



# Intellectuals ponder a promising paradigm, landscape ecology, in 1983 USA meeting

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Quiet evening pondering, e.g., here by R. Forman, complemented the workshop discussions of 25 ecological scientists (24 from North America and one from France)

A landmark workshop in Allerton Park, Illinois, the first meeting on landscape ecology in North America, helped launch the field. Well after the subject had emerged in Europe, the workshop discussions and report (Risser et al. 1984) catalyzed recognition of the field's importance, especially among North America ecologists. Without recorded notes, here I share my

recollections 40 years later. Lacunae exist below, but hopefully no errors.

## Background

Paul G. Risser, James R. Karr and I organized and ran the meeting, and wrote the published report. Clearly Risser (then Director, Illinois Natural History Survey) was the leader. He secured National Science Foundation funding, wrote initial drafts of the meeting description and final publication, and led much of the discussion. In advance, I slightly knew him as a grassland ecologist and active in the Ecological Society of America, whereas we interacted much more in subsequent years, when he stayed active in landscape ecology while serving as president of Miami University (Ohio), Oregon State University, University of New Mexico, and finally a top administrator at University of Oklahoma. No-one could distill the essence of a complex discussion, and highlight the consequent positive steps, better than Risser. My observations on James Karr's role are especially inadequate. I mainly knew James Karr (then at University of Illinois) as a talented limnologist, and a stream ecologist interested in how stream corridor conditions interacted with the surrounding landscape.

Building on plant and avian interests, my career began as a mainstream plant ecologist with a physiological and then community focus. In the 1970s at Rutgers University, I launched into two

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landscape-wide projects: (A) avian and tree diversity in different-size woodlots surrounded by cropland (Forman and Elfstrom 1975; Forman et al. 1976), and (B) ecology of the extensive New Jersey Pine Barrens (Forman 1979a, b; Forman and Boerner 1981). Michel Godron and I published an article (1981) on the patch-corridor-matrix model for analyzing and understanding landscapes. That same year, Frank Golley, Gray Merriam and I gave invited presentations at an international conference of the 400-members-strong Netherlands Society of Landscape Ecology (Forman 1981). There I learned of landscape ecology mainly emerging at the edge of the important German geography field (Neef 1967), as well as the Dutch land planning field (Zonneveld 1979). Yet also, a small Dutch group apparently headed by Paul Opdam was researching animal diversity and movements in farmland with woods and hedgerows, very much like our mid-1970s cropland landscape work and Gray Merriam's birds-mice-and-movements work in Ontario cropland (Wegner and Merriam 1979). See Forman (2015) and Barrett et al. (2015) for a fuller description of landscape ecology's origins in North America, especially in 1972–1983.

Having attended about 20 annual meetings of the Ecological Society of America and served six years on its Council, I knew most of the invited participants for this Allerton Park workshop. Additionally, I was half way through a book with Michel Godron on landscape ecology. Also, several directors of the National Science Foundation ecology programs (including Gary Barrett and Paul Risser) had recently given talks at the Rutgers Ecology Seminar Series, and I had highlighted to them the importance of a new important subject—landscape ecology.

Risser and others later wrote reports on the Allerton Park workshop (Risser 1995; Wiens 2008; Wu 2013; Risser and Iverson 2013). My report here differs markedly. I highlight: (A) the route to the meeting, (B) discussions by participants, and among the organizers, during the 3-day meeting, (C) writing the report, and (D) reflections four decades later.

#### Route to the Allerton Park meeting

Sometimes referred to as mainly spatial ecology at the human scale (or simply ecology of the area seen from an airplane window), landscape ecology's North American roots at this time were primarily island

biogeography, earlier vegetation analysis, and some prescient threads in population ecology and ecosystem ecology. The last two fields were mostly focused on analyzing quasi-homogeneous study areas, such as field or woods, almost never field and woods together, or field, woods and stream corridor, and especially not these features plus human-dominated areas such as housing development, shopping mall, or village.

Meeting discussions by the invited multidisciplinary giants, and the organizers' views

#### Day 1

Most of the participants were mid-career, with their best-known work in later years. Apparently, the earliest North American women in this field, Lenore Fahrig and Kathryn Freemark, were just beginning in Canada. Virginia Dale, Joan Nassauer, and Monica Turner were also pioneer landscape ecologists in the USA. Brief comments here on the participants I knew best might be helpful in imagining the group's discussion of incipient landscape ecology. Many disciplines and strong personalities made their mark.

*Frank B. Golley* (University of Georgia), an animal-population and ecosystem ecologist with a diplomatic sense from international collaborations, knew the most about landscape ecology emerging in Europe. *Gary W. Barrett* (Miami University), a small-mammal-and-vegetation-patches experimentalist, worked with Risser to get support for this meeting. *Michel Godron* (CEPE, Montpellier), originally a physicist and recent Director of France's largest ecology center, published on vegetation methodology and H' information theory, and was midway through a book with Forman on landscape ecology. *Gray Merriam* (Carleton University, Ottawa), mammal population ecologist studying mice movements in Ontario cropland-woods-hedgerows landscape, knew the European landscape ecology emergence. *Robert O'Neill* (Oak Ridge National Laboratory, Tennessee), a fountain of ideas, theoretical ecologist, and spatial thinker, worked with Robert Gardner, Monica Turner, and other ORNL scientists over many years. *Robert Costanza* (Louisiana State University), modeler of extensive heterogeneous coastal wetland areas with people, especially using an ecosystem focus. *H. H. "Hank" Shugart* (Oak Ridge National Laboratory) worked creatively on ecological forest succession and

spatial forest modeling. *Carl Steinitz* (Harvard University), a landscape architect/planner who used early geographic information systems to understand and plan large landscape areas, kept his strong ideas modest in the discussions. *John A. Wiens* (University of New Mexico) provided data and perspectives from his pioneering studies of birds in dry land with prominent shrub patches. *David M. Sharpe* (Southern Illinois University, geography) worked with ORNL and other ecologists on changing riverine landscape patterns, and added a geography dimension to discussions. *Simon A. Levin* (Cornell University) was a younger ecological bright light and theoretical ecologist in a long university program of leading ecologists. *Daniel B. Botkin* (University of California-Santa Barbara) had published a model of successional patch change within forests, and was writing on the effects of environmental degradation. *Jack Ward Thomas* (U.S. Forest Service, Oregon), an emerging forestry leader, seemed interested in planned alternatives to the dispersed-patches cutting prevalent in Pacific Northwest Forests. Five other top ecologists less known to me then were major contributors as well: *Thomas Hoekstra* (USDA, Colorado), *William J. Parton* (Colorado State University), *Robert L. Rabb* (North Carolina State University), and *Bob Woodmansee* (National Science Foundation, Ecosystems).

In addition to Risser, four other Illinois Natural History Survey staff were active contributors and ever helpful: *Louis R. Iverson* (later a US-IALE President), *William G. Ruesink*, *Glen C. Sanderson*, and *Michael Wiley*.

The organizers had invited each outside participant to lead-off with a brief summary of the person's main work and interest, and pinpoint how it might contribute to the development of a potential field of landscape ecology. These intriguing encapsulations took more than a morning since participants interpreted "brief" differently. The talks basically highlighted each person's research interest. Many speakers mentioned coming to see what landscape ecology was all about, and whether their interest linked or could link to it. These disjointed introductions were simply "all over the map." Everyone realized that we were nowhere near understanding what landscape ecology was or might become. The group had barely budged from a collection of disparate interests.

Risser gallantly proceeded with an afternoon discussion focused on what landscape ecology could

be, and how our individual interests might mesh to develop a vibrant valuable field. Godron, the French ecologist, seemed little interested in the Northern Europe approach. Golley, Merriam and I had some experience with the European perspective, but each of us chose to minimize it in hopes that a novel, more compelling result could emerge from ecologists in North America.

That evening we three organizers caucused in a low mood. The participants seemed tightly wrapped in their own interests. The dearth of comments attempting to discern something big, new and important rattled in our minds. A discouraged Risser lamented that the meeting seemed to be going nowhere—"We've just about "lost this meeting!" We kept mulling along these lines. So, I volunteered to lead the discussions on Day 2. Risser slightly perked up. Karr added an OK. It seemed like the only route ahead toward our target. Yet, I remember thinking that all I had to go on was a sense that some big landscape ecology thing existed out there, waiting to be discovered, and delineated.

## Day 2

Next morning, I quickly realized that most participants saw and shared our concern of last evening. *Quo vadis?* There's too much talent here to miss success. Let's dig in. They did. Listening, thinking creatively, linking concepts, collaborative ideas rolled forth. Promising threads to weave a significant novel North American brand of landscape ecology formed tantalizingly in the mist. From morning to afternoon, positive ideas and occasional syntheses kept emerging. Most participants seemed energized. But, *tempus fugit*.

Leading those discussions was simple. They barely needed a leader. That evening Risser promptly said he'd be happy to lead the wrap-up Day 3 discussion. Great. He already saw things coming together—tangible themes. Karr and I noticeably smiled. How different we felt from last evening! Risser couldn't wait to start Day 3 of the workshop he had labored so long to create.

### Day 3

True to what I saw happen in later years, Risser (and probably some other participants) detected many promising ideas to visualize, even establish, an important field of landscape ecology shaped by ecologists in North America. The Europeans had presciently created an ecumenical flavor, so any discipline that could contribute positively was welcome. Maybe that model was also emerging here. I pushed for a photo of the group. After working hard, probably most everyone left with some good feelings about the workshop, and what might emerge in time from our ponderings. None of us realized the importance and tangibility of results in Risser's mind.

#### *Writing the published report*

Risser volunteered to do a draft. Karr and I efficiently went back and forth in reviews with him. The manuscript coalesced with promising tangible themes and results, as it kept on schedule. All three of us seemed pleased. The photo of participants would remain a good memory.

I was delighted to see the report (Risser et al. 1984) arrive a year later. Yet soon a mild disappointment set in. The definition/concept given, the four representative questions addressed by landscape ecology, and most of the 11 conclusions listed at the beginning—overall, the content seemed too general. Tangible examples were few. Methods were scarce. Maybe it was too early for these. It ignored the preceding European progress in landscape ecology (mostly Golley's and my fault). Thinking of my recent publications and ongoing landscape ecology book-writing with Godron, I knew it was somewhat out-of-date (again my fault).

Yet the report seemed to faithfully encapsulate the participants' discussions (and occasional consensus) from the North American perspective. Rather than a state-of-the-subject, my hands held the story of a paradigm launching.

#### *Reflections four decades later*

In the years following the Allerton Park catalyst, a perception of difference or schism between European and North American landscape ecology developed,

and persisted much too long. Adding ecology at the fringe of the strong German geography and plant/animal geography tradition, plus some important land planning approaches used in The Netherlands and elsewhere was of course distinctly European.

Yet, the spatial ecology or land mosaic approach that quickly spread across North America, had also recently developed in Europe and Australia. In Holland, the animal ecologists, Paul Opdam and colleagues, worked mainly on biodiversity and species movement in agricultural land with woodlots, hedgerows and other features. In the 1980's in Australia, Chris Margules, Denis Saunders, Richard Hobbs, and colleagues were doing important analogous studies (Saunders et al. 1987). Indeed, the spatial ecology or land mosaic approach to understanding large heterogeneous landscapes, discussed at Allerton Park, developed independently in North America, Europe, and Australia. It quickly coalesced into a vibrant research and application field worldwide.

It is impressive indeed to see how many of the twenty invited participants plus Risser became respected leading landscape ecologists in the years following: Barrett, Forman, Godron, Golley, Iverson, Merriam, O'Neill, Risser, Sharpe, Wiens, and Woodmansee. Indeed the list of leaders includes at least five more, whose work also addressed other frontiers: Costanza, Hoeckstra, Karr, Levin, and Shugart.

I end with a quote from Simon Levin, who participated in this Allerton Park launching early in his career. Much later, as a leading American ecologist, he began his Foreword (Levin 2015) to a landscape ecology book, as follows:

Three decades after the seminal workshop at Allerton Park, Ill., landscape ecology has developed into one of the most vibrant branches of ecological science, with exceptionally strong links between theory and practice. 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.

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