

CONCLUDING REMARKS--SOME IMPLICATIONS
FOR FUTURE RESEARCH

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Trying to make sensible concluding remarks on a diverse presentation of research papers is an exceptional opportunity to show one's ignorance. The problem is, we've heard good research reports; they have come from University, Federal and State Agencies; and they have come from ecologists concerned with basic science as well as from foresters concerned with both basic and applied science. Thus, for me to say, 'now here's what we ought to do', simply will not sit well. Besides, after some years in the federal forest research program in eastern Canada, and more years in the University setting, I am all too aware of the problems of doing things in new or different ways. It is natural, therefore, to hesitate in casting the first stone.

But in science, the name of the game is change; that means regular critiques, and inevitably, some treading on toes. We should all be used to that.

In the keynote talk by Dr. Clark, we heard estimates of the size of the Central Hardwood forest complex: 82 million acres, or twice the size of the state of Illinois. This is also a region of large demand for wood products now, but only 52% of the growth is being cut at the present time. Obviously this is going to change.

But let us consider too, what were the objectives of this conference, as stated in the conference announcement. The second objective read, "to disseminate research results through discussion of recent research and publication of the Proceedings." On this there seems no doubt that the conference is meeting its goal.

The first objective however, reads as follows: "to develop cooperation among researchers that will lead toward a more coordinated regional research program." On this objective we may have taken some steps, but we've heard few, if any, research reports on "coordinated regional research". From some queries in the halls, I found there is research of this type going on, and we could have heard about it. This isn't to say that the papers we heard weren't very worthwhile. They were, but they represent studies of components in the Central Hardwoods forest system: community development, water relations, nutrient cycling, etc. The questions being posed were being answered satisfactorily, but are they the only questions we want to ask of forest problems in this region? In other words, has the conference as a whole asked the right questions?

Consider if you will, the pattern of changes that is taking place in the forestry scene in the Central United States. Dr. Clark discussed the changes in ownership in his opening paper--the move to more owners who may permit cutting of timber, but who are going to manage mainly for values other than timber. We all know, too, that state and county lands are being re-oriented to emphasize recreation-related values. In Wisconsin, we are going to "big tree" management on state lands. We should harvest significant timber, but on a much longer rotation, and the management will be very different from what we've known. At the same time, all states in this area are increasingly concerned about both quantity and quality of water yield from these lands.

Add to these changes the new patterns in wood utilization that I hear from the Forest Products Laboratory: as natural gas supplies are being cut off from the wood using industries, some are converting to the use of hardwoods for their industrial process heat. As some of you know, there is one pulp mill in Arkansas that is using on the order of 300,000 cords of hardwood per year for process heat, using full-tree harvest, and hauling up to 100 miles. With all this, they are saving money in comparison to any other fuel source.

When you look at the schedule for terminations of natural gas over the next 2, 3 and 4 years for industries in Wisconsin, Minnesota and Michigan, you begin to see the handwriting on the wall. It is saying that changes in markets and prices will put extreme pressures for increased cutting on public and private lands within 10 years, not the 20 years that most forecasts are saying. With luck, and some effort, we may have an intelligent, intensive silviculture by that time. But it seems more likely that many of the cuts for fuel will be poorly designed, too frequent and will put us right back to the barren landscapes of Pennsylvania and other areas ravaged by excessive cutting for charcoal a few generations ago. Do we have the understanding of the Central Hardwood types to make recommendations for a balanced harvest and to make them stick?

Let me suggest that at this meeting we've been fussing about ants in the system, while elephants are running us down. Throughout the country we have also embarked on the process of Environmental Impact Assessment for major harvesting programs, especially on the National Forests, and, in some states, on State and County Forests. The concerns are principally evaluation of effects on water quality, soil losses, effects on wildlife, and the overall health and aesthetics of the forest resource.

Obviously, these impact evaluations are being written with or without the input of a conference such as this one, and they represent an important synthesis of the kinds of information we've heard here. The synthesis is often a preliminary statement of whole system responses. However, are any of us satisfied with the kinds of prescriptions, or assessments of expected effects, that we are able to make now for the

Central Hardwood types? I think not. Still, not one person has mentioned the environmental assessment process in relation to forest harvest practices!

Am I simply jousting with windmills when I suggest we try to address these issues? I don't think so. I suspect that most of you are already working in these directions and would like more opportunity to participate in an orderly review of these impact statements and the whole system forest response questions. I understand that the Agricultural College Experiment Station Directors and the U.S. Forest Service are reviewing some of these problems right now, and will have recommendations for future programs on an interstate basis. But there is plenty of room, and a great need, for the kind of contribution that could be made by study groups or working groups within the context of future meetings of the Central Hardwood Conference.

Our collective strength is the diversity of component study results, such as we have heard at this meeting. Our weakness is in the diffusion of people at many labs and institutions over a large area. The obvious need, therefore, is to increase the opportunities for working together toward some of the composite questions we would all like to see answered.

Some organizations such as IUFRO have used "working groups", voluntary teams of people who can get together occasionally, but who are prepared to work mainly by correspondence. What would such "working groups" do in the Central Hardwood region?

Let me suggest, first, a group synthesis of our understanding of community and seedling response relations. This would have to include an effort to reassess our understanding of the role of fire in establishing the present forest, and as a tool in regeneration.

Secondly, there could be a working group on the synthesis of energy balances, CO₂ exchange, respiration costs, and including relationships to classical forestry site index measures.

Thirdly, we could do a much better synthesis of stand nutrient budgets, watershed nutrient losses, nutrient leakage, and responses to major upsets to the nutrient cycle.

Fourthly, it is essential that we improve our summary of all old stand treatments to obtain regeneration, leading to complete review monographs by major species or types, such as the U.S. Forest Service is trying to do with seriously reduced staff.

Finally, much more attention will have to be given to other forest management issues, planting priorities, rotation age, tree genetics, etc., in relation to the basic science results above.

Don't misunderstand--I am not suggesting that the reports on basic studies of the kind we have seen at this meeting be passed over. Rather we should make the effort to have both. Also, we will not be able to do all the synthesis on all the topics mentioned above in any one session, or even in several. Still we can make a beginning.

Well, having mentioned the Environmental Impact Statement, I have the foresters mad at me, and mad at the ecologists; having mentioned full-tree clear-cutting, I have the ecologists mad at me and mad at the foresters; by implication, I've criticized all the papers presented here and have the contributors mad at me; I've criticized the focus achieved by the organizing committee, so they are mad at me; and I'm mad at myself for taking on this chore of trying to make concluding remarks.

This seems to have us all mad at each other. Surely, therefore, we must be fired up enough to go home now, do some extra homework, and come back in two or three years ready to meet the challenge at that time.

ABOUT THE AUTHOR

Orie Loucks received a B.Sc.F. in forestry from the University of Toronto in 1953, and a M.Sc.F. in 1955, also from the University of Toronto. He received a Ph.D. in botany from the University of Wisconsin-Madison in 1960. He served as a Research Officer for the Canada Department of Forestry from 1955-1962, before joining the Department of Botany at the University of Wisconsin in 1962. From 1969 to 1973, he headed an inter-disciplinary study of the Lake Wingra basin as part of the U.S. contribution to the IBP. During the 1973-74 year, he served as Coordinator of Environmental Management Programs in the US/IBP at the University of Texas in Austin, Texas. Currently, he is Acting Director of the Center for Biotic Systems, the Institute for Environmental Studies, at the University of Wisconsin, as well as Professor of Botany. He is the author of over 35 publications in the field of Botany, Forestry and Systems Modeling.