

Indiana Dunes Celebrates Near-Century of Research

By Sam Vaughn

It was 1896 when University of Chicago ecologist Dr. Henry Cowles began his pioneering research in the Indiana Dunes. It was 90 years later when 162 scientists, park rangers, students and dunes devotees assembled for the first Indiana Dunes Research Conference.

Like Frederic Clements in Nebraska, Cowles studied the dynamics of plant succession – the gradual evolution of plant communities over time. He found the Dunes to be a natural laboratory. Bare sand dunes were colonized by succeeding populations of grasses, forbs, shrubs, cottonwoods, pines, and finally an oak forest. This Conference, appropriately entitled: *Indiana Dunes: A Century of Scientific Inquiry*, proved that science in the Dunes has evolved as well.

Researchers gave some 50 papers describing Dunes research. Four symposia constituted the main body of the Conference, supplemented by contributed papers and innumerable hallway and coffee pot conferences.

In the Plant Succession symposium, systems ecologist Jerry Olson presented an updated version of terrestrial plant succession, confirming and clarifying the earlier work of Cowles. His mathematical model compared rates of income and loss for successional stages, and analyzed the "functions describing transient adjustment toward steady states." James MacMahon described how a knowledge of successional variables can enhance our ability to reclaim strip-mined land, and decrease the need for supplementary fertilization and irrigation. In addition, he presented evidence that the "general form and architecture of the plant components of the community are more influential in determining the presence or absence of native animals than is the specific species array of plants" – which might suggest modifications in current law mandating reclamation standards.

Researchers from the National Lakeshore Science Division reported on the effects of cultural disturbances on successional dynamics. Ken Cole documented the impact on terrestrial vegetation of lumbering, drainage, pollution and introduction of exotic species since 1850, while Doug Wilcox related differences in aquatic vegetation to post-settlement disturbances that modified classical successional patterns. Norm Henderson and Noel Pavlovic detailed the importance of fire as a factor in maintaining the climax species composition of black oak savannahs. Ron Hiebert and Noel Pavlovic described the relationship between past land use and plant succession in abandoned residential sites. They reported that site disturbance can affect species composition and successional patterns for at least 100 years. Studies such as these will help managers to restore and preserve park resources amidst urban development and burgeoning visitation.

The Visitor Aspects of Resource Management symposium featured several sociological studies of park visitors. Gary Machlis used human ecology techniques to explore the dynamics of human behavior in urban parks; he compared examples from Cuyahoga Valley, Indiana Dunes and Xuan Wu Hu in the People's Republic of China. Joe Roggenbuck evaluated environmental education programs at the National Lakeshore. He also reported on techniques

that the interpretive staff can use to monitor program effectiveness. Other researchers looked at factors affecting participation in recreational programs, and our ability to predict such participation.

The Shoreline Processes symposium was especially timely, given the current high lake levels and severe shoreline erosion. Stratigraphic studies provided a detailed depositional history that charts Lake levels going back at least 2000 years. Models of wave dynamics and off-shore bottom profiles were applied to predictions of storm damage and coastal stability. A plan for regional shoreline management was introduced. This information could play a vital role in public policy decisions that will affect millions.

The fourth symposium was the Indiana Natural Areas Conference, sponsored by the Indiana Department of Natural Resources. This Conference is held annually in various areas of the state, and was this year incorporated into the Indiana Dunes Research Conference. Sessions had a natural history focus, and covered prairies, plants, bugs and botanists of the Dunes, as well as natural area management in urban settings. Field trips then gave participants a chance to explore the area.

Contributed papers were presented on aquatic resources, cultural sciences, animal and plant sciences, and air quality. Researchers reported on such topics as threats to groundwater chemistry, alternative paradigms for environmental education, nesting success for the great blue heron, prehistoric patterns of plant succession, and the use of lichens as air pollution indicators. University of Chicago ecologist James Teeri summarized the proceedings in his banquet speech on Henry Cowles and the history of ecology.

Lakeshore Chief Scientist and Conference Coordinator Ron Hiebert noted that the conference "provided state-of-the-art education on our most critical resource management issues. The exchange of ideas, the synergy, was really impressive. The public will benefit directly through interpretive programs and publications, and indirectly through more informed public policies."



Conference Coordinator Ron Hiebert welcomed participants and described the current state of science at the Indiana Dunes.

Lakeshore Supt. Dale Engquist added: "It brought together people from broadly diverse fields. In and out of the sessions I heard researchers talking to managers, and sociologists talking to plant ecologists. This conference makes a strong statement about National Park Service support for research and resource management."

The conference was sponsored by Indiana Dunes National Lakeshore, the Friends of Indiana Dunes, Indiana Department of Natural Resources, the Save the Dunes Council and Indiana University Northwest, where the sessions were held. Conference Proceedings will be available after the first of the year from the National Lakeshore. The second Research Conference has been tentatively scheduled for the fall of 1988, and will emphasize the application of research to the management of dune areas.

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Dunes researchers shared their interests at a barbeque at Indiana Dunes State Park.