

PROJECT TITLE: Legacy of Irrigation in the American Southwest	
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CLASSROOM PRACTICE

1. **HI Overview & Teaching Thesis:** A system of irrigation was essential for groups settling in the American Southwest. Students will study the irrigation methods employed by three groups, the Hohokam, the Spanish colonizers, and the U.S. government to discover irrigation's lasting effects on the environment and human settlement in the region. This will provide students with a better working knowledge of the geographic theme of human-environmental impact.
2. **Suggested Grade Level and Length of Activities:** Grade Levels 7-10, 60- 90 Minutes for Wikipage, additional time as needed for assessment

3. **Significance & Relevance:**

Students will explore the methods of irrigation practiced by three groups (the indigenous Hohokams, the Spanish colonizers, and the government of the United States) to explain how each dealt with the realities of life in an arid climate. By examining the climate reality of the region through the use of climate maps and weather data, students will understand the need for irrigation in this region. Knowledge of the technology applied by each group in regards to irrigation should also be gained. A larger focus deals with the interplay between man and environment. For example, how is man impacted by his environment and what impacts do man's actions have on the environment.

Selected State & National Standards

Virginia SOL:

World Geography 2b. The student will analyze how selected physical and ecological processes shape the Earth's surface by describing how humans influence the environment and are influenced by it.

U.S. History II:

- USII 2. The student will use maps, globes, photographs, pictures, or tables for
- a) explaining how physical features and climate influenced the movement of people westward

- USII.4 The student will demonstrate knowledge of how life changed after the Civil War by
- a) identifying the reasons for westward expansion, including its impact on American Indians

OAH Historical Inquiry Skills

1. **Chronological Thinking**-students will gain a historical understanding of the progression of western irrigation from Pre-Columbian groups through present –day. Beginning with the methods of the Hohokam of the Pre-Columbian, continuing with the Spanish colonials, and concluding with the U.S. government student will gain a rudimentary chronology of the groups involved in the settlement of the American southwest. In looking at how the irrigation technology improved with each group student will be able to order each group chronologically.
2. **Historical Comprehension**- students will develop historical comprehension skills by analyzing the arguments in favor of irrigation through the words of those involved

4. **Technology (if applicable)** - Students will need internet access to complete this activity.

5. **Modifications, Differentiation, and Extensions –**

1. Heterogeneous grouping could be utilized for students of mixed abilities.
2. Number of assessment questions can be reduced

6. Lesson Overview

Guiding Questions	Objectives	Assessment	Activities to support objectives and assessment
Title: Irrigation in the West Guiding Questions 1. What are the limiting climate factors to living in the American southwest? 2. Who were some of the groups settling the Southwest? How did each group deal with the arid landscape? 3. How did each group use available technology to modify the landscape and thus make it more inhabitable? 4. How did the irrigation of the Southwest represent a global convergence of technology? 5. What was the environmental or ecological legacy of irrigation in the American Southwest?	1. Students will be able to explain the challenges to settlement in the American Southwest. 2. Students will be able to describe the technology and period modern innovation used by the inhabitants of the American Southwest to carve out an existence in an arid landscape. 3. Students will identify a basic chronology of settlement in the American southwest from the indigenous groups to Spanish colonizers to the modern (U.S.) inhabitants. 4. Students will show that irrigation methods draw upon skills and ideas from across the world. 5. Students will be able to identify some of the lasting human and ecological impacts of irrigation in the American Southwest.	A menu of assessment options has been provided. Depending upon time and ability level of students, teachers can chose to use a select combination of performance based assessments. (File is formatted in Word, so as to make it modifiable.)	Interactive question sheet to be completed in conjunction with a PowerPoint and Wikisite activity.

7. Related Materials and Resources:

1. Lesson Plan (FILE: LPT-Irrigation)
2. PowerPoint – Irrigation in the West
3. Students will need access to <http://irrigationinthewest.wikispaces.com/>
4. Guided Notes and Question Sheet for Wiki (answers included)
5. Irrigation in the West Assessment Page (rubrics included)

8. Annotated Instructional Bibliography

"Brief History." Bureau of Reclamation Homepage. Web. 30 Apr. 2011.
<http://www.usbr.gov/history/borhist.html>

This webpage contains an overview of the Bureau of Reclamation from its inception with the passage of the Reclamation Act through the present. Specific focus is paid to outcomes and impacts of the Bureau's projects.

Eckhardt, Gregg. The San Antonio River. 1 May 2011.
<http://www.edwardsaquifer.net/sariver.html>

This article is a rather brief examination of the acequias system constructed along the San Antonio River. It provides a good historical account of the usage of the acequias system in the area.

Fradkin, Phillip (1981). *A River No More*. New York: Knopf

Fradkin's book is an exploration of the Colorado River and its importance to the American Southwest. As one of the most heavily irrigated and dammed river in the United States, Fradkin argues that understanding the legacy of the Colorado is vital to studying the people of the region. This book provides a historical overview of irrigation in the Southwest.

Gumerman, George (Editor) (1991). *Exploring the Hohokam*. Albuquerque: University of New Mexico

This is a collected work of essays written by historians, anthropologists, and archaeologists dealing with the culture of the prehistoric Hohokam people. Jill Neitzel focuses particular attention to irrigation with her essay, *Hohokam Material Culture and Behavior*.

Haury, Emil (1976). *The Hohokam: Desert Farmers and Craftsmen*. Tucson: Univ. of Arizona Press

Due to their prehistoric existence, much of what historians know about the Hohokam comes from the archaeological record. Archaeologist Emil Haury's work is of value to scholars interested in daily life among the Hohokam. Numerous black and white photographs help shape readers images of prehistoric life in an arid climate.

Howard, Jerry. *Hohokam Legacy: Desert Canals*. Web. 3 May, 2011

<http://www.waterhistory.org/histories/hohokam2/>

A brief article describing the canals of the Hohokam as found in and around the Salt River Valley. Of particular use are the included maps and illustrations.

Pisani, Donald (1992). *To Reclaim a Divided West: Water, Law, and Public Policy, 1848-1902*.

Albuquerque: University of New Mexico Press

Pisani focuses on the emerging Republic's debate over how to settle the lands of the arid west. He traces the rise of private irrigation systems and how their subsequent failure necessitated the involvement of the federal government. This culminates in the passage of the Reclamation Act of 1902 which is covered in detail in Chapter 8.

Powell, John Wesley. (1962) *A Report on the Land of the Arid Region of the United States*. Edited by Wallace Stegner. Cambridge: Belknap Press

A seminal work by one of the strongest advocates of federal irrigation system in the West. This work gives a first hand account of the climate and geology of the West.

Reisner, Marc (1986). *Cadillac Desert: The American West and Its Disappearing Water*. New York: Viking

This work offers a historical look at the efforts to utilize the limited water in the American Southwest. Chapter 8 provides the reader with a survey of the Hohokam people and their efforts at irrigation in the Gila River valley. Reisner also sheds light on the climate factors that make irrigation a necessary part of daily life in this region. This is best exemplified by chapters 1 and 2.

Rivera, Jose A., and Thomas F. Glick. "The Iberian Origins of New Mexico's Community Acequias." *Taos Valley Acequias Association*. Web. 30 Apr. 2011.

<http://www.taosacequias.org/Documents/GlickRivera409.pdf>

This article provides a detailed history of the Spanish colonialist's promotion of an "acequias" irrigation system. It also details the influence of Arab invaders in bringing this system to Spain.

Rowley, William (1996). *Reclaiming the Arid West: The Career of Francis G. Newlands*. Bloomington, Indiana University Press

Dealing with the life of one of the strongest advocates of federally funded irrigation, this work is beneficial in understanding Newlands role in the passage of the Reclamation Act of 1902. While a good portion deals with his early life and career, chapters 1 and 8 are of particular value to those interested in his advocacy for federal irrigation projects.