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Environmental politics and policy in U.S.-Mexican border studies: developments, achievements, and trends

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Abstract

The study of environmental politics and policy on the U.S.-Mexican border is barely more than 30 years old. This interdisciplinary field has grown substantially since the 1970s, however, and now generates a substantial literature addressing a range of environmental media, politics, and policy problems within and across the international boundary. While most of this effort is descriptive and normative, focused on understanding institutional arrangements and practices, new areas of emphasis and new theoretical approaches have emerged in the 1990s that are attracting greater scholarly attention. This essay describes the development of the field from the 1970s to the present, pointing to particular achievements and trends that will doubtlessly shape future research in the area.

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1. Introduction

Scholarly concern with environmental politics, policy, and management on the U.S.-Mexican border is little more than three decades old. The field is thus relatively young in borderlands studies, rivaling gender studies, indigenous studies, and other emerging or recently established areas of inquiry in the literature on border affairs. The formal study of environmental politics is an inherently interdisciplinary undertaking that has attracted the attention of political scientists, lawyers, economists, sociologists, urban planners, anthropologists, and geographers, as well as practitioners of the physical and natural sciences. These diverse perspectives have enriched our knowledge even as they have made more difficult agreement on a unifying paradigm or dominant analytical perspective. Much of the emphasis in the past three decades has been to adequately describe, and raise scholarly and public awareness of, the vast range of environmental issues affecting the border region, and to seek solutions to them. While strongly

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driven by normative concerns, an accumulation of knowledge is apparent, as well as a growing sophistication in the way issues and topics are framed and analyzed. We are far more aware of the institutional and political dynamics contributing to environmental degradation, and far more aware of the strength and character of the social, economic, and political forces that stand in the way of viable solutions within the context of sustainable development.

The aim of this essay is to describe the evolution of U.S.-Mexico border environmental inquiry, to trace its development, identify those areas where literatures have accrued and where they have not, point to areas of common agreement as well as areas of scholarly contention, and spot emerging issues and analytical trends that are drawing or likely to draw greater attention in the near future. Efforts to recapitulate, interpret, and draw together the strands of an essentially interdisciplinary field are exceedingly difficult, and it is not possible in a brief essay to summarize all of the various contributions worthy of note. Hopefully, however, a literature review, however sketchy, will be helpful to researchers who may not be familiar with the origins and evolution of this growing field.

2. Development of environmental policy and politics scholarship on the border

2.1. 1971–1980

It is hardly an accident that the earliest scholarship on environmental politics and policy in the border region was generated in the mid-1970s, a moment of deep global concern with the quality of the human environment. The U.S.-Mexico border, long an area of national environmental neglect on both sides, quickly became a focal point of concern, and scholars interested in the border began writing about the subject. The passage of new environmental legislation in the United States and Mexico in 1969 and 1971, respectively, and the United Nations' Stockholm conference on the human environment in 1972 were critical markers of the dawn of the environmental era and the emergence of a new public awareness of the importance of environmental protection for the maintenance of human health and the protection of planetary species. On the U.S.-Mexico border, a process of rapid industrialization and social transformation was set in motion in the mid-1960s with binational adoption of the *maquiladora* program in 1965 and other national and cooperative efforts to promote economic development in the border zone.

That a literature expressly addressing these new concerns for the border community began to flower in 1973–1974, in the wake of these national concerns, is not surprising. With the exception of the area of water resources, which owing to its vital role in the development of the arid border region had already generated a substantial scholarly literature in law, economy, and government, literature on the environment was genuinely new, emerging from various symposia and conferences convened at border universities. It is worth noting that the environmental agencies of the two governments had not yet developed an institutional concern with the border per se, and were just beginning to build administrative capacity to manage environmental issues.

Early studies were largely descriptive and normative works that aimed at describing a certain set of environmental problems in the border area and, in some instances, prescribing policy solutions. With the exception of isolated journal articles, they were published by border university presses. A good example is the compilation of essays on air pollution in the border region by

political scientist C. Richard Bath published by Texas Western Press (1974). This study, which marked the first comprehensive effort to understand the political influences on air pollution policy in the border at the national and binational levels, also drew together a dozen or more essays from engineers, agronomists, range scientists, and urban planners interested in the topic. The study was motivated, in part, by a binational air quality monitoring study begun in 1972 under the auspices of local health authorities in El Paso, Cd. Juarez, and the Pan American Health Organization (PAHO). Another such example is Albert E. Utton's compilation *Pollution and International Boundaries*, which focused on the U.S. Mexico border and was published by the University of New Mexico (UNM) Press in 1973. These works, written for a conference at the University of New Mexico's law school, described the legal milieu affecting water pollution, air quality, and industrialization along the border. Other studies soon followed in conferences organized by the new Association for Borderlands Studies. The first published paper dealing with the border environment by the U.S. Environmental Protection Agency (EPA) appeared in 1978 in a volume entitled *View Across the Border* edited by historian Stanley R. Ross and published by the UNM Press. That paper, by Arthur Busch (1978), portrayed a fairly healthy border environment with little of the urgency and serious preoccupation more typical of later scholarship. A bleaker, more critical view appeared in a profile of border environmental problems written by University of Texas, El Paso engineer Howard Applegate, published in 1979 (Applegate, 1979).

Environmental media, of course, span the gamut from air and water quality to solid waste, toxic substances, and biodiversity with numerous issues interior to each. In this early period of attention to environmental policy and politics in the border area, the issue receiving greatest attention was water. Water today still receives the greatest scholarly attention. At the conceptual level the linkage between water for development and water pollution was drawn early on, as was an awareness of the competing pressure on the borderland's water resources from urban, industrial, and agricultural users. The importance of water supply for public health was a known factor contributing to interest in the nexus between water supply and water pollution. The U.S.-Mexican crisis over the salinity of the Colorado River, resolved in 1973, drew further attention to these issues. In 1975, the University of New Mexico's *Natural Resources Journal* (*NRJ*), edited by Al Utton, published another collection of articles devoted specifically to the problem of salinity on the Colorado River, focusing on international legal questions, institutional constraints, and economic issues raised by the dispute. This collection, which drew together a number of prominent lawyers, political scientists, and agricultural economists from both sides of the border was among the first volumes where contributors attempted to frame the issues using theoretical approaches faithful to the distinct disciplines represented (Dworsky, 1975; Furnish & Ladman, 1975; Kneese, 1975; Mann, 1975; Sepulveda, 1983). The *NRJ* followed in 1978 with a two-part symposium of 22 articles dealing with various facets of environmental concern ranging from demographic and growth impacts on border populations to groundwater management and energy development in the Rio Grande and Colorado River basins. Much of this work explicitly aimed at cataloguing and describing the institutions at work in managing binational environmental resources (Applegate & Bath, 1978; Bath, 1978; Bradley & DeCook, 1978; Day, 1978; Hayton, 1978; Miramontes, 1978).

During this early period themes and questions raised tended to reflect the disciplinary interests of the authors. Political scientists like Bath and Dean Mann, for instance, drew on the theory of federalism and issue-area driven policy analysis to analyze the political basis of

environmental problems on the border. Economists like Alan Kneese and Jerry Ladman, and political scientist David LeMarquand, drew on public goods and common property theory to analyze salinity and water pollution problems on the border. Lawyers like Utton drew on domestic and international prescriptive law to identify potential avenues of binational cooperation in managing shared environmental problems. In general, however, in this phase, there was less theory than simply an eagerness to describe environmental and ecological issues deserving attention in the border area. This early phase of scholarship had few comparative reference points within the border region itself, and analytical perspectives tended to be drawn from U.S., rather than Mexican, national experience. Scholars like Bath and Utton, however, were familiar with Mexican government and politics relevant to these issues.

2.2. 1981–1992

The period after 1980 through the early 1990s marked a transition period in scholarship on the environmental politics of the border. By the early 1980s the U.S. and Mexico had begun to allocate a greater priority to environmental management on the border. Achievement of the landmark 1983 Border Environment Cooperation Agreement, known as the *La Paz Agreement*, attracted further scholarly attention. The field became more institutionalized, drawing on scholars from a variety of backgrounds. There was also a trend towards more focused, in-depth studies and better conceptualization and utilization of a wider range of disciplinary models and theories in thinking about environmental politics and policy processes. There was greater awareness of the multiple social and institutional actors shaping border environmental politics. As in the earlier period, water resources management dominated scholarly attention. And scholarship began to respond more keenly to public activism in environmental affairs at the border and the greater articulation of public demands for environmental improvement.

Theories of international relations, public policy, and economics began to be introduced into some studies. Mumme (1985), for instance, drew on the preceding work of Dean Mann in extending issue-area analysis to an understanding of outcomes in binational water disputes. He argued that decentralized policy dynamics typified this issue-area and could help explain the intractability of international groundwater disputes (1988) and institutional practices at the International Boundary and Water Commission (IBWC) (Mumme, 1984; Mumme & Moore, 1990). Helen Ingram and Suzanne Fiederlein extended this perspective to a discussion of state level influences on environmental policy-making generally in the border area (Ingram & Fiederlein, 1988). A Mexican specialist in urban ecology, Roberto Sanchez, published a broad analysis of binational environmental diplomacy, framing the problem of binational cooperation for environmental management explicitly within the rubric of international development and dependency theory (Sanchez, 1990a). Sanchez studied negotiations on environmental annexes to the *La Paz Agreement* and reviewed a case study of the Tijuana sewage dispute and binational dispute over smelter pollution in the 1970s and 1980s, concluding that many institutional problems observed in the management of water resources, air sheds, and toxic wastes, and much of the painfully slow progress in binational cooperation had their origins in Mexico's structural dependence on the U.S. While Sanchez might have been guilty of over-generalizing his analysis prompted other studies that explicitly incorporated this dependency perspective, or critiqued it (Mumme, 1988); his work was extremely influential.

In addition to a growing number of focused and theoretically informed studies of issue-areas and institutions, the linkages between economic development, industrialization, and border ecology continued to be explored. In 1982, the *NRJ* helped push the agenda of environmental policy studies forward by publishing another symposium entitled *Anticipating Transboundary Resources Needs and Issues in the U.S.-Mexican Border Region to the Year 2000*. This volume, published later as book (Sepulveda & Utton, 1984), drew nearly two dozen scholars together in examining a new developments in demography, industrialization, water quality, groundwater, air quality, and binational planning. While legal studies predominated, much of this work demonstrated greater sensitivity to the dynamics of local government, municipal planning, and inter-sectoral arrangements influencing binational environmental policy. Other scholars moved to examine the specific impact of the *maquiladora* industry on the border environment, examining issues such as worker health (Sanchez, 1990b) and the management of toxic wastes (Sanchez, 1990c; Trevino & Fernandez, 1992). These studies, compared with an earlier generation of broad scale generalization, more frequently drew of site-specific surveys and interviews, or detailed case studies of specific issues.

2.3. 1993–2003

The past decade has undoubtedly been the most fertile period of scholarship on the politics and policy of the border environment. Much of the impetus for this is directly attributable to the regional, national, and international mobilization around environmental concerns associated with the North American Free Trade Agreement (NAFTA), though the deepening and cumulative effect of preceding scholarship cannot be discounted. Since the early 1990s a greater number of scholars have been engaged in research on the border environment, attracted by the stronger institutionalization of binational cooperation on environmental issues, renewed and broadened emphasis on the linkages between trade and environment, and greater social mobilization on environmental issues within the border region. Scholars are pursuing a greater number of discrete issues and continue to develop theoretically informed and empirically rich investigations of particular problems. Scholarship has broadened to incorporate a concern with social movements and processes, community level activism, gender relations, environmental justice, and innovative institutional solutions to extant problems. A new advocacy journalism has emerged, as have efforts to theorize and understand policy relations and outcomes from the perspective of the complexity of the border as a unique and situated locale and as a site and repository of place-based society and meaning.

NAFTA's advent was certainly a major driving force in moving scholarship on the border environment forward, and its impact on the environmental movement deserves greater attention than it has thus far received. As early as 1991–1992 scholarly interest in the border surged in response to growing debate on the environmental impact of trade and its implications for the border region. A new generation of advocacy journalists backed by leading foundations, best represented by the Inter-hemispheric Resources Center (IRHC) at Silver City, New Mexico, dedicated resources to fostering popular empowerment and public awareness of environmental and health concerns on the border. These efforts complemented and reinforced the proliferation of environment and health care advocates in non-governmental groups in the border region, and helped legitimize and institutionalize environmental advocacy throughout the border region.

By 1992, the NAFTA debate at the governmental level had generated a new Integrated Border Environmental Plan (IBEP 1992–1994) under the *La Paz Agreement* that in 1995 became the five-year Border XXI Program. Side agreements to NAFTA establishing the Border Environment Cooperation Commission, the North American Development Bank, and the Commission for Environmental Cooperation greatly amplified the agenda of institutional and policy studies for border environment scholars.

The introduction of advocacy groups and networks had a profound impact on the development of the contemporary environmental policy milieu. A new monthly newsletter-magazine introduced by the IHRC, *Borderlines*, published in English and Spanish, furnished a needed forum and link between groups, scholars, and policy officials. Two books authored by IRHC (Barry & Sims, 1994; Barry, Browne, & Sims, 1994) provided a readable, popularly accessible panorama of the range of environmental and social issues in the border community. The emerging work of the Texas Center for Policy Studies (TCPS) generated a steady set of reports and policy documents aimed at altering unsustainable institutional practices and generating political support for needed improvements in the border environment (Kelly, 1991). Activists interested in the NAFTA debates over labor and the environment generated new studies of the maquiladora sector, new questions about environmental degradation at the U.S.-Mexico border (Perry et al., 1990; Montalvo, 1992). The prospect of new border environmental institutions in the context of NAFTA focused attention on particular border communities. Activists and scholars alike began exploring the linkages between economic development, community capabilities, and inter-governmental relationships in a binational setting. Helen Ingram, Nancy Laney, and David Gillilan's *Divided Waters*, an in-depth study of binational cooperation on water resources management at Ambos Nogales (Ingram, Laney, & Gillilan, 1995) supported by the University of Arizona's new Udall Center for the Study of Public Policy, set a new standard for cross-disciplinary inter-sectoral binational analysis of situated environmental challenges in the border area, drawing needed attention to shortfalls of federally dominated solutions to the border's pressing water supply and public health needs.

The new NAFTA-generated border institutions themselves attracted considerable interest as scholars sought to anticipate and assess their effects on the border environment. By 1997 new works analyzing the BECC appeared in outlets like the *Journal of Borderlands Studies* (Varady, Colnic, Merideth, & Sprouse, 1996) as well as publications generated by TCPS and National Wildlife Federation (Kelly & Reed, 2001; Spalding & Audley, 1997). These more descriptive and normative works would be followed shortly by more analytical and comparative efforts to understand their operational scope and policy dynamics (Carter, 1999; Liverman et al., 1999; Milich & Varady, 1999; Mumme & Moore, 1999; Mumme & Sprouse, 1999; Spalding, 2000a) and their impact on public participation (de Mello Lemos & Luna, 1999; Pena & Cordova, 2001). Other studies of these new institutions focused on the impact of the trinational North American Commission for Environmental Cooperation (CEC) on border environmental management (Kiy & Wirth, 1998; Jones et al., 1997; Mumme & Duncan, 1998; Spalding, 2000b; Wirth, 2000).

Another new development was the emergence of new studies on social movements and public advocacy in the border area. While older studies had detailed the range of governmental and non-governmental public interest groups associated with various environmental policy areas, various new studies drew on social movement theory and focused on emerging

and non-traditional groups and organizations at least partly neglected by an earlier generation of scholars. In 1997, urbanologist Carol Zabin (Zabin, 1997) published a study of Mexican non-governmental organizations in the western reach of the northern border analyzing the orientation, resources, and activities of 26 NGOs, of which 12 were environmental organizations of one kind or another. In short order a number of other studies appeared that described the orientation and networking of Mexican environmental groups in greater detail (Alfie Cohen, 2002; Lara, 2000; Michelli, 2002) or analyzed the role of social movements in particular environmental conflicts (Rodriguez-Estevez & Cevera Gomez, 1999; Trujeque, 1999). These studies provided foundation for the recently published *Crossborder Activism and its Limits* by Hoogenboom, Alfie Cohen, and Antal (2003).

Policy studies of the border environment were given a strong boost when the EPA funded the Southwest Center for Environmental Research and Policy (SCERP) in 1990. The SCERP is a consortium of research universities in the U.S. and Mexico dedicated to the study of environmental problems. After a delayed start, SCERP began to influence the creation of a border environmental agenda by holding annual conferences and publishing monographs. Focusing both descriptively and analytically on the problems of demographic growth, urbanization, water resources, and environmental indicators, these papers and monographs are useful resources for border environmental policy scholars, as is SCERP's innovative on-line data base, *Border EcoWeb*. Other collaborative efforts, such as Lawrence Herzog's *Shared Space: Rethinking the U.S.-Mexico Border Environment* (2000), were sponsored by border universities and leading foundations, generating timely review of binational institutions (Spalding, 2000b) as well as explorations of governmental, private sector, and non-governmental roles in environmental health (Corliss, 2000; Pezzoli, 2000), traditional and eco-tourism (Herzog, 2000), land-use (Ojeda Revah, 2000), municipal water management (Pineda, 2002), watershed management and responses to drought (Michel, 2000a; Brown & Mumme, 2002), environmental education (Hill, 2000), and policy decentralization, local capacity building, and subnational administration in the border environment arena (Cortez-Lara, Quezada, & Whiteford, 1999; Fredericksen & Weaver, 1999; Lybecker & Mumme, 2002; Mumme, 2000a).

This brief overview cannot possibly capture all the useful contributions to the burgeoning literature on the politics and policy of the border environment. What is certain is that environmental research has now acquired a momentum and level of institutional support that insures its perpetuation and viability as an interdisciplinary field of scholarly investigation. The field has generated a greater awareness of the societal and governmental complexity of environmental protection in the border area, the importance and progress of sustainable development, and a better understanding of the institutions, practices, and resources deployed in both countries in response to environmental demands by the border public. In sum, the past three decades has witnessed the emergence and consolidation of this field of study. What follows is an attempt to assess the state of affairs in border environment policy studies.

3. Trends in the study of environmental politics and policy on the U.S.-Mexico border

At the present time environmental research has produced a number of strong descriptions and assessments of existing domestic and binational environmental institutions, especially on

the U.S. side. These were needed badly, since any effort to improve environmental practices and policy requires a sound knowledge of the law, structure, and the institutional practices of governmental agencies. But at the present time many governmental environmental institutions on the border are undergoing profound changes, on both sides. For example, The boards of directors of the two most important international environmental institutions on the border, the Border Environmental Cooperation Commission (BECC) and the North American Development Bank, are scheduled to merge together. The International Boundary and Water Commission and its Mexican counterpart have been discussing ways to streamline their activities and to incorporate more public input into their decision-making. Mexican national water agencies have implemented programs designed to create viable water markets throughout the country. Moreover, the recent drought crisis, especially on the Conchos River, has elevated tensions at the highest levels between Mexico and the U.S., putting pressure on existing institutions to find ways to absorb and manage environmental problems before they reach crisis proportions. For the next few years there is a strong need for vigilant tracking of these and other agencies.

At a more theoretical level of analysis, scholars have recently incorporated insights from issue-arena analysis (Ingram & Fiederlein, 1988; Mann, 1975; Mumme, 1985), which bases explanations of political behavior on the content of policy issues. In the border environmental world, important distinctions can be made between policies associated with economic development (water supply and sanitation policies, for instance), and policies associated with enforcement or compliance requirements, or regulatory policies important to environmental protection. Other policy scholars have drawn on some of the more refined variants of policy systems theory to describe the process of policy formulation and implementation of policies in the border area (see, for example, Brown & Mumme, 2000; Villegas, 2002). Some have drawn on agenda-building theory to understand the impact of social and political actors in the border region on policy development for environmental protection (Lopez & Reich, 1997), while still others have applied game-theoretic models to understand the process of binational cooperation (Fernandez, 2002; Frisvold & Caswell, 2000). What is clear is that no one model or theoretical expression is robust enough to characterizing the binational policy process for environmental protection. And most scholars remain acutely aware that policy models, even highly abstracted general systems models, may not be applicable to both countries or their interactions in the same degree.

Older concerns with dependency theory have been partly displaced by more recent resort to the theory of international regimes and regime formation. This literature, framed at a higher level of analysis, is not incompatible with policy literatures deriving from theories of national policy processes, and is particularly helpful to clarify the dynamics of a particular binational policy field as it unfolds in the context of macro-economic and globalized policy initiatives like trade integration. Such approaches are attracting the interests of younger scholars and are likely to see greater use in the future (Spears, 2003). Most scholars employing these approaches come to the area from political science, policy studies, economics, or political geography, reflecting the multi-disciplinary character now a tradition in environmental research.

Another set of theoretical orientations derives more from sociology and anthropology and has been used in trying to understand the process of empowerment, capacity building, and policy change. Scholars such as Cortez-Lara and Garcia-Acevedo (2000), Bennett (1995, 2002), Alfie Cohen (2002), Verduzco (2001), and Michelli (2002) draw on aspects of social movement theory to examine the associational foundations and strategic action of non-governmental

environmental groups and civic organizations in advancing agendas for environmental policy change and empowerment in the border region.

What is, perhaps, most striking about the use of social theory to explain border environmental regime is how removed the theory is from the border itself or from borders in general. It's not that border writers don't theorize. Indeed a substantial body of theory exists (Anderson, 1997; House, 1982; Martinez, 1986; Morehouse, 1995; Prescott, 1987). But for some reason border *political* theory is virtually nonexistent. Recent work may be a harbinger of change. Joaquim Blatter, whose substantive interest is comparative environmental policy formation and implementation, draws on experience in the European region and the U.S.-Mexico and U.S.-Canada border region for insights as to how politics functions in border regions (Blatter, 1997; Blatter & Ingram, 2000). Blatter's analytical framework explains transboundary cooperation as a function of border region characteristics and external contextual functions that shape advocacy coalitions within and across boundaries. His approach represents a useful distillation and refinement of past insights of scholars of the U.S.-Mexican border and can be appropriated for the analysis of policy dynamics in any number of issue-areas as well as the environment. This represents a welcome addition, and hopefully will inspire more border-specific theorizing.

A new generation of political geographers is surfacing. Both Suzanne Michel (2000a, 2000b) and Chris Brown (Brown & Mumme, 2000) employ a place-based and spatial notion of situated decision-making and social action to account for policy alignments, choices, and outcomes in border water policy. These approaches complement, but don't displace, older theoretical models and add to the theoretical pluralism of approaches.

The literature on border environmental politics and policy is clearly weighted in favor of water. As it has in the past, much of the work on binational environmental cooperation over the past decade has centered on the question of water provisions and entitlements, water quality, and the role of water in sustainable development. A good deal of this literature is problem driven, problem descriptive, and policy prescriptive, as befits a policy area riven with unresolved disputes and conflicts. Even so, the persistence of intra-regional and binational water conflicts, the development of new NAFTA-based institutions with water infrastructure mandates, and the evolution of social concern with particular water problems has made this a fertile area of interdisciplinary research.

At the substantive level, an established concern with sanitation and sewage management has been given a new impetus since the creation of the BECC and NADBank and amplification of the *La Paz Agreement* agenda. Old treaty problems arising from the limits of the binational agreements in force on the border have recently grown more pressing, drawing renewed attention to problems like drought and groundwater management (Morehouse, Carter, & Sprouse, 2000; Mumme, 1999, 2000b). Changing patterns of water utilization and managing binational rivers have drawn greater attention to water related ecological problems, such as conservation of the Colorado River Delta and its valuable wetlands (Glennon & Culp, 2002; Pitt et al., 2000; Spears, 2003; Ward, 2003). More attention is being paid to watershed management and complex patterns of governance of public participation in developing solutions to water needs in particular basins (Brown & Mumme, 2000). Recent studies of water problems have also drawn on innovative approaches to understanding the prospects and mechanics of binational cooperation, approaches informed by place-based analysis (Michel, 2000a, 2000b), and post-modern constructivist theory (Doughman, 2001; Garcia-Acevedo, 2001) that

could profitably be applied to the analysis of binational cooperation in other environmental arenas.

Water is likely to continue to dominate studies of environmental politics, given contemporary research trends, recent history, and increased public concern. What this suggests, however, is that other areas may remain understudied. The analysis of political and administrative aspects of air quality, solid and hazardous wastes, land uses, and natural resources such as wildlife conservation, fisheries, and other concerns is still episodic and underdeveloped. Other important themes such as the study of environmental justice on the border (see, for instance, Neighbor, 1999) remain in their infancy. Sustainable development of the border environment is likely to require serious work in these areas as well.

4. Conclusion

The preceding review is at best a partial recapitulation of developments, achievements, and trends in the relatively youthful field of environmental policy and political analysis. What is evident from this stock-taking is that however one may conceptualize or organize the literature and its various elements, we have moved into a more institutionalized stage of scholarly research in which there is now a history of scholarly inquiry and a theoretical basis on which to build and craft new studies and research designs. Contributions flow steadily from both sides of the border. The field continues to be dominated by case-study analyses based on descriptive approaches and normative debate on particular policy preferences, needs, and options but is gradually accumulating a substantial body of applied analytical work that draws on disciplinary foundations. In the past decade, case studies have been stronger, and based more on field observation and detailed empirical work that can be replicated and substantiated. More comparison is found in studies of particular aspects of border environmental politics and policy. Several interesting new approaches are now available, and border-generated theories are beginning to surface. These efforts clearly demonstrate the growing maturity of the field. In sum, there is every reason to suppose the study of environmental politics and policy will continue to develop and improve in this new century.

References

- Alfie Cohen, M. (2002). Imagenes de ONG Ambientalistas en la Frontera Mexico-Estados Unidos. *Frontera Norte*, 27, 83–122.
- Anderson, M. (1997) The political science of frontiers. In P. Ganster, et al. (Eds.), *Borders and border regions in Europe and North America*. San Diego: San Diego State University Press.
- Applegate, H. (1979). *Environmental problems of the borderlands*. El Paso: Texas Western Press.
- Applegate, H., & Bath, C. R. (1978). Air pollution along the United States-Mexico border with emphasis on the El Paso-Ciudad Juarez-Las Cruces air shed. *Natural Resources Journal*, 18(1), 91–100.
- Barry, T., & Sims, B. (1994). *The challenge of cross-border environmentalism*. Albuquerque: Resource Center Press.
- Barry, T., Browne H., & Sims, B. (1994). *The Great Divide*. New York: Grove Press.
- Bath, C. R. (Ed.). (1974). *Air pollution along the United States-Mexico border*. El Paso: Texas Western Press.

- Bath, C. R. (1978). Alternative cooperative arrangements for managing transboundary air resources along the border. *Natural Resources Journal*, 18(1), 181–200.
- Bennett, V. (1995). *The politics of water: Urban protest, gender, and power in monterrey, Mexico*. Pittsburgh: University of Pittsburgh Press.
- Bennett, V. (2002). Different managers, same problems: Public versus private management of municipal water service. In S. Whiteford & R. Melville (Eds.), *Protecting a sacred gift*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Blatter, J. (1997). Explaining cross-border cooperation: A border focused and border external approach. *Journal of Borderlands Studies*, 12(1/2), 151–174.
- Blatter, J., & Ingram, H. (2000). States, markets, and beyond: Governance of transboundary water resources. *Natural Resources Journal*, 40(2), 439–474.
- Bradley, M., & DeCook, K. (1978). Groundwater occurrence and utilization in the Arizona-Sonora border region. *Natural Resources Journal*, 18(1), 29–48.
- Brown, C., & Mumme, S. (2000). Applied and theoretical aspects of binational watershed councils (*Consejos de Cuencas*) in the U.S.-Mexican borderlands. *Natural Resources Journal*, 40(4), 895–930.
- Brown, C., & Mumme, S. P., (2002). Decentralizing water policy on the U.S.-Mexico border. In: S. Whiteford & R. Melville (Eds.), *Protecting a Sacred Gift*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Busch, A. (1978). Environmental management: A basis for equitable resource allocation. In S. Ross (Ed.), *Views across the border*. Albuquerque: University of New Mexico Press.
- Carter, N. (1999, December). *Performance of drinking water and wastewater assistance programs for the U.S.-Mexico border region*. Palo Alto: Unpublished Doctoral Dissertation, Stanford University.
- Corliss, D. (2000). Regulating the border environment: Toxics, *maquiladoras*, and the public right to know. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Cortez-Lara, A., & Garcia-Acevedo, M. R. (2000). The lining of the all-American canal: The forgotten voices. *Natural Resources Journal*, 40, 261–280.
- Cortez-Lara, A., Quezada, S., & Whiteford, S. (1999). Water security and the policy of decentralization in Mexico. In S. Witter & S. Whiteford (Eds.), *Water policy, security issues: International review of comparative public policy*. Stamford: JAI Press.
- Day, J. C. (1978). International aquifer management: The Hueco Bolson on the Rio Grande River. *Natural Resources Journal*, 18(1), 153–162.
- de Mello Lemos, M. C., & Luna, A. (1999). Public participation in the BECC: Lessons from the Aquaferico Project, Nogales, Sonora. *Journal of Borderlands Studies*, 14(1), 43–64.
- Doughman, P. (2001). Discourses and water in the U.S.-Mexico border region. In J. Blatter & H. Ingram (Eds.), *Reflections on water*. Cambridge: MIT Press.
- Dworsky, L. (1975). The management of international boundary waters of Canada and the United States: A comparative study. *Natural Resources Journal*, 15(1), 223–228.
- Fernandez, L. (2002). Trade's dynamic solutions to transboundary pollution. *Journal of Environment and Economic Management*, 43(3), 386–411.
- Fredericksen, P., & Weaver, W. (1999). Don't ask–Don't tell: Legal issues and management strategies in the development of binational, municipal environmental agreements. In D. Soden & B. Steele (Eds.), *Handbook of global environmental policy and administration* (pp. 7779–7802). New York: Marcel Dekker.
- Frisvold, G., & Caswell, M. (2000). Transboundary water management: Game-theoretic lessons for projects on the U.S.-Mexico border. *Agricultural Economics*, 24(1), 101–111.
- Furnish, D., & Ladman, J. (1975). The Colorado River Salinity Agreement of 1973 and the Mexicali Valley. *Natural Resources Journal*, 15(1), 83–108.
- Garcia-Acevedo, M. R. (2001). The confluence of water, patterns of settlement, and constructions of the border in the Imperial and Mexicali Valleys (1990–1999). In J. Blatter & H. Ingram (Eds.), *Reflections on water*. Cambridge: MIT Press.
- Glennon, R., & Culp, P. (2002). The last green lagoon: How and why the bush administration should save the Colorado River Delta. *Ecology Law Quarterly*, 28(4), 903–992.

- Hayton, R. (1978). Institutional alternatives for Mexico-U.S. groundwater management. *Natural Resources Journal*, 18(1), 201–212.
- Herzog, L. (2000). Tourism development and the politics of the northern Baja California Landscape. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Hill, S. (2000) The political ecology of environmental learning in Ciudad Juarez and El Paso county. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Hoogenboom, B., Alfie-Cohen, M., & Antal, E. (2003). *Cross-border activism and its limits* (Vol. 13). Amsterdam: Cuadernos del CEDLA.
- House, J. (1982). *Frontier on the Rio Grande*. Oxford: Oxford University Press.
- Ingram, H., & Fiederlein, S. (1988). Traversing boundaries: A public policy approach to the analysis of foreign policy. *Western Political Quarterly*, 41(4), 725–745.
- Ingram, H., Laney, N., & Gillilan, D. (1995). *Divided Waters*. Tucson: University of Arizona Press.
- Jones, L., Duncan, P., & Mumme, S. (1997). Assessing transboundary environmental impacts on the U.S.-Mexican and U.S.-Canadian borders. *Journal of Borderlands Studies*, 12(1/2), 73–96.
- Kelly, M. (1991). *Facing reality, the need for fundamental change in protecting the environment along the United States-Mexico border*. Austin: Texas Center for Policy Studies.
- Kelly, M., & Reed, C. (2001, April). *The Border Environment Cooperation Commission (BECC) & North American Development Bank (NADB): achieving their environmental mandate*. Austin: Texas Center for Policy Studies.
- Kiy, R., & Wirth, R. (Eds.). (1998). *Environmental management on North America's borders*. College Station: Texas A&M University Press.
- Kneese, A. (1975). A theoretical analysis of Minute 242. *Natural Resources Journal*, 15(1), 135–140.
- Lara, F. (2000). Transboundary networks for environmental management in the San Diego–Tijuana border region. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- LeMarquand, D. (1977). *International rivers*. Vancouver: Westwater Research Centre.
- Liverman, D., et al. (1999). Environmental issues along the U.S.-Mexico border: Drivers of change and responses of citizens and institutions. *Annual Review of Energy and the Environment*, 24, 607–643.
- Lopez, C., & Reich, M. (1997). Agenda denial and water access in Texas colonias. In R. Cobb & M. Ross (Eds.), *Cultural strategies of agenda denial*. Lawrence: University of Kansas Press.
- Lybecker, D., & Mumme, S. (2002). Decentralization and environmental protection on Mexico's northern and southern boundaries. *Journal of Environment and Development*, 11(4), 402–429.
- Mann, D. (1975). Politics in the United States and the salinity problem of the Colorado River. *Natural Resources Journal*, 15(1), 113–128.
- Martinez, O. (Ed.). (1986). *Across boundaries: Transborder interaction in comparative perspective*. El Paso: Texas Western Press.
- Michel, S. (2000a). Place and water quality politics in the Tijuana-San Diego region. In L. Herzog (Ed.) *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Michel, S. (2000b). Defining hydrocommons governance along the border of the Californias: A case study of transbasin diversions and water quality in the Tijuana-San Diego metropolitan region. *Natural Resources Journal*, 40(4), 931–972.
- Michelli, J. (2002). Politica ambiental en Mexico y su dimension regional. *Region y Sociedad*, 23, 129–170.
- Milich, L., & Varady, R. (1999). Openness, sustainability, and public participation: New designs for transboundary river basin institutions. *Journal of Environment and Development*, 8(3), 258–306.
- Miramontes, R. (1978). Las Comisiones Fluviales Internacionales y la Comision Internacional de Limites y Aguas. *Natural Resources Journal*, 18(1), 111–130.
- Montalvo, C. (1992). *Costo ambiental del crecimiento industrial: Caso de estudio de la maquiladora electronica en Tijuana, B.C., Mexico*. Mexico, D.F.: Friedrich Ebert Foundation.
- Morehouse, B. (1995). A functional approach to boundaries in the context of environmental issues. *Journal of Borderlands Studies*, 10 (2): 53–74.

- Morehouse, B., Carter, R., & Sprouse, T. (2000). The implications of sustained drought for transboundary water management in Nogales, Arizona and Nogales, Sonora. *Natural Resources Journal*, 40(4), 783–818.
- Mumme, S. (1984). Regional power in national diplomacy: The case of the U.S. section of the international boundary and water commission. *Publius*, 14(4), 115–135.
- Mumme, S. (1985). State influence in foreign policy making: Water related environmental disputes along the United States-Mexico border. *Western Political Quarterly*, 38(4), 620–640.
- Mumme, S. (1988). Complex interdependence and hazardous waste management along the U.S.-Mexico border. In C. Davis & J. Lester (Eds.), *Dimensions of hazardous waste politics and policy*. New York: Greenwood Press.
- Mumme, S. (1999). Managing acute water scarcity on the U.S.-Mexico border: Institutional issues raised by the 1990's drought. *Natural Resources Journal*, 39(1), 149–166.
- Mumme, S. (2000a). Sustainable development and environmental decentralization on the border: Insights from Sonora. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Mumme, S. (2000b). Minute 242 and beyond: Challenges and opportunities for managing transboundary groundwater on the Mexico-U.S. border. *Natural Resources Journal*, 40(2), 341–378.
- Mumme, S., & Duncan, P. (1997–1998). The commission for environmental cooperation and environmental management in the Americas. *Journal of InterAmerican Studies and World Affairs*, 39(4), 41–62.
- Mumme, S., & Moore, S. (1990). Agency autonomy in transboundary resource management: The United States section of the international boundary and water commission, United States and Mexico. *Natural Resources Journal*, 30(3), 661–684.
- Mumme, S., & Moore, S. (1999). Innovation prospects in U.S.-Mexico border water management: The IBWC and the BECC in theoretical perspective. *Environment and Planning C: Government and Policy*, 17(6), 753–772.
- Mumme, S., & Sprouse, T. (1999) Beyond BECC: Envisioning needed institutional reforms for environmental protection on the Mexico-U.S. border. In D. Soden & B. Steele (Eds.), *Handbook of global environmental policy and administration* (pp. 759–778). New York: Marcel Dekker.
- Neighbor, H. (1999, April 21–24). *Mobilizing low income minorities to fight environmental justice*. Paper prepared for the annual meeting of the Association for Borderlands Studies. Fort Worth, Texas.
- Ojeda Revah, L. (2000). Land use and the conservation of natural resources in the Tijuana River basin. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Pena, S., & Cordova, G. (2001). Public participation and water supply: The case of two communities on the USA-Mexico border. *Water International*, 26(3), 1–10.
- Perry, D., et al. (1990). Binational management of hazardous waste: The maquiladora industry at the U.S.-Mexican border. *Environmental Management*, 14(4), 441–450.
- Pezzoli, K. (2000). From pollution prevention to industrial ecology: An agenda for research and practice. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Pineda, N. (2002). Water supply performance, policy, and politics on Mexico's northern border. In S. Whiteford & R. Melville (Eds.), *Protecting a sacred gift*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Pitt, J., et al. (2000). Two nations, one river: Managing ecosystem conservation in the Colorado River Delta. *Natural Resources Journal*, 40(4), 819–864.
- Prescott, J. (1987). *Political frontiers and boundaries*. London: Allen and Unwin.
- Rodriguez-Estevez, J., & Cervera Gomez, L. (1999). Aspectos de la Relacion Sociedad-Ambiente Natural en la Cuenca Binacional del Rio Santa Cruz, Sonora. *Frontera Norte*, 22, 81–112.
- Sanchez, R. (1990a). *El medio ambiente como fuente de conflicto en la relacion binacional Mexico-Estados Unidos*. Tijuana: El Colegio de la Frontera Norte.
- Sanchez, R. (1990b). Health and environmental risks of the maquiladora in Mexicali. *Natural Resources Journal*, 30, 163–186.
- Sanchez, R. (1990c). *Manejo transfronterizo de residuos toxicos y peligrosos: una amenaza para los paises del tercer mundo*.

- Sepulveda, C. (1983). *La Frontera Norte de Mexico, historia, conflictos*. Mexico, D.F.: Editorial Porrua, S.A.
- Sepulveda, C., & Utton, A. (Ed.). (1984). *Anticipating transboundary resource needs and issues in the Mexico border region to the year 2000*. El Paso: Texas Western Press.
- Spalding, M. (2000a). Addressing border environmental problems now and in the future: Border XXI and related efforts. In P. Ganster (Ed.), *The U.S.-Mexican border environment, road map to a sustainable 2020* (SCERP Monograph No. 1). San Diego: San Diego State University Press.
- Spalding, M. (2000b). The NAFTA environmental institutions and sustainable development on the U.S.-Mexico border. In L. Herzog (Ed.), *Shared Space: Rethinking the U.S.-Mexico Border Environment*. La Jolla: Center for U.S.-Mexican Studies, University of California, San Diego.
- Spalding, M., & Audley, J. (1997). *Promising potential for the U.S. Mexico border and the future: An assessment of the BECC/NADBank Institutions*. Vienna, Virginia: National Wildlife Federation.
- Spears, K. (2003). *The Colorado River Delta and NGO interaction*. Fort Collins: Masters of Arts Professional Paper, Department of Political Science, Colorado State University.
- Trevino, M., & Fernandez, A. (1992). The *maquiladora* industry, adverse environmental impact, and proposed solutions. *Journal of Borderlands Studies*, 7(2), 53–73.
- Trujeque, J. (1999). La Legislacion Ambiental Como Marco de Conflictos Sociales, El Caso De Matamoros, Tamaulipas. *Frontera Norte*, 21, 61–94.
- Varady, R., Colnic, D., Merideth, R., & Sprouse, T. (1996). The U.S.-Mexican border environment cooperation commission: Collected perspectives on the first two years. *Journal of Borderlands Studies*, 11(2), 89–120.
- Verduzco, B. (2001). Ambientalismo y sociedad civil en la frontera Mexico-Estados Unidos. *Region y Sociedad*, 22, 3–48.
- Villegas, C. (2002). *La gestion ambiental binacional a partir del TLCAN y el desarrollo de proyectos de infraestructura en la frontera: un contraste Mexico-EE.UU.* Tijuana: Tesis de Maestria, El Colegio de la Frontera Norte.
- Ward, E. (2003). *Border oasis: The political ecology of the Colorado River Delta, 1940–1975*. Tucson: University of Arizona Press.
- Wirth, J. (2000). *Smelter smoke in North America*. Lawrence: University of Kansas Press.
- Zabin, C. (1997). Nongovernmental organizations in Mexico's northern border. *Journal of Borderlands Studies*, 12 (1&2), 41–72.