



# GEOLOGY OF WYOMING

## GREEN RIVER LAKE GOSIUTE & THE BLUE FOREST

**Wow Factor** (*3 out of 5 stars*):



# Geologist Factor *(2 out of 5 stars):*



PDF LAKE GOSIUTE & THE BLUE FOREST (? MB)

## Attraction:

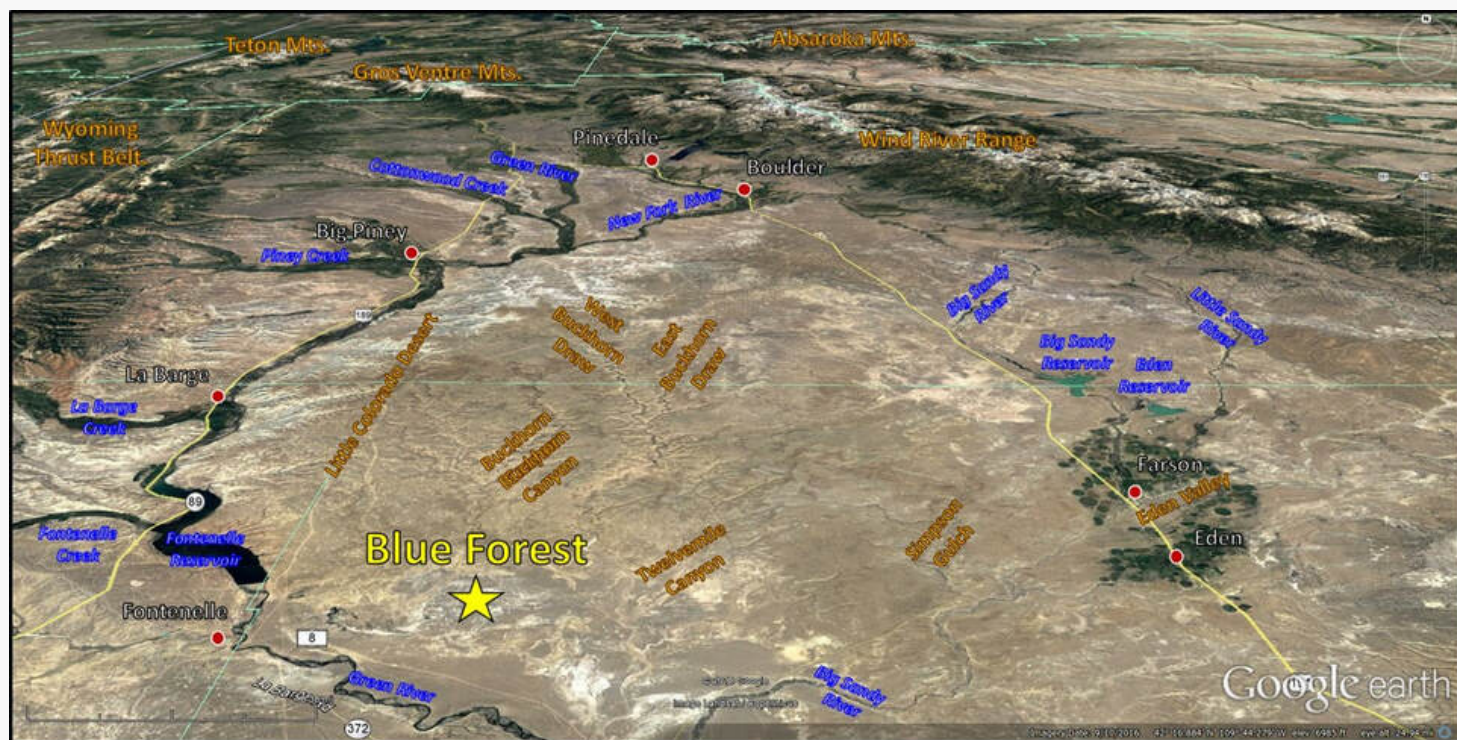
Fifty million-year-old lake beds with petrified tree branches and stromatolites. The blue chalcedony found in the fossil wood is the origin for the site name.

## Geology of Lake Gosiute and the Blue Forest

The Green River Formation was deposited continuously for 5 million years (53.5-48.5 M.Y.) in the Eocene Green River Lake complex of the Green River Basin in southwest Wyoming, the Uinta Basin in northeast Utah, and the Sand Wash Basin in northwest Colorado. Wyoming's Lake Gosiute was a large crocodile-infested water body in a closed basin. Lake Gosiute located in the Greater Green River Basin was bounded by the Laramide mountains of the Wind River Range and Granite Mountains to the north, the Sierra Madre to the southeast, the Uinta Mountains to the south and the Sevier mountains of the Wyoming Range on the west. The Rock Springs Uplift is a large (75-mi-long, 50-mi-wide) north-south trending anticline or fold that divides the Greater Green River Basin into sub-basins (Green River or Baxter on the west, Great Divide on the northeast, Washakie on the center east,

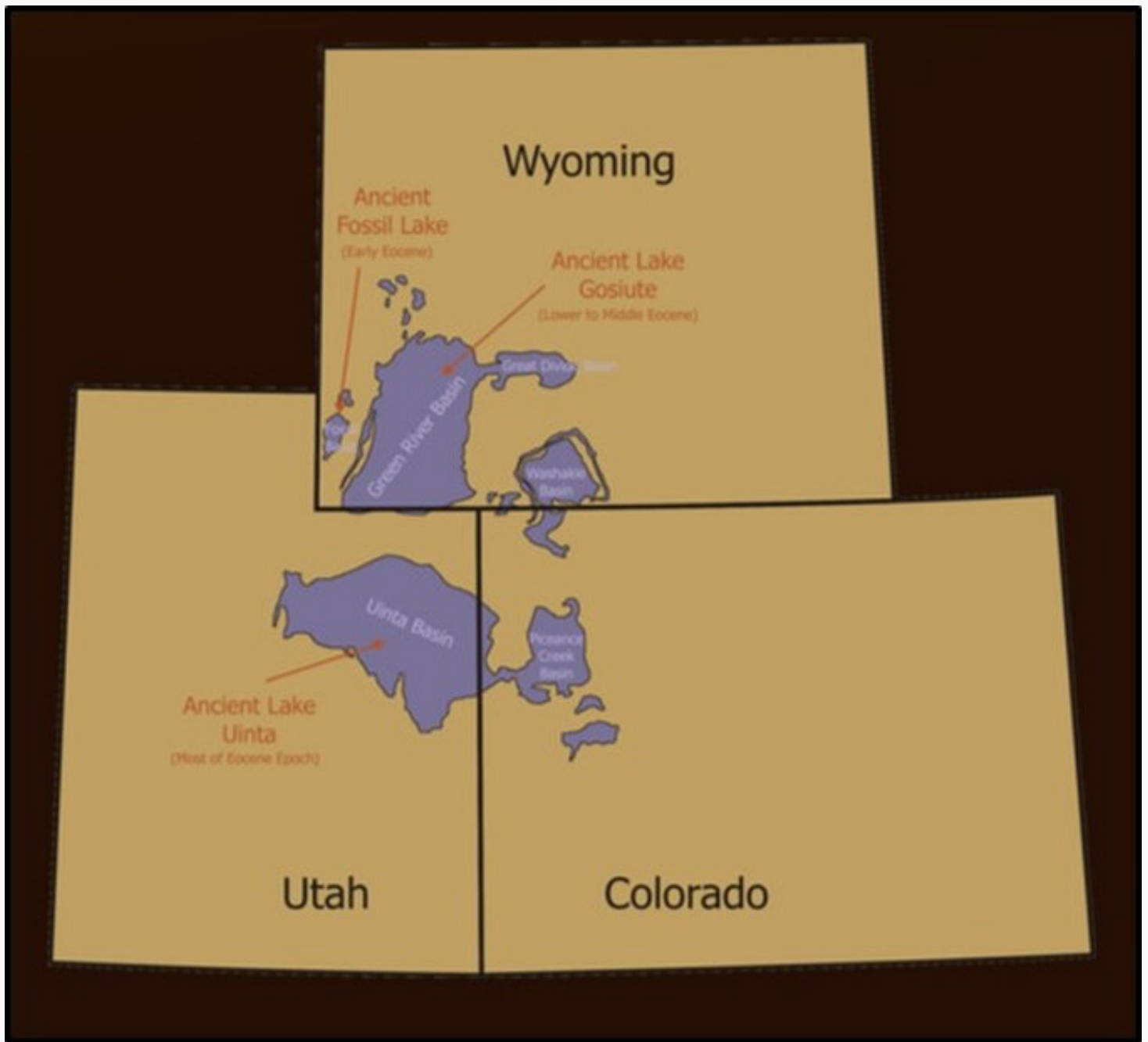


and Sand Wash on the southeast). Lake Gosiute hosted catfish and suckers adjacent to a forest of sycamore and palms. Many species of mammals lived in the niches vacated by the extinct dinosaur. When the lake flooded the forest during high water stages, branches, limbs and trees fell into the water where they became encrusted with algae. Ash rained down on the region from the Absaroka and San Juan volcanic fields. Over time the wood was preserved in the lake sediment layers. The collecting area west of Eden Valley is known as the Blue Forest for the blue calcedony found in the areas fossilized wood specimens.



**North aerial view of Blue Forest fossil site, Sweetwater County.**

*Image: Google Earth*



**Eocene Green River Lakes region of the Rocky Mountains. Lake Gosiute was one of a complex of Eocene intermountain paludal lakes (Fossil, Gosiute, and Uinta) that occupied southwestern Wyoming, northeastern Utah and western Colorado. The lakes lifespan extended for five million years (53.5-48.5 Ma)**

*Image: <https://www.virtualmuseumofgeology.com/green-river-lagerstatte.html>.*





## Exploring the Blue Forest adjacent to the Eocene Green River Lake Gosiute.

Image: Base: After <https://buckrail.com/wyomings-bighorn-basin-unlocks-secrets-to-massive-global-warming-events-some-50m-years-ago/>.

The strata of the Green River Formation record the history of deposition and catalog the biota that lived in the region. The formation is a world famous lacustrine deposit containing beautifully preserved fossils (fish, insects, birds, reptiles, leaves, and wood), and the large deposits of oil shale (lamosite: organic matter from planktonic blue-green algae (cyanobacteria)) and trona (hydrated sodium bicarbonate carbonate).

**Catfish**



**Dragonfly**



**Bird**



**Crocodile**



**Turtle**



Sycamore leaf



Palm frond



Blue Forest tree branch



Oil Shale



Trona



**Green River Formation fauna, flora and economic resource deposits.**

Image: FAUNA: Catfish: <https://www.fossilera.com/fossils/rare-9-5-fossil-catfish-site-closed-green-river-formation>;

Dragonfly: <https://geology.com/articles/green-river-fossils/insect-fossils.shtml>;

Bird: <https://www.flickr.com/photos/jsjgeology/15529177925>;

Crocodile: <https://www.pinterest.com/pin/157485318196997744/>;

**Turtle:** <https://www.google.com/amp/s/depositmag.com/2019/05/08/important-green-river-formation-fossils-come-to-new-york/amp/>;

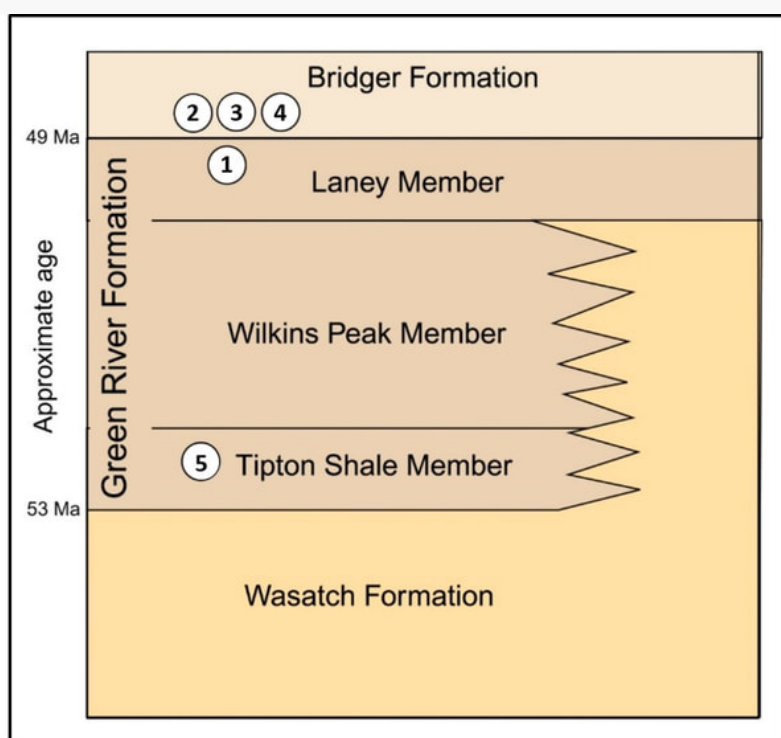
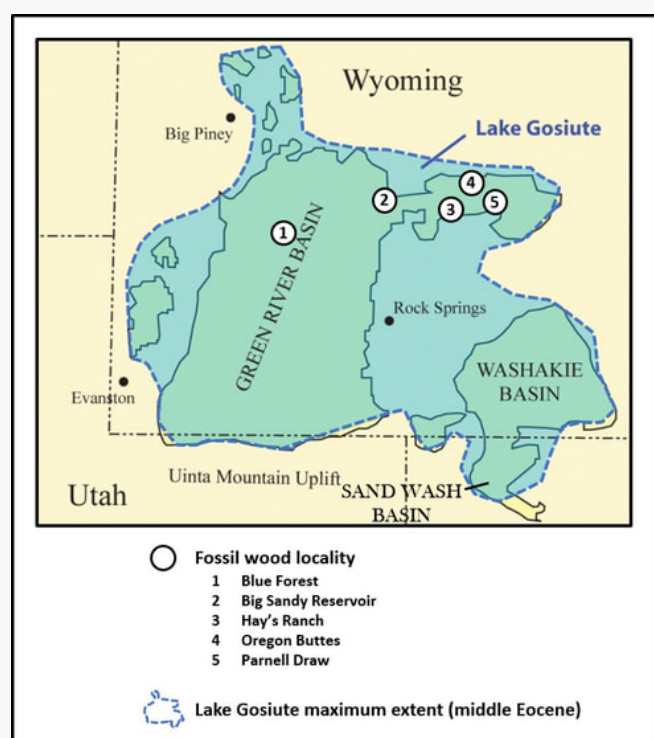
**FLORA: Sycamore:** <https://ucmp.berkeley.edu/tertiary/eoc/greenriver.html>;

**Palm:** [https://commons.m.wikimedia.org/wiki/File:Sabalites\\_powelli\\_fossil\\_palm\\_fronde\\_%26\\_fossil\\_fish\\_\(Green\\_River\\_Formation,\\_Lower\\_Eocene,\\_Fossil\\_Lake\\_Basin,\\_southwestern\\_Wyoming,\\_USA\)\\_1\\_\(15528796852\).jpg](https://commons.m.wikimedia.org/wiki/File:Sabalites_powelli_fossil_palm_fronde_%26_fossil_fish_(Green_River_Formation,_Lower_Eocene,_Fossil_Lake_Basin,_southwestern_Wyoming,_USA)_1_(15528796852).jpg);

**Branch:** <http://blueforestpetrifiedwood.com/about-us/>;

**ROCKS: Oil Shale:** [https://www.wikiwand.com/en/Green\\_River\\_Formation](https://www.wikiwand.com/en/Green_River_Formation);

**Trona:** <https://www.wsgs.wyo.gov/products/wsgs-1998-pic-39.pdf>.



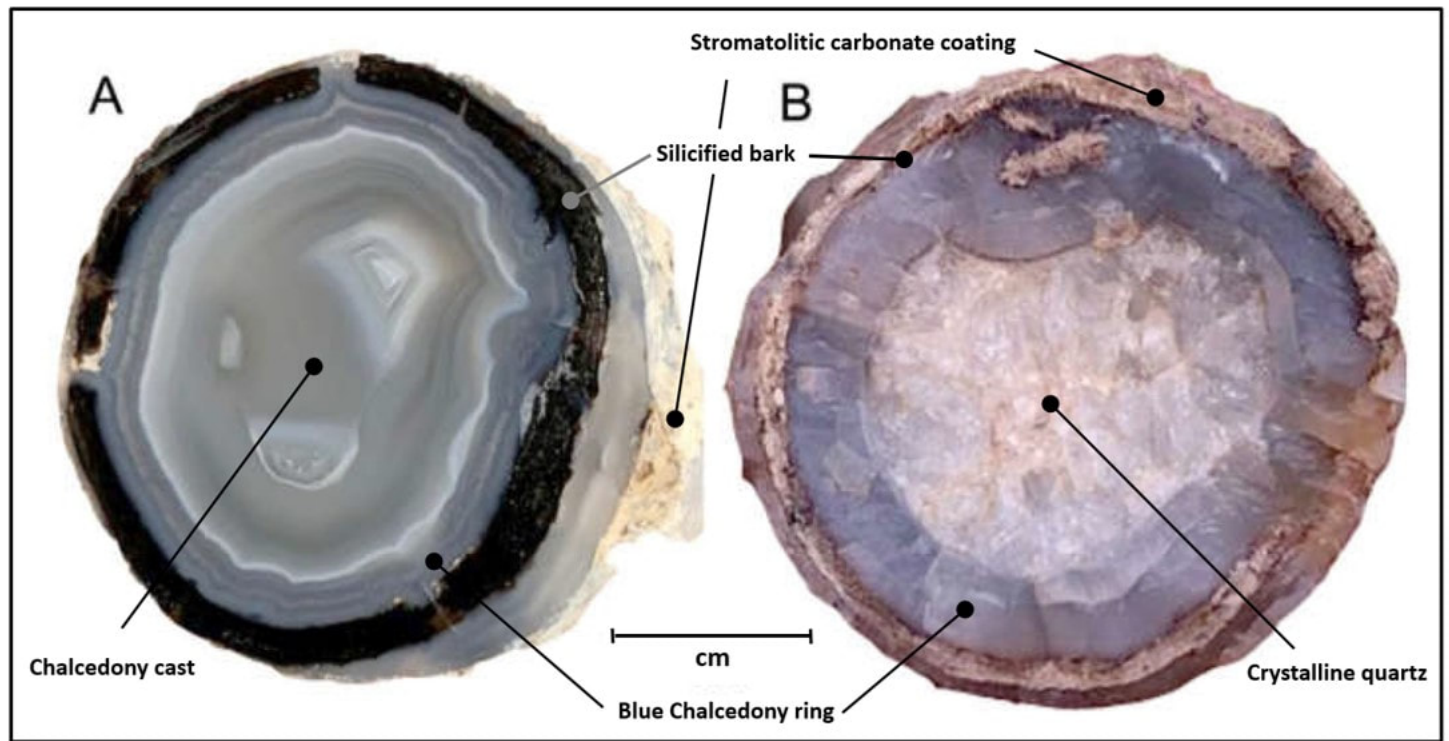
**Left:** Maximum extent of Lake Gosiute covering the Green River, Washakie, and Sand Wash Basins. Location of petrified wood locations are shown by number and maximum lake extent shown by dashed blue line.

**Right:** Generalized stratigraphy of the Eocene sediments in the Green River basin, showing the relative position of the fossil wood localities. This diagram is a simplification; stratigraphic members typically have interfingering contacts.

**Image:** Left: After Berg, M.V., 2011, *Exploring Utah's Other Great Lake*; <https://geology.utah.gov/map-pub/survey-notes/exploring-utahs-other-great-lake/>; Right: After Mustoe, G.E., Viney, M., and Mills, J., 2019,



*Mineralogy of Eocene Fossil Wood from the "Blue Forest" Locality, Southwestern Wyoming, United States: Geosciences (Switzerland), 9(1), Fig. 13, p. 13; <https://www.mdpi.com/2076-3263/9/1/35/htm>.*



**Fossilized wood specimen from Blue Forest locality. The chalcedony blue hue is due to traces of copper, manganese, titanium and iron.**

*Image: After Mustoe, G.E., Viney, M., and Mills, J., 2019, Mineralogy of Eocene Fossil Wood from the "Blue Forest" Locality, Southwestern Wyoming, United States: Geosciences (Switzerland), 9(1), Fig. 13, p. 13; <https://www.mdpi.com/2076-3263/9/1/35/htm>.*



Early Exploration



Exploration pits in today's Blue Forest



Exposed fossil specimen



Blue chalcedony

**Excavation for fossil wood in the Blue Forest has been ongoing for over 100 years.**

Image: Top left & bottom left: Dhgrkkit, 2011, Blue Forest Wyoming Petrified Wood video, YouTube; <https://www.youtube.com/watch?v=08aChIwiHVM>; Top right: <http://viewsofthemahantango.blogspot.com/2010/08/blue-forest.html>; Bottom right: Drakeford, J., 2018, Blue Forest; [https://www.google.com/maps/place/Blue+Forest/@42.0202282,-109.9109804,3a,75y,90t/data=!3m8!1e2!3m6!1sAF1QipMRI6mxBn6yvmUiZ7j\\_ii20sc6t5C2MRuUOKhu!2e10!3e12!6shhttps:%2F%2Fh5.googleusercontent.com%2Fp%2FAF1QipMRI6mxBn6yvmUiZ7j\\_ii20sc6t5C2MRuUOKhu%3Dw360-h480-kno!7i3024!8i4032!4m5!3m4!1s0x8750b52581e2ac23:0x380e61b5ec5486db!8m2!3d42.0202282!4d-109.9109804](https://www.google.com/maps/place/Blue+Forest/@42.0202282,-109.9109804,3a,75y,90t/data=!3m8!1e2!3m6!1sAF1QipMRI6mxBn6yvmUiZ7j_ii20sc6t5C2MRuUOKhu!2e10!3e12!6shhttps:%2F%2Fh5.googleusercontent.com%2Fp%2FAF1QipMRI6mxBn6yvmUiZ7j_ii20sc6t5C2MRuUOKhu%3Dw360-h480-kno!7i3024!8i4032!4m5!3m4!1s0x8750b52581e2ac23:0x380e61b5ec5486db!8m2!3d42.0202282!4d-109.9109804).



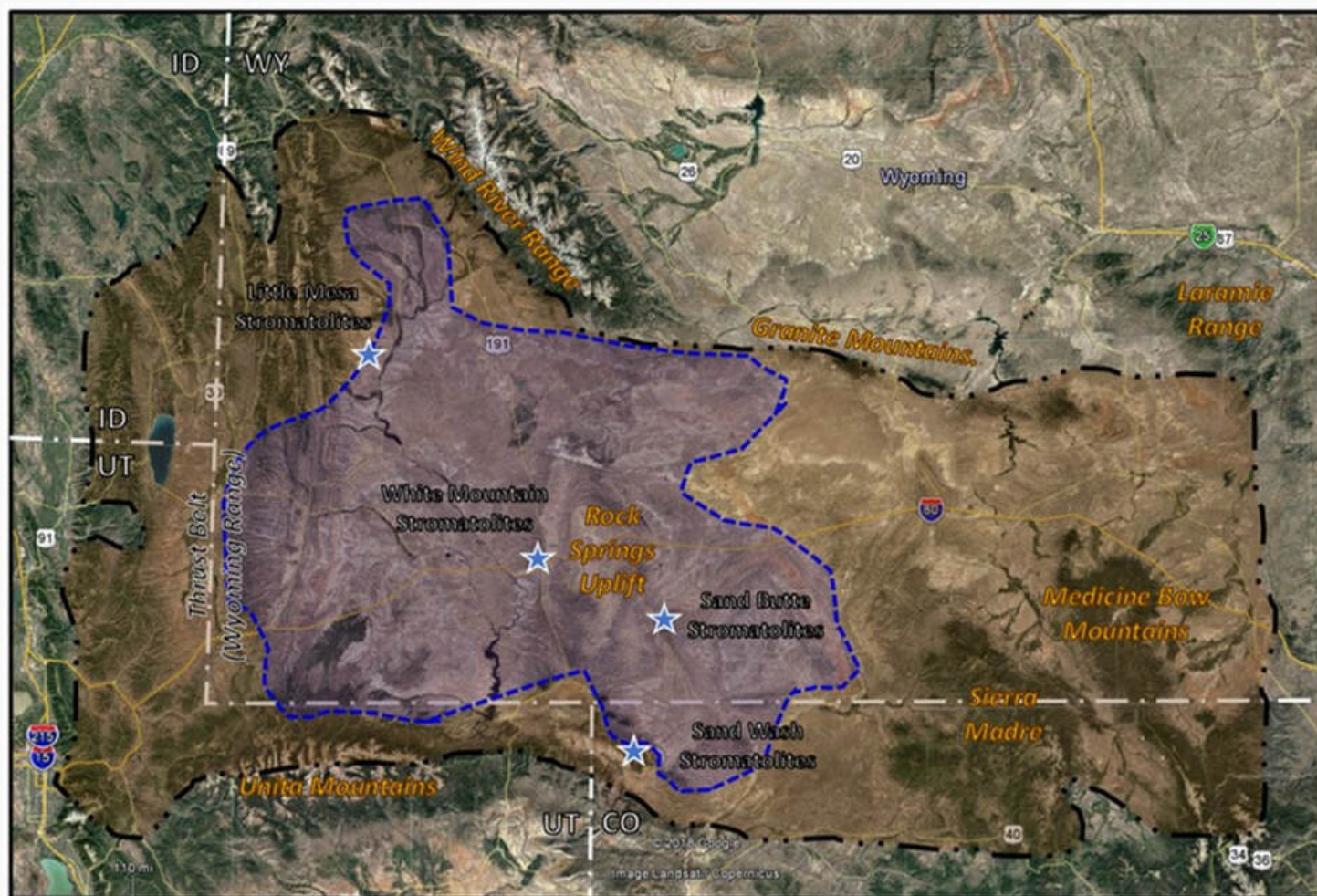
Mineralization in the Blue Forest petrified wood occurred in stages. Fallen branches and flooded trees were sites of algae and cyanobacteria growth during periods of lake growth. Desiccation encrusted branches as lake level receded. Silicification of wood tissue occurred after burial in lake sediments. Secondary chalcedony precipitated into void space within and surrounding the silicified wood. Traces of copper, manganese, titanium, and iron give the chalcedony the blue color for which the area is named. The final stage was precipitation of crystalline calcite into any remaining void spaces. Not every stage is present in all specimens.

The rocks of the Green River Formation were deposited in and adjacent to Lake Gosiute. The formation has been described as carbonate and mudstone lenses interfingering with terrestrial Wasatch Formation at the margins. The strata can be divided into three depositional types with characteristic mineralogy: 1) marginal silt and sand, 2) carbonate mud flat, and 3) lacustrine. The distribution of these facies define a playa lake complex with large changes in shoreline, lake level and salinity. Numerous volcanic tuff beds occur within the Green River Formation and provide excellent time markers for the strata (see cross section below, Smith et. al, 2003). For more on the Green River Formation see <https://www.geowyo.com/flaming-gorge.html> and <https://www.geowyo.com/fossil-butte.html>.

The earliest stage of Lake Gosiute is found in the low-grade oil shales, coquina limestone, sandstone, shale and coal beds of the Luman Tongue of the Green River Formation. It was deposited on the low-relief fluvial plain of the Wasatch Formation. The Tipton Member represents an expansion of the lake which is dominantly oil shale and dolostone. During arid periods, trona was precipitated in the lake basin. The Wilkins Peak Member shows the oscillation between oil shale and trona deposition occurred at least 60 times (Eugster and Surdam, 1973). The Laney Shale Member represents a more humid climate and expanded lake. The deposits include siltstones, marlstones and sandstones.

Algae and microbes not only encase wood but formed reef-like accumulations of microbialites (deposits that have accreted as a result of a

benthic microbial community trapping and binding detrital sediment). Stromatolites are present in the Wilkins Peak and Laney Members of the Green River Formation. These carbonate build-ups were due to the abundance of algae and cyanobacteria in Lake Gosiute. A forty-mile long zone of large stromatolitic bioherms are present in the Laney Member along the northern paleoshoreline of Lake Gosiute in the Little Mesa area north of La Barge. Giant stromatolites are also present across the stateline along the southeast margin of the lake in the LaCledde Bed of the Laney Member, Sand Wash Basin. The flanks of the Rock Springs Uplift have smaller microbial build-ups to the west at White Mountain, in the Wilkins Peak Member, Green River Basin and east at Sand Butte, in the LaCledde Bed of the Laney Member, Washakie Basin. For more on stromatolites see <https://www.geowyo.com/snowy-range-stromatolites.html>.

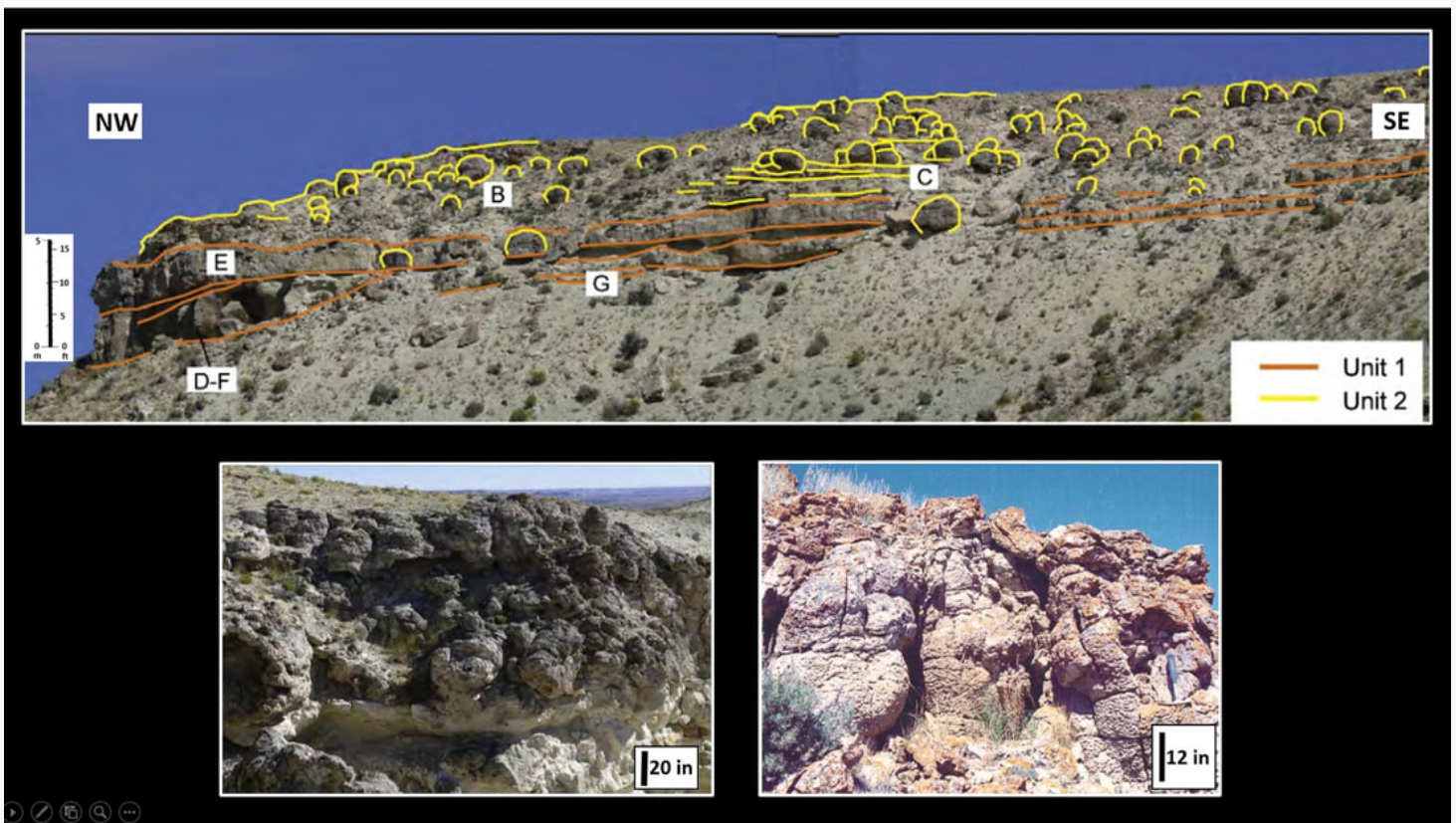


**Aerial image of maximum Lake Gosiute extent (blue) and drainage basin (brown). Laramide (brown/gold) and Sevier (white/black) tectonic boundary uplifts are shown. Blue stars mark stromatolite locations.**

*Image: Google Earth*



## Little Mesa Area



Composite microbial mat build-ups

**Little Mesa area bioherm in the Laney Member Green River Formation along the northern boundary of Eocene Lake Gosiute, Green River Basin. Caddisfly insect larval cases are prolific on the bioherms. Bottom two images show the stromatolite composite architecture. Columns can reach 30 feet tall (9 m) and 130 feet in diameter (40 m).**

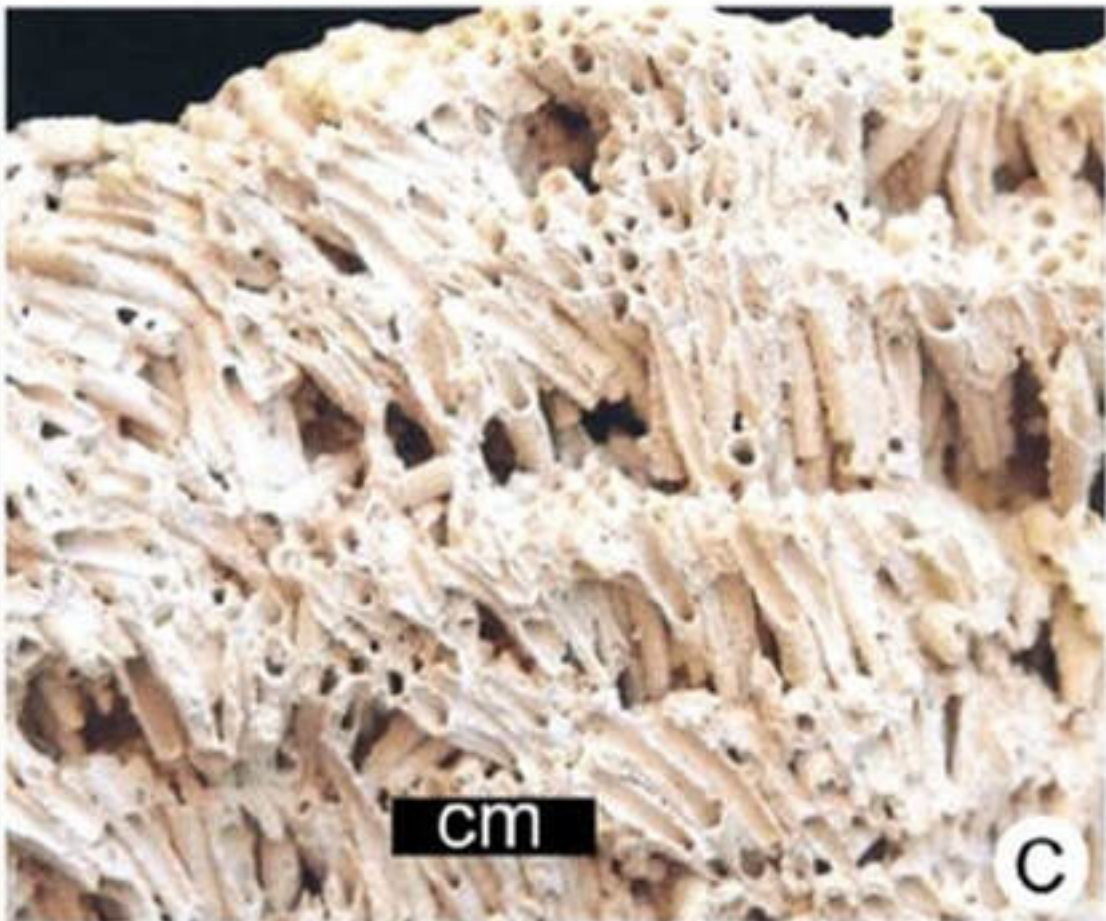
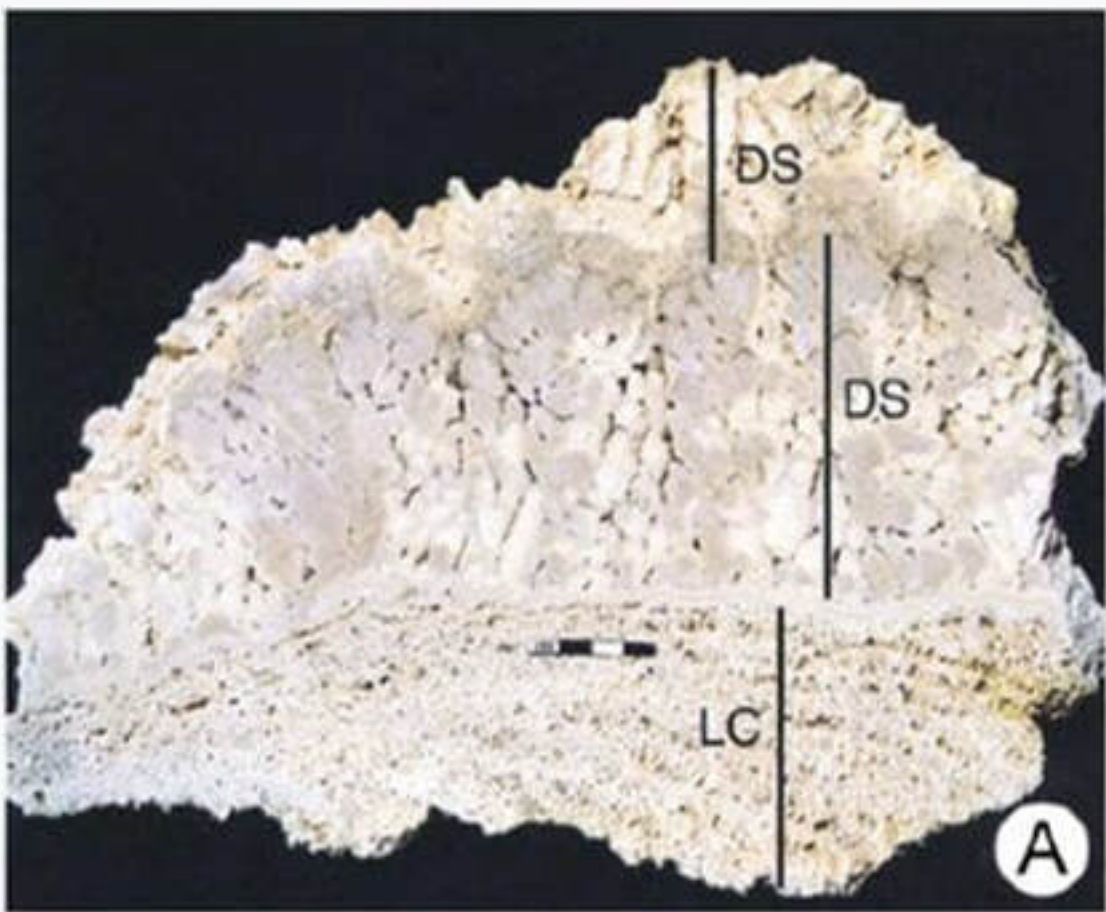
*Image: Top & Bottom Left: Seard, C., Camoin, G., Rouchy, J-M., and Virgone, A., 2013, Composition, structure and evolution of a lacustrine carbonate margin dominated by microbialites: Case study from the Green River formation (Eocene; Wyoming, USA): Palaeogeography, Palaeoclimatology, Palaeoecology 381–382, Fig. 4A, p. 133 & Fig. 6B, p. 135;*

*[https://www.researchgate.net/publication/256822420\\_Composition\\_structure\\_and\\_evolution\\_of\\_a\\_lacustrine\\_carbonate\\_margin\\_dominated\\_by\\_microbialites\\_Case\\_study\\_from\\_the\\_Green\\_River\\_formation\\_Eocene\\_Wyoming\\_USA](https://www.researchgate.net/publication/256822420_Composition_structure_and_evolution_of_a_lacustrine_carbonate_margin_dominated_by_microbialites_Case_study_from_the_Green_River_formation_Eocene_Wyoming_USA);*

*Right: After Leggitt, V.L and Cushman, R.A., 2001, Complex caddisfly-dominated bioherms from the Eocene Green River Formation: Sedimentary Geology 145, Fig. 6D, p. 384; <http://citeseerx.ist.psu.edu/viewdoc/download?>*

[doi=10.1.1.596.1208&rep=rep1&type=pdf.](#)





Caddisfly larval cases encrusted by microbial bioherms. (A) Vertical section through one of the microbial-caddisfly bioherms showing large

masses of digitate stromatolites (DS) covering approximately 10 layers of caddisfly cases (LC). The larval cases are arranged normal to bedding, Little Mesa area. (C) Close-up view illustrating the three-dimensional nature of the caddisfly larval case layers. The cases are arranged parallel to each other in layers that are as thick as the length of one case. The smaller end is down, and both ends of the cases are open, Little Mesa area.

*Image: After Leggitt, V.L. and Cushman, R.A., Jr., 2001, Complex caddisfly-dominated bioherms from the Eocene Green*

*River Formation: Sedimentary Geology 145, Fig. 7A,C, p.*

386; <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.596.1208&rep=rep1&type=pdf>.



**Larvae Trichoptera Caddisfly**



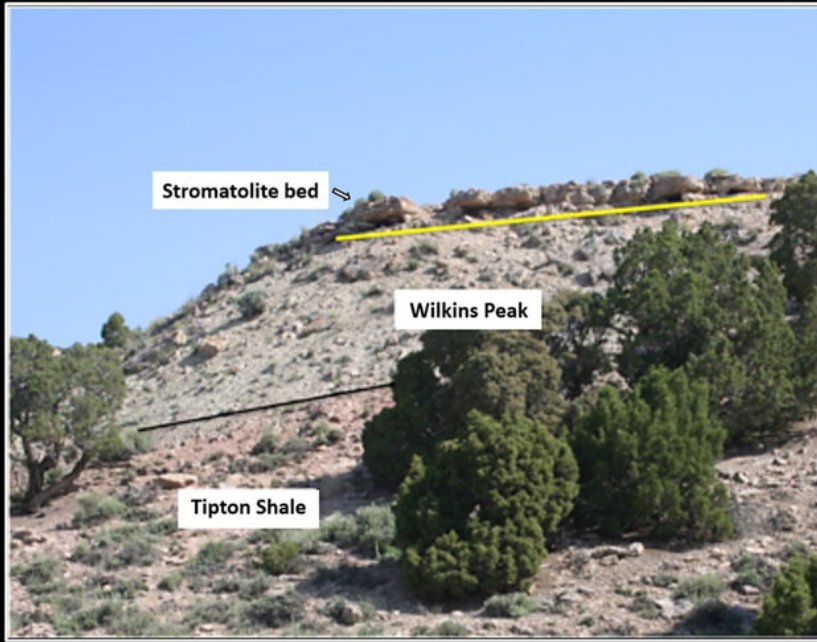
Image by <http://www.liberaldictionary.com/caddisfly/>



## Adult Caddisfly

Image by Marlin, B.,

2005, [https://en.m.wikipedia.org/wiki/Caddisfly#/media/File%3ATrichoptera\\_caddisfly\\_1.jpg](https://en.m.wikipedia.org/wiki/Caddisfly#/media/File%3ATrichoptera_caddisfly_1.jpg)



Cross section view

**White Mountain stromatolites in the Wilkins Peak Member Green River Formation on the west flank of the Rock Springs Uplift, Green River Basin.**

Image: Left: After Reiners, L., 2017, *Relationships Among Morphology, Texture, and Chemistry in Stromatolites of the Green River Formation (Eocene, Wyoming, USA)*: B.A. Geology Thesis, Gustavus Adolphus College, Fig. 3, p.

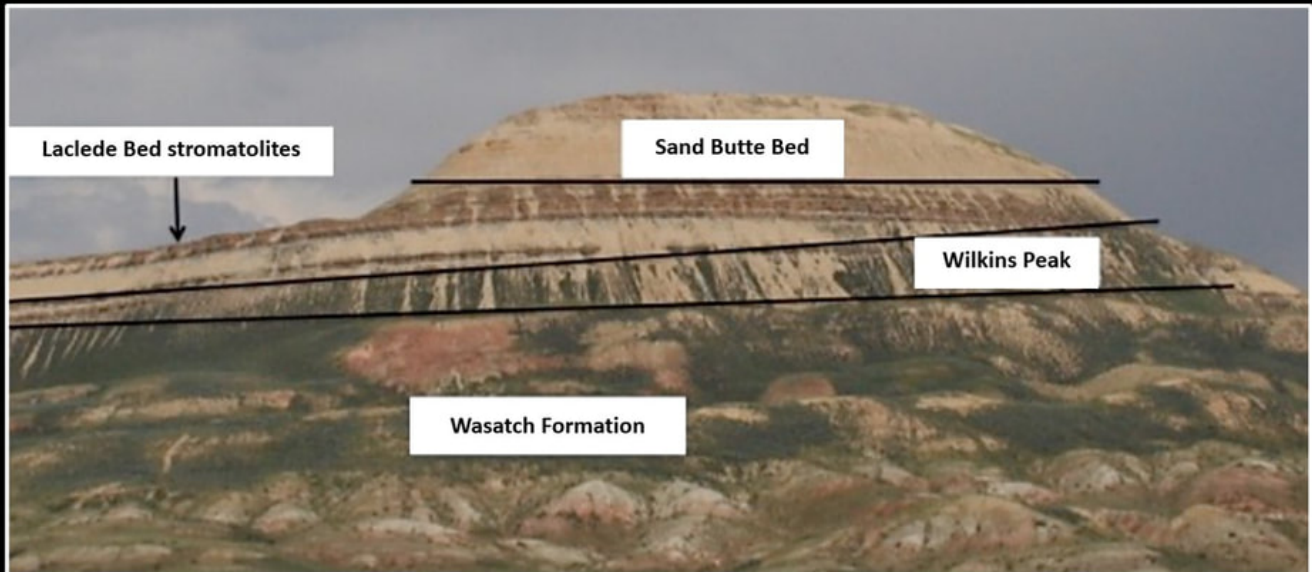
8; [https://gustavus.edu/geology/concertFiles/media/Reiners\\_Thesis\\_final.pdf](https://gustavus.edu/geology/concertFiles/media/Reiners_Thesis_final.pdf);

Right: After Bentley, C., 2012, *Stromatolites of the Green River Formation: Mountain Beltway*

Blog; <https://blogs.agu.org/mountainbeltway/2012/12/25/stromatolites-of-the-green-river-formation/>.



## Sand Butte Area



Outcrop to hand sample

**Sand Butte area stromatolites in the LaClede Bed, Laney Member, Green river Formation on the east flank of the Rock Springs Uplift, Washakie Basin.**

Image: After Reiners, L., 2017, *Relationships Among Morphology, Texture, and Chemistry in Stromatolites of the Green River Formation (Eocene, Wyoming, USA)*: B.A. Geology Thesis, Gustavus Adolphus College, Top: Fig. 5, p. 9 & Bottom: Fig. 6A, 6B, 6C, p.

10; [https://gustavus.edu/geology/concertFiles/media/Reiners\\_Thesis\\_final.pdf](https://gustavus.edu/geology/concertFiles/media/Reiners_Thesis_final.pdf).



**From hand sample to microstructure. Black box (middle row) represent where the microscope image is located on the stromatolite. In this example, a different microstructure is shown in each sample, however, all samples contain multiple types of microstructures.**

*Image: After Reiners, L., 2017, Relationships Among Morphology, Texture, and Chemistry in Stromatolites of the Green River Formation (Eocene, Wyoming, USA): B.A. Geology Thesis, Gustavus Adolphus College, Fig. 3, p. 8; [https://gustavus.edu/geology/concertFiles/media/Reiners\\_Thesis\\_final.pdf](https://gustavus.edu/geology/concertFiles/media/Reiners_Thesis_final.pdf).*



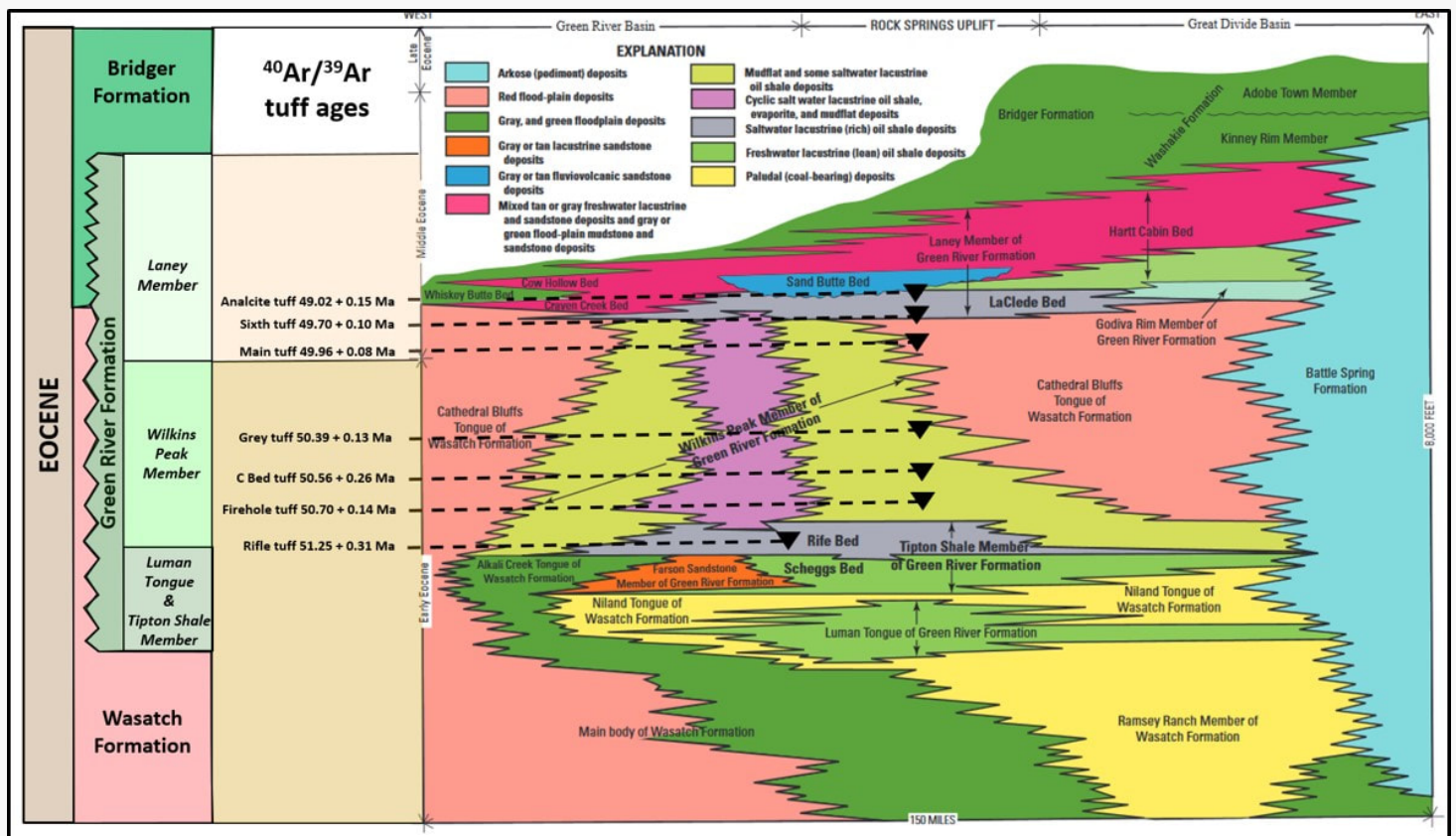
## Sand Wash Area



Jacob Staff is 2 meters tall (6.6 ft)

**Sand Wash area giant stromatolites in the LaClede Bed, Laney Member of the Green River Formation deposited in the southeast margin of Lake Gosiute, Sand Wash Basin, Colorado. The microbial mat includes fossilized tree branches and shrubs.**

*Image: After Awramik, S. and Buchheim, P., 2014, Giant Microbialites from the Green River Formation, Laney Member, Sand Wash Basin, Colorado: American Association of Petroleum Geologists Search and Discovery Article #50984; [http://www.searchanddiscovery.com/documents/2014/50984awramik/ndx\\_awramik.pdf](http://www.searchanddiscovery.com/documents/2014/50984awramik/ndx_awramik.pdf)*



**Generalized east-west cross section of Eocene rocks in the Greater Green River Basin. First appearance of Lake Gosiute with deposition of the Luman Tongue. Expansion of Lake Gosiute at beginning of Tipton Shale Member. During deposition of Tipton Shale Member, the outlet to Lake Gosiute closes and the lake becomes saline. At the end of the deposition of the Tipton Shale Member, the lake retreats and evaporites are deposited during the Wilkins Peak Member. At end of deposition of Wilkins Peak Member, Lake Gosiute outlet retreats and evaporite deposition ends. At end of deposition of LaCiede Bed, Lake Gosiute retreats and dries up. Lake Gosiute disappears at conclusion of Laney Member deposition.**

*Image: After Johnson, R.C., Mercier, T.J., Ryder, R.T., Brownfield, M.E., and Self, J.G., 2011, Assessment of in-place oil shale resources of the Eocene Green River Formation, Greater Green River Basin, Wyoming, Colorado, and Utah, in U.S. Geological Survey Oil Shale Assessment Team, ed., Oil shale resources of the Eocene Green River Formation, Greater Green River Basin, Wyoming, Colorado, and Utah: U.S. Geological Survey Digital Data Series DDS-69-DD, chap. 1, Fig. 3, 5, 7-8, 10, 13-18, p. 6, 9, 11-12, 15, 19-24; [https://pubs.usgs.gov/dds/dds-069/dds-069-dd/REPORTS/69\\_DD\\_CH\\_1.pdf](https://pubs.usgs.gov/dds/dds-069/dds-069-dd/REPORTS/69_DD_CH_1.pdf) ; Lake History from Roehler, H.W., 1992, Description and correlation of Eocene rocks in stratigraphic reference*

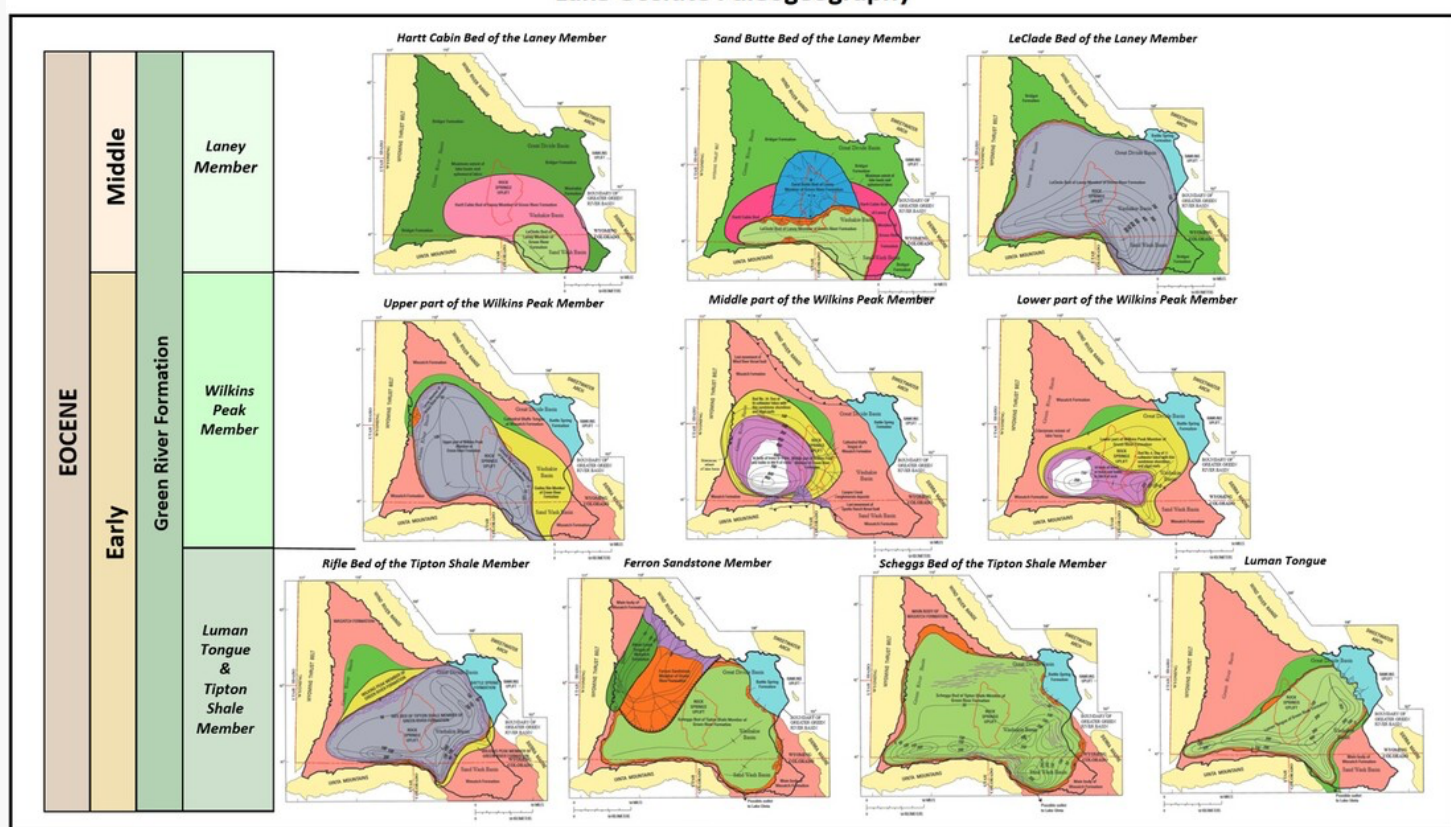


sections for the Green River and Washakie basins, Southwest Wyoming includes analyses of Eocene rocks in the Washakie Basin: U.S. Geological Survey Professional Paper 506-D, Fig. 6, p.

D17; <https://pubs.usgs.gov/pp/1506d/report.pdf>; After Smith, M.E, Singer, B., and Carroll, A., 2003, 40Ar/39Ar geochronology of the Eocene Green River Formation, Wyoming: Geological Society of America Bulletin, v. 115, no. 5, Fig. 2, p.

551; <https://pdfs.semanticscholar.org/b2ec/e45019699b528d4c19e392df0e2f06d0ea4e.pdf>.

### Lake Gosiute Paleogeography



### EXPLANATION

- Gray or green flood-plain mudstone and sandstone deposits
- Mixed tan or gray freshwater lacustrine and sandstone deposits and gray or green flood-plain mudstone and sandstone deposits
- Tan or brown freshwater lacustrine oil shale deposit
- Gray or tan fluviovolcanic sandstone deposits
- Brown or black saltwater lacustrine oil shale deposits
- Gray or tan pediment arkose deposits
- Gray or tan lacustrine sandstone deposits

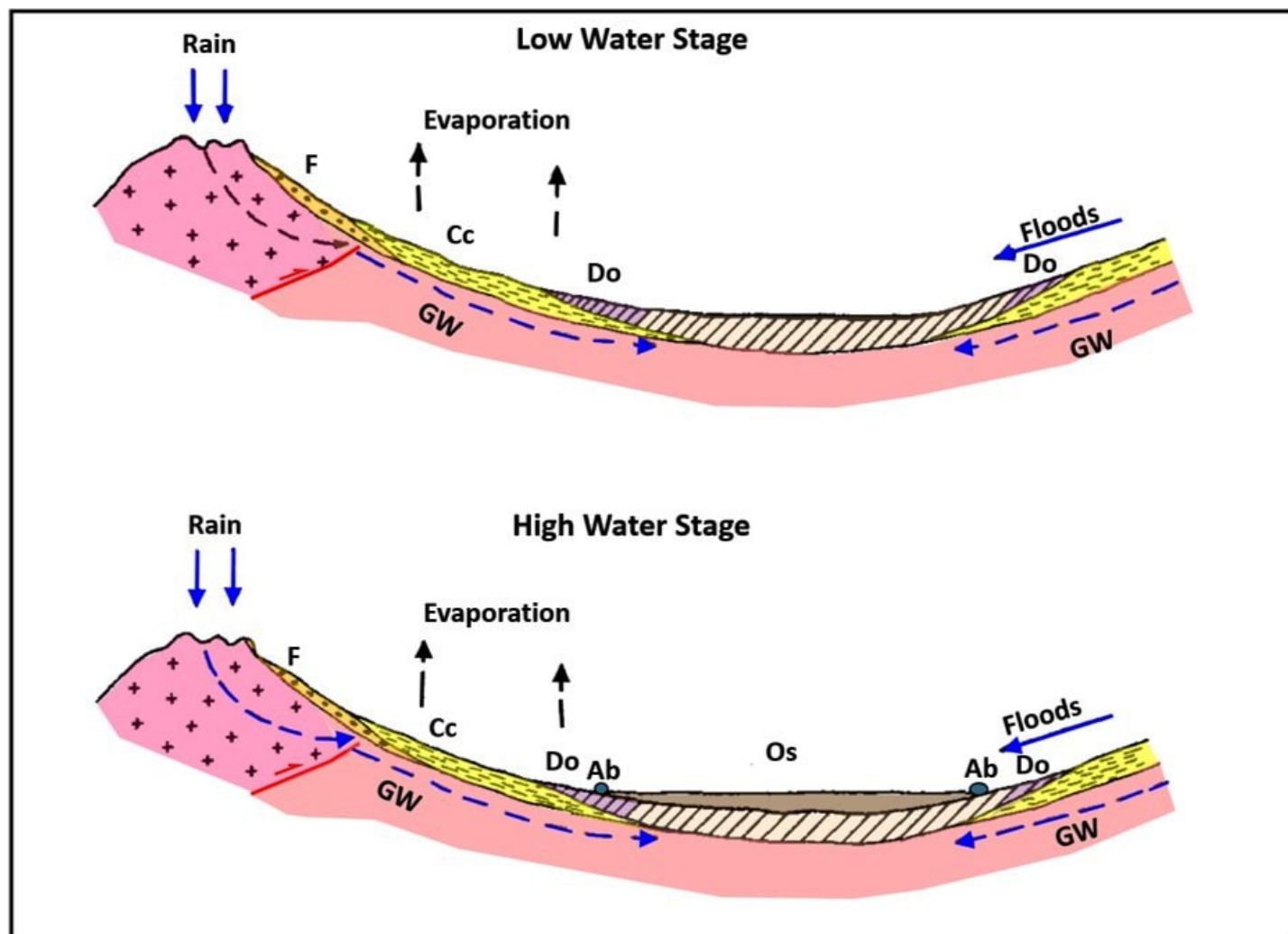
- Red or variegated flood-plain mudstone and sandstone deposits
- Gray or green flood-plain mudstone and sandstone deposits
- Gray or green mudflat mudstone and playa-lake dolomite deposits
- Cyclic saltwater lacustrine oil shale deposits
- White, gray, green, or brown bedded evaporite deposits
- Gray or tan alluvial fan conglomerate deposits

- Contact of stratigraphic unit
- Boundary of depositional environment
- Anticlinal axis- Showing dip, strike and plunge
- Depositional axis
- Outline of Rock Springs uplift

**Paleogeography of Members of the Green River Formation. Units are colored as on the stratigraphic cross section above.**

*Image: After Johnson, R.C., Mercier, T.J., Ryder, R.T., Brownfield, M.E., and Self, J.G., 2011, Assessment of in-place oil shale resources of the Eocene Green River Formation, Greater Green River Basin, Wyoming, Colorado, and Utah, in U.S. Geological Survey Oil Shale Assessment Team, ed., Oil shale resources of the Eocene Green River Formation, Greater Green River Basin, Wyoming, Colorado, and Utah: U.S. Geological Survey Digital Data Series DDS-69-DD, chap. 1, Fig. 3, 5, 7-8, 10, 13-18, p. 6, 9, 11-12, 15, 19-24; [https://pubs.usgs.gov/dds/dds-069/dds-069-dd/REPORTS/69\\_DD\\_CH\\_1.pdf](https://pubs.usgs.gov/dds/dds-069/dds-069-dd/REPORTS/69_DD_CH_1.pdf); After Smith, M.E, Singer, B., and Carroll, A., 2003, 40Ar/39Ar geochronology of the Eocene Green River Formation, Wyoming: Geological Society of America Bulletin, v. 115, no. 5, Fig. 2, p. 551; <https://pdfs.semanticscholar.org/b2ec/e45019699b528d4c19e392df0e2f06d0ea4e.pdf>.*

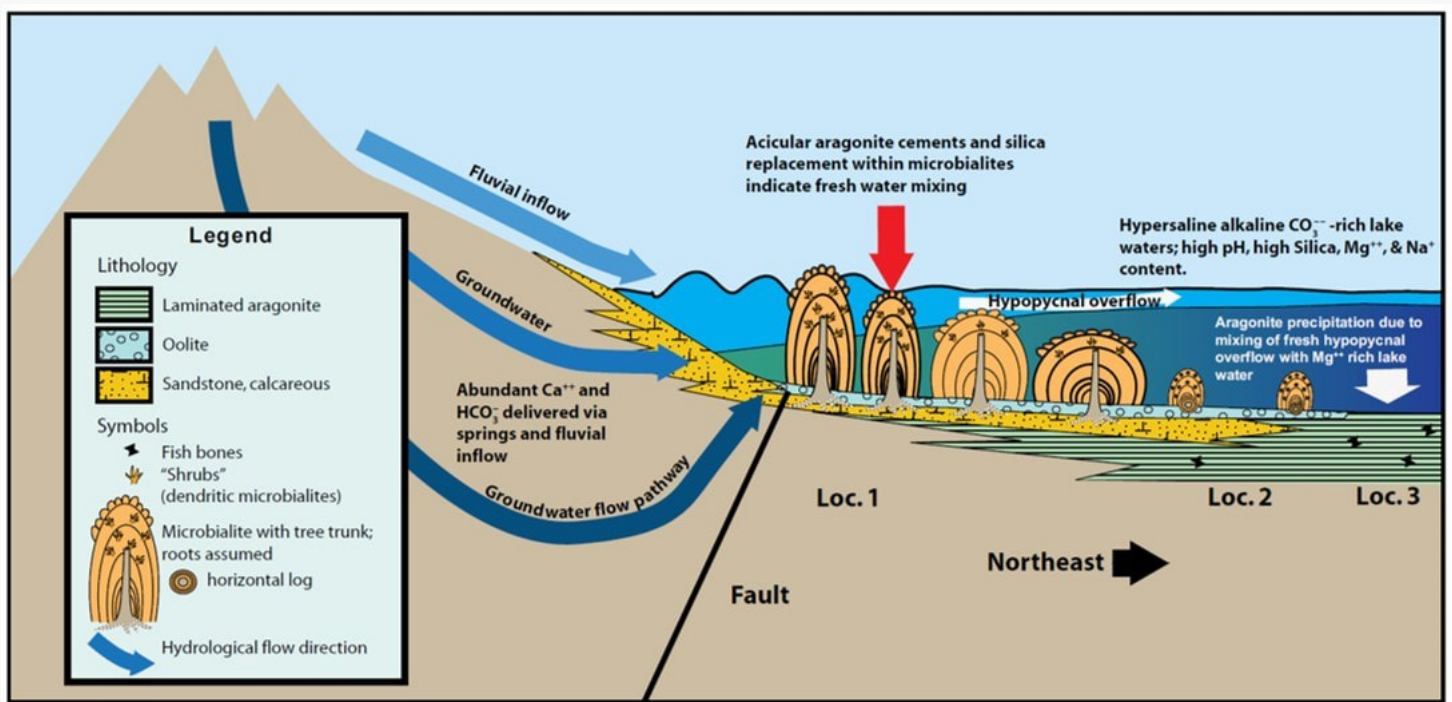




**Features of Lake Gosiute playa-lake model. The distribution and evolution of hydrology, mineralogy, and brine is displayed at low and high water stages. Abbreviations: F – alluvial fans, Cc – calcite precipitation, Do – dolomite precipitation, Ab – algal bed, Os – oil shale, Gw – ground-water; Symbols: plus sign – granitic basement, dotted – fan conglomerate and sandstone, dashed – alluvial sandstone and mudstone, diagonal – carbonate muds, blue ovals – algal buildups, blue dashed – ground-water circulation path., red line – reverse fault.**

*Image: After Surdam, R.C. and Wolfbauer, C., 1975, Green River Formation, Wyoming: A Playa-Lake Complex: Geological Society of America Bulletin, Vol. 86, Fig. 2, p.*

336; [https://pdfs.semanticscholar.org/0f2a/2df82431be09dca0599629433a86f88c80e0.pdf?\\_ga=2.249996609.676233718.1568921713-2049234404.1568921713](https://pdfs.semanticscholar.org/0f2a/2df82431be09dca0599629433a86f88c80e0.pdf?_ga=2.249996609.676233718.1568921713-2049234404.1568921713).



**Depositional model of Sand Wash microbialites** (deposits that have accreted as a result of a benthic microbial community trapping and binding detrital sediment). Giant stromatolite growth is enhanced by hydrologic input via springs and surface water sources enriched in calcium carbonate. Hypersaline-alkaline, carbonate-rich lake waters are enriched with silicon (Si), magnesium (Mg), and sodium (Na). Carbonates rapidly precipitate, especially as aragonite, during mixing of inflow waters with ambient lake waters. Silica is precipitated as cements and replaces carbonates as the pH drops during mixing. Acicular (slender, needle-like crystals) aragonite precipitates within the microbialites along with silica. Basinward, aragonite precipitates as whittings (drifting clouds of carbonate sediment) during mixing of hypopycnal (density of the suspended sediment flow is less than that of the water) overflow with ambient lake water. Standing tree trunks act as substrates for stromatolite development, promoting giant size. Study locations 1-3 are labeled.

Image: Awramik, S. and Buchheim, H.P., 2015, *Giant stromatolites of the Green River Formation (Colorado, USA)*: Geological Society of America Geology 43 (8), Fig. 3, p.

693; [https://www.researchgate.net/profile/Paul\\_Buchheim2/publication/281762140\\_Giant\\_stromatolites\\_of\\_the\\_Eocene\\_Green\\_River\\_Formation\\_Colorado\\_USA/links/566754e508ae8905db8baa29/Giant-stromatolites-of-the-Eocene-Green-River-Formation-Colorado-USA.pdf?origin=publication\\_detail](https://www.researchgate.net/profile/Paul_Buchheim2/publication/281762140_Giant_stromatolites_of_the_Eocene_Green_River_Formation_Colorado_USA/links/566754e508ae8905db8baa29/Giant-stromatolites-of-the-Eocene-Green-River-Formation-Colorado-USA.pdf?origin=publication_detail).



# Things To Do

Visit the stromatolites at Little Mesa, White Mountain, and Sand Butte, or dig for blue chalcedony petrified wood at the Blue Forest site. We have not been to these stromatolites or the Blue Forest site, so rather than comment about something we have not experienced, we refer you to the following websites and articles.

## Blue Forest

Wyoming State Mineral and Gem Society seven page article from 2018 on Blue Forest:

[www.wsmgs.org/jsn/2018-02.pdf](http://www.wsmgs.org/jsn/2018-02.pdf)

YouTube five minute video on how to dig for petrified wood at the Blue Forest site: <https://www.youtube.com/watch?v=08aChIwiHVM>

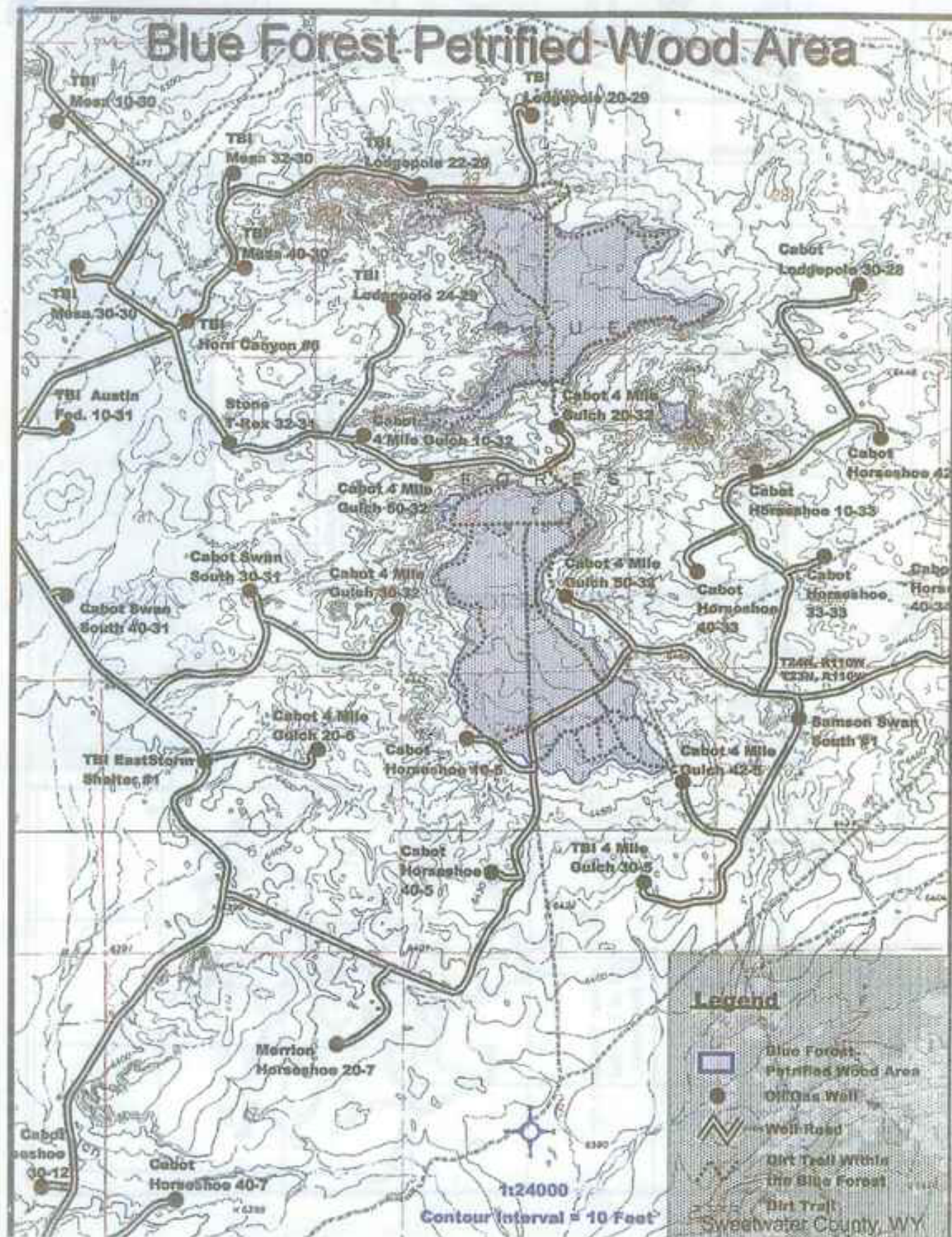
YouTube three minute video on directions to the Blue Forest: <https://www.youtube.com/watch?v=jwE5AINP5Ck>

Scientific paper on Blue Forest:

*Mustoe, G.E., Viney, M., and Mills, J., 2019, Mineralogy of Eocene Fossil Wood from the "Blue Forest" Locality, Southwestern Wyoming, United States: Geosciences (Switzerland), 9(1), Fig. 13, p. 13; <https://www.mdpi.com/2076-3263/9/1/35/htm>.*







Detailed map of the Blue Forest petrified wood area. The black dots are

locations of private oil and gas wells with about four wells per section. The last number in the well names are the section numbers. Do not park near these wells or approach them, they can be dangerous. The land is all Federal within the Blue Forest area administered by the Bureau of Reclamation. Read the Code of Federal Regulations Part 43, Sub part 3622. At the time of writing in 2019, you are allowed to dig 25 pounds of petrified wood plus one piece per day. Not to exceed 250 pounds per year. Hand digging only. Not for commercial use. You must fill in your holes.

*Map provided by Wyoming Fossils rock shop in Kemmerer, Wyoming*

## Little Mesa Stromatolites

Scientific papers on Little Mesa:

Seard, C., Camoin, G., Rouchy, J-M., and Virgone, A., 2013, Composition, structure and evolution of a lacustrine carbonate margin dominated by microbialites: Case study from the Green River formation (Eocene; Wyoming, USA): Palaeogeography, Palaeoclimatology, Palaeoecology 381–382, Fig. 4A, p. 133 & Fig. 6B, p. 135;

[https://www.researchgate.net/publication/256822420\\_Composition\\_structure\\_and\\_evolution\\_of\\_a\\_lacustrine\\_carbonate\\_margin\\_dominated\\_by\\_microbialites\\_Case\\_study\\_from\\_the\\_Green\\_River\\_formation\\_Eocene\\_Wyoming\\_USA](https://www.researchgate.net/publication/256822420_Composition_structure_and_evolution_of_a_lacustrine_carbonate_margin_dominated_by_microbialites_Case_study_from_the_Green_River_formation_Eocene_Wyoming_USA)

Leggitt, V.L and Cushman, R.A., 2001, Complex caddisfly-dominated bioherms from the Eocene Green River Formation: Sedimentary Geology 145, Fig. 6D, p. 384; <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.596.1208&rep=rep1&type=pdf>.

## White Mountain Stromatolites

Scientific papers on White Mountain:



Reiners, L., 2017, Relationships Among Morphology, Texture, and Chemistry in Stromatolites of the Green River Formation (Eocene, Wyoming, USA): B.A. Geology Thesis, Gustavus Adolphus College, Fig. 3, p. 8; [https://gustavus.edu/geology/concertFiles/media/Reiners\\_Thesis\\_final.pdf](https://gustavus.edu/geology/concertFiles/media/Reiners_Thesis_final.pdf);

Bentley, C., 2012, Stromatolites of the Green River Formation: Mountain Beltway Blog; <https://blogs.agu.org/mountainbeltway/2012/12/25/stromatolites-of-the-green-river-formation/>.

## Sand Butte Stromatolites

Scientific paper on Sand Butte:

Reiners, L., 2017, Relationships Among Morphology, Texture, and Chemistry in Stromatolites of the Green River Formation (Eocene, Wyoming, USA): B.A. Geology Thesis, Gustavus Adolphus College, Fig. 3, p. 8; [https://gustavus.edu/geology/concertFiles/media/Reiners\\_Thesis\\_final.pdf](https://gustavus.edu/geology/concertFiles/media/Reiners_Thesis_final.pdf);

## Sand Wash Stromatolites

Scientific paper on Sand Wash:

Awramik, S. and Buchheim, P., 2014, Giant Microbialites from the Green River Formation, Laney Member, Sand Wash Basin, Colorado: American Association of Petroleum Geologists Search and Discovery Article #50984; [http://www.searchanddiscovery.com/documents/2014/50984awramik/ndx\\_awramik.pdf](http://www.searchanddiscovery.com/documents/2014/50984awramik/ndx_awramik.pdf)



The material on this page is copyrighted

Proudly powered by [Weebly](#)