

Preface to “A Creative Critique of U.S. Water Education”

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With the world facing increasingly daunting water problems, it seems appropriate to review the educational programs that are producing the water specialists who will have to deal with the attendant range of hydrologic and social issues. There is concern in some circles about the number and qualifications of graduates coming into the water field (graduates that we will call “water specialists”) whether from engineering or closely related fields. The increasing complexity of the water field (scarcity, water quality, ecosystem protection, recreation) and increasing public participation in the policy process appear to make impossible demands on water specialists and on water education.

The need for broadly trained water managers raises the age-old questions of how much can be taught in the university or college and how much must be acquired through experience; how much should solid specialized backgrounds be traded off against exposure to other disciplines. The possibilities are limited by the opportunity cost of students’ time and the capacity of instructors.

This issue of the Journal brings together a group of experienced water specialists, representing several disciplines and expressing differing concerns and prospects. Some are concerned that engineering is being slighted in favor of science by funding agencies and foundations, and that, as a result, the disciplines related to water, especially engineering, lack the support needed to attract the best students. Others worry that university attempts to respond to the increasing complexities have produced watered-down, excessively broad degree programs at the expense of strength in the basic disciplines. They raise the question whether we are trying to make each student a renaissance problem solver or whether water management is better

served by teams of solidly equipped specialists. The various views of employers are expressed in the “Demand Side” section of the journal.

The “Supply Side” essays focus on the academic provision of the needed educational programs and existing barriers to accommodating those needs. That accommodation must consist in part in the expeditious incorporation of scientific and technical advances in teaching programs. It must continue to provide a solid foundation in one of the basic disciplines, hopefully including some appreciation of leadership and teamwork skills. In part it should provide various forms of continuing education to suit the needs of practitioners. Achievement of these objectives is complicated by the traditional disciplinary boundaries and socialization within those boundaries, as well as limits on student and faculty time and resistance to new programs.

The social sciences have important roles to play in educating water specialists and in water policy formation. All practitioners must operate within the framework of laws and regulations, including those that specify analytical requirements, such as performing cost-benefit analyses. Training in water law and regulations is important but limited, again, by student time and the availability of appropriate faculty because Law School courses typically are not open to other disciplines. Yet it is desirable to sensitize water specialists to the interplay of changing social needs and the law.

The social and institutional dimensions of water management extend beyond the law to the decision environment involving widely varying stakeholder groups and bureaucracies. Effecting cooperation in this setting is a needed skill for water managers, including the ability to impress the public with the need to provide for the future in the face of short-run costs. Controlling the human population and

