



# LEAVERTITE NEWS

Grand Junction Gem and Mineral Club  
2328 Monument Road  
P.O. Box 953, Grand Junction, CO 81502



## PRESIDENTS MESSAGE BY MEL BERSCH



It has been a privilege and honor these past two years serving as your club President.

I'd like to especially thank my board members for all their input and help. Without it, many of the accomplishments would not have happen. A big THANK YOU from me!

It's been a busy year with a lot of changes as we grow as a club. I know next year 2018, under new Presidency, will be just as productive.

Just a reminder that club dues are due the first of the year. Your membership helps our club continue furthering the hobby we all share of rocks and geology. I encourage you all to do what you can to perpetuate the club into the future.

I'm looking forward to the Christmas dinner and I wish you all a very Merry Christmas and a Happy New Year. The board will meet at Mel Bersch's house (248 Little Park Road) at 7:00 pm on Wednesday Dec 13, 2017. I would like to have all this year and next year board members present. Also, all club members are welcome to attend.

| November, 2018  |   |         |   | Volume 34 Number 9                        |        |   |
|---|---|---------|---|---|--------|---|
| Sunday  | Monday  | Tuesday | Wednesday                                   | Thursday                                  | Friday | Saturday                                    |
|   |   |         | 12-3<br>Open Shop                           |   | 1      | 2<br>9-12<br>Open Shop                      |
| 3<br><br>Full Moon | 4   | 5       | 6<br>12-3<br>Open Shop                      | 7   | 8      | 9<br>9-12<br>Open Shop                      |
| 10  | 11  | 12      | 13<br>12-3<br>Open Shop<br>Board<br>Meeting | 14<br><b>CHRISTMAS<br/>PARTY<br/>6:30</b> | 15     | 16<br>9-12<br>Open Shop<br>9:30<br>Facetors |
| 17  | 18  | 19      | 20<br>12-3<br>Open Shop                     | 21  | 22     | 23<br>9-12<br>Open Shop                     |
| 24<br>31  | 25<br> | 26      | 27  | 28  | 29     | 30  |

December  
14, 2016  
6:30 pm



### Joanna Marini Dindinger

We would like to welcome back for a third year Joanna Marini Dindinger. Joanna is the harpist who played for our Annual Christmas Dinner the last two years and we would like to welcome her back again. Joanna has a beautiful full-sized harp made by Marini Harps, a company created by her father.

<http://www.marinimadeharps.com/>

Joanna and her husband, Stephen Dindinger, live in Glade Park, where their children can grow up with space to run and play. Don't miss this wonderful Harp program. This is a rare Christmas treat and we are grateful to her and her family for taking the time during the Christmas season to favor us with her beautiful talent and music.



THE MAKERS



**Also, just a reminder of all the great food!  
Home cooked meat and potatoes and gravy!  
The club will provide three turkeys, two hams, and mashed potatoes.  
Please bring sides or dessert.**

### Proposed New Board Members.

At the December club meeting, our new board members will be voted on and sworn in for 2018. Here is a list of present board members and the nominees for the 2018 club positions.

| Office         | 2017                              | 2018                            |
|----------------|-----------------------------------|---------------------------------|
| President      | Mel Bersch                        | Jim Schultz                     |
| Vice President | Mike Burritt                      | Val Medeiros                    |
| Treasure       | Pam Bersch                        | Dave McCollough                 |
| Secretary      | Chris Henderson<br>Anita Martinez | Anita Martinez<br>Nancy Schuerr |
| 1-Year         | Tom Ericson                       | Cindy Teare                     |
| 2-Year         | Pat Martinez                      | Teri Drost                      |
| 3-Year         | Cindy Teare                       | Chris Henderson                 |
| Finance        | Jim Schultz                       | Tony Kovschak                   |
| Past President | B J Brown                         | Mel Bersch                      |



### Lifetime Honorary Membership

The Board voted to provide a lifetime honorary membership to Jan McCollum for her hard work and dedication to the club.

### Facetors' Meeting

**November 18, 2017**

Members present: Jim Vaughn, Jim Smith, Howard Whipple, Kathy & Thom Ericson, Mike Ryan, Dale Breckenridge, Ralph Stuart and Connie Duncan.

Our Project: "Formee Cross Rectangle" was cut by Howard from Syn. Blue Quartz.. Jim Vaughn had cut the prior months project, "Trixie" in Blue CZ. Connie had an Aquamarine that she cut. Dale had a Sphalerite, a Yellow Corundum - "Whirlwind" and a Peridot - "Trixie".

Howard brought up the problems that happen when transferring. Seems Epoxy will move a stone as it dries. Dale stated that backing your stone off the dop a hair will help to eliminate this. Ralph also told the group that you need to compensate for your transfer block not being perfect, as none of them are. After all, it's metal sliding on metal and there has to be some movement, which will affect the accuracy of your transfer.

Connie passed around a three-page document that listed all the heat treated and dyed stones. It would appear that almost all natural material is altered in some way.

Our next meeting is December 16th, our monthly project is "Princess Cut".

### Yard Sale and Rock Sale

Both the Yard Sale and Rock Sale brought in \$1587. Though this is less than last year it is still a significant contribution to the club! Thanks to all who worked so hard to make this event a success.

**Thanks to Jim Schultz and Judy Nason!**



## 2018 Membership Dues

Please pay your 2018 membership dues by December 31st to keep your name and contact information in the current membership roster. Annual dues: single adult: \$30.00, Couple \$ 40.00

Make checks payable to: Grand Junction Gem and Mineral Club.

Mail to : Evita Schultz, 686 Long Rifle Road, Grand Junction, CO 51507



### December Birthstone

Turquoise is perhaps the oldest stone in man's history, the talisman of kings, shamans, and warriors. It is a stone of protection, strong and opaque, yet soothing to the touch, healing to the eye, as if carved from an azure heaven and slipped to earth. Its unique shade of blue, often blue-green, lends it name, Turquoise, to all things of this tranquil hue. The delicate veining or mottled webbing in cream or brown is inherent to the stone and serves to enhance its character. The name Turquoise is derived from the French, pierre turquoise, meaning "Turkish stone," because the trade routes that brought Turquoise to Europe from the mines in central Asia went through Turkey, and Venetian merchants often purchased the stone in Turkish bazaars. Turquoise beads dating back to 5000 B.C. have been found in Iraq, and the Egyptians were mining the stones in the Sinai in 3200 B.C. The death mask of Tutankhamun was studded with Turquoise, as were the mosaic masks dedicated to the gods, the fabulous inlaid skulls, shields and power statues of Moctezuma, the last ruler of the Aztecs. For nearly a thousand years, Native Americans have mined and fashioned Turquoise, using it to guard their burial sites. Their gems have been found from Argentina to New Mexico.

### December Gem and Mineral Shows in the Region

| Days  | Show                             | Location          | Email                  |
|-------|----------------------------------|-------------------|------------------------|
| 1-3   | Gem Faire Inc                    | Costa Mesa, CA    | info@gemfaire.com      |
| 2     | Verde River Rockhounds           | Cornville, AZ     | jaelav334@gmail.com    |
| 2-3   | Mojave Desert Gem & Mineral      | Barstow, CA       | www.mdgms.net          |
| 8-10  | Gem Faire Inc                    | Santa Barbara, CA | info@gemfaire.com      |
| 8-10  | Flatirons Mineral Club           | Longmont, CO      | hoss@q.com             |
| 9-10  | OrangeBelt Mineralogical Society | Rialto, CA        | jpearson1915@gmail.com |
| 15-17 | Gem Faire Inc                    | San Diego, CA     | info@gemfaire.com      |

### RMFMS

RMFMS delegates voted to have the 2018 held in Fairplay, as proposed, the weekend of June 8,9,10... in conjunction with the Fairplay Contin-Tail Rock Swap. The meetings/breakfast/banquet will be held at the new Riverside Inn, next to the swap grounds, along US 285. This convention will be totally different than most RMFMS events I've ever attended. We'll do the dirty work on Saturday, then adjourn to field trips on Sunday and perhaps Monday. Saturday night's speaker will be Dr. Peter Modreski and his "Colorado's Best 10 Collecting Sites." (to be followed on Sunday with trips to probably five of the sites).

This event requires that all Colorado clubs in some way be involved in the event (spread the wealth and the whole organization won't fall on one club). Denver Gem and Mineral Guild will take the lead in organizing the events in the hotel. We'd like the other clubs to offer to lead at least one field trip, provide favors for the breakfast and banquet, and help handle registration and field trip organization.

The FIRST preparatory gathering of clubs (any officers/ reps) was held Saturday May 6, 2017, at the Pikes Peak Historical Museum in Florissant, CO at 10:00. The building houses the nation's largest smoky quartz crystals and other fine specimens donated by the members of Lake George Gem and Mineral Club. The meeting will aim to prepare an "agenda" and organize our thoughts about the Fairplay event. Who will do what and when?

Please let me know who will be attending this meeting from YOUR club! THANKS!

Beth Simmons, Ph.D., RMFMS 2017 President

## Colorado River's Connection with the Ocean was a Punctuated Affair

New interpretation of how one of America's great rivers got linked to the ocean amid tectonic influences and changing sea level

Date: November 15, 2017

Source: University of Oregon

### Summary:

The Colorado River's initial trip to the ocean didn't come easy, but its story has emerged from layers of sediment preserved within tectonically active stretches of the waterway's lower reaches. Researchers theorize that the river's route off the Colorado Plateau was influenced by tectonic deformation and changing sea levels that produced a series of stops and starts between roughly 6.3 and 4.8 million years ago.



Bioclastic limestone and cross-bedded conglomerate are visible in exposed rocks at Marl Wash in the Bouse Formation, south of Blythe, California. The wash was named by geologists studying the deposits. The sedimentary structures preserve a record of deposition by strong tidal currents at the north end of the Gulf of California about 6 million years ago, prior to arrival of the Colorado River and its sediment load. A team led by University of Oregon geologist Rebecca Dorsey interpreted a wide range of depositional processes and environments, and their changes through time, using detailed stratigraphic analysis and micropaleontology.

Credit: Photo by Rebecca Dorsey


A scientific team, led by geologist Rebecca Dorsey of the University of Oregon, theorizes that the river's route off the Colorado Plateau was influenced by a combination of tectonic deformation and changing sea levels that produced a series of stops and starts between roughly 6.3 and 4.8 million years ago. Dorsey's team lays out its case in an invited-research paper in the journal *Sedimentary Geology*. The team's interpretation challenges long-held conventional thinking that once a river connects to the ocean it's a done deal.

If you shop on Amazon.com we would like you to try AmazonSmile. AmazonSmile is a website operated by Amazon that lets customers enjoy the same wide selection of products, low prices, and convenient shopping features as on Amazon.com and the AmazonSmile Foundation will donate 0.5% of the price of eligible purchases to the charitable organizations selected by customers. We would hope you choose Grand Junction Gem & Mineral Club!



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## Grand Junction Gem and Mineral Club

### Officers

|                |                 |              |
|----------------|-----------------|--------------|
| President      | Mel Bersch      | 242-3134     |
| Vice President | Mike Burritt    | 260-3897     |
| Co-Secretary   | Anita Martinez  | 434-9270     |
| Co-Secretary   | Chris Henderson | 719-244-3192 |
| Treasurer      | Pam Bersch      | 242-3134     |

### Directors

|                     |          |
|---------------------|----------|
| Pat Martinez        | 434-9270 |
| Cindy Teare         | 462-6806 |
| Teri Drost          | 256-0983 |
| Jim Schultz         | 242-0428 |
| Betty Jo (BJ Brown) | 241-3051 |

### Committee Chairpersons

|                     |                  |          |
|---------------------|------------------|----------|
| Audit               | Kathy Ericson    | 623-2522 |
| Building and Ground | Sylvester Spaeth | 846-5716 |
|                     | Judy Nason       | 250-9128 |
| Compliance          | Jim Schultz      | 242-0428 |
| Correspondence      | Bambi Harmon     | 216-4540 |
| Decorating          | Linda Dunham     | 623-3610 |
| Display Cases       | Val Meduros      | 773-4244 |
|                     | Carmen Bruno     | 773-4247 |
| Education           | Cindy Teare      | 462-6806 |
| Field Trips         | Wayne Sims       | 314-2970 |
| Funding/Constr.     | Mike Cosby       | 589-0687 |
| Historian           |                  |          |
| Hospitality         | Judy Nason       | 250-9128 |
| Inventory           | Pat Martinez     | 434-9270 |
| Name Tags           | Melinda Hanson   | 712-6972 |

### Leaverite Editors

### Librarian

### Meet-Up

### Membership/Badges Carrie Riggs and

### Nominating

### Publicity

### Scholarships

### Shop Foremen

### Show

### Show Assistant

### Supplies

### Vests

### Website

|                |              |
|----------------|--------------|
| Lorrie Wallace | 250-1122     |
| JoAnn Whalen   | 424-2007     |
| Joyce Frost    | 255-7078     |
| Jim Schultz    | 242-0428     |
| Evita Shultz   | 242-0428     |
| Sue Smith      | 245-5602     |
| Teri Drost     | 260-2478     |
| Wayne McMacken | 208-2534     |
| Bill Hood      | 241-8020     |
| Thom Ericson   | 623-2522     |
| Scott Pugsley  | 972-953-7735 |
| Wayne McMacken | 208-2534     |
| Bambi Harmon   | 216-4540     |
| Evita Shultz   | 242-0428     |
| Linda Sims     | 314-2970     |
| John Mayerik   | 243-8589     |

### Board Meeting

The board will meet at Mel Bersch's house, 248 Little Park Road, at 7:00 pm on the Wednesday before the 2<sup>nd</sup> Thursday Cookie Meeting each month. All club members are welcome to attend. Hope to see you there.

### Club Information

The Grand Junction Gem & Mineral Club, Inc. is affiliated with the American Federation of Mineralogical Societies, and the Rocky Mountain Federation of Mineralogical Societies. The club is located at 2328 Monument Road Grand Junction, CO, mailing address: P. O. Box 953, Grand Junction, CO 81502 The Club is a nonprofit, 501(c)3 tax-exempt, educational organization. Our purpose shall be exclusively educational and social: To increase and disseminate knowledge of the earth sciences pertaining to minerals, gems, rocks, artifacts, fossils and similar subjects; To promote and perpetuate knowledge of the lapidary arts; To encourage field trips; To encourage greater public interest and education in gems, fossils and minerals, cooperating with established institutions in such matters. The Grand Junction Gem and Mineral Club meets on the second and fourth Thursday of each month at 6:30 pm in our club building. June, July, and August meetings will be on the fourth Thursday only. November and December meetings will be on the second Thursday only. Our Annual Show is Mother's Day Weekend and is held at Two Rivers Convention Center at 159 Main St, Grand Junction, CO 81501. Classes and workshops are offered throughout the year and are announced in the newsletter.

### The Facetors Group

The Facetors Group meets at the clubhouse on the 3<sup>rd</sup> Saturday of each month at 9:30 am. They have a Project of the Month and a People's Choice. They also have teachers available for one-on-one classes. Contact Connie Duncan at 244-2984 for information about the group or classes.

### The Grand Valley Gold Prospectors Group

The Grand Valley Gold Prospectors Group is now part of the Gem and Mineral club. They will meet each month at the clubhouse at 7:00 pm on the 2<sup>nd</sup> Tuesday. Everyone is welcome to attend the group. P.O. Box 1357 Grand Junction, CO 81501. Laura Adamson pres., 260-6375; Robert Hubbard vice pres., 254-1449; Chuck Shepard Secretary, 270-5807

### The Mineral Group

The Mineral Group meets at the Bersch's, 248 Little Park Rd, at 6:30, on the Friday after the 4<sup>th</sup> Thursday's Club Meeting and is open to all club members and guests. A potluck will be followed by discussion and microscopic images of various minerals. Please bring up to 5 specimens, and/or other minerals you wish to look at for the discussion.

## New Members

Welcome to the Grand Junction Gem and Mineral Club. Include your email address when you register to receive newsletters and updates. Check out the website for past newsletters and general information. Order a vest made to your size from Linda Sims for \$20.00 and a name Tag from Melinda Hanson for \$10.00. Be sure to sign up for some classes to learn how to use the machines in our shop so you can participate in open shop.

## Dues

Our calendar year is January 1 - December 31. Dues are due by January 1 but must be in by January 30 for names to be included in the Club Directory. Please pay your dues at the meeting or send check made out to Grand Junction Gem and Mineral Club, P. O. Box 953 Grand Junction, CO 81502. Prospective members should attend one general meeting to obtain a membership application. Annual dues will be prorated after July 1st.

Adult Member - \$30.00 (18+), 2nd Adult, same household - \$10.00 Children under 18 years, same household - No Cost

## Club Rules and Regulations

The notebook of rules and regulations is available on the front table at all meetings for members to read.

## Gem and Mineral Classes

Most classes are 6 weeks. Member's cost \$30.00. Non-member's cost is \$60.00. The cost of the classes is based on 6 weeks and prorated when the class is shorter. Please contact instructors to sign up for classes.

| Class        | Instructor     | Phone    | Open Shop  |
|--------------|----------------|----------|--|
| Beading      | Tiny Blasdal   | 858-7975 | <b>Shop Chairman:</b> Thom Ericson 623-2522          |
| Chain Making | Cindy Teare    | 462-6806 | <b>Shop Supervisors:</b>                             |
| Faceting     | Connie Duncan  | 244-2984 | Wednesday: 12-3 Thom Ericson 623-2522                |
| Filigree     | Pam Bersch     | 242-3134 | Saturday: 9-12 Scott Pugsley 972-953-7735            |
| Intarsia     | Jim Lynch      | 361-2123 | Previous instruction in use of equipment is required |
| Lapidary     | Jim Schultz    | 242-0428 | before using any tools or machines in the shop.      |
| Lapidary     | Mike Burritt   | 260-3897 | Sign in each time you use the shop.                  |
| Silversmith  | JoAnn Piburn   | 245-1669 | Help with the clean-up before leaving.               |
| Silversmith  | Wayne McMacken | 208-2534 | Shop fee is \$5.00/session.                          |
| Wire Weaving | JoAnn Piburn   | 245-1669 | Slab saw \$.26 per square inch.                      |
| Wire Wrap    |                |          | <b>Always—Safety First</b>                           |

## The Leaverite News

The Leaverite News is your newsletter. Articles, ideas and news should come from the club members. If you are an officer, director, or committee chair person you should plan to submit monthly updates by the 15th of each month. News should be emailed to [leaveriteneews@gmail.com](mailto:leaveriteneews@gmail.com) or contact Lorrie Wallace (250-1122 or JoAnn Whalen (424-2007, 554 Casa Rio Ct., Grand Junction, CO, 81507. *Leaverite News is published nine months of the year (Sept-May by the Grand Junction Gem and Mineral Club, Inc. Articles printed in this newsletter are the experiences and/or opinions of the individuals submitting them. They do not necessarily reflect the views or opinions of the Grand Junction Gem and Mineral Club, nor of the editors. Articles written without a byline are written by the editor. We are not responsible for authenticity, safety, or reliability of publications. All articles/photos are included in accordance to fair use for research and education. Caution and safety should always be practiced when trying out any new idea, venture or exploration in the field. We request corrections and/or additions to articles.*

## Grand Junction Gem and Mineral Website

Our website, [www.grandjunctionrockclub.org](http://www.grandjunctionrockclub.org), has meeting information, Leaverite Newsletter, Classes, Field Trips, & Photo Gallery. Send information to John Mayerik; 243-8589; email [Grandjunctionrockclub@gmail.com](mailto:Grandjunctionrockclub@gmail.com)

## Meetup

Meetups are neighbors getting together to learn something, do something, share something. The Club is registered at the Grand Junction Meetup. Go to [http://www.meetup.com/cities/us/co/grand\\_junction/](http://www.meetup.com/cities/us/co/grand_junction/) to register or for information or call Jim Schultz at 242-0428.

## Summary of Minutes of the Gem and Mineral Club

Board Meeting November 8, 2017

### Old Business:

Both the **Yard Sale and Rock Sale** brought in \$1587. Though this is less than last year it is still a significant contribution to the club! Thanks to all who worked so hard to make this event a success.

**Scholarships:** GJGMC will provide one \$500 scholarship to a CMU Geology student from the annual show silent auction profits. The board will decide annually if any additional scholarships will be provided, and on how additional profits from the silent auction will be spent.

**Classes:** Free membership will be granted to each instructor the year after a class is taught. Spouse/family membership dues will be \$10 in the year of the free membership. Only one free membership will be granted per year, per instructor, regardless of the number of classes taught the previous year.

Teachers are reminded that students must be members and must attend at least two meetings before they can participate in classes at the membership rate.

**GJGMC Inventory:** The inventory needs additional work before final approval.

**Building Fund:** The property survey is complete and will be recorded with the county. Corner pins with metal caps are set. Future building permit(s) will be based on this survey.

A building committee will be established. This committee will submit a proposed budget/plan on the direction the club may take toward a future building.

**Show committee:** Scott Warren will be the show chairman for 2018.

**Dues:** Please note the due date for payment of 2018 membership dues is January 1, 2018. If possible, please pay by December 31st.

**Building Maintenance:** The paper product/vacuum closet will be locked, and four new keys will be distributed to appropriate members

The Shop will be padlocked with a Simmons lock that cannot be cut with bolt cutters. Thirteen keys marked with "Do Not Duplicate" and unique identifiers will be issued by the Vice-president to appropriate members including, the President, Vice-president, class instructors, shop foremen, and maintenance man.

*Submitted by Anita Martinez, co-secretary*

General Meetings November 9, 2017

### Old Business:

**Yard and Rock Sale** raised \$1587.89 Thanks to Jim Schultz and Judy Nason!

**Instructors** will get a free membership and spouse/family will pay a \$10 membership due. The free membership will be granted the year after the class is taught. Only one free membership will be granted to an individual instructor, regardless of the number of classes taught in a given year. Instructors will have a meeting soon to coordinate classes for 2018. Watch your emails for more information. JoAnn Piburn will start a chain making class soon.

**Building Funds:** The property survey is done. Corner pins with metal caps are set. This survey will be recorded with the county. Any building permit will be based on this survey.

**Dues:** Please note the due date for payment of 2018 membership dues is January 1, 2018. If possible, please pay by December 31, 2017.

### New Business:

Nominating Chairman: Teri Drost

Nominees for President - Jim Schultz, Vice President - Val Medeiros, Financial Director - Tony Kovschak, Secretaries - Anita Martinez and Nancy Schuerr, Treasurer - Dave McCollough, Directors; 1 year – Cindy Teare, 2 year – Teri Drost, 3 year – Chris Henderson, Past President – Mel Bersch

Voting for officers will be done at the meeting following our Christmas dinner.

### Presentation: Show and Tale – Skill and Technique

Lapidary – Three instructors had seven students present and discuss their projects.

Intarsia – One instructor had 2 students show their pieces each of which took many hours to complete.

Filigree – three instructors had five students discuss their very creative necklaces and earrings. One student entered her work in the Garfield County Fair and won a ribbon.

Chain Making & Wire Weaving - numerous pieces were discussed and displayed

Silver Smithing - was discussed and a variety pieces were shown.

Silver Casting – is a one on one class with several molds available to students.

Faceting – is another one on one class.

Wire wrapping – is another class available to students



## Colorado River's Connection with the Ocean was a Punctuated Affair

### Continued...

"The birth of the Colorado River was more punctuated and filled with more uneven behavior than we expected," Dorsey said. "We've been trying to figure this out for years. This study is a major synthesis of regional stratigraphy, sedimentology and micropaleontology. By integrating these different datasets we are able to identify the different processes that controlled the birth and early evolution of this iconic river system."

The region covered in the research stretches from the southern Bouse Formation, near present-day Blythe, California, to the western Salton Trough north of where the river now trickles into the Gulf of California. The Bouse Formation and deposits in the Salton Trough have similar ages and span both sides of the San Andreas Fault, providing important clues to the river's origins.

Last year, in the journal *Geology*, a project led by graduate student Brennan O'Connell, a co-author on the new study, concluded that laminated sediments found in exposed rock along the river near Blythe were deposited by tidal currents 5.5 million years ago. The Gulf of California, it was argued, extended into the region, but the age of the deposits and tectonic and sea level changes at work during that time were not well understood.

Analyses by Kristin McDougall, a micropaleontologist with the U.S. Geological Survey and co-author on the new paper, helped the team better pinpoint the timing of the limestone deposits to about 6 million years ago, when tiny marine organisms lived in the water and were deposited at the same time.

About 5.4 million years ago, conditions changed. Global sea level was falling but instead of bay water levels declining, as would be expected, the water depth increased due to tectonic subsidence of the crust, the researchers discovered.

The basal carbonate material left by marine organisms was then inundated by fresh water as the river swept down into lower elevations, bringing with it clay and sand from mountain terrain, they found.

"The bay filled up with river sediment as the sediment migrated toward the ocean," Dorsey said. "As more sediment came in, transport processes caused the delta front to move down the valley, transforming the marine bay into a delta and then the earliest through-flowing Colorado River."

The river had arrived in the gulf, but only temporarily. A tug-of-war lasting for 200,000 to 300,000 years began some 5.1 million years ago, when the river stopped delivering sediments from upstream. The delta retreated and seawater returned to the lower Colorado River valley for a short time. The evidence is in the stratigraphy and fossils. Researchers found that clay and sand from the river became mixed with and then covered by marine sediment.

Something, Dorsey said, apparently was happening upstream, trapping river sediment. A good bet, the researchers think, is tectonic activity, perhaps earthquakes along a fault zone in the river's northern basin that created subsidence in the riverbed or deep lakes along the river's path.

At roughly 4.8 million years ago, the river resumed depositing massive amounts of sediment back into the Salton Trough and began rebuilding the delta. Today's view of the delta, however, reflects human-made modern disturbances to the river's sediment discharge and flow of water reaching the gulf.

To meet agricultural demands for irrigation and drinking water for human consumption, Hoover Dam was constructed on the river to form Lake Mead during the 1930s. In 1956-1966, Glen Canyon Dam was built, forming Lake Powell.

"If we could go back to 1900 before the dams that trap the sediment and water, we would see that the delta area was full of channels, islands, sand bars and moving sediment. It was a very diverse, dynamic and rich delta system. But humanmade dams are trapping sediment today, eerily similar to what happened roughly 5 million years ago," Dorsey said.

The bottom line of the research, she said, is that no single process controlled the Colorado River's initial route to the sea. "Different processes interacted in a surprisingly complicated sequence of events that led to the final integration of that river out to the ocean," she said.

The research, Dorsey said, provides insights that help scientists understand how such systems change through time. The Colorado River is an excellent natural laboratory, she said, because sedimentary deposits that formed prior to and during river initiation are well exposed throughout the lower river valley.

"This research," Dorsey said, "is very relevant to today because we have global sea level rising, climate is warming, coastlines are being inundated and submerged, and the supply of river sediment exerts a critical control on the fate of deltas where they meet the ocean. Documenting the complex interaction of these processes in the past helps us understand what is happening today."

Story Source:

Materials provided by University of Oregon. Note: Content may be edited for style and length.

Journal Reference:

Rebecca J. Dorsey, Brennan O'Connell, Kristin McDougall, Mindy B. Homan. Punctuated Sediment Discharge during Early Pliocene Birth of the Colorado River: Evidence from Regional Stratigraphy, Sedimentology, and Paleontology. *Sedimentary Geology*, 2018; 363: 1 DOI: 10.1016/j.sedgeo.2017.09.018

Cite This Page:

MLA

APA

Chicago

University of Oregon. "Colorado River's connection with the ocean was a punctuated affair: New interpretation of how one of America's great rivers got linked to the ocean amid tectonic influences and changing sea level." *ScienceDaily*. ScienceDaily, 15 November 2017.

<[www.sciencedaily.com/releases/2017/11/171115124616.htm](http://www.sciencedaily.com/releases/2017/11/171115124616.htm)>.