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Introduction to special section: Dreiss memorial special section

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On December 14, 1993, Shirley Dreiss died in a car crash while driving to the San Francisco airport. In the ensuing weeks the news spread through the hydrological community accompanied by profound shock and sadness. We all lost a colleague, and many of us also lost a friend. At the time of her death, Shirley was a professor of hydrogeology and chair of the Department of Earth Sciences at the University of California at Santa Cruz. She was only 44 years old and in the prime of her career.

Shirley had a special talent for stimulating research in hydrogeology, especially research on interesting and important geological questions that require the application of hydrological principles. She expressed this talent in numerous ways and, as a result, influenced a host of scientists. Her students, of course, were direct beneficiaries of her insightful advice. Those who were fortunate enough to collaborate with Shirley know firsthand of her enthusiasm for science. Many others were touched less directly, but with significant impact nonetheless, by conversations at professional meetings, at meetings of various committees, through her critical reviews of our own work, and from her published papers. The community of hydrogeologists worldwide remains indebted to her legacy. This special section is dedicated to the memory of Shirley J. Dreiss.

Shirley had broad interests, encompassing karst hydrology, groundwater–surface water interaction, unsaturated flow, geostatistical analysis of geological heterogeneity, and fluid flow in subduction zones. Her work in karst hydrogeology was long-standing, starting with M.S. research with Stan Davis at the University of Missouri [*Dreiss*, 1974], continuing with Ph.D. work with Irwin Remson at Stanford [*Dreiss*, 1982, 1983, 1984], and completed with additional field work after she joined the faculty at University of California, Santa Cruz [*Dreiss*, 1989a, b]. As the Birdsall Lecturer of the Geological Society of America during 1991–1992 (since renamed the Birdsall-Dreiss Lecturer), she again returned to the theme of karst hydrology.

The other of her two Birdsall lectures was on fluid flow in subduction zones. Her work on this most geological of topics was pioneering [*Borja and Dreiss*, 1989; *Screaton et al.*, 1990; *Bekins and Dreiss*, 1992] and continuing [*Bekins et al.*, this issue]. Another major contribution was the paper with N. M. Johnson [*Johnson and Dreiss*, 1989] on the use of indicator geostatistics to quantify geological heterogeneity. This work has been continued by others, as reported in papers published elsewhere [e.g., *Bierkens and Weerts*, 1994; *Poeter and Townsend*, 1994; *Ritzi et al.*, 1994], as well as four papers included herein [*Johnson*, this issue; *McKenna and Poeter*, this issue; *Ritzi et al.*, this issue; *Scheibe and Freyberg*, this issue]. Shirley also was interested in sampling and measurement problems in the unsaturated zone [*Dreiss and Anderson*, 1985; *Narasimhan and Dreiss*, 1986; *Dreiss*, 1986; *Creasey and Dreiss*, 1988; *Reid and Dreiss*, 1990] and hillslope hydrology [*Reid et al.*, 1988].

When she died, Shirley was working on the hydrology of the Mono Lake groundwater system, a project initiated as a result of her participation on a National Research Council committee to study the Mono Lake ecosystem [*National Research Council*, 1987]. The results of this work are presented in this issue [*Connell and Dreiss*, this issue; *Neumann and Dreiss*, this issue; *Phillips et al.*, this issue; *Rogers and Dreiss*, this issue (a, b)].

To all of her activities, Shirley brought enthusiasm for the work of others as well as for her own. Consequently, she was an effective spokesperson for all of hydrogeology, especially through her service on panels for the Ocean Drilling Program and the National Academy of Sciences as well as for the Hydrological Sciences initiative of the National Science Foundation. She was held in high regard for her optimistic encouragement as well as for her innovative work.

Shirley was a frequent and visible presence at professional conferences. In the last three months of her life, she participated in three such meetings, the breadth of which reflect the

Figure 1. Shirley J. Dreiss (1949–1993)

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scope of her interests and influence. In mid-October she presented an invited paper on geostatistics at the Silver Anniversary meeting of the International Association for Mathematical Geology, in Prague, Czech Republic. Later that month she was in Boston for the annual meeting of the Geological Society of America, and finally in early December we saw her for the last time at the AGU conference in San Francisco.

The collection of papers in this special section reflects the diversity of Shirley's interests and shows the strong influence that she had on the field in her too brief career. Papers on salinity in semiarid regions such as the Mono Lake basin, on waters in modern accretionary complexes, on geostatistical analysis of heterogeneity, and on modeling of flow and transport in rift zones, watersheds, and contaminated aquifers are included. Some of the papers were contributed by her former students, some by colleagues who worked closely with her, and others by those who were influenced by her pioneering work.

A collection of papers cannot begin to substitute for a vibrant, enthusiastic, and thoughtful colleague. Our hope is that this special section will, in a small way, play a part in stimulating thought and further research in hydrogeology. In her own distinctive way, Shirley was a catalyst as well as an active agent for promulgating research in hydrogeology, work that kept the "geology" in "hydrogeology" at the forefront.

In 1915 the novelist Henry James wrote a condolence letter to a friend whose wife was killed in an automobile accident: "How can I 'write' to you under this cruellest & most unspeakable of calamities, & yet how can I be silent? ... To have been what she was, with that flawless distinction, all the years, with this black atrocity *waiting*, makes one ask what is the sense of life?" [*Plante*, 1994, p. 92]. In her life we never saw any trace of the blackness that awaited Shirley. We saw her smiles, her wit, her intelligence, her compassion, and her love of life.

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