Gary W. Barrett Terry L. Barrett Jianguo Wu *Editors*

History of Landscape Ecology in the United States



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ISBN 978-1-4939-2274-1 ISBN DOI 10.1007/978-1-4939-2275-8

ISBN 978-1-4939-2275-8 (eBook)

Library of Congress Control Number: 2015933837

Springer Singapore Heidelberg New York Dordrecht London

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Printed on acid-free paper

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Foreword

Three decades after the seminal workshop at Allerton Park, IL, landscape ecology has developed into one of the most vibrant branches of ecological science, with exceptionally strong links between theory and practice. Indeed, it is hard to think of any area in ecology where theory has had a greater impact on application, or where applications have done more to stimulate creative theory. Allerton represented a milestone in launching the field; and this book, by bringing together many leaders in landscape ecology who have done so much to shape the field, represents another milestone.

The editors of this volume have asked me to provide a personal perspective, tracing my own involvement in and perspective on events before and after Allerton. I was fortunate to begin my career at Cornell University in the 1960s. Cornell was a powerhouse in ecology, and indeed in the areas of ecology that were to form a foundation for landscape ecology; but I had no idea of that when I went there. I was a mathematician, with a strong nascent interest in issues like succession, fire, and the linkages between ecological science and the management of parks; but I really knew nothing of the subject. It was my good fortune, however, that my wife, Carole, and I decided to audit lectures by Dick Root as part of his introductory course in ecology, and Dick and we became fast friends. Indeed, I dedicate this foreword to Dick; though he has been in failing health, his contributions to ecology in general and to landscape ecology in particular, through so many of his publications, continue to grow in importance.

I learned a lot from Dick and our interactions; but an added bonus was that he also introduced me to the ecology community at Cornell, and especially to Bob Whittaker. Whittaker was one of the greats of landscape ecology though he preferred to call what he did synecology. Bob revolutionized the application of ordination methods to plant community ecology, but had a broader view that blended ecological and evolutionary theory, and revitalized the subject. His many contributions to ecology, and to biology more generally, are legendary, but we interacted most on understanding the mosaic nature of ecological communities, and on the notion of the ecotope of a species. Gene Likens was another member of the Ecology and Systematics Department, which I joined in 1970, and his integration of population, community, and ecosystem perspectives, together with Herb Bormann, and complemented by

vi Foreword

Whittaker, helped build the scientific foundation for addressing the first two of the grand challenges of landscape ecology, "How are fluxes of organisms, of material, and of energy related to landscape heterogeneity?" and "What formative processes, both historical and present, are responsible for the existing pattern in a landscape?" Peter Marks, a Bormann student, also joined the department, and Art Lieberman, a landscape ecology pioneer, was already at Cornell; Zev Naveh spent a sabbatical working with Art. So Cornell was a hotbed of landscape ecology, and the perfect place for me to be.

The richness of Cornell attracted many visitors, but five in particular deserve mention here. Dick Forman, another pioneer and a contributor to this volume, visited Bob Whittaker, and we began discussions that have continued over the years; Dick Levins also visited and shared his ideas on metapopulations, among other things. Metapopulation theory, of course, has become a cornerstone of conservation biology, especially in the work of Ilkka Hanski and others. For me, combining metapopulation theory with island biogeography, which I had started to learn about, perhaps in an explicitly spatial context, helped put community dynamics in a framework where explicit predictions could be made that could aid understanding, and guide conservation.

I had been introduced to island biogeography earlier, through two other visitors. One day, probably in early 1970s, Dick Root told me I really should come to the Ecology and Systematics Seminar Series to hear Dan Simberloff, a most recent graduate student of Ed Wilson, speak about his experimental testing of the ideas of MacArthur and Wilson; it was immediately clear that these were critical experiments, and that the ideas of island biogeography had much broader relevance, for example, to islands of vegetation in terrestrial landscapes; so Whittaker and I began to work together on developing these ideas. Robert MacArthur also visited to lecture in Bob Whittaker's course, and Bruce Wallace and I developed a seminar course on the landmark MacArthur and Wilson book entitled, The Theory of Island Biogeography. For me, a number of independent building blocks were fitting together, and an emergent pattern of landscape ecology was taking shape. I became fascinated with spatial processes and patterns, trying to weave these ideas together. Bob Paine was the fifth, and for me the most crucial visitor. Hearing him decorate profound ecological theory with the facts of the intertidal, I knew that this was the system and the collaborator in which and with whom to take these ideas further, which we did. The British Ecological Society presidential lecture given by Alexander Watt was a rich source of ideas for us; Watt was clearly a pioneer of landscape ecology, and helped shape our thinking on two key pillars of landscape ecology: disturbance and patch dynamics.

In the very early 1970s, I paid my first visit to Oak Ridge National Laboratory (ORNL); Bob O'Neill and Hank Shugart came to my talk, and we had great discussions afterward. I became an advisor to the terrific group that Stan Auerbach had built there, through which also passed other pioneers of landscape ecology—Monica Turner, Virginia Dale, Bob Gardner, Don DeAngelis, and Bill Emanuel among them. Many of these have key chapters in this book. My connections with Oak Ridge folks shaped many of my views going forward, but Bob O'Neill was

Foreword

especially key in helping me to appreciate the importance of scale, and the indeterminacy of the definition of an ecosystem. This crystallized in my thinking later, but I owe much to my ORNL interactions for whatever insights I had.

The 1970s and 1980s were key periods in the development of landscape ecology, especially for me. At a conference on ecosystem analysis and prediction I organized in Alta, UT in 1974, a remarkable collection of seminal figures attended. I interpreted that to be evidence of the interest among ecologists and others, coming from different perspectives, to find a unifying framework for what later fused into landscape ecology. Orie Loucks was one who took part, and we developed a strong interaction for a number of years after. Orie did me a huge favor by sending me his student Jianguo Wu to be a postdoc a number of years later, and Jianguo of course has become one of the key players in landscape ecology. Another key conference for me, but one that flies below the radar of landscape ecology, was one organized by John Steele and others in Sicily, focused on pattern formation in the plankton. John was another pioneer, and especially committed to building bridges between the marine and terrestrial ecological communities. That meeting introduced me to ideas, like the Stommel diagram, which have become cornerstones of landscape ecology. John and his co-organizers—Trevor Platt, Gunnar Kullenberg, and my late and dear friend Akira Okubo—decided that they should have a couple of token terrestrial ecologists at the meeting, who turned out to be Bill Clark, now at Harvard, and me. Bill was a student of Buzz Holling, producing a thesis on the dynamics of the spruce budworm, and he encouraged me to come spend my next sabbatical at the University of British Columbia (UBC), which I did with great intellectual profit. The ideas that Holling, Clark, and Don Ludwig were developing, based on the budworm, on resilience, system flips, and critical transitions, have had tremendous influence. They not only profoundly influenced the development of landscape ecology but also have given birth to sister organizations to the International Association for Landscape Ecology (IALE) like the Resilience Alliance, and helped foster the current interest in resilience and in critical transitions. The budworm also was a prime example of how disturbances could spread in landscapes, relevant to the third grand challenge from Allerton Park, IL, "How does landscape heterogeneity affect the spread of disturbance?" Of course, I would be remiss if I did not mention here the keystone meeting that inspired this book and included many of its contributors, the Allerton Park Workshop in 1983, organized by Paul Risser.

Landscape ecology in the United States, as well as globally, is a vibrant science today, as evidenced by the chapters in this book. The IALE and the journal *Landscape Ecology* have played a wonderful catalytic role. The foundational subjects mentioned already will continue to flourish, but I predict expansion in a number of directions that I think are currently underdeveloped and stronger linkages with a number of other disciplines. From a theoretical perspective, great progress is being made and will continue to be made in making connections across scales, especially from the microscopic to the macroscopic and back. This is the essential challenge in dealing with complex adaptive systems; methods from statistical physics, fluid dynamics, and elsewhere are proving invaluable. These considerations relate fundamentally to issues like the robustness and resilience of systems, and the contagious

viii Foreword

spread of disturbances; but I think that of special interest to landscape ecology are the management issues associated with problems of the commons. For this reason as well as because of increasing attention to ecosystem services, I foresee much greater interactions between ecologists on the one hand, and economists and other social scientists on the other.

Secondly, I think that John Steele's dream of a unification of landscapes and seascapes is here. Approaches such as those of Mick Follows and his colleagues to build up from the individual level to models of the dynamics of marine communities, and complementary approaches of Dan Botkin, Hank Shugart, Dean Urban, Steve Pacala, and others scale from individuals to ecosystems and seascapes/landscapes. Furthermore, the explosion of metagenomic data, mainly currently from marine ecosystems but ultimately clearly from terrestrial ecosystems, together with theoretical advances in evolutionary ecology, will lead to closer linkages between molecular biology and landscape ecology and the ability to address the emergence of ecosystem patterns and nutrient cycling from an evolutionary perspective. Many of these also involve problems of the commons: nitrogen fixation, nutrient retention, and prudent resource use all benefit the collective, but at cost to the individual.

Thirdly, a focus on resilience and robustness has made clearer than ever the potential for systems to lose resilience, and flip from one domain of behavior to another. We have the ability now to combine data from remote sensing and field work with mathematical models to elucidate landscape dynamics, and explore the potential for mechanisms like fire to shift systems from one basin of attraction to another. Critical transitions of systems, from physics to economics to the biosphere, are properly attracting great attention today, and there will be benefits for the science of landscape ecology.

These are just a few of the areas where I predict major advances. Obviously, there will be others, like the linkages to conservation biology and reserve design, to climate change science, and to movement ecology. The connections with management are crucial, and will continue to see positive developments, in accord with the fourth Allerton Park grand challenge, "How can natural resource management be enhanced by a landscape ecology approach?" We have come a long way since the Allerton Park Workshop, but the fun is just beginning.

Simon A. Levin

Preface

The initial premise of this book was an archival account of 25 years of history in landscape ecology within the USA. In 2007, a poster entitled, "USIALE: The First Twenty-five Years of Landscape Ecology in North America (1983–2008)," was presented by Gary W. Barrett and Terry L. Barrett at the Seventh World Congress, International Association for Landscape Ecology (IALE) held in Wageningen, the Netherlands (see Chap. 11). What precipitated this concern was the research of past and at that time present USIALE documents of record found scattered in a loose web of redundancy. This was due to the fact that each consecutive administration had separately recorded its unique contribution to the USIALE records for the most part irrespective of past entries. Accordingly, the continuity of the organizational documents appeared as a trace of interrupted information through no fault of any one administration. The poster was one of the first public attempts to accurately assign USIALE a consistent referent title (United States Regional Association of the International Association for Landscape Ecology), timeline, and ordered accomplishments from selected USIALE documentation. "... The poster will attempt to summarize the themes and sites of the US-IALE annual meetings, award recipients, and officers of the association. In addition, a forthcoming paper will attempt to quantify topics, principles, and advances in the field of landscape ecology based on publications in the journal, Landscape Ecology." This volume is in answer to this promised paper.

The inceptive timeframe concerning this volume was drawn from the meeting of USIALE held at the University of Georgia during January 1986 (see Chap. 3) through the 25th year celebration, which took place at the University of Georgia during April 2010. However, when researching the chapters that follow, it becomes apparent that USIALE was conceptualized during the Allerton Park Workshop sponsored by the National Science Foundation (NSF), held in Piatt County, IL from 25 to 27 April 1983. Therefore, the book now describes a 30-year history of land-scape ecology in the United States (i.e., 1983 through 2013).

This volume outlines the mission of USIALE, link between IALE and USIALE, and effort to promote transdisciplinary research and training among colleagues across continents and disciplines. Landscape Ecology, as readers will become increasingly aware, is a holistic and an integrative science as scholars in landscape

x Preface

ecology address agrolandscape, environmental education, pollution abatement, resource allocation, or global climate change with a slide rule of scales.

Scientific disciplines typically have a charter, by-laws, annual meeting, journal describing findings for its membership, and approved committees to guide its future. However, landscape ecology is being revalued to address multiple facets of the plane of traditional landscape (see Chap. 8). For example, not only the surface of Earth but the substance of celestial bodies becomes apparent with new technologies. Ecological and anthropological processes linked to Earth can no longer be exclusively juxtaposed with celestial observations. Customary strategy alone can be equally inadequate when approaching the tests of expanding global agendas of governments and individuals—such as planetary mining or bandwidth regulation. Similarly, where inquiry cannot be limited to a preset of questions, refreshed thinking is required to approach ever-increasing complexities in a vignette of economy, politics, security, and society. It is rare during a lifetime to witness a paradigm evolve into a comprehensive and integrative science such as Landscape Ecology.

Gary W. Barrett Terry L. Barrett Jianguo (Jingle) Wu

Acknowledgments

We thank Paul the late G. Risser, then Director of the Illinois Natural History Survey, for helping to organize the workshop, sponsored by the National Science Foundation (NSF), held at Allerton Park, IL during April 1983. We appreciate his cooperation and distribution of the special publication entitled "Landscape Ecology: Direction and Approaches" published by the Illinois Natural History Survey.

Thanks are extended to each author, or coauthor, of each chapter supplied in this volume. We thank Simon A. Levin for contributing the Foreword to this book. In addition to her contribution as writer and organizer of this volume, Jingle and Gary recognize Terry L. Barrett regarding the initial copyediting, extensive correction of references, and adherence to *Springer* publishing format within each contributing chapter as needed.

Brian Perkins, Principal Systems Administrator, Eugene P. Odum School of Ecology, University of Georgia, is recognized for information technology (IT) assistance pertaining to this volume. We extend our appreciation to Kip Carter MS CMI, Chief of Medical Illustration Services, and Harsh Kumar Jain, Design and Production Manager, Educational Resources, College of Veterinary Medicine, University of Georgia, for the illustration and graphics in this volume.

Special thanks are extended to Michael Koy, Project Coorinator, *Springer*, and Shivani Pal, Production Editor, *Springer* for each assistance with their respective expertise during the publication process. We are especially grateful to Editor Janet Slobodien, Ecology, Primatology, and Evolutionary Biology, *Springer* New York, for approval and management of this volume from its conception until completion. We also appreciate her consideration during the final stages toward completion of this volume.

Gary W. Barrett Terry L. Barrett Jianguo (Jingle) Wu

Contents

1	Thirty Years of the United States Regional Association of the International Association for Landscape Ecology: The	
	Evolution of Its Organization and Science	1
2	Launching Landscape Ecology in America and Learning from Europe	13
3	Right Time at the Right Place in History	31
4	Twenty-Five Years of United States Landscape Ecology: Looking Back and Forging Ahead Monica G. Turner	43
5	History and Evolution of the Journal <i>Landscape Ecology</i>	55
6	Historical Perspectives from Former Presidents of USIALE	75
7	Significant Theories, Principles, and Approaches that Emerged Within Landscape Ecology During the Previous Thirty Years Gary W. Barrett and Herman H. Shugart	103
8	Transforming Fields of Study in Landscape Ecology	125

xiv Contents

9	A Tale of Two Continents: The Growth and Maturation of Landscape Ecology in North America and Australia	143
10	Landscape Ecology at Oak Ridge National Laboratory	163
11	A Future for USIALE	177
Inc	dex	191

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Gary W. Barrett holds the Eugene P. Odum Chair of Ecology in the Eugene P. Odum School of Ecology, University of Georgia (UGA). He is the coauthor of eight books and has published over 190 articles in professional journals. Until 1994, he was Distinguished Professor of Ecology, Miami University, Oxford, OH. At Miami University, he was recipient of the 1986 Sigma Xi Researcher of the Year Award. From 1994 through 1996, Barrett was the Director of the Institute of Ecology, UGA. He was the Ecology Program Director with the National Science Foundation (1981–1983). Barrett is a Fellow of the American Association for the Advancement of Science (1990). He served as President of the United States Regional Association of the International Association for Landscape Ecology (USIALE) (1988–1990), Association for Ecosystem Research Centers (1995–1996), and American Institute of Biological Sciences (AIBS) (1998). He received the 2000 AIBS Presidential Citation Award in recognition of leadership and contributions to the biological sciences, and the prestigious Distinguished Landscape Ecologist Award in 2001 from USIALE. Barrett was the recipient of the 2005 Excellence in Undergraduate Mentoring Award, UGA.

Terry L. Barrett holds an MA in art and an MFA in painting from Miami University, Oxford, OH. Barrett continues to contribute to the field of landscape aesthetics with 12 publications in professional journals, including 2 edited books. She served as Cohost and Program Cochair of the 2010 Twenty-fifth Anniversary Symposium of the United States Regional Association of the International Association for Landscape Ecology (USIALE), University of Georgia, Athens, GA. As independent scholar, she received the 2012 Purple Heart Award given by graduate students within the Eugene P. Odum School of Ecology, University of Georgia, for extraordinary fidelity and dedication to graduate education.

Jianguo (Jingle) Wu is Dean's Distinguished Professor in the Oxford, School of Life Sciences and School of Sustainability, Arizona State University. He received his BS from Inner Mongolia University, his MS and PhD from Miami University, Oxford, OH, and did his postdoctoral work at Cornell University and Princeton University. His current research areas include landscape ecology, urban ecology, and sustainability science. He has published over 250 scientific papers,

xviii About the Editors

including 12 books. Wu has been the Editor-In-Chief of *Landscape Ecology* since 2005. He has been the Program Chair and Councilor-At-Large of United States Regional Association of the International Association for Landscape Ecology (USIALE), and was recipient of 2012 USIALE Distinguished Service Award, 2011 IALE Outstanding Scientific Achievements Award, 2010 USIALE Distinguished Landscape Ecologist Award, and 2006 American Association for the Advancement of Science (AAAS) Award for International Scientific Cooperation. He was elected AAAS Fellow in 2007 and Leopold Leadership Fellow in 2009.

Chapter 1

Thirty Years of the United States Regional Association of the International Association for Landscape Ecology: The Evolution of Its Organization and Science

Gary W. Barrett, Jianguo Wu and Terry L. Barrett

Introduction

This book accounts the early history of the United States Regional Association of the International Association for Landscape Ecology (USIALE). In Chap. 1, we describe the revision in mission of USIALE that was influenced by officers during the first 30 years since its conception, recipients of society awards, timelines of annual symposia, and hosts for these annual events.

Chapter 2, prepared by Richard T. T. Forman, traces the USIALE evolution from and early relationship to the International Association for Landscape Ecology (IALE). This chapter describes early meeting sites of IALE, and individual leadership that emanated from the United States during these formative years.

Chapter 3, prepared by Gary W. Barrett, outlines his role as ecology program director with the National Science Foundation during the early 1980s, when he recommended funding for the Allerton Park Workshop held in Piatt County, Illinois from 25 to 27 April 1983. This workshop became the catalyst and a milestone in the establishment of landscape ecology in North America (Risser 1995; Wiens 2008; Risser and Iverson 2013; Wu 2013a).

Monica G. Turner, in Chap. 4, describes the first meeting of USIALE held at the University of Georgia from 15 to 16 January 1986. The late Frank B. Golley

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1

© Springer Science+Business Media New York 2015 G. W. Barrett et al. (eds.), *History of Landscape Ecology in the United States*, DOI 10.1007/978-1-4939-2275-8 1 G. W. Barrett et al.

interacted with Turner in hosting this initial symposium entitled "The Role of Landscape Heterogeneity in the Spread of Disturbance." The USIALE 25th anniversary symposium returned to the University of Georgia from 5 to 9 April 2010 with Gary W. Barrett and Terry L. Barrett as co-program chairs and cohosts. The theme of this 25th symposium was "Is What Humans Do Natural?"

The first volume of the journal *Landscape Ecology* was published in 1987 with Frank B. Golley serving as founding editor-in-chief. In Chap. 5, the current editor-in-chief of *Landscape Ecology*, Jianguo (Jingle) Wu, provides a historical perspective of the evolution of this quintessential transdisciplinary journal.

Chapter 6 provides a glimpse of the numerous challenges faced by several past presidents of USIALE; they also describe benchmark events, policy changes, and administrative directions during their tenure as president. Chapter 7, prepared by Gary W. Barrett and Herman (Hank) Shugart, presents an overview of landscapelevel research developments during the past 30 years; they briefly address how landscape-level ecological changes, instrumentation refinement, and large-scale perturbations have changed the field of landscape ecology. They relate these changes to significant theories, principles, and approaches that have emerged in landscape ecology during the past three decades (i.e., since the Allerton Park workshop).

Terry L. Barrett and Gary W. Barrett, in Chap. 8, consider fields of study relevant to landscape ecology, organizational models, and changing parameters of landscape study. John A. Wiens and Richard J. Hobbs in Chap. 9 provided a holistic perspective contrasting the evolution of landscape ecology between two continents—namely, North America and Australia.

Robert V. O'Neill, in Chap. 10, describes how scientists from Oak Ridge National Laboratory (ORNL) have made major contributions to the development and evolution of landscape ecology during these past three decades. O'Neill discusses the leadership, research environment, close collaboration, and interdisciplinary approaches that made ORNL a "hotbed" of advanced theories, integrative research, and holistic approaches in the field of landscape ecology. ORNL perhaps has been one of the leading centers for landscape ecology in training, productivity, and interdisciplinary research; O'Neill describes the history and reasons for this success.

In Chap. 11, the coeditors of this volume discuss a future of USIALE, including collaborative possibilities, research foci, and a broaden universe of landscape.

Mission and Actions of USIALE

Permit us to now note the purpose of USIALE. The purpose of the Regional Association of the IALE shall be to foster landscape ecology in the United States; provide a link among persons concerned with landscape ecology in the United States and IALE, and other Regional associations of IALE; and promote interdisciplinary research and communication among scientists, planners, and other professionals concerned with landscape ecology in the United States and colleagues in other countries under the aegis of IALE.

Table 1.1 USIALE Presidents and terms of service

Name of the president	Term of service
David M. Sharpe	1986–1988
Gary W. Barrett	1988–1990
Joan I. Nassauer	1990–1992
Thomas R. Crow	1992–1994
Monica G. Turner	1994–1996
Louis R. Iverson	1996–1998
Jack Ahern	1998–2000
Virginia Dale	2000–2002
Eric J. Gustafson	2002–2004
Peter August	2004–2006
Robert H. Gardner	2006–2008
Jianguo Liu	2008–2010
Dean L. Urban	2010–2012
Kurt Ritters	2012–2014

The president of USIALE is responsible for the leadership to carry out this mission. Above are the 14 presidents of USIALE who have served this leadership position with distinction (Table 1.1).

Perhaps the next most challenging leadership task is hosting the annual symposia, including selecting the theme for this annual event. Below is the record of USIALE symposia, the location of each symposium, and the local host responsibilities for this special event (Table 1.2).

USIALE presents two annual awards for those individuals who have served with distinction in the field of landscape ecology. The prestigious awards are the Distinguished Landscape Ecologist (Fig. 1.1), and Distinguished Landscape Practitioner (Fig. 1.2). These awards represent the highest USIALE honor bestowed on these recipients. The recipients of these awards are listed in Tables 1.3a and b, respectively.

Other USIALE special awards include the Distinguished Service Award and Outstanding Paper in *Landscape Ecology*, which may be accessed in the *USIALE Executive Committee Handbook*.

We would remiss if we did not recognize the outstanding services contributed to USIALE by Forest Stearns (1995 Distinguished Service Citation), Richard T. T. Forman (1997 Outstanding Book Published in Landscape Ecology) for *Land Mosaic*, Cambridge Press, 1995, Frank B. Golley (1998 Outstanding Service Award), Eugene P. Odum (1998 Distinguished Service Award), Jerry F. Franklin (2001 Leadership Action Award) David J. Mladenoff (2005 Distinguished Service Award), Garik Gutman, William Taylor, Jianguo Liu (2006 Distinguished Service Award), Monica Turner (2010 Distinguished Service Award), and Jianguo Wu (2012 Distinguished Service Award).

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University of Georgia Athens GA University of Virginia Charlottesville VA University of New Mexico Albuquerque NM Colorado State University Fort Collins CO Miami University Oxford OH Carleton University Ottawa ON Oregon State University Corvallis OR University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Dutham NC Michigan State University Exact Lonsing MI	Host	Theme of symposium	Program chair
University of Virginia Charlottesville VA University of New Mexico Albuquerque NM Colorado State University Fort Collins CO Miami University Oxford OH Carleton University Ortawa ON Oregon State University Corvallis OR Oak Ridge TN University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Dutham NC Michigan State University Exact Lonsing MI	of Georgia Monica G. Turner	The Role of Landscape Heterogeneity in the Spread of Disturbance	Frank B. Golley
University of New Mexico Albuquerque NM Colorado State University Fort Collins CO Miami University Oxford OH Carleton University Ortawa ON Oregon State University Corvallis OR Oak Ridge TN University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Dutke University Michigan State University Exact Longing MI	of Virginia William E. Odum ille VA	The Influence of Land-Use Pattern on Landscape Function: Ecological Theory and Management Implications	Monica G. Turner
Colorado State University Fort Collins CO Miami University Oxford OH Carleton University Ottawa ON Oregon State University Corvallis OR Oak Ridge TN University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Duthe University Exact Longing MI	of New Mexico Bruce T. Milne as NM	Observations Across Scales: The Structure, Function, and Management of Landscapes	Monica G. Turner
Miami University Oxford OH Carleton University Ottawa ON Oregon State University Corvallis OR Oak Ridge TN University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Durham NC Michigan State University Exact Logica Ma	tate University Ingrid C. Burke s CO	Linking Landscape Structure to Ecosystem Processes	James F. Thorne
Carleton University Ottawa ON Oregon State University Corvallis OR Oak Ridge TN University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Durham NC Michigan State University Exact Longing MI	versity John L. Vankat, Gary W. Barrett	The Role of Landscape Ecology in Public Policy-Making and Land-Use Management	James F. Thorne
Oregon State University Corvallis OR Oak Ridge TN University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Duke University Dutham NC Michigan State University Exact Longing MI	niversity Gray Merriam	Farming Landscape and Natural Values Combined with third IALE World Congress	Louis R. Iverson
Oak Ridge TN University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Durham NC Michigan State University Exact Logica Ma	te University Robert Lackey, Michael Caims	Regional Landscape Change: Impacts of Climate and Land Use	Louis R. Iverson
University of Arizona Tucson AZ University of Minnesota Minneapolis MN Galveston TX Duke University Durham NC Michigan State University East Longing Mi	TN Monica G. Turner	Pattern and Process in Landscape Ecology	Margaret M. Moore
University of Minnesota Minneapolis MN Galveston TX Duke University Durham NC Michigan State University East Longing Mt	of Arizona Guy R. McPherson	Spatial and Temporal Models for Analyzing Pattern and Process in Landscapes	Margaret M. Moore, Jeffrey C. Klopatek
Galveston TX Duke University Durham NC Michigan State University East I passing Mi	of Minnesota Joan I. Nassauer, is MN Lucinda Johnson	Working in a World Dominated by Humans	Jeffrey C. Klopatek, Dean L. Urban
Duke University Durham NC Michigan State University	TX Robert G. Coulson, Robert Giordano	Integration of Cultural and Natural Ecosystems Across Landscapes: Applications of the Science	Dean L. Urban, Kevin Gutzwiller
Michigan State University	ersity Dean L. Urban	The Pace and Pattern of Landscape Change	Kevin Gutzwiller, John A. Wiens
IMI	state University Jianguo Liu, Nilliam Taylor	The Role of Landscape Ecology in Natural Resource Management	John A. Wiens, Fred Sklar
Snowmass CO John A.	CO John A. Wiens	Landscape Ecology: The Science and the Action Combined with Fifth IALE World Congress	Fred Sklar

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Year	Location	Host	Theme of symposium	Program chair
2000	Fort Lauderdale FL	Fred Sklar, Yegang Wu	Integration of Societal and Landscape Heterogeneity: Problems and Solutions	Fred Sklar
2001	Arizona State University Tempe AZ	Jianguo (Jingle) Wu	Pattern, Process, Scale, and Hierarchy: Interactions in Laura Musacchio Human-Dominated and Natural Landscapes	Laura Musacchio
2002	University of Nebraska Lincoln NE	Jim Merchant, Geoff Henebry	Landscapes in Transition: Cultural Drivers and Natural Constraints	Geoff Henebry
2003	BanffAB	Marie-Josée Fortin, Bruce T. Milne	Beyond Borders: Linking Landscapes	Bruce T. Milne
2004	Las Vegas NV	Nita Tallent-Halsell, K. Bruce Jones	Transdisciplinary Challenges in Landscape Ecology	K. Bruce Jones
2005	SUNY-ESF Syracuse NY	Jim Palmer	Landscape Ecology: At the Intersection	George Hess
2006	San Diego CA	Janet Franklin	Linking Landscapes and Seascapes: Conservation and Ecosystem Management at the Land-Sea Interface	Sarah C. Goslee
2007	University of Arizona Tucson AZ	Don McKenzie, Disturbances Acre Robert Keane, John Dibari Mountain Islands	Disturbances Across Gradients: From Desert Sears to Mountain Islands	Robert Keane
2008	University of Wisconsin Madison WI	Monica Turner, Phil Townsend	Landscape Pattern and Ecosystem Processes	Sarah C. Goslee
2009	Snowbird UT	John Bissonette, Tom Edwards	Coupling Humans and Complex Ecological Landscapes	Tom Edwards
2010	University of Georgia Athens GA	Gary W. Barrett, Terry L. Barrett	Is What Humans Do Natural?	Terry L. Barrett, Gary W. Barrett
2011	Portland OR	Anita Morzillo, Rob Scheller	Sustainability in Dynamic Landscapes	Rebecca Kennedy
2012	Newport RI	Pete August, Ann Kuhn-Hines	Informing Decisions in a Changing World	Jeff Hollister
2013	Austin TX	Wendy S. Gordon, Timothy H. Keitt	Landscape Dynamics Along Environmental Gradients	Timothy H. Keitt, Kenneth R. Young