



Colorado Scientific Society

*The objective of the Society is to promote
the knowledge and understanding of Earth Science,
and its application to human needs*

October Presentations:

“Groundwater vulnerability to agricultural contamination in Colorado and the High Plains”

**by John McCray*,
Kyle Murray, and Stephanie Schlosser**

**Department of Geology and Geological Engineering, Colorado School of Mines
(*speaker)**

And

“Geochemistry of the Leaking Radioactive Waste Tanks at Hanford, Washington”

Kathryn Nagy

Department of Geological Sciences, University of Colorado at Boulder

Thursday, Oct 19, 2000

American Mountaineering Center

710 10th Street (NE corner with Washington)

Golden, Colorado

Social Half-hour: 7:00 p.m.

Meeting Time: 7:30 p.m.



President's Note

Greetings and happy fall! This month we are fortunate to have Kathy Nagy (CU) and John McCray (CSM) as speakers. We look forward to hearing about their research on different facets of the ever-growing field of hydrogeology.

This is a good time to convey thanks to several Society members for their recent contributions: to Robert Weimer for his enlightened overview of river types and history at last month's Family Night and to Sherman Marsh for organizing yet another great field trip during the peak of fall foliage in southern Colorado and northern New Mexico. Thanks are also in order for Bob Bucknam for his development and management of the Society membership database. Bob is stepping down from this role after many years of service but his carefully constructed relational database will continue to serve the Society in the future. We welcome Cynthia Rice who will take up the management reins of the database.

We are delighted that Robert Fleming has agreed to serve on the CSS council, filling a recently vacated position. Bob has a long been active in the Society, including serving as president.

Students! You should start preparing their talks for the upcoming annual Student Night. Regional finals will be held at CSU, CU, and CSM during the week of October 23-27. The finalists will give their presentations to the Society on November 8th. Remember this is a great way to prepare for the upcoming GSA meeting and win a few \$\$ to boot. Contact Scott Lundstrom (303-236-7944, sclundst@usgs.gov) for more information.

-Mark R. Hudson, CSS President

<http://home.rmi.net/~css/>



Please Note CSS Meeting Time for November

The November CSS meeting will be a special student night, held on Wednesday, November 8th at 7 pm, at the American Mountaineering Center. Guest Speakers will be student finalists, one from each of the University of Colorado, Colorado State University, and the Colorado School of Mines.

Geochemistry of the Leaking Radioactive Waste Tanks at Hanford, Washington

Abstract for presentation by Kathryn Nagy:

The Hanford radioactive waste tanks, located in east central Washington adjacent to the Columbia River, contain a mixture of solutions and solids from the reprocessing of nuclear fuel. Early tanks, constructed of concrete lined with a single shell of iron, have failed resulting in leakage of radioactive elements such as cesium and technetium into the underlying sediments during the last 50 years. Some evidence has indicated that cesium has been transported to the depth of the water table, approximately 150 feet below the surface, but it is not clear how such transport has occurred in a relatively short time. Leaking tanks also release highly caustic high-temperature aluminum-nitrate solutions to the sediments resulting in unusual geochemical reactions that affect the transport of the radionuclides. Evidence for what these reactions are and how fast they can occur will be presented with the goal of understanding longer-term aspects of the transport of radionuclides through the unsaturated sediments to the water table.

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Groundwater Vulnerability to Agricultural Contamination in Colorado and the High Plains

Abstract of Presentation By John McCray*, Kyle Murray, Stephanie Schlosser:

Department of Geology and Geological Engineering

Colorado School of Mines

(**Speaker*)

The importance of ground water as a resource in the state of Colorado motivates research to investigate the vulnerability of unconfined aquifers to contamination from agricultural sources. Review of previous vulnerability studies indicates that hydrogeologic factors, chemical transport characteristics, land-use, and land-management factors contribute to the vulnerability of ground water to chemical contamination. However, few vulnerability studies have been rigorously validated using large, reliable groundwater chemical data sets. In addition, the impacts of data-collection scale on the accuracy of the predicted vulnerabilities have not been assessed. For this research, we use cell-based geographic information systems to analyze the sensitivity and vulnerability of Colorado ground water to agricultural contamination (e.g., pesticides and nitrates) in Rio Grande and Weld Counties. Subjective and physics-based mathematical expressions that represent transport of contaminants in vadose zones are developed and included in the cell-based GIS calculation scheme. Specific goals of the research are to: assess the impact of data-collection scale on vulnerability-model results and accuracy; develop vulnerability models that account for pesticide-specific transport and management data; and validate the vulnerability models using ground water quality data. The results of this study will allow us to develop a methodology for evaluating the vulnerability of ground water to contamination from land-surface-applications of agrochemicals.

John E. McCray

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Student Night 2000

On Wednesday November 8 at the American Mountaineering Center, the Colorado Scientific Society will host a special night highlighting the geoscience work of students from Front Range colleges and universities. The program will consist of three 15-minute talks by the winners of semifinals to be run at CSU, CSM, and CU. Cash prizes will be given to these finalists at Student Night. This occasion provides a fine opportunity for students to showcase their research before a knowledgeable yet friendly audience. Students are welcome to give talks they have prepared for upcoming meetings, such as GSA and AGU. CSS preliminary runoffs for speaker finalists will be held October 23-30th. Interested students can contact Scott Lundstrom (sclundst@usgs.gov; 303-236-7944) to be included in the semifinals to be run at CU, CSM and CSU.

Earth Science Meetings and Talks

Denver International Petroleum Society (DIPS) meets the 2nd Friday of each month at the Wynkoop Brewing Co., 18th and Wynkoop Streets. Reception begins at 11:30 a.m., luncheon at 12 p.m., program at 12:30 p.m. Make reservations (required) by leaving message at (303) 623-5396. Reservations accepted after 8 a.m. on Friday until 10:30 a.m. on Wednesday prior to the meeting. Cancellations accepted until 11:00 am Wednesday prior to the meeting. Cost: \$15 for lunches; talk only is available for \$2 (make checks payable to "D.I.P.S."). Contact Keith Murray at (303) 986-8554 for information.

Denver Region Exploration Geologists' Society (DREGS) meets in the Mutual Consolidated Water Building, 12700 West 27th Avenue, Lakewood. Social hour 6:00-7:00 p.m. Technical presentation at 7:00 p.m. Meetings are normally scheduled for the first Monday of each month. For information contact Jim Piper, (303) 932-0134, or the website <http://www.dregs.org>.

Colorado School of Mines Lectures -For Heiland Lectures at 4:00 p.m. on Fridays, contact Michelle Szobody (303) 273-3451. For information on Van Tuyl Lectures, call the Dept. of Geology at (303) 273-3800.

Colorado State University Geology Lectures -Mondays, 4:10 p.m. in room 109 or 316 of the Natural Resources Building. Call the Dept. of Earth Resources at (970) 491-5661 for further details.

University of Colorado at Boulder, Geological Sciences Colloquium
Wednesdays, 4:00-5:30 p.m., Rm. 180. For schedule, contact Kathy Madsen 303-492-8141.





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