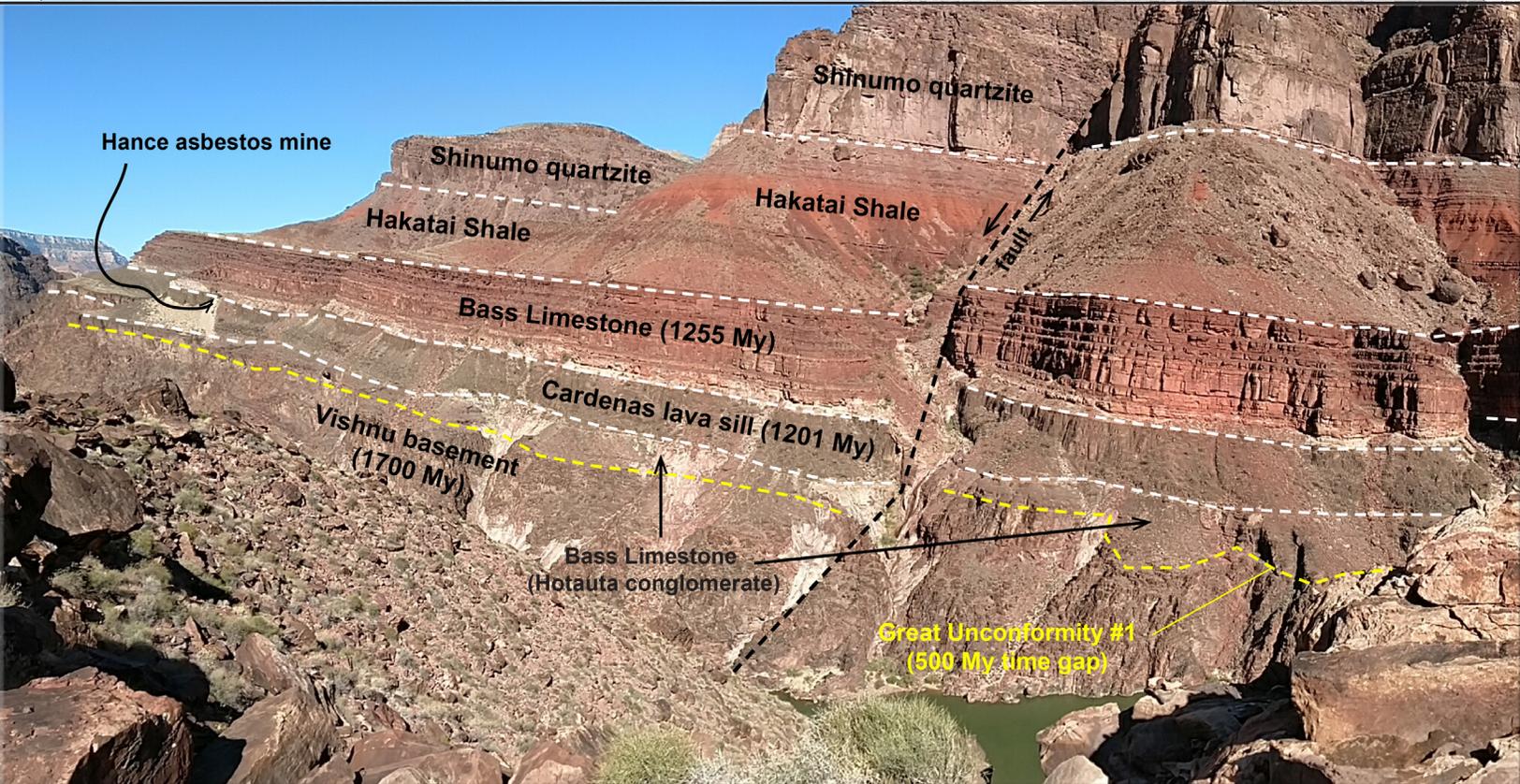


Supplemental resource document for Geologic Timeline of the Grand Canyon

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Arizona Geological Survey



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Cover image: Looking north at Grand Canyon Supergroup rock formations, the Great Unconformity, and New Hance asbestos mines as seen from south side of Colorado River on the Tonto Trail between New Hance and Grandview trails.



UA SCIENCE

Supplemental resource document for Geologic Timeline of the Grand Canyon

B.F. Gootee | Arizona Geological Survey

This supplemental document contains a list of resources and publications used to create the 'Geologic Timeline of the Grand Canyon' region. Most references are technical journal articles, so provided is a short reading list of books that I have found helpful for learning more about geology of the Grand Canyon and Colorado Plateau. References are listed by sections from the pamphlet and in many cases a publication was used to refine several sections. Geology terms commonly used in the timeline are included in a short glossary. Links to online resources I have found informative and visually helpful are also listed.

This geologic timeline was originally inspired by a poster I purchased in 2005 by PanTerra, Inc. called "A Correlation History of Earth". The Grand Canyon timeline was created in Adobe Illustrator; the generalized geologic map was built in ESRI ArcMap.

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Reading List

- Exploration of the Colorado River by John W. Powell, 1875. 2003 by Penguin Classics, 432 p.
- Carving Grand Canyon: Evidence, Theories, and Mystery, by Wayne Ranney, 2005. Grand Canyon Association, 160 p.
- Life in Stone by Christa Sadler, 2005. Grand Canyon Association, 72 p.
- Ancient Landscapes of the Colorado Plateau by Ron Blakey & Wayne Ranney, 2008. Grand Canyon Association, 176 p.
- Grand Canyon, Written and illustrated by Jason Chin, 2017. Roaring Brook Press/Macmillan, 54 p.

Online Visual Resources

- Interactive Geologic Map of Grand Canyon: <http://rclark.github.io/grand-canyon-geology/>
- Video of downstream spillover integration by Kyle House, 2013: <https://www.youtube.com/watch?v=6inRutNMDCo>
- Virtual Field Trip of Grand Canyon by John Douglass, 2002, at http://www2.pvc.maricopa.edu/~douglass/v_trips/grand_canyon/introduction.html

Glossary

- Aggraded: the vertical accumulation of sediment. E.g. the Bullhead Alluvium aggraded up to 1,000 ft along the margins of the lower Colorado River valleys.
- Crust: Outermost solid layer of Earth, made of continental and oceanic crust. 98% of the crust is composed of the "Big 8" elements: Si, O, Fe, Mg, Na, Al, K, Ca.
- Erosion: transportation or removal of sediment primarily via water.
- Fault: a break across rock strata with movement along the fault.
- Joint: a break across rock strata with no movement on either side.
- Mass wasting: the downslope movement of loose soil and rock (sediment).
- Metamorphic rocks: rock formed by altering pre-existing rocks through heat and/or pressure. E.g. gneiss, schist, marble, and quartzite.
- Monocline: a step-like fold or bend in otherwise nearly horizontal rock strata.
- Plutonic rocks: igneous rocks formed below the Earth's crust. E.g. gabbro, granite.
- Sedimentary rocks: rock formed from the cementation and compaction of sediment.
- Transgression: when the shoreline moves inland over a region, possibly because of a rise of sea level or lowering of the land. Opp. Regression.
- Unconformity: a "gap" of missing rock strata marked by an erosional surface between two rocks of different ages.
- Volcanic rocks: igneous rocks formed near or at the earth's surface. E.g. basalt, andesite.

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