009 changes to federal wildfire management policy and help students formulate thoughts for their written argument on healthy forests and wildland fire policy.)

3. Distribute paper copies or project “Reconciling Frictions in Policy to Sustain Fire-Dependent Ecosystems.” Distribute the *Reconciling Frictions in Policy to Sustain Fire-Dependent Ecosystems* graphic organizer.
https://www.frames.gov/documents/usfs/fmt/fmt_65-4.pdf
4. Read and discuss the information as a whole class and complete the graphic organizer. (This assignment will provide students with an understanding of the many factors that influence and complicate wildland fire policy for land managers.)
5. Ticket Out the Door: “Fire is unique in that it can be either a beneficial natural process or a devastating catastrophe.” Explain this statement in your own words.

SESSION FIVE

1. Begin class by recalling the definition of healthy forests that the class developed at the start of this lesson. Ask them to think about it again as they have now gained a better understanding of the relationship between fire, ecosystems and humans, and see if the definition still suits them.
2. Instruct students to compose an argument that addresses the question: “How do you define a *healthy forest* and what should the federal policy on wildland fires be in order to ensure the future of healthy forest ecosystems?”
3. End class with this quote from Stephen Pyne, “Fire matters because nothing else can so alter the land at a stroke, which is why fire remains today, as at the founding of forestry in the United States, the great instrument of any land stewardship that seeks to preserve or enhance the ecological integrity of a place, and why, a century from now, scholars will look back and say that we too got it wrong in our particulars. What we can hope is that we will get the basics right: that fire is something many lands need, and that we as a species must do our part to get it right with dedication, humility, and tolerance.”

Assessment

Social Science, ELA, and Science

The final assessment (argument) can be graded using the rubric provided. Mastery will be considered 3 or higher in each of the categories scored.

The Key Issue and Vocabulary T-Chart can be graded for accuracy and completeness. Mastery will be considered a score of 80% or higher.

ELA and Social Science

The 1910 Fires Worksheet can be graded for accuracy and completeness. Mastery will be considered a score of 80% or higher.

The political cartoon “A Clash of Titans” can be scored with the 6 Traits Writing Rubric with a focus on Ideas and Content. Mastery will be considered 3 or higher.

Social Science

The Forest Firefighting Policy Sequence Graphic Organizer can be graded for accuracy and completeness. Mastery will be considered a score of 80% or higher.

Extensions

Trace the history of federal (and/or local) laws and efforts to ensure or restore forest ecosystem health and the probable impact of the law or effort on wildfire.

Research one of the major catastrophic wildfires of the past 100 years and prepare a brief report on its cause, impact, results and possible lessons learned that influenced fire policy.

Examine the impact of the global climate change in the late 20th century and early 21st century on forest ecosystems in the American Southwest by creating a PowerPoint© presentation to share with the class

Sources

Highly recommended reading:

- *America’s Fires: A Historical Context for Policy and Practice* by Stephen J. Pyne; Forest History Society, 2010.
- *The Wildfire Reader* by George Wuerthner (ed.); Island Press, 2006.

Additional selected reading:

- *American Forests: A History of Resiliency and Recovery* by Douglas W. MacCleery; Forest History Society, 2012.
- *The Big Burn: Teddy Roosevelt and the Fire that Saved America* by Tim Egan; Houghton Mifflin Harcourt, 2009.
- *Burning Questions: America's Fire With Nature's Fire* by David Carle; Praeger Publishers, 2002.
- *The History Teacher* 45, No. 3 (May 2012): 405-420. "Avoiding the Complex History, Simple Answer Syndrome: A Lesson Plan for Providing Depth and Analysis in the High School History Classroom" by David H. Lindquist.
- *Fire in America: A Cultural History of Wildland and Rural Fire* by Stephen J. Pyne; University of Washington Press, 1982.
- *Forest Sustainability: The History, the Challenge, the Promise* by Donald W. Floyd; Forest History Society, 2002.
- *Introduction to Fire in California* by David Carle; University of California Press, 2008.
- *Living With Fire: Fire Ecology and Policy for the Twenty-First Century* by Sara E. Jensen and Guy R. McPherson; University of California Press, 2008.
- *Looking Through the Smoke* by E.F. "Jinx" Pyle; Git a Rope! Publishing, 2002.
- *The Monster Reared His Ugly Head: The Story of Rodeo-Chediski Fire and Fire as a Tool of Nature* by Jim Paxon; Cedar Hill Publishing, 2007.
- *Pathway to Sustainability: Defining the Bounds on Forest Management* by John Fedkiw, et.al.; Forest History Society, 2004.
- *A Sand County Almanac* by Aldo Leopold; Ballantine Books, 1966.
- *Scorched Earth: How the Fires of Yellowstone Changed America* by Rocky Barker; Island Press, 2005.
- *Tending Fire: Coping With America's Wildland Fires* by Stephen J. Pyne; Island Press, 2004.
- *The Tinder Box: How Politically Correct Ideology Destroyed the U.S. Forest Service* by Christopher Burchfield; Stairway Press, 2012.
- *Uncommon Ground: Rethinking the Human Place in Nature* by William Cronon (ed.); Island Press, 2006.
- *Year of the Fires: The Story of the Great Fires of 1910* by Stephen J. Pyne; Mountain Press Publishing, 2008.

Selected Films on Wildfire

The Greatest Good

The choices about how we use our rich natural heritage are filled with controversy. Whether it is the protection of endangered species or meeting

the needs of a growing public, the fate of public lands is constantly challenged by the constraints of democracy. Visionary foresters Gifford Pinchot and Aldo Leopold shaped the debate over land stewardship for a hundred years. Their journey from the "wise use" of resources to the idea of a "land ethic" has defined the evolution of the Forest Service and the management of National Forests and Grasslands. (2005, 3-DVD set, 300+ min)

Nova: Fire Wars

In the program, NOVA accompanies the men and women of a wildland firefighting crew known as the Arrowhead Hotshots as they battle one of the most destructive wildfire seasons ever, the summer of 2000. (2002, DVD, 120 min.)

Yellowstone Aflame

An exciting film showing Yellowstone before, during, and after the Great Yellowstone Fires of 1988. Learn the complete story where the fires and their gale force winds destroyed millions of trees, burned nearly a million acres and yet, gave birth to a new cycle of growth that will insure a healthy forest for years to come. (2008, DVD, 65 min.)

Classroom Lesson Sources

Library of Congress 1873 map

http://memory.loc.gov/cgi-bin/map_item.pl?data=/home/www/data/gmd/gmd370m/g3701m/g3701gm/gct00008/ca000055.jp2&style=setlmap&itemLink=r?ammem/gmd:@field%28NUMBER%2B@band%28g3701gm%2Bgct00008%29%29&title=Statistical%2batlas%2bof%2bthe%2bUnited%2bStates%2b

The 1910 Fires Reading

<https://foresthistor.org/research-explore/us-forest-service-history/policy-and-law/fire-u-s-forest-service/famous-fires/the-1910-fires/>

A Clash of Titans by Jim Petersen, Evergreen Magazine [Winter Edition 1994-1995]
<http://toyfj40.freeshell.org/Stories/Fire1910p4.html>

The U.S. Forest Service Reading

http://www.foresthistor.org/ASPNET/Publication/s/first_century/index.htm

Managing Fire for Multiple Objectives

Reading

http://gallery.mailchimp.com/35f64585b7351c71937d858e9/files/Fire_Policy_Final.pdf

YouTube Videos – Recommended!

Mann Gulch: The Wrath of Nature (9:56)
<http://www.youtube.com/watch?v=wbs1Uqc-y4c>

Smoke Jumpers – USDA (54:30)
<http://www.youtube.com/watch?v=iFYDiwK1wrQ>

The Great Fire of 1910 – Documentary (30:47)
<https://www.youtube.com/watch?v=0qWjXBlzHE>

Forest Fires and Forest Management (17:04)
<http://www.youtube.com/watch?v=UiKh297dOZE>

Forests Under Fire – Documentary (28:56)
<http://www.youtube.com/watch?v=5WcT5cdbu5Q>