

**ROBIN LAMBERT GRAHAM**

**Computing, Environment and Life Sciences Directorate  
Argonne National Laboratory  
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**EDUCATION:**

Ph.D. (1982) Forest Ecology, Oregon State University, Corvallis, OR

A.B. (1976) Biology, Dartmouth College, Hanover, NH *Summa Cum Laude*

**RESEARCH INTERESTS:** Carbon and nutrient cycling within terrestrial ecosystems. Biomass energy and its environmental implications. Methods for integrating ecological and economic models within GIS for resource assessment.

**PROFESSIONAL EXPERIENCE:**

**Employment at Argonne National Laboratory (12/11 to present):**

**Deputy Associate Laboratory Director** – Computing, Environment, and Life Sciences Directorate, Argonne National Laboratory, Argonne, IL – (12/11 to present)

**Employment at Oak Ridge National Laboratory (6/85 to 10/11):**

**ORNL Bioenergy Program Manager** – (7/08 to 10/11)

**Group Leader** – Renewable Energy Systems, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. – (1/08 to 10/11)

**Group Leader** – Environmental Data and Systems, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. – (8/06 to 12/07)

**Group Leader** – NASA DAAC, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. – (10/05 to 8/06)

**Group Leader** - Ecosystem and Plant Sciences, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. - (9/04 to 9/05)

**Group Leader** – Ecosystem, Plant and Microbial Sciences, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. - (10/01 to 9/04)

**Section Head** - Ecological and Earth Sciences Section, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. - (10/98 to 10/01) (ORNL eliminated the Section Head position in 2001)

**Research Staff** - Natural Resource Analysis Group, Ecological Sciences Section, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. - (3/88 to 10/98)

**Group Leader** - Natural Resource Analysis Group, Ecosystem Studies Section, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. - (1/92 to 10/96)

**Acting Section Head** - Ecosystem Studies Section, Environmental Sciences Division, Oak Ridge National Laboratory, TN. - (9/94 to 8/95)

**Research Associate** - Regional Resources Group, Environmental Analyses Section, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. - (6/86 to 3/88)

### **Research Management Experience**

Currently serving as Deputy Associate Laboratory Director for the Computing, Environment and Life Sciences Directorate at Argonne National Laboratory. This directorate of ~ 340 research staff encompasses three Divisions and the Leadership Computing Facility. In this capacity I am responsible for developing and executing a strategic vision for the Directorate especially with regards biological and environmental research.

Prior to joining Argonne in December 2011, I was employed by Oak Ridge National Laboratory. While there, I served in a variety of line management roles with a staff load of anywhere from 12 to 50 scientists and their associated postdoctoral students and guests. The collective value of the research has ranged up to \$25M/yr and varied with the group. As line manager I was responsible for strategic planning, performance planning and reviews, staff coverage and laboratory safety.

### **Research areas**

#### **Bioenergy**

Served as ORNL Program Manager for Bioenergy. In this capacity I coordinated and promoted ORNL bioenergy research across the Laboratory and interacted extensively with Department of Energy Office of Biomass Program. ORNL had a Bioenergy research portfolio in excess of \$35M/yr that encompassed the entire bioenergy supply chain from feedstock production and acquisition to engine performance under intermediate biofuel blends. Sustainability was a core element of ORNL bioenergy research.

Past personal research (beginning in the late 1980s) focused on assessing the potential of dedicated energy crops and crop residues such as corn stover to serve as feedstock for bioenergy production and understanding the environmental implications of widespread adoption production of bioenergy feedstocks. Research was focused on developing and applying innovative analytical tools for assessing the economic potential for biomass crops in the United States, the environmental consequences of large-scale biomass crop production, and the carbon emission benefits of substituting biomass fuels for fossil fuels. Research was highly interdisciplinary involving collaboration with economists, engineers and environmental scientists. Developed a regional-scale, spatially explicit model of energy crop production within a GIS framework. The framework interfaced economic and environmental models of crop production with a transportation model to predict both where energy crops have the greatest economic potential and the environmental implications of their deployment in those areas.

#### **Carbon Sequestration in Terrestrial Ecosystems**

Served as co-PI of the ORNL component of the DOE Carbon Sequestration in Terrestrial Ecosystems Project. This project, which involved Argonne and Pacific Northwest National Laboratories and several Universities, sought to understand the fundamental processes that control soil carbon sequestration and evaluate greenhouse gas implications of management practices to enhance carbon sequestration. The research focused on using switchgrass production as a model system for exploring the fundamental chemistry of humification processes, elucidating microbial community changes associated with carbon sequestration, understanding soil aggregation processes, quantifying the capacity for subsoils to sequester carbon, developing approaches for scaling research findings to regional assessments, and quantifying the net greenhouse gas emissions associated with agricultural practices to enhance soil carbon content

### **Environmental Data Management**

Served as project manager of the NASA-funded ORNL Distributed Active Archive Center for biogeochemical data (2005-2007). This data center archives and distributes NASA's terrestrial data for the EOS platform.

### **Regional and Landscape Assessment**

Assessed carbon emissions and inventory of Sub-Saharan Africa for AID. Assessment involved integrating continental information on soil, climate, vegetation, and deforestation rates using GIS and developing models to project future carbon emissions under alternative land use management strategies. Used satellite imagery to better determine forest boundaries on the continent and to improve estimates of deforestation and forest degradation.

With scientists at Illinois Natural History Survey on a grant from NASA, developed a methodology for evaluating regional forest cover and productivity by using GIS and scaling coarse resolution AVHRR data with fine resolution LANDSAT data. Later applied methodology to analyze forest cover in Ghana as part of FAO/UNEP ad-hoc Expert Group on Tropical Forest Cover Monitoring.

Aided EPA in development of methodology for assessing the critical load of nitrogen and sulfur to regional ecosystems. Responsible for mapping portion of methodology. Prepared document for international conference on mapping critical loads.

Developed regional risk assessment methodologies for the EPA. Developed probabilistic, spatial model of land cover change to illustrate the unique regional-scale risks posed by ozone to both terrestrial and aquatic endpoints.

Evaluated effect of climate change and elevated CO<sub>2</sub> on forest resources and unmanaged ecosystems as part of the Resource Analysis Research Plan for the Carbon Dioxide Research Program, U.S. Dept. of Energy.

Working with scientists at Illinois Natural History Survey, analyzed feasibility of using Thematic Mapper satellite imagery in conjunction with a GIS to evaluate forest productivity at a landscape scale.

## **Environmental Impact Assessment**

Participated in NEPA assessment of Titan IV missile launches from Cape Canaveral, Florida and Vandenberg Air Force Base, California.

Participated in NEPA assessment of Building facility at Vandenberg Air Force Base, CA.

Participated in NEPA assessment for Federal Energy Regulatory Commission (FERC) on the impact of proposed rules affecting electric power generation.

Participated in NEPA assessment for FERC on the impact of removing financial benefits to developers of small hydropower (ECPA).

Participated in NEPA assessment for U.S. Air Force on the impact of a proposed land trade in Colorado.

Participated in NEPA assessment for the U.S. Army on the disposal of chemical weapons.

## **Employment prior to position at Oak Ridge National Laboratory:**

**Project Leader - Vegetation Management** - Western Forest Research Department, Weyerhaeuser Research and Development, Weyerhaeuser Company, Centralia, WA. (10/81 to 3/86)

Was responsible for research addressing vegetation management in Weyerhaeuser plantations and nurseries in Washington, Oregon, and British Columbia. Developed new approach for assessing growth benefit of vegetation management techniques in northwest plantations based on resource availability. Initiated long term studies designed to evaluate region wide impact of competing species on conifer growth and use of site resources. Managed \$256,000 annual budget involving 3 scientists and 5 technicians located in 3 different company regions. Served as technical liaison for company to Oregon State University Vegetation Management cooperative.

**Forest Ecologist** - Integrative Technology Department, Weyerhaeuser Research and Development, Weyerhaeuser Company, Tacoma, WA. - (1/83 to 9/84)

Member of team of scientists responsible for integrating company R&D efforts and initiating strategic long term forestry research. Worked with all divisions in R&D from forestry to energy and fiber. Developed forest productivity model based on fundamental ecosystem processes for evaluating potential productivity of company lands.

Investigated and summarized company opportunities for profitably managing tree species other than Douglas fir and loblolly pine. Initiated hybrid cottonwood research field study. Worked on team that sponsored international symposium on Forest Potential and subsequent publication. Evaluated published productivity models for utility to company and subsequently acquired and documented FORCYTE for company use.

**National Science Foundation Fellow** - Oregon State University, Corvallis, OR. (9/77 to 10/81)

Developed computer simulation model that predicted the amount and kind of rotting wood in Douglas-fir forests. Thesis research included developing equations to describe the detrital system, designing field studies to determine wood decomposition parameters, and validating model with independent data. Headed team that examined the nutrient and biomass dynamics of dead bole wood in the Olympic forests. Minored in statistics and soils. Major advisor was Dr. Jerry Franklin.

**HONORS:**

ORNL Significant Event Award for authorship of the DOE report "U.S. Billion-Ton Update: Biomass Supply for a Bioenergy and Bioproducts Industry", 2011.

ORNL Significant Event Award for authorship of the DOE-USDA report "Biomass as a Feedstock for a Bioenergy and Bioproducts Industry: the Technical Feasibility of a Billion-Ton Annual Supply, 2005.

ORNL Significant Event Award for leading ORNL's seminal contributions to a new mission-oriented description of the DOE BER Genomes to Life Program, 2002.

ORNL Significant Event Award for 11 Lab Study Technology Opportunities to Reduce U.S. Greenhouse gas emissions, 1997.

ORNL Significant Event Award for TVA Biomass Resource Assessment, 1993.

Adjunct Faculty member of Institute of Ecology at the University of Tennessee. 1992 to 2011.

Remote Sensing Society Best Letter Award for "A technique for extrapolating and validating forest cover across large regions", in vol. 11 of Int. J. Rem. Sens, 1989.

National Science Foundation Graduate Fellowship, 1977-1981.

Summa Cum Laude with high distinction in major - Dartmouth College, 1976.

Willard W. Eggleston Memorial Botany Prize - 1976.

**MISCELLANEOUS PROFESSIONAL ACTIVITIES**

Member of National Academy Committee on Soil Science

Secretary of the Association of Ecosystem Research Centers 1999-2011

Contributor to the U.S. Climate Change Technology Program draft Strategic Plan. 2005

Panel member of NASA Carbon Cycle Solicitation- June 2004.

Member of the California Spotted Owl Federal Advisory Committee - Summer 1997; A committee to provide the Sec. of Agriculture advice on the USFS draft EIS Managing California Spotted Owl Habitat in the Sierra Nevada National Forests of California: An Ecosystem Approach.

Activity Leader for Systems Integration Activity of Task XII under the Bioenergy Agreement of the International Energy Agreement. Activity duration - 1995-1997; Activity Budget - 60K (Canadian) per annum. Austria and Sweden were co-members.

Organized and chaired session on Integrated Assessment at the International MODSS Conference. Honolulu, HI, Aug. 22-26, 1995.

Panel review member for NSF TECO proposals. Washington, D.C. June 7-9, 1995.

Invited reviewer of EPA Ozone Impacts to Forests program, Corvallis, OR, Dec. 8-10, 1993.

Panel review member for the EPA EMAP Program. Columbia, MD, June 17-18, 1993.

Panel review member for the USDA Competitive Grants Program. Washington, D.C., Mar. 16-18, 1993.

Invited reviewer of EPA Hydrocarb Program. Raleigh, NC, Jan. 12-13, 1993.

Chairperson of Technical Steering Committee for the Center for Forest Environmental Studies of the U.S. Forest Service. Aug. 1992 - Aug. 1994.

Invited participant on EPRI Workshop on Assessing the Potential for Biomass Energy in the United States. Palo Alto, CA, Aug. 6-7, 1992.

Invited participant on Office of Technology Assessment Workshop on Mitigating Climate Change Impacts on Forests and Forestry. Washington, D.C., June 18-19, 1992.

Invited participant on Interagency Workshop on Global Deforestation. Arlington, VA, Apr. 2-3, 1990.

Invited reviewer of U.S. Park Service Research Proposals on monitoring and predicting the effects of global change on National Parks. New Orleans, LA, May 1990.

Organized and chaired symposium on ecological risk assessment at the summer meeting of the American Institute for Chemical Engineers. Philadelphia, PA, August 1989.

Chairperson of NAPAP Review Committee on Site Characterization and Dendrochronological Studies. Atlanta, GA, Mar 9-13, 1987.

Invited lectures at Massachusetts Institute of Technology, Dartmouth College, University of Tennessee, University of Georgia, Colorado State University, University of Washington, and Oregon State University.

Advisor to post-graduate, graduate and undergraduate students on research internships in the Environmental Sciences Division, Oak Ridge National Laboratory.