ERVIN H. ZUBE (1931-2002)
The Significance and Impact of His Contributions to Environment-Behavior Studies

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ABSTRACT: Ervin H. Zube was a primary force among environment-behavior researchers, particularly those who helped develop the area of landscape perception and assessment. In this commemorative essay, the authors highlight some of Zube’s significant contributions to environment-behavior studies and identify a set of his publications that has had an impact on the field. In particular, they examine how Zube, Sell, and Taylor’s article “Landscape Perception: Research, Application and Theory” has helped shape subsequent research in landscape perception and suggest how environment-behavior researchers might build on its achievements.

Keywords: Ervin Zube; environment-behavior research; biography; landscape perception; research significance

In this article, we discuss the scholarly contributions of Ervin H. Zube, who in a long and distinguished career enriched our field of environment-behavior studies in many significant ways. Erv, as he was known to friends and acquaintances alike, died February 16, 2002, of complications from Alzheimer’s disease. For one with such a broad-ranging intellect and continued thirst for knowledge, such a fate seems too tragic and unjust to comprehend. Yet what Erv left behind, his work and the spirit he infused into the people whose lives he touched, has not faded and will continue to help inform and advance our field for many years to come. These are the things we celebrate here, and in the following pages we highlight some areas where we feel Erv Zube has made unique and significant contributions to the research and practice of environment-behavior studies.

Erv was a prolific writer whose 200-plus publications over 40 years thoroughly document his thoughts and work. He also wrote two particularly illuminating autobiographical essays where he summarized his life experiences and scholarly contributions, one for a theme issue of the Journal of Environmental Psychology on environmental psychology at Clark University circa 1970-1972 (Zube, 1987a) and the other for a volume of the Human Behavior and Environment book series on the emergence of intellectual traditions (Zube, 1990b). Our purpose is not to rehash these efforts but instead to offer a somewhat more independent assessment of the significance and impact of his
contributions. In this essay, we examine Ervin Zube’s work and identify the following four theme areas where we feel he made significant contributions to environment-behavior studies: landscape perception and assessment, a fusion of knowledge perspectives, connecting research to policy and action, and education. We then look at some of his most frequently cited articles in the area of landscape perception research to assess how his work has impacted this focus area of environment-behavior studies. In particular, we examine Zube, Sell, and Taylor’s (1982) “Landscape Perception: Research, Application and Theory” to better understand how this work has helped shape the environment-behavior field in the 20 years since its publication. From this analysis, we suggest how environment-behavior studies might continue to build on his work given the directions he established.

Our data for this effort came from four different sources. First, we examined Erv’s published work. We reviewed a third of his more prominent and nonduplicative publications; these were mostly journal articles but also included books, book chapters, reports, and newsletter articles. Based on our review of these copies as well as the titles and our familiarity with his other work, we coded the 226 publications listed on his curriculum vitae into a number of categories to help us understand the breadth and depth of his work over the years.

Second, we invited those who knew Erv’s work to write and tell us what they felt was its significance to environment-behavior studies. From an April 11, 2002, posting on a widely subscribed academic listserv for landscape architecture (larch-l@listserv.syr.edu) and direct appeal to colleagues from throughout Erv’s career, we received letters and calls from two dozen individuals. Their comments were both heartfelt and insightful, and although space does not permit us to reprint them here in full, we include selective quotes where appropriate.

Third, we conducted a citation analysis of Erv’s publications. In an April 2002 search of the Web of Science™, we identified his most significant publications in terms of the number of times others have cited them. We then examined a few of his top-cited research-oriented publications to see when and where the work was cited and reviewed a portion of those publications citing Zube et al. (1982) to see how his work was being used. These analyses offer one way of assessing the impact of his work; to corroborate our findings, we also reviewed the results of two other studies that assessed significant work in landscape perception as well as pertinent comments sent in by colleagues.

Finally, we drew on our own experience as students and colleagues of Erv. Both Jim Palmer and Joe Crystal were graduate students of Erv’s during the 1970s at the University of Massachusetts and, as was often the case with
Erv’s students, maintained contact as friends and professionals with him through the years. Paul Gobster’s contact was much less direct but still influential in Paul’s research program. Whereas Jim and Joe offered personal insights into Erv Zube as a mentor, friend, and human being, Paul contributed a measure of distance needed to help balance memories and emotions from a loss that is still too recent.

SIGNIFICANT THEMES IN ZUBE’S WORK

LANDSCAPE PERCEPTION AND ASSESSMENT

_Landscape_ is a term with which the name Zube goes hand in hand; in fact, _landscape_ appears in more than a third of his publication titles. “Simply stated, I think Erv’s strategic contribution is that he was one of a small number of great teachers and researchers who saw the larger public landscape as the legitimate focus of design-oriented studies” (C. Steinitz, personal communication, April 25, 2002).

Ervin Zube was instrumental in developing the specialty focus of landscape perception and assessment within environment-behavior studies, and his dedication to this area stemmed from a deep understanding and appreciation of landscapes that grew from his earliest years. From his boyhood home in Milwaukee, the Zube family enjoyed vacationing in the rural Midwestern landscape and eventually purchased a small resort in the Wisconsin Northwoods. Out of high school, Zube enrolled in a preforestry program at the University of Wisconsin–Madison in 1949 after a summer working on a national forest in Idaho but soon switched to landscape architecture, developing core skills in site-scale design under the tutelage of William Longenecker (Zube, 1995). His awareness of the broader issues of landscape perception was heightened when as an Air Force intelligence officer during the mid-1950s he was charged with providing intelligence information based on assessments of aerial photos and interview records of Iron Curtain escapees (Zube, 1990b). This experience was followed by a master’s degree in landscape architecture from Harvard (1957-1959), where he studied design history with Norman Newton and site and regional design with Hideo Sasaki. He began teaching and private practice in landscape architecture upon his return to Madison (1961-1964), then later at University of California-Berkeley (1964-1965), where a coteaching assignment with J. B. Jackson led to a growing understanding of the importance of history and values in the shaping of “everyday” landscapes of modern America (Zube, 1997).
Zube had begun some large-scale landscape assessments in Wisconsin (e.g., Zube, 1966; Zube & Dega, 1964), but it was not until his move to the University of Massachusetts in 1965 that these ideas were brought into the context of environment-behavior studies. Until this time, landscape architects had developed expert-based approaches to assessing visual and cultural landscape values. But in working on his part of a multidisciplinary assessment of the 167,000-square-mile North Atlantic Region that encompassed a quarter of the nation’s population (Zube, 1970a), Zube realized the considerable limitations of operating on the basis of “professional myths and assumptions” (Zube, 1987a). Consequently, in 1970 he made the unconventional decision as professor and head of the Department of Landscape Architecture to return to school at age 40 and pursue a Ph.D. in geography at Clark University, focusing on environmental psychology. There, under the guidance of Robert Kates, Kenneth Craik, and others, Zube added a dimension to his skill set that would serve him well in the years to come.

I was immediately impressed by his breadth of knowledge and by what a quick study he was. He had picked up a mastery of the rationale of psychometric measurement and how it might apply to observer judgments of landscape scenes as well as physical variations in landscape settings. He employed these methods in his dissertation research and subsequent classic analyses of the relationships between judgments of scenic attractiveness and physical properties (e.g., presence of water, length of view) across settings in the Southern Connecticut River Valley. In my opinion, the reports from this project (Zube, 1976; Zube, Pitt, & Anderson, 1974) remain unrivalled in scope and scientific soundness. (K. Craik, personal communication, May 13, 2002)

These early studies in landscape perception were products of the Institute for Man and Environment (IME), a rich collaborative environment for students and faculty at U Mass that Zube directed upon his return from Clark in 1972. In addition to his interest in uncovering and measuring the characteristics of rural and regional landscapes salient to people’s scenic preferences, the IME studies also examined important substantive and procedural issues for which there was little systematically collected data at the time. These issues dealt with agreement among professional, lay, and cultural groups on the evaluation and description of landscapes (e.g., Palmer & Zube, 1976; Zube, 1974; Zube & Mills, 1976); the efficacy of various means of representing the landscape through drawings, photographs, aerial photos, and field visits (e.g., Zube et al., 1974); and comparisons between different participant response formats including ratings, semantic scales, sorting, and ranking (e.g., Zube, 1973b). His work during this period was highly quantitative and
aimed toward modeling, prediction, and hypothesis testing, perhaps a reaction against the subjective biases he saw in his earlier, expert-based approaches.

With a move to the University of Arizona in 1977, a new landscape and new challenges further expanded Zube’s philosophical and methodological perspectives on landscape perception research. Beginning as director of the School of Renewable Natural Resources and associate dean of the College of Agriculture (1977-1983), then as chair of the school’s Landscape Resources Division (1984-1987), and in the last part of his career as full-time professor in landscape architecture and geography (1987-1997), Zube gradually turned away from administrative responsibilities to more fully concentrate on his research, teaching, and professional service interests. This evolution led to some of his most significant research contributions in landscape perception, developing a focus on the understanding of landscape values (e.g., Law & Zube, 1983; Zube, 1987b), an increasing appreciation for international and cross-cultural dimensions (e.g., Zube & Pitt, 1981; Zube, Vining, Law, & Bechtel, 1985), and an exposition of the need for and elements of theory development (e.g., Zube, 1984; Zube et al., 1982). His adopted homeland, the southwest desert landscape of Arizona, became a principal focus of his attention, and here he undertook a series of studies addressing such cutting-edge issues as riparian values (e.g., Simcox & Zube, 1990), water use in urban landscape management (e.g., Kennedy & Zube, 1991; Zube, Simcox, & Law, 1986), and the perception of landscape change (e.g., Sell & Zube, 1986; Zube, Friedman, & Simcox, 1989; Zube & Sell, 1986).

Erv was visionary in the sense that he worked to develop things that were needed long before people knew they were needed. I worked with him on a project looking at people’s perceptions of riparian landscapes in Southern Arizona. Nobody else was doing it at the time, and when the research was coming to fruition, groups like the Bureau of Land Management [BLM] were talking about how badly they needed this type of work done. They came to Erv asking if he could do some work in the area and he had already done it! I specifically remember the meeting. We were sliding copies of various reports on the San Pedro River over to the BLM guys. They really were stunned—it was like they just found a new bicycle under the Christmas tree. (D. Simcox, personal communication, May 15, 2002)

In these studies, Zube continued to make use of quantitative methods to address his research questions. But in striving to better contextualize the ways in which everyday people perceived landscapes and to more fully describe the depth and complexity of their landscape values and experiences, he also began to incorporate qualitative, phenomenological approaches to his...
work. He used biography and analyses of historical plans to understand the roots of his home discipline of landscape architecture (Zube, 1986a; Zube, Simcox, & Law, 1987) and examined historical accounts and landscape images of settlers to explore reasons for contemporary values in the Arizona landscape (Zube, 1982; Zube & Kennedy, 1990a). His scholarship often reflected his own personal observations and experiences, whether trying to understand Egyptian natural scientists’ dislike for the desert (Zube, 1983) or working to see that local values and perceptions were taken into account in the management of parks and protected areas in the United States and internationally (e.g., Zube, 1986c; Zube & Busch, 1990). These approaches contrasted noticeably with his earlier work, and in a paper given to environment-behavior researchers on the need to address global environmental issues by studying local landscape perceptions, Zube (1991) recommended that

the more traditional experimental and quasi-experimental approaches which frequently involve college students and other opportunity samples need to be reconsidered in term of concepts and designs that can most effectively address global issues at local landscape scales. These might include, for example, experiential, historiographic and ethnographic concepts and methods. (p. 332)

A FUSION OF KNOWLEDGE PERSPECTIVES

A second area where Erv Zube made significant contributions to environment-behavior studies was in the fusion of diverse knowledge perspectives. With nearly two decades of training and practice as a landscape architect, Zube had become adept in the landscape architectural tradition of synthesizing knowledge from various disciplines to develop solutions to landscape planning, design, and management problems. Thus, when he entered the environmental psychology program at Clark, his emphasis on a strongly analytical approach grounded in the behavioral science tradition contrasted markedly with his earlier experience. While valuing this new focus on knowledge creation and the analysis of variables and relationships in landscape perception, Zube also realized that a more holistic interpretation of environment-behavior studies could result from a fusion of these two traditions (Zube, 1987a).

Zube sought knowledge fusion in various ways. One was in his teaching and research, where he often brought together a range of individuals from diverse professional and disciplinary perspectives to work on broad-based projects. These efforts included the development of perceived environmental quality indices (Craik & Zube, 1976), the integration of social science into environmental planning (Zube, 1981), and the exposition of various
approaches and experiences in environmental design evaluation (Friedman, Zimring, & Zube, 1978).

Shortly after my arrival at U Mass in 1972, Erv and I started to talk and found we were both very interested in what was at that time a new field—environment and behavior. We enlisted the help of a colleague from the psychology department and started to teach a graduate seminar dealing with environment and behavior the following year. The course was cross-listed in art, landscape architecture, and psychology. The seminar was offered yearly and was quite successful. Based on the team-taught seminar we decided to write a book under the title *Environmental Design Evaluation* (Friedman et al., 1978), published by Plenum. (A. Friedman, personal communication, April 26, 2002)

A second way in which Zube fused knowledge perspectives was in editorial efforts for the environment and behavior field. As coeditor for the Zube and Moore (1987, 1989, 1991) book series and guest coeditor on one of the Altman volumes (Altman & Zube, 1989), Zube brought landscape perception and related issues to the environment-behavior audience.

“Erv and I coedited a volume on ‘Public Places and Spaces’ in my ‘Human Behavior and Environment’ book series. With his wide-ranging background, Erv was superb—a thoughtful and constructive critic who brought great perspective to each author’s contributions” (I. Altman, personal communication, May 1, 2002).

Zube’s editorial efforts also contributed to a number of other thematic syntheses. He was lead editor of one of the first anthologies in landscape perception and assessment (Zube, Brush, & Fabos, 1975) and helped produce a number of other compilations of new research projects (e.g., Daniel, Zube, & Driver, 1979; Zube, 1978). His interest in landscape perception also helped to shape the content of other thematic syntheses on coastal zone planning (Noyes & Zube, 1977), wildlands recreation (Zube, 1980c), wildlife values (Shaw & Zube, 1980), and local populations and protected areas (Zube, 1990a; Zube & Sanders, 1996). As an editorial board member, Zube helped infuse a number of journals with a concern for landscape perception issues, including *Landscape Research, Leisure Sciences, Landscape Journal, Journal of Architectural and Planning Research, Landscape Ecology, Landscape and Urban Planning, Journal of Environmental Psychology*, and *Society and Natural Resources*. And in his continued interest in landscape history and the interpretation of everyday landscapes, Zube and his wife, Margaret, brought two anthologies of Jackson’s essays from *Landscape* to a broader audience (Zube, 1970b; Zube & Zube, 1977).
A final way in which Zube brought a fusion of knowledge perspectives to the environment-behavior field was through the many review and synthesis articles he wrote over the years. Some of these synthesized and drew conclusions from his own work (e.g., Zube, 1976, 1987b), others drew lessons for contemporary practice from historical roots (e.g., Steiner, Young, & Zube, 1988; Zube, 1986b), and still others aimed at developing theory and direction for future research (e.g., Zube et al., 1982). Across all of this work, Zube’s fusion of diverse knowledge perspectives has contributed to a richer understanding of environment-behavior issues.

CONNECTING RESEARCH TO POLICY AND ACTION

A third area where Erv Zube made a significant contribution to environment-behavior studies was in connecting research in the field to policy and action outcomes. The field has from its beginnings had a pragmatic and mission-oriented side to it, a side that meshed well with Zube’s scholarship philosophy. His writing and service activities helped to solidify and expand that commitment in several ways. His work in design evaluation (e.g., Friedman et al., 1978) explicated the many kinds of settings and projects where systematic postoccupancy evaluations could be used to improve environments. In some cases, though, Zube saw that these project-by-project evaluations were not sufficient and that more comprehensive assessments were needed. For example, in evaluating the architectural design program of the National Park Service, Zube, Palmer, and Crystal (1976) examined a dozen visitor centers across the country to ascertain on a more general level how setting, context, user, and design activity factors affected overall design success. But in this and other projects dealing with public sites and large-scale landscapes, Zube also saw it was not enough to aim at assessment and evaluation; one also had to address broader questions of public policy. This policy dimension set the context for many of Zube’s research papers and was a major focus of his only sole-authored book, *Environmental Evaluation: Perception and Public Policy* (Zube, 1980a).

He was a person of great personal integrity who truly believed that our profession had yet to realize its potential for influencing public policy, creating a more fit environment for human life, and for developing the intellectual protocols required of a true academic discipline. Today, his work remains unfinished, but it is being pursued by others, inspired by his example. (N. Dines, personal communication, April 26, 2002)
While Zube worked to bring policy and action components to environment-behavior studies, he was even more instrumental in bringing the knowledge and methods of environment-behavior studies into the policy and action arenas of landscape design, planning, and management. Similar to landscape aesthetic assessment mentioned earlier, many of the resource-oriented professions have had an expert-based tradition of decision making, and in his work on subjects ranging from urban forestry (e.g., Zube, 1973a; Zube & Kennedy, 1990b) to global climate change (Zube, 1991), Zube helped make clear the importance of considering human perceptions and values.

I would suggest that one of the major contributions he made to the field was to pull environmental psychology into resource management. Today, the attitudes of stakeholders and the importance of attitudes in decision making are givens in resource management. The term environmental psychology probably isn’t even mentioned. Erv was one of the key people in the second generation of scholars looking at landscape perception who were instrumental in bringing about this paradigm shift. (C. Kennedy, personal communication, May 18, 2002)

Finally and perhaps most importantly, Zube’s deep care and interest in seeing positive change occur drew him into many research and service projects in a spectrum of areas. He served on several international boards for architecture and city planning, forestry, geography, and landscape architecture, including the board of directors for the Environmental Design Research Association from 1982 to 1985, where he chaired the group from 1984 to 1985. Among his many national activities, he made substantive contributions to the landscape architecture profession and was given numerous awards and recognition for his efforts over the years. He was also actively involved in the U.S. Man and Biosphere Program, a UNESCO program aimed at promoting sustainable resource use and conserving biodiversity, and served on its National Committee and chaired its Committee on Perception of Environmental Quality for 6 years. But in looking across all of his professional service contributions, one gets the feeling Zube drew his deepest satisfactions from working locally. He held many leadership positions with such groups as the Arizona Sonora Desert Museum, Tucson Botanical Garden, Research Ranch Foundation, Southwest Parks and Monuments Association, Arizona Riparian Council, Sonoran Institute, and the Rincon Institute and often oriented his scholarly pursuits with his personal passions.

I know that Erv was quite proud to see that his work made an important contribution toward the establishment of the San Pedro River Conservation Area in
southern Arizona. This shows something important about Erv. In addition to his contributions to theory and scholarship, Erv’s work had real practical applications. Erv’s influence reached far beyond the campus and academia. (D. Simcox, personal communication, May 15, 2002)

EDUCATION

The fourth and final contribution of Erv Zube’s we would like to highlight here deals with his dedication to education. He saw his role as educator as an integral part of his commitment to environment-behavior studies, and it is perhaps the role that any student who came into contact with him remembers as his most significant contribution. Zube inspired hundreds of students over his 35-year teaching career, team-teaching a graduate-level class in environment, behavior, and design at U Mass and Arizona from 1973 to 1995 and leading graduate seminars at Arizona on landscape planning, law and aesthetics, American landscape, heritage resources planning and management, and history and theory of landscape architecture. As graduate committee chair for 14 doctoral and 72 master’s candidates, Zube’s mentorship was renowned and was the main topic of nearly all of his students’ responses to our request.

Erv Zube was a quintessential academic advisor and later colleague for me. He was a wellspring of synergy. His great strengths lay in his ability to listen to an idea and respond to it in a manner that expanded not only the original concept but also my ability to grasp the essence of what I was considering. His tireless energy and his boundless generosity meant that the fountain was always working and available. I always came away from meetings with Erv supercharged and with a strong sense of direction that he had helped me discover. (D. Pitt, personal communication, May 20, 2002)

As an environment-behavior scholar, Zube was also a teacher and mentor to his first profession of landscape architecture. In his affiliation with the American Society of Landscape Architects, he served on several task forces on research and often wrote on the subject (e.g., Zube, 1980b, 1995, 1998; Zube, Davis, & Brush, 1971). In looking at his writings on research and education in landscape architecture over the years, it is evident that Zube saw the profession evolve from one aimed largely at synthesizing and applying knowledge generated from outside landscape architecture to one that is now active in creating its own base of knowledge (Gobster, 2002). Zube’s persistent efforts played a significant role in this evolution.
I believe his most important contribution to landscape architecture was legitimizing and demystifying the role of research. More than anyone of his generation, he single-handedly raised the bar of scholarship and critical inquiry for the profession. Landscape architecture owes a great debt to Erv for making our actions as professionals and teachers based more on defensible process and solid scholarship. For me, I will miss his warm and generous style and his gentle nudging to go farther and deeper in one’s work. (M. Francis, personal communication, April 12, 2002)

A final comment on Zube’s contribution to education in environment-behavior studies relates to his commitment to lifelong learning. Many who wrote us mentioned that this was a key quality they learned from Erv, who showed them the value of lifelong learning by his own example.

Can you imagine what kind of impression it must have made on me at 21 years old to work with a full professor in landscape architecture who had been department chair for many years and was currently directing a new environmental institute at U Mass, who then decided to go back to get a Ph.D. because he wanted to learn more about how to conduct research? Erv was clearly one of the most visible and influential landscape architects in the country and yet here he was going back to school so he could learn more—WOW! That style didn’t stop after he got the Ph.D., either. At the close of his career, Erv became increasingly interested in history and culture and its influence on attitudes and values with respect to resource use and conservation. (G. Evans, personal communication, May 5, 2002)

IMPACT OF ZUBE’S RESEARCH IN LANDSCAPE PERCEPTION

ZUBE BY THE NUMBERS

In this section we take a closer look at Erv Zube’s published research in landscape perception to help understand how his work helped shape this area of environment-behavior studies. Erv was fond of tallying things as a measure of scholarly progress in his fields of interest (e.g., Zube, 1998; Zube et al., 1982), and although some might think it crass to try to quantify the impact of his publications at the time of his death, we think he would be pleased with the effort and delighted by the results. Citation analysis is one method of quantifying the impact of intellectual scholarship as it indicates the influence a publication has on other people’s thinking. A highly cited paper is thus an indication that an author has made a substantial impact in informing or
changing the course of a field (Institute for Scientific Information, 2002). In addition, the date of papers that cite the original publication can help indicate the longevity of the contribution, and the disciplinary location of the publication can help tell about its breadth and depth of interest to other researchers.

Table 1 is a rank ordering of Zube’s 10 most highly cited publications from our April 2002 Web of Science™ search. We looked at the number of times his publications were cited compared to those of a dozen other established landscape perception researchers and concluded that these 10 could be regarded as significant publications for the field. By the same type of comparative estimate, the top 3 might also be thought of as high-impact publications, whereas Zube et al. (1982) could likely be considered a seminal publication. The findings of this analysis generally correspond with other available evidence. The publications in the upper half of the table are also cited in Cats-Baril and Gibson’s (1985) nominal group evaluation of the landscape aesthetics literature and with the exception of Zube et al. (1982), in Priestly’s (1983) analysis of bibliographies from papers in the Our National Landscape conference proceedings. These studies, along with comments from those who wrote us and mentioned specific publications of significance, provided a check on the validity of the citation analysis and our interpretation of it.

In looking more closely at the citations for the top five publications (Figure 1), we found that each of them tended to be cited at about the same rate over each subsequent 5-year interval. This indicates the enduring nature of Zube’s work in that these publications continue to have value to the research community. As for the range or applicability of Zube’s work, those who cited these same five papers tended to publish their work in the main environment-behavior and landscape journals, particularly Landscape and Urban Planning, Environment & Behavior, Journal of Environmental Management, and Journal of Environmental Psychology. However, there were also significant numbers of citations in journals related to planning and architecture, geography, environmental education and interpretation, tourism and leisure science, and general psychology and sociology, indicating that the influence of Zube’s research may be somewhat wider than the principal audiences for whom he wrote.

ZUBE ET AL. (1982)

As a seminal publication in the landscape perception literature, we looked in detail at Zube et al.’s (1982) “Landscape Perception: Research, Application and Theory” to better understand its significance to the field. We looked at two thirds of the 106 articles that cited Zube et al. between 1983 and 2002 to see how they referred to the paper. Combined with our own familiarity with
the paper, we feel Zube et al. is significant in at least three ways: for its comprehensive review of the literature, for its classification of studies into research paradigms, and for the development of a theoretical framework for landscape perception research with an eye toward building a general theory of landscape perception. We discuss each of these in turn and for each suggest how future research in landscape perception might build from these contributions.

### TABLE 1
Rank Order of Ervin Zube's Top-Cited Publications, April 2002 Web of Science™ Search

<table>
<thead>
<tr>
<th>Rank/Number</th>
<th>Cites</th>
<th>Author(s)</th>
<th>Year</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>1/106</td>
<td>Zube, Sell, and Taylor</td>
<td>1982</td>
<td>Landscape Perception: Research, Application and Theory</td>
<td></td>
</tr>
<tr>
<td>2/89</td>
<td>Zube, Brush, and Fabos (Eds.)</td>
<td>1975</td>
<td>Landscape Assessment: Values, Perceptions and Resources</td>
<td></td>
</tr>
<tr>
<td>4/48</td>
<td>Craik and Zube (Eds.)</td>
<td>1976</td>
<td>Perceiving Environmental Quality: Research and Applications</td>
<td></td>
</tr>
<tr>
<td>5/32</td>
<td>Zube and Pitt</td>
<td>1981</td>
<td>Cross Cultural Perceptions of Scenic and Heritage Landscapes</td>
<td></td>
</tr>
<tr>
<td>6/30</td>
<td>Zube</td>
<td>1974</td>
<td>Cross-Disciplinary and Intermode Agreement on the Description and Evaluation of Landscape Resources</td>
<td></td>
</tr>
<tr>
<td>7/30</td>
<td>Zube, Simcox, and Law</td>
<td>1987</td>
<td>Perceptual Landscape Simulations: History and Prospect</td>
<td></td>
</tr>
<tr>
<td>8/27</td>
<td>Zube</td>
<td>1973</td>
<td>Rating Everyday Landscapes of the Northeastern US</td>
<td></td>
</tr>
<tr>
<td>9/26</td>
<td>Zube, Pitt, and Evans</td>
<td>1983</td>
<td>A Lifespan Developmental Study of Landscape Assessment</td>
<td></td>
</tr>
<tr>
<td>10/25</td>
<td>Zube</td>
<td>1984</td>
<td>Themes in Landscape Assessment Theory</td>
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</table>
First, Zube et al. (1982) provided a comprehensive review of the landscape perception research literature, examining 160 articles from 20 selected journals published between 1965 and 1980. Although now somewhat dated, it still remains one of the best literature reviews yet published and is still frequently cited as an authoritative source (e.g., Daniel, 2001; Kaltenborn & Bjerke, 2002). Substantial reviews have been done since then, either as stand-alone efforts (e.g., Ribe, 1989) or as part of a paper with a different focus (e.g., Daniel, 2001; Lothian, 1999), but nothing as systematic or comprehensive has ever been attempted.

Since the publication of Zube et al. (1982), much has changed in the nature of landscape perception research. There are several new journals that did not exist in 1980 that have facilitated the publication and dissemination of this type of research to audiences that consider landscape perception research a primary rather than an esoteric area of interest. Research topics have greatly expanded beyond initial concerns with forest, rural, and architectural settings. And electronic databases have greatly facilitated the degree to which articles can be identified, reviewed, and evaluated. As a tribute to Erv Zube’s efforts and to provide a second benchmark for assessing the state of the field, we propose that a follow-up review be conducted in such a way that it can build on the findings of Zube et al.

Second, Zube et al. (1982) provided a meaningful way of categorizing the principal paradigms of landscape perception research. The authors labeled

![Figure 1: Longevity of Zube’s Top-Cited Publications Over Time](image)
and defined these as the expert paradigm, a professionally based evaluation of landscape quality often built on design or ecological principles; the psychophysical paradigm, a public-preference approach that links people’s landscape quality judgments with external landscape properties; the cognitive paradigm, a person-focused approach aimed at uncovering the meaning and values that landscapes have for people; and the experiential paradigm, a largely qualitative approach aimed at understanding the experiences and outcomes of human-landscape interactions. Although others, including Zube himself, have argued over and/or tinkered with this classification of paradigms (e.g., Daniel & Vining, 1983; Karjalainen & Tyrvainen, 2002; Lothian, 1999; Zube, 1984), the principal ideas behind it remain valid and are still in wide use. In addition to using the classification as a means to discuss the state of the field of landscape perception research, we also found that researchers singled out individual paradigms as a means of locating their own research (e.g., Bergen, McGaughey, & Fridley, 1998; Bishop, 2001; Clay & Daniel, 2000).

In their study, Zube et al. (1982) coded the 160 articles they reviewed to examine trends in the conformance of studies to the various paradigms. They found an increase in studies across all paradigms over 1965 to 1980, but especially in the expert and psychophysical paradigms. Is this still the case, or have things changed in the past two decades? If Zube’s own research is a
bellwether for the field, it certainly has. Using the same methods as Zube et al., we coded the cumulative number of Zube’s research-oriented publications by paradigm over consecutive 5-year periods (Figure 2). As can be seen, his work in later years became much more cognitively and experientially oriented.

As a collaborative team, there was a definite shift in our thinking after our 1982 overview paper. This was partly a product of the atmosphere at the University of Arizona, where Jon Taylor and I both had maximum exposure to the transactional theoretical perspective of Bill Ittelson, and Erv often had lunch with Bill, Tom Saarinen (geography), and Dennis Doxtater (architecture). . . . Much of the shift in Erv’s own thinking (or was he just subtly guiding us?) came after we added a “purpose” criterion to our evaluation of the articles to ask the question, “What for?” In this, we found the expert and psychophysical paradigms severely wanting in purpose. While perhaps not as rigorous in method, the cognitive and experiential approaches were much better at answering this question. (J. Sell, personal communication, July 24, 2002)

Although we also suspect there has been change in the field overall, we know little about the application of these paradigms over time. Thus, as a second follow-up to the efforts of Zube et al., we recommend that a similar trend analysis be conducted to assess changes in the uses of approaches since 1980.

Third, Zube et al. (1982) developed a theoretical framework for landscape perception based on a transactional model of humans and the landscape and a set of considerations adapted from work by Ittelson (1973) for studying the spectrum of conditions pertaining to humans, the landscape, their interactions, and the outcomes that result. The intent behind this framework was to guide future research efforts and to work toward the development of a “general theory” of landscape perception. In subsequent publications (Sell, Taylor, & Zube, 1984; Taylor, Zube, & Sell, 1987; Zube, 1984, 1991), Zube clarified these ideas and, as noted earlier, advocated expanding beyond the expert and psychophysical paradigms to develop approaches that “consider the dynamics and multi-sensory characteristics of human-landscape transactions” (Zube, 1991, p. 323).

Although there has likely been some diversification of questions and approaches over the years, we suspect that most landscape perception research has not yet embraced the changes called for by Zube et al. (1982). Their set of considerations still shows great potential for contributing to practical and theoretical issues in landscape perception research, and thus a third follow-up would be to incorporate these considerations more actively into future research. We paraphrase them here: Landscapes surround the perceiver,
inviting movement and exploration; they are multimodal and perceived simultaneously through multiple senses; they are information rich and provide central, peripheral, redundant, and conflicting arrays of information; they involve action and provide opportunities for control and manipulation; they engender symbolic meanings that call forth purposeful actions; and they have an ambience that includes aesthetic and systemic qualities.

As for developing a general theory of landscape perception, papers citing Zube et al. (1982) aimed at theory development are also few and far between (e.g., Bourassa, 1990; Dearden, 1986; Han, 1999; Kaplan, 1987; Lothian, 1999). But whereas Zube often wrote about the need to develop a general theory of landscape perception, he also wrote about the utility of producing a hierarchy of knowledge from general theory to theoretical frameworks, conceptual models, and testable hypotheses (Zube, 1984). Never proposing a general theory himself or adopting one developed by someone else, Zube’s own actions seemed to favor working at the smaller scales of this theoretical hierarchy, scales at which his policy and educational interests seemed to operate most effectively. From this bottom-up approach, his synthesis of findings would lead to more general concepts, models, and frameworks for landscape perception theory. The benefit of this grounded strategy, whether consciously planned or serendipitous, is aptly illustrated in work by Zube and his graduate students at the University of Arizona. In one of the last papers he would write, Zube along with David Simcox and Steven Friedman (1998) summarized 15 years of work focused on uncovering the issues, perceptions, and values that people held for desert riparian landscapes in Arizona. Synthesizing work based on a variety of approaches at a range of geographic scales, Zube et al. demonstrated how effective incremental progress can be in developing a broad base of knowledge about a landscape: “This project demonstrates the potential benefits of sequential, interrelated studies, in contrast with a more frequently encountered practice of executing a series of independent studies” (p. 88). So although it is important to continue development of top-down general theories of landscape perception such as Appleton’s (1975) “prospect-refuge theory,” Zube’s work suggests that environment-behavior researchers should also plan and coordinate studies and synthesize results so as to allow more general findings and principles about landscape perception to emerge from the bottom up.

One might come to the same conclusion about Erv Zube’s contributions when they are summed up across his entire career. In working across different paradigms, immersing himself in different landscapes at different scales, and examining different facets of people and landscapes, their transactions and outcomes, Erv Zube developed a significant body of knowledge about landscape perception and assessment that has contributed greatly to progress in
environment-behavior studies. As we move ahead with our own work and prepare the field for those who will follow, let us continue to draw inspiration from Erv—scholar, leader, teacher, and friend.

**REFERENCES**


