

Pre-proposal for Sabbatical Leave  
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The three principal forested watersheds of the U.S. Forest Service - Andrews, Coweeta, and Hubbard Brook - have been extraordinarily successful long-term research sites during the past few decades. As participants of the NSF-LTER program the outlook for continued productivity from these sites is outstanding, and the need for increased scientific interaction and collaboration is essential. As a contribution toward this interaction I propose to spend my sabbatical year (1988-1989) at Andrews Oregon State University (August - December) and Coweeta University of Georgia (January - June). The goal of my leave would be to advance the scientific collaboration among the three forest-watershed LTER sites. My specific objectives would be: (i) to facilitate the coordination of ongoing and new interactive studies among the three forest sites; (ii) to learn more about current techniques and experimental designs in the areas of soil microbiology and forest entomology and (iii) to develop and write a popular synthesis of past, present and future research activities at the three sites. I emphasize that this proposed sabbatical leave would be particularly beneficial to the LTER program; during my automobile travel to the base sites I would also plan brief visits to several of the other LTER sites.

Several ongoing and new research efforts at the three forest-watershed LTER sites have been developed in parallel, with some direct collaboration. These efforts include studies of bole wood decay and leaching; root decomposition and formation of root channels; effects of soil resource availability on self-thinning of dense hardwood stands; mineralization and availability of soil nitrogen; and studies of soil and watershed hydrology.

The bole decay studies were originated at Andrews with ancillary studies at Coweeta and very similar studies will be initiated at Hubbard Brook, probably in summer 1989. The initiation of this study and its coordination with the Andrews' effort will profit greatly from my visit. The Hubbard Brook study will include detailed examination of leaching, from deadwood and this aspect could be incorporated into the Andrews study. Intensive interaction with the research group of Schowalter and Harmon would help me to design and develop entomology/mycology aspects of the Hubbard Brook studies.

Decomposition of fine roots and woody roots of several species has been a focus of my program at Hubbard Brook. A similar effort has been carried out by C. Berish at Coweeta. I would hope to stimulate a parallel effort at Andrews and while in Georgia, to work with Berish on a cross-system comparison of root decay. Also, I would expect to study techniques of selective biocides in laboratories of Ingham at OSU and Coleman at Georgia.

Through funding from the USDA Competitive Research Grants Program, we are initiating a project on the effects of soil resource availability and neighborhood competition on growth and self-thinning of pin cherry-dominated stands in the Hubbard Brook area. A parallel study is ongoing at Andrews (D.A. Perry), and a comparison and integration of these projects would be very enlightening. The potential for stimulating a parallel effort at Coweeta would be pursued during my Georgia visit.

Nitrogen mineralization and availability is an important topic of research at all three forest-watershed sites, as well as several of the other LTER projects. We are comparing methods and approaches to this problem and additional coordination and synthesis along these lines is essential to a broader understanding of this critical nutrient.

Perhaps the most critical weakness in our understanding of forest watersheds is the problem of soil hydrology. A major focus of the Hubbard Brook LTER project will be field and modeling studies of soil hydrology. Within the LTER program this area of study has been best advanced by the Coweeta project, and I would hope to enhance coordination between their studies and the new work at Hubbard Brook.

The final objective of my proposed sabbatical leave would be to write a popular synthesis of past, present and future research at the three forest-watershed LTER sites, with American Scientist or BioScience as probable outlet journals. Drawing upon insights and information obtained while in Oregon and Georgia, I would focus on summarizing the major research findings and comparing and contrasting the structure and function of forest ecosystems at these three sites. A major emphasis of the paper would be the vision and role of LTER in shaping the future of these research projects.

Cornell University will provide 6 months of funding for my salary during this proposed leave. I would utilize funds from my own research grants to support one month of salary. I would request the provision of four months of salary (about \$15,000) from the LTER program to carry out the proposed activities.