

Engaging students in local to global contexts with an online atlas

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How can an atlas be used by educators and students to develop 21st century skills?

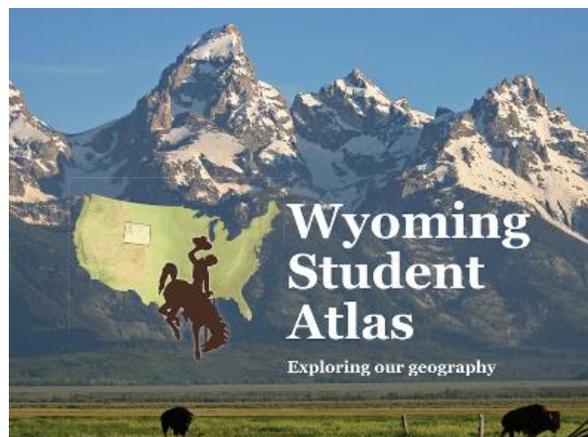
The skills required for students to master in preparation for success in a rapidly changing, digital society:

- Collaboration and teamwork
- Creativity and imagination
- Critical thinking
- Problem solving
- Flexibility and adaptability
- Global and cultural awareness
- Information literacy
- Technology literacy
- Leadership
- Civic literacy and citizenship

A little background:

The Wyoming Student Atlas was published in 2014: a full color, 9 x 12 inch soft-cover book

- based on geography standards and developed as tool for teaching spatial awareness and critical thinking skills
 - How has the geography of Wyoming influenced its history? It's economy?
- fourteen pages of Wyoming physical geography maps (geology, climate, water, wildlife, land cover, and more)
- twenty five pages of Wyoming human geography maps (history, economy, energy, cultural heritage and more)
- Includes facts and statistics about Wyoming and map reading skills
- Class sets have been distributed to all Wyoming elementary, middle, and junior high schools (targeting grades 4 through 8)
- Since publication in 2014, many teachers have adopted the Atlas into social studies and science lesson plans



Online version of the Atlas

<http://atlas.wygisc.org>

- 38 pages from the paper version of the Atlas were expanded using ESRI's Story Map templates and apps (Journal, Tour, Swipe, Time Series)
- Additional maps, images and popups allow much more detail and exploration than paper version, including ability to modify maps and add data
- The online version includes updated maps and data (2016-2017)
 - Parts of Wyoming's economy have undergone drastic changes since the 2014 publication of the paper version
- The online version includes local to global context
 - Students start by exploring a topic specific to Wyoming, then zoom in for more local context and zoom out for connections at regional, national and global scales

Local to global context example

An example of one of the pages of the story map on earthquakes.

Wyoming Student Atlas

Earthquakes and landslides

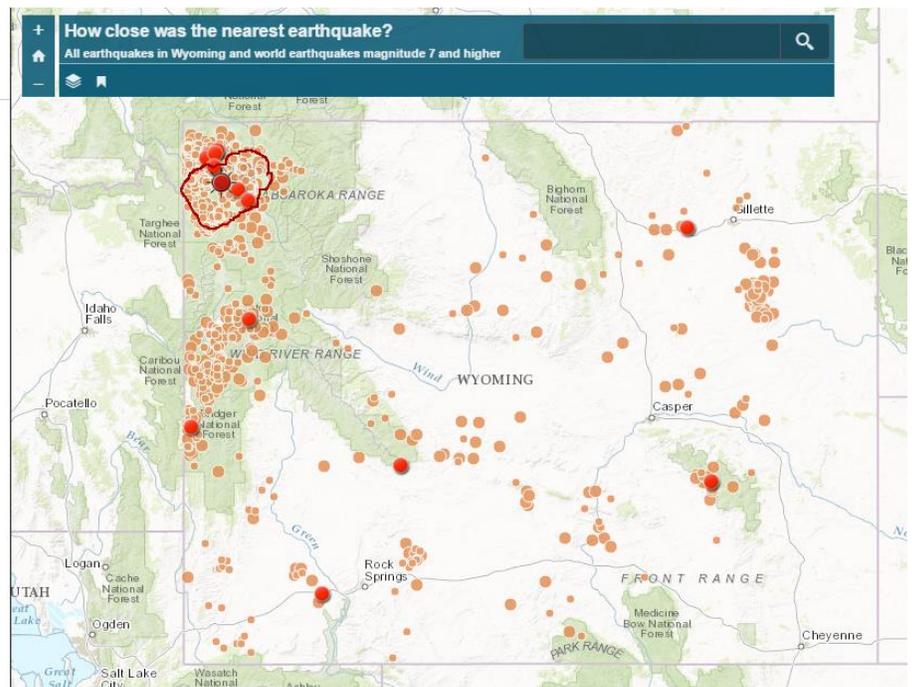
Historical earthquakes

Type your town in the search box on the map to zoom to your location. Then slowly zoom out to locate earthquakes that have occurred near your town. Click on any earthquake to find out when it happened and what its magnitude was. Magnitude is a measure of the size of an earthquake and total energy released.

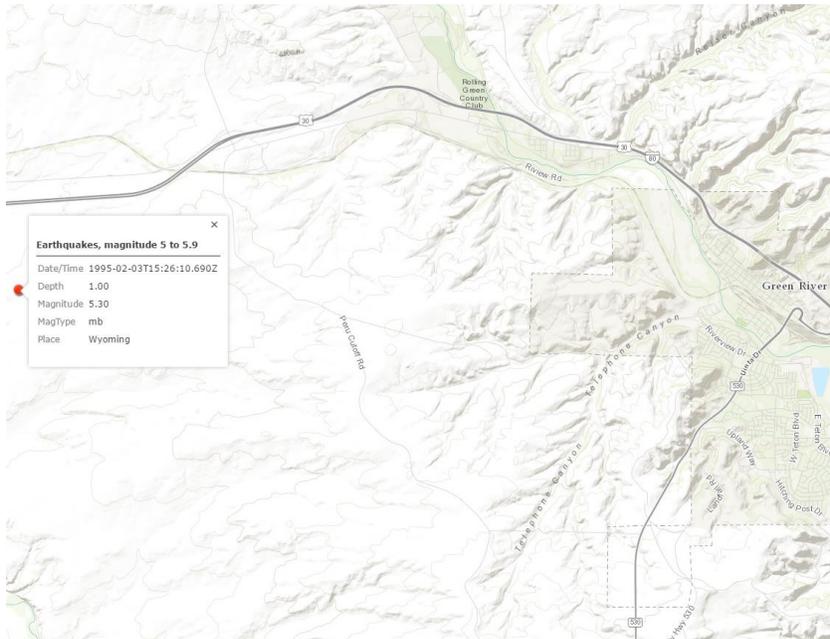
Zoom out even further to see significant earthquakes (magnitude 7 and higher) around the world from 1900 to 2016.

Earthquakes in Yellowstone

The 7.3 magnitude Hebgen Lake earthquake in 1959 was centered just outside of Yellowstone in Montana, but was also the largest recorded earthquakes (magnitude 6.5) in Wyoming.

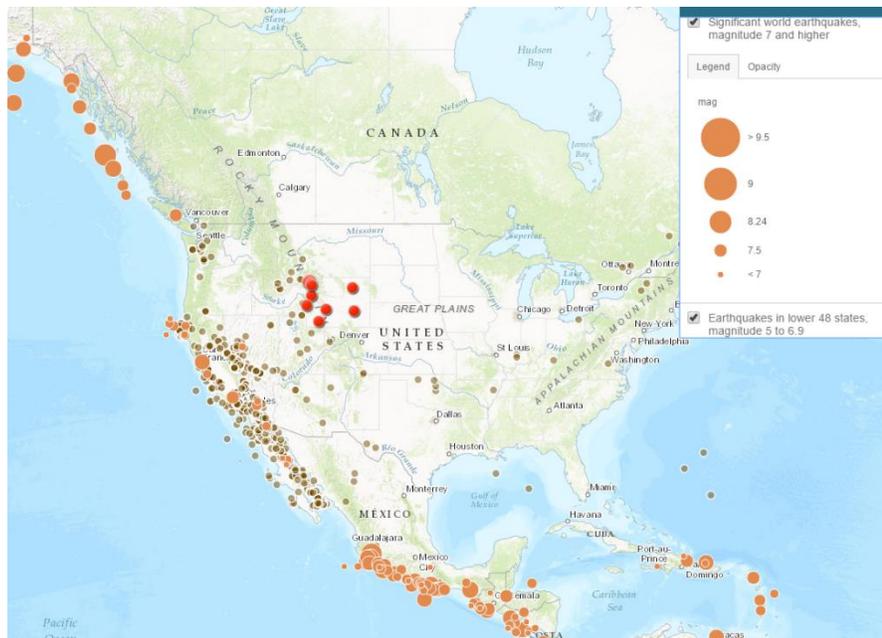


Where are earthquakes close to my town? (Green River, Wyoming)



Local context: a student can zoom to their own town and find recognizable features. Then they can zoom out and see what earthquakes have occurred near their town, and then explore more details about earthquakes (when did recent earthquakes occur? How often? What magnitude? Each story map in the online Atlas is also linked to interactive web maps which students and educators can modify to fit specific lesson plans. For instance, students can modify the earthquake web map by searching for and adding fault data and exploring what might have caused the earthquake(s).

National or global context: How do earthquakes in Wyoming compare to patterns around the world?



- ▶ Exploring data in the maps to answer questions like what changes have occurred over time and space, and why?
- ▶ Modifying maps and adding data
- ▶ Zoom in for more local context
 - ▶ I recognize that place, it's near my school! What else is around my school? Or neighborhood?
- ▶ Zoom out for connections at regional, national and global scales
 - ▶ I didn't realize how similar/different that place is from my community

- ▶ Critical thinking
- ▶ Problem solving
- ▶ Collaboration and teamwork
- ▶ Information literacy
- ▶ Creativity and imagination
- ▶ Flexibility and adaptability
- ▶ Technology literacy
- ▶ Civic literacy and citizenship
- ▶ Global and cultural awareness

Connecting to high school curriculum

Many high school teachers do not have time to focus on Wyoming history, but units on westward expansion include the Trail of Tears, the forced removal of eastern tribes to Oklahoma. The loss of almost all original reservations in Oklahoma can be tied to loss of treaty land in other states like Wyoming, allowing students to make a connection with their own community.

Wyoming Student Atlas

Native American tribes

Sioux and the Crow, and relocated the Arapaho to the Wind River Reservation in 1878 to live with the Shoshone, a traditional enemy.

Present day native lands

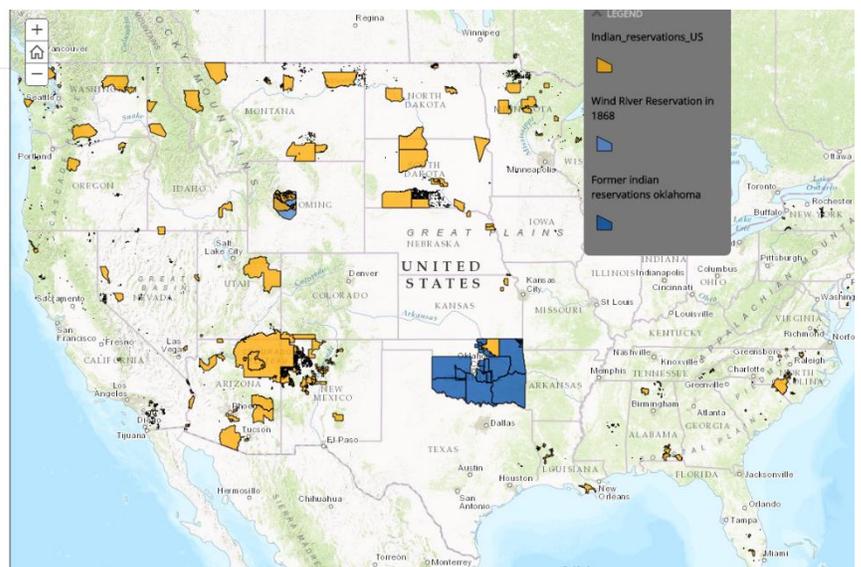
Today, many Shoshone and Arapaho live on the Wind River Reservation in central Wyoming; the Crow and Northern Cheyenne live on reservations in southeastern Montana; and the Sioux Nation is split between reservations in South Dakota, North Dakota, and Nebraska.

This map shows present day native lands in and around Wyoming (orange). The size of the Wind River Reservation was reduced from its original extent in the Fort Bridger Treaty of 1868 (blue) by three subsequent treaties in 1872, 1897 and 1904. In each case, land originally given to the Shoshone and the Arapaho was deemed to be valuable to whites. Townsites, mineral development, and irrigation were economic factors that encouraged these treaties to be signed.

Zoom out to the entire United States to see other reservations. The original size of reservations was reduced in many other states. Which state shows an example of another significant reduction of size (blue)? Click on some of the former reservations to see which tribes were affected by a treaty in 1907.

Sources

Approximate territories of tribes in Wyoming in 1850: Wyoming State Historic Preservation Office.



Four components of the online Wyoming Student Atlas

1. [Story maps](#): 14 Physical Geography story maps and 24 Human Geography story maps with text, images, graphs and interactive maps that explore the subjects in greater detail than possible in the paper version of the Wyoming Student Atlas.
2. [Modifiable web maps](#): Students and educators may modify the web maps used in the story maps to show additional data, or display existing data in different ways
3. [Digital flipbook](#): a digital copy of the paper version of the Atlas with links to Story Maps and web maps.
4. [Downloadable data](#): most of the geospatial data used to create the web maps, story maps, and paper maps of the Wyoming Student Atlas is available for download to use in Google Earth, ArcGIS, QGIS, etc.