



NORTHWEST GEOLOGICAL SOCIETY

A regional association of professionals, students & others interested in geology
Please browse www.nwgs.org for more about us



March 2013 Newsletter

Volume 27, Number 3



March 12 Program Speaker

Speaker: Dr. Jim Sears, U. of Montana Dept. of Geosciences

Title: Origin of the Grand Canyon: the Canadian connection

Abstract: Fluvial sediments map out a Middle Miocene 'super-river' from headwaters in the Colorado Plateau to the Labrador Sea, where delta deposits at the mouth of Hudson Strait contain fossil fragments derived from Paleozoic and Mesozoic beds of western North America. From Saskatchewan south, sources of Middle Miocene fluvial gravel successively link the Great Plains, Northern Rockies, Great Basin, and Colorado Plateau. The delta in the Labrador Sea may represent the depositional site for part of 2-3 km of cover that was eroded from the upper Colorado River basin between 26 and 16 million years ago.

About 26 million years ago, the Rio Grande Rift and its extensions to the northwest cut the upper Colorado River basin out of the Great Plains and tilted it to the southwest. The upper Colorado River flowed down the structural axis of the basin and initiated erosion of the Grand Canyon by 23 million years ago. I propose that the river turned north at the Grand Wash (Lake Meade area), following existing strike-parallel valleys, and flowed into an existing system of rifts in the eastern Great Basin. It followed the rifts north to Idaho. Northeast-trending rift valleys across the Idaho and Montana Rockies provided the final link to the Great Plains, where the Miocene drainage joined the pre-Pleistocene South Saskatchewan River and 'Bell River' that drained across Canada to the Labrador Sea.

The long river graded to sea level by 16 million years ago, when down-cutting stopped along the main stems, and aggradation began. The paleo-river was segmented by faulting and volcanism after about 16 million years ago. After 6 million years ago, faulting diverted the Colorado River to the newly-opened Gulf of California. The drop in local base level allowed erosion to incise the deep and narrow Inner Gorge of the Grand Canyon along the trace of the broader Miocene bedrock valley floor, which remains as a prominent terrace along the length of the canyon. The Yellowstone hotspot cut off the river in Idaho after 6 million years ago. The segment in Nevada simply dried up. Pleistocene continental glaciation beheaded the Labrador delta at Hudson Strait and diverted Montana's drainage into the present Missouri River.

5:30pm: No-host social hour

6:30pm: Buffet dinner

7:30pm: Speaker program

All are welcome to attend –
reservations are required
if coming for dinner.

► [Reservations here](#) 

PROGRAM DINNER RESERVATIONS: NWGS members: **\$40**; Non-members: **\$45**; Full-time students : **\$20**. \$45 for LATE REGISTRATION. Make your reservation and payment on-line at www.nwgs.org (or mail your payment to *Northwest Geological Society, 4616 25th Ave NE #397, Seattle, WA. 98105* (must be received by Thursday prior to meeting)). Contact [Dan Smith](mailto:Dan.Smith@nwgs.org) at 206-937-5313 or nwgeo@yahoo.com.

If attending the speaker program only, a \$5 voluntary donation to help defray the meeting room cost is requested.

Location: Pacific Dining Hall at the [Talaris Conference Center](#), 4000 NE 41st St., Seattle, WA. Ph 206-268-7000. **Directions:** See [on-line directions with map](#), or: from I-5 northbound or southbound in Seattle, take Exit 168B (NE 45th St.). Drive east on NE 45th St. past UW down the hill and past University Village. Turn south (right) onto Mary Gates Memorial Drive at the 5-way intersection. MGM Drive will curve east (left) and become NE 41st St. Continue several blocks to the [Talaris Conference Center](#) entrance on the north (left) side. We meet in the Pacific Dining room on the left.

Upcoming Speakers and Field Trips

April 9: TBA

May 3-5: Second NWGS Symposium. See more in the *Announcements* section on the next page.

Spring, 2013 Field Trip: May 5, Eric Cheney, UW ESS, Fidalgo Island, associated with the Second NWGS Symposium. See more in the *Announcements* section on the next page.

Fall, 2013 Field Trip: TBA

If you would like to volunteer to give a talk or lead a field trip for NWGS, please contact President [Kathy Troost](#).

Please see the [NWGS website](#) for detailed announcements.

Contact webmaster [Julie Masura](#) if you have any announcements to post on the website.

Announcements

- The **Second NWGS Symposium, *The Paths Ahead for Northwest Geosciences*** is scheduled for **May 3-5, 2013** at the University of Washington:
 - * **May 3:** dinner for speakers, past & present NWGS officers, & organizing committee members;
 - * **May 4:** symposium main event at Kane Hall, UW, with 11 speakers, coffee service, lunch, and reception afterwards;
 - * **May 5:** symposium field trip to Fidalgo Island led by Eric Cheney, UW Dept. of Earth and Space Sciences;
 - * Please contact [Dave McCormick](#) (206-838-5834) if you would like to **contribute to the symposium as a sponsor**;
 - * Details will be posted at [NWGS web-site](#) as they become available.
- **Next Board meeting:** March 12, 4:30 P.M., Talaris Conference Center.
YOU would like to be involved!

Photo Spotlight



The Inner Gorge of the Grand Canyon looking west down the Colorado River from Tonto Platform. The Colorado River drainage has undergone significant reorganization during its history. T. Bush photo.

About NWGS

NWGS, a regional association of professionals, students & other persons interested in **geology**, provides a forum for the presentation and discussion of a wide range of geological topics, emphasizing those of the Pacific Northwest of fundamental scientific interest.

YOU would like to be involved!

Program meetings: 2nd Tuesdays, October through May in the Pacific Dining Hall at the [Talaris Conference Center](#) in Seattle (see 1st page). Anyone may attend the speaker program, but a reservation is necessary for those wanting dinner (see 1st page). **Field trips (members only):** one in late spring/early summer and one in late summer/early fall, usually of 1-3 days in length. **Membership** is open to anybody with a professional or amateur interest in geology. **Annual dues:** Professional: \$30; Student: \$5. **To join or pay annual dues:** send a check payable to NWGS to Secretary [Dan Smith](#), 10203 40th Ave SW, Seattle, WA. 98146. Please include your name, address, home phone, email, and employer/affiliation (if any). Professional dues may now also be paid at www.nwgs.org.

YOU would like to be involved!

Recommended Readings

Sears, J.W., 2009, Great elliptical basin, western United States: Evidence for top-down control of the Yellowstone hotspot and Columbia River Basalt Group: <http://www.mantleplumes.org/CRBEllipse.html>

Sears, J.W., 2010, Lost lakes and re-arranged rivers: Neotectonic disruption of the Middle Miocene Big Hole River basin, SW Montana: *Northwest Geology*, v. 39, p. 113-121.

Sears, J.W., and Thomas, R.C., 2007, Extraordinary Middle Miocene crustal disturbance in southwestern Montana: Birth of the Yellowstone hot spot? in Thomas, R.C., and Gibson R., eds., *Geologic history of Southwest Montana: Northwest Geology*, v. 36, p. 133-142.

Please send your reading recommendations to Newsletter Editor [Tom Bush](#).

To report a change of email or postal address or request to be removed from mailings, notify Secretary [Dan Smith](#) at 206.937.5313. Questions or comments? Contact President [Julie Masura](#).

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