

ROLLA WATER RESOURCES LUNCHEON SEMINAR

Environmental Research Center – USGS Joint Seminar

Tuesday, April 19, 2011

3:00 PM – Room 5-G, HSS Building, History Department

UNIVERSITY OF MISSOURI SCIENCE & TECHNOLOGY

500 W. 14TH STREET

ROLLA, MO 65409

Wellsprings: A Natural History of Bottled Spring Waters

Dr. Francis H. Chapelle

U.S. Geological Survey—Columbia, South Carolina

Abstract

Bottled water is a part of everyday life for millions of Americans. Per capita consumption in the United States now tops fifteen gallons per year with sales over \$5 billion in 2002. Even as fuel prices climb, many people are still willing to pay more for a gallon of bottled water than they are for the equivalent in gasoline. At the same time, bottled water has become a symbol of refined taste and a healthy lifestyle. But despite its growing popularity, many people cannot quite put their finger on just why they prefer bottled water to the much less expensive tap variety. Some have a vague notion that bottled water is "healthier," some prefer the convenience and more consistent taste, and others are simply content to follow the trend. The fact is most people know very little about the natural beverage that they drink and enjoy. It is reasonable to wonder, therefore, just what differentiates bottled water from other water? Is it really better or healthier than tap water? Why is it that different brands seem to have subtle variations in taste? Some answers to these questions can be found by considering the history of bottling water, a practice that extends back to the invention of ceramic pottery more than 10,000 years ago.

Wednesday, April 20, 2011

2:00 PM – Room 121, Butler Carlton Civil Eng. Hall

UNIVERSITY OF MISSOURI SCIENCE & TECHNOLOGY

1401 NORTH PINE STREET

ROLLA, MO 65409

Assessing Vulnerability of Groundwater Systems to Contamination: Geochemical & Modeling Approaches

Dr. Francis H. Chapelle

U.S. Geological Survey—Columbia, South Carolina

Abstract

The vulnerability of groundwater systems to anthropogenic contamination is a function of aquifer properties such as hydraulic conductivity and recharge rates, the input of chemical contaminants, and the mobility and persistence of those contaminants.

A variety of process-based methods are available to assess both aquifer vulnerability and the vulnerability of particular public supply wells. One modeling methodology considers (1) contributing areas and travel times of groundwater flowpaths converging at individual supply wells; (2) the oxic and/or anoxic conditions encountered along each flowpath; and (3) the combined effects of hydrodynamic dispersion and contaminant-specific biodegradation. Contributing areas and travel times can be assessed using particle tracts generated from calibrated regional groundwater models. These results can then be used to estimate contaminant concentrations relative to an unspecified initial concentration (C/C_0) at individual public supply wells. The more general issue of aquifer vulnerability can be assessed using solute-transport models that simultaneously consider the sequential reaction of electron acceptors (dissolved oxygen, nitrate, etc) with natural and anthropogenic contaminants such as volatile organic carbon (VOC) compounds. The aquifer underlying the eastern San Joaquin valley of California provides an example of the application of these two approaches for assessing the vulnerability to VOC contamination in public supply wells and aquifer vulnerability to long-term nitrate contamination.

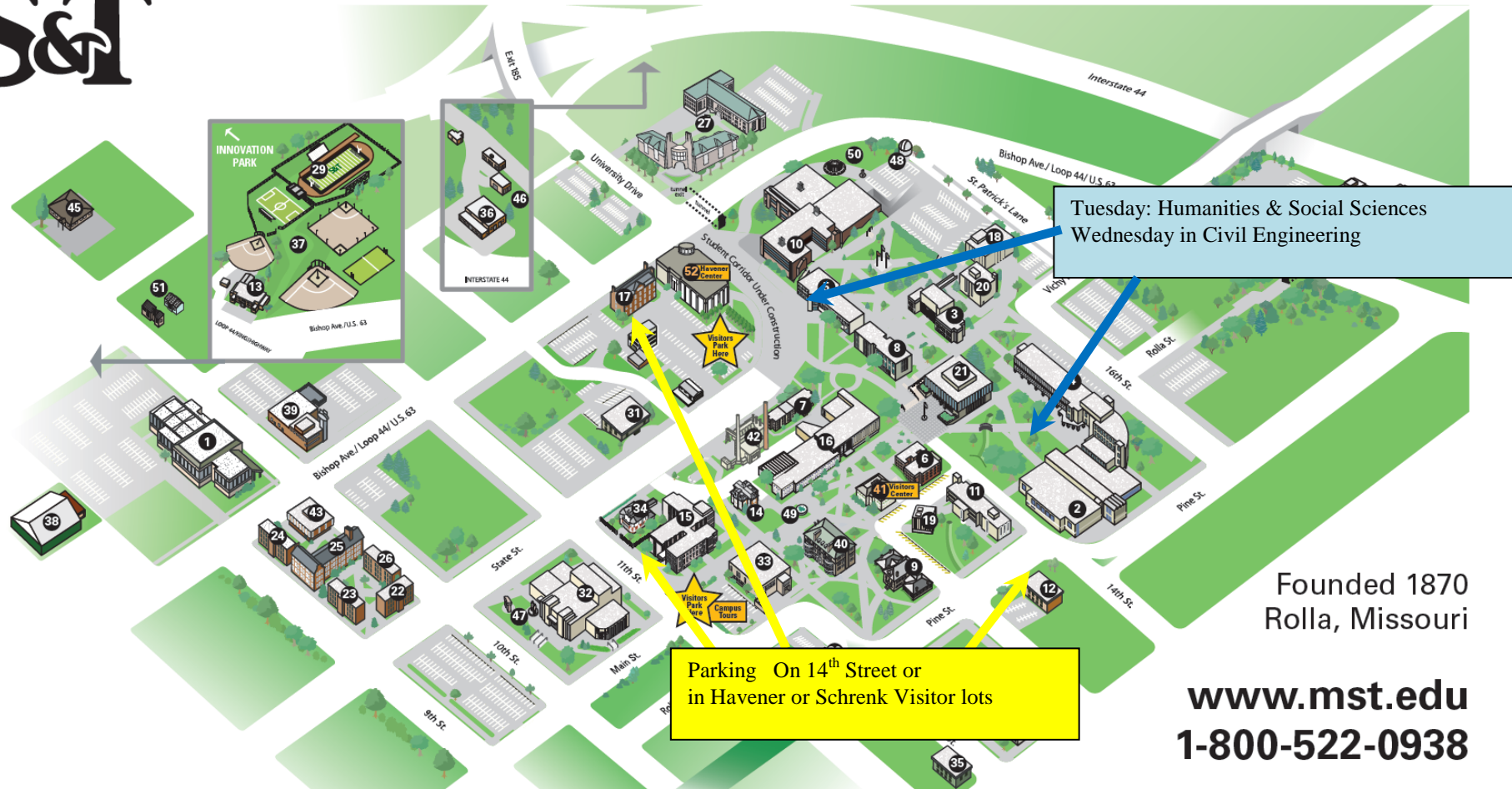
Biography: Francis H. Chapelle received B.A. (Music) and B.S. (Geology) degrees from the University of Maryland, and M.S. and Ph.D. degrees from the George Washington University. He has been a hydrologist for the U.S. Geological Survey since 1979. His research interests center on how microbial processes affect the chemical quality of ground water in both contaminated and pristine environments. He has authored more than 130 scientific papers and a textbook (Ground Water Microbiology and Geochemistry, John Wiley & Sons, 2001) on these subjects. In addition, he has written a book for the non-specialist "The Hidden Sea" (National Ground Water Association, 2000) describing the various mystic and rational approaches to understanding ground-water systems. His most recent book "Wellsprings" (Rutgers University Press, 2005) describes how the unique hydrology and chemical quality of particular spring waters led to the development of the modern bottled water industry.

---Next Luncheon---

NEED A SPEAKER!!!!

Thursday, May 12, 2011 11:45AM – 1:00 PM

Directions and parking – See map below.



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4. Emerson Hall/Electrical & Computer Engineering
5. Engineering Management
6. Fulton Hall
7. Harris Hall/ROTC
8. Humanities & Social Sciences Bldg.
9. IDE Bldg.
10. McNutt Hall
11. Physics
12. Pine Street Bldg.

13. Rock Mechanics
14. Rolla Bldg./Math

15. Schrenk Hall/Chemistry, Chemical & Biological Eng., Biological Sciences
16. Toomey Hall/Mechanical & Aerospace Eng.

RESEARCH SUPPORT FACILITIES

17. Bureau of Mines
18. Engineering Research Lab
19. MSTR
20. Straumanis-James Hall (Materials Research Center)
21. Curtis Laws Wilson Library

RESIDENCE HALLS

22. Altman Hall
23. Farrar Hall
24. Holtman Hall
25. Kelly Hall
26. McAnerney Hall
27. Residential College
28. Thomas Jefferson Hall

CAMPUS AND STUDENT SUPPORT

29. Allgood-Bailey Stadium
30. Campus Housing & Dining (Residential Life)
31. Campus Support Facility

32. Castleman Hall/Leach Theatre
33. Centennial Hall
34. Chancellor's Residence
35. Custodial & Landscape Services
36. General Services*
37. Golf Course/Athletic Fields
38. Indoor Athletic Facility
39. Kummer Student Design Center
40. Norwood Hall
41. Parker Hall (Administration Bldg.)
42. Power Plant
43. Rayl Cafeteria
44. Southwestern Bell Cultural Center
45. Student Health Services

CAMPUS LANDMARKS

46. E³ Commons
47. Millennium Arch
48. Observatory
49. The Puck
50. Stonehenge
51. Solar Village

STUDENT CENTER

52. Havener Center

* General Services and E³ Commons are located across Interstate 44 on Facilities Avenue.