



UNIVERSITY *of* WASHINGTON

School of Forest Resources

RESEARCH NEWSLETTER ISSUE TWO, VOLUME 9

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News

Budget modifications and large purchases

We have recently been reminded that purchases over \$10,000 require some extra steps. Under State of Washington regulations, a purchase of that amount must be let for bid. The process takes time (advertising, waiting for bids, etc.), so it is important to start the process 5-6 weeks before the order will be submitted to the successful bidder. This applies to both goods and services. If the proposed purchase is planned from the inception of the project, the timing is easier to manage, but frequently, the need for a change becomes clear only after the work is underway. In addition to the purchasing process, authorization from the sponsor may be required if there is a change in the planned spending or if the change leads to a variance from the outlined plan of work. That, too, can take a surprising amount of time. The UW's purchasing department web site lists the necessary steps in the process, but please do not attempt to run the process for yourself – we have learned that there are some nuances that are not published, so the description cannot be considered a manual to be followed. Rather than try to get an exception to the requirements after the fact, the easiest way to get to yes for the contractor of your choice is by contacting your fiscal team to work through the requirements and present it to purchasing in the form that will cause the least stress and most timely result.

Inflation calculation on SAGE

NIH has determined that 2% is reasonable figure to use for inflation on new and current projects, so OSP has set that as the default multiplier on new budgets in SAGE budget module. While we are not required to use 2%, it is the best that NIH economic analysts can come up with; unless your project has an unusual situation in play, this is the figure that is recommended. Please note however, that 2% will NOT apply to the tuition increases, which we are still expecting to be in the neighborhood of 11% over the next 2 years for graduate students.

Access award documents directly from SAGE

Tired of e-mailing your OSP campus administrator for copies of those all-important award documents? Soon you won't have to. SAGE is being enhanced to give you (and anybody with permission to view your eGC1) on-demand access to documents attached by OSP to your proposal. That includes the signed concurrence letter, agreements, and the fully executed award document. You'll be able to track and access these documents from the Attachments page of your eGC1 in SAGE. And to make it even more useful, this revision will be retroactive to January, 2009

Look for this and other improvements in the July release from the SAGE team.

Opportunities

USDA Rural Cooperative Development grants due July 22, 2011. The USDA is seeking proposals for Rural Cooperative Development grants. Rural Cooperative Development grants are made for establishing and operating centers for cooperative development for the primary purpose of improving the economic condition of rural areas through the development of new cooperatives and improving operations of existing cooperatives. The U.S. Department of Agriculture desires to encourage and stimulate the development of effective cooperative organizations in rural America as a part of its total package of rural development efforts. Funding will be for up to \$225,000 for a period of one year, beginning in September, 2011.

<http://www07.grants.gov/search/search.do?&mode=VIEW&opId=99073>

Awards

Application Number: A65169

Faculty Member: David Briggs

Role: Principal Investigator

Title: **REU: Terrestrial LiDAR Dynamic Monitoring of Leaf Area Index (LAI) Change in Intensely Managed Forest Types of the Pacific Northwest**

Agency: National Science Foundation

Period: 3/1/2011 - 2/28/2012

Amount: \$8,331

Supplement and Extension

The University of Washington is a member of the Center for Advanced Forestry Systems (CAFS), a National Science Foundation Industry/University Cooperative Research Center (NSF I/UCRC), along with

North Carolina State University, Virginia Polytech Institute and State University, Purdue University, Oregon State University, the University of Georgia, and the University of Maine. The mission of CAFS is to optimize genetic and silviculture systems to produce high-quality raw materials for existing and developing wood based industries. The funding will be used to support and undergraduate student who will collect a periodic scan using terrestrial LiDAR (hourly) to monitor temporal changes in plot level LAI to demonstrate nutrient treatment and genetics in intense forest management installations established by the UW Stand Management Cooperative (SMC). The student will specifically explore short term changes in LAI to establish our algorithm's sensitivity to the inherent variability of this measure due external factors such as wind. The results produced by the undergraduate student will allow us to better understand the various change factors that need to be quantified for efficient dynamic change monitoring of LAI.

Application Number: A65305

Faculty Member: Robert Edmonds

Role: Principal Investigator

Title: **Biocontrol and fungicide efficacy: *Cylindrocarpon* spp. in containerized Douglas-fir seedlings**

Agency: WA Commission on Pesticide Registration

Period: 1/1/2011 - 12/31/2011

Amount: \$11,000

New

Project goal is to determine the efficacy of soil drenches (Mancozeb, Chipco 26019, Cleary's and Heritage) and biocontrol agents (Root Shield, Root Guard, Actinovite, and Companion) in protecting bareroot and containerized Douglas-fir seedlings from infection by *Cylindrocarpon* spp. Co-applied fungicide and biological control agents could have the potential for decreasing fungicide use, reducing the fears of fungicide tolerance buildup and improving seedling yield and performance. Phytotoxicity and Root Growth Potential tests will also be conducted. *Cylindrocarpon* isolates from representative Pacific Northwest forest nurseries (Weyerhaeuser-Aurora (OR), Mima and Rochester (WA), WADNR Webster (WA), and IFA Canby (OR)) will be used. Data will be shared with Weyerhaeuser and other seedling growers.

Application Number: A57812

Faculty Member: Richard Gustafson

Faculty Member: Renata Bura

Role: Principal Investigator

Role: Co-Investigator

Title: **Washington state biofuels industry development**

Agency: US Department of Energy

Period: 10/1/2010 - 12/31/2011

Amount: \$1,000,000

New

Project goal is to develop a world class laboratory for research on the production of fuels and high value chemicals from cellulosic biomass feedstocks. Specific areas are fractionation of biomass components and conversion of biomass into high value chemicals. Research is focused on bioconversion processes; a bioconversion pretreatment laboratory is being developed. To complement this facility a laboratory focused on biomass fractionation and conversion to high value chemicals will be constructed, involving renovation of existing laboratory space and purchasing equipment necessary for current and proposed projects.

Application Number: A66602
Faculty Member: Joshua Lawler
Role: Principal Investigator
Title: **National Return on Conservation Investment Analysis**
Agency: David and Lucile Packard Foundation
Period: 6/1/2011 - 1/31/2013
Amount: \$164,789
New

Much of the world's biodiversity remains unprotected. Making wise use of limited conservation funds requires an understanding of where the highest return on conservation investments lie. However, to date, decisions on where to invest in land purchases for conserving biodiversity have been primarily driven by our limited knowledge of how species and ecological systems are distributed across the landscape. Only recently, have there been attempts to incorporate land costs and threats to biodiversity into more formal return-on-investment analyses. None of these analyses have incorporated the threat of climate change. Here, we propose to assess the potential return on conservation investment of lands across the United States in the face of threats posed by both climate and land-use change. We will produce maps and datasets that will help guide environmental NGOs, foundations, regional land trusts, and federal agencies in making conservation investment decisions.

Application Number: A66462
Faculty Member: Sarah Reichard
Role: Principal Investigator
Title: **Seeds of Success 2011**
Agency: Center for Plant Conservation
Period: 4/1/2011 - 8/1/2012
Amount: \$30,000
Supplement and Extension

Under this project, Washington Rare Plant Care and Conservation will continue its collaboration with the Center for Plant Conservation and the Bureau of Land Management to collect and conserve seeds of native plants for stabilizing, rehabilitating and restoring lands in the United States. In addition, seed

collections of native plants will be completed for Millennium Seed Bank at the Royal Botanic Gardens in Kew, England. All seeds collected under this project will be provided to the National Seed Extractory in Bend, Oregon or the Millennium Seed Bank in Kew, England for cleaning and storage.

Proposals

Application Number: A66466

Faculty Member: Ernesto Alvarado

Faculty Member: James Agee

Role: Principal Investigator

Role: Co-Investigator

Title: **Wildland Fuel and Fire Management in a Changing Climate**

Agency: USDA Forest Service

Period: 5/11/2009 - 3/31/2014

Amount: \$145,953

Non-Competing Supplement

The amendment to the Joint Venture Agreement with the USFS proposed here will generate, develop, apply and transfer science-based information, strategies and tools for fire management in public, and Tribal lands. This agreement supports USFS PNW FERA and School of Forest Resource's research vision to:

- A. Enhance programmatic fire planning, large fire decision support, hazardous fuel characterization and management, hazard assessment, fire behavior prediction, fire danger rating, and carbon flux assessments.
- B. Promote attainment of desired future conditions and ensure the long-term integrity of ecosystems under a changing climate scenario, reduce air quality impacts and carbon emissions, and contribute to carbon management.
- C. Improve fire management effectiveness and safety of firefighters and communities, and advance national and regional policy goals to reduce management costs.
- D. Enhance restoration of healthy, resilient, fire-adapted ecosystems through evaluation of integrated fire/fuel management practices.
- E. Develop a research-management partnership of USFS research stations and national forests to develop the decision support needed by the US Forest Service to incorporate climate change into management and planning of federal lands in the western US.

Specific objectives for this amendment to the joint venture agreement are:

- To continue a third phase of data collection in the spring and fall of 2011 of live fuel consumption and environmental variables from a series of prescribed fires in federal lands of Florida to improve fuel consumption models for the southern forest region of the United States.
 - To continue a second year study of fuel amount and composition following dormant and growing season prescribed fires for flatwoods pine ecosystems in the Florida Panhandle.
 - To continue the work for integration of the forest vegetation simulator (FVS) and FCCS to generate dynamic fuelbeds derived from stand data collected from FIA and CFI plots, and silvicultural treatments.
 - Recode CONSUME 3.0 into python programming language to make this fire management tool a web application for fuel consumption and smoke emissions from wildfires.
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Application Number: A67186

Faculty Member: Ivan Eastin

Role: Principal Investigator

Title: **Research opportunities in forest products marketing as a result of global green consumerism**

Agency: USDA

Period: 1/12/2012 - 1/11/2017

Amount: \$202,500

New

Faculty Member: Indroneil Ganguly

Role: Co-Investigator

The international competitiveness of the US forest products industry is affected by the interplay of various economic, social, environmental and political factors. The proposed graduate students' training program aims to provide students with the necessary skills and exposure to understand the contemporary issues and externalities that affect the US forest products' industry and assess their impact on international competitiveness. Curricular emphasis will be given to developing a deeper understanding of phenomenon like illegal logging and global warming which have resulted in an increased interest in 'green' living and environmental procurement policies, globally. The students will be encouraged to explore the linkages between the international competitiveness of the US forest products industry and trade restrictions, including public procurement policies, green building programs and various tariff/non-tariff barriers (thereby addressing USDA's strategic goals 1 and 2 for FY 2007-2012). As a result of developing a strategic partnership with a Native American college, this program will identify qualified students from tribal communities to transfer the necessary technical and forestry business skills into Native American communities.

The proposed training program will train three masters and one doctoral student in the area of 'Agricultural Management and Economics' (TESA no. 4) with specialization in forest trade policy. The disciplinary focus for the program is agricultural marketing and management (Code M) and international competitiveness of the forest products industry (Code I). The program includes relevant interdisciplinary components designed to enhance students' understanding of environmental science, international marketing, decision modeling and public policy analysis (Code G).

Application Number: A67241

Faculty Member: Robert Edmonds

Role: Principal Investigator

Title: **Management of Pacific Madrone Canker Disease**

Agency: Horticultural Research Institute (HRI)

Period: 7/1/2012 - 6/30/2013

Amount: \$34,412

New

Pacific madrone (*Arbutus menziesii*) is a low-maintenance broadleaf evergreen tree which is valued greatly as a landscape tree in western Washington, Oregon and British Columbia, in city parks, streets, and homes. *Arbutus*, however, has been experiencing a major decline during the past 40 years, particularly in the Puget Sound area and thousands of trees are in serious state of decline or have died. The decline first became obvious after a period of drought in the late 1960s in urban areas of Seattle, Washington, particularly in older madrone trees. A canker disease caused by the fungus *Neofusicoccum*

arbuti is primarily responsible for the decline. No successful techniques for managing this disease have been found to date. However, there are apparently resistant trees on the landscape where other trees have died. The objectives of this study are to determine: (1) the physical and chemical bark characteristics of Pacific madrone trees in the Puget Sound that are apparently resistant to the madrone canker fungus (*Neofusicoccum arbuti*), (2) if bark extracts from resistant trees inhibit the growth of *Neofusicoccum arbuti*, (3) if these trees can be identified using molecular techniques, and (4) if these trees can be easily propagated either vegetatively or from seed. If truly resistant trees can be propagated and sold by the green industry then they can be used to replace dead and dieing trees. This would increase the health of the population of madrone trees in the Puget Sound area over time.

Application Number: A67951

Faculty Member: James Fridley

Role: Principal Investigator

Title: **Enhancing Ecosystem Service Delivery of the Western Forest Systems**

Agency: Northern Arizona University

Period: 1/1/2012 - 12/31/2013

Amount: \$79,044

New

Forested ecosystems deliver a range of important ecosystem services, and generated about 12% of all economic outputs from agroecosystems. This is expected to grow substantially in the near future as several ecosystem service markets are now emerging. The overall goal of this study is to enhance the ecosystem service delivery resulting from management activities in western forest systems. This study will develop a decision support system (DSS) that integrates current biophysical models for carbon sequestration, biomass production, and water yield and quality with ecosystem service valuation models and resilience indicators.

The DSS will help land managers understand the ecosystem service production potentials of their management alternatives and harness uncertainties associated with emerging ecosystem service markets. The DSS will demonstrate additionality, where services are generated in addition to the most plausible baseline scenario, to calculate tradable credits. Also, the DSS can clarify how co-production of different ecosystem services should be credited and how combined payments for two or more ecosystem services should be structured, thus improving USDA standards for ecosystem service production and marketing while promoting long-range sustainability of forest systems.

This study will lower the social, economic, and behavior barriers for adopting the DSS into practice by testing it for three distinctively different, actively managed forest systems in Arizona, Montana, and Washington and developing an exemplary online DSS to attract users. We will evaluate the effectiveness of the information sharing strategies by monitoring the frequency and duration of online activities, and by conducting periodic online surveys.

Application Number: A67521

Faculty Member: Soo-Hyung Kim

Role: Co-Investigator

Title: **Interactive regulation of flowering by temperature and photoperiod: linking the mechanism with models**

Agency: National Science Foundation

Period: 1/2/2012 - 12/31/2014

Amount: \$664,508

Resubmission

Anthropogenic climate change has dramatically altered the seasonal responses and development of organisms especially in the last 50 years. It is imperative that we understand precisely which organisms will be able to adjust their behavior and development to a new climate, and how these adjustments will occur. In this proposal, we will focus on elucidating the molecular mechanism of seasonal flowering. Further, based on our findings, we aim to establish new computational models that could be used to predict flowering time in a changing climate.

Application Number: A67916

Faculty Member: Soo-Hyung Kim

Role: Principal Investigator

Title: **Development, validation and verification of new modules for corn model: MaizSim and potato model: SpudSim**

Agency: USDA

Period: 6/1/2011 - 5/31/2016

Amount: \$30,000

New

We will improve the crop simulation models for corn - MAZSIM and potato - SPUDSIM by developing enhanced modules and algorithms for simulating crop physiological and growth responses under arid conditions. Using the data collected under irrigated conditions of the northwest and other regions, we will integrate the new modules and algorithms with the MAZSIM and SPUDSIM models. These models will be tested against field data collected under a range of environmental, soil, and management conditions using several cultivars. We will also identify and develop cultivar specific parameters.

The specific aims of this research include 1) to develop new modules to partition carbon, nitrogen, phosphorous, and potassium in individual leaves, modules for simulation of leaf growth and reproductive stages and organs in corn crop, 2) to develop algorithms to calculate the effects of nutrient and water stress on leaf addition rates, and 3) to determine variety related parameters for the corn and potato models.

Application Number: A67849

Faculty Member: Robert Lee

Role: Principal Investigator

Title: **Supporting Teacher Strategies to Prepare Students in Remote Rural Communities for College-Level Mathematics**

Agency: WA Higher Education Coordinating Board

Period: 7/1/2011 - 6/30/2012

Amount: \$141,121

Supplement and Extension

Thirty middle and high school teachers from the following cluster of Lewis County school districts, together with their principals, will be assembled to form sustainable mathematics learning communities: Adna, Centralia, Chehalis, Morton, Mossyrock, Napavine, Toledo, White Pass, and Winlock plus two high-need districts, Onalaska (partner) and Boistfort. This project will address seven objectives:

- 1) Increase participant mathematics content knowledge
- 2) Increase participant instructional skill, including ability to use State standards
- 3) Foster the sustainability of professional development by forming professional learning communities, including administrators
- 4) Involve parents and the community to gain support for more effective methods of learning mathematics
- 5) Improve student achievement, morale, performance, and college readiness for all students
- 6) Provide teachers and administrators with useful methods for monitoring and evaluating student performance
- 7) Extend and deepen the capacity of the University of Washington to effectively prepare teachers of mathematics.

These objectives will be accomplished by three summer institutes, coupled with classroom studios, observations, and coaching to prepare teachers for adopting practices utilizing group-based learning focused on inquiry-based problem solving. Activities are designed to prepare students for meeting Revised Mathematics Standards and improving college readiness, particularly for students in isolated rural communities where the learning of advanced mathematics is not highly valued. Workshops for principals will be held to familiarize them with new classroom practices and elicit their support of teachers who adopt these practices. Community Math Nights will be held to coach parents interested in supporting their children in learning mathematics.

Application Number: A66960

Faculty Member: John Perez-Garcia

Role: Principal Investigator

Title: **Exploring the Economics of Forest Restoration**

Agency: USDA Forest Service

Period: 7/15/2010 - 6/30/2012

Amount: \$15,000

Supplement and Extension

The PNW Research Station's Urban Wildland Interaction Team (UWI) is developing a new program focusing on forest restoration economics. The purpose of this agreement is to generate, disseminate, and integrate economic analysis techniques into forest restoration activities in the Pacific Northwest region. Specifically, the objectives of this agreement are to investigate the state of economics as an analysis tool for restoration projects, estimate market and non-market impacts of restoration activities in the Pacific Northwest, identify ways to incorporate economics into restoration planning and evaluation, describe barriers to integration, and develop and communicate a baseline understanding of methods and data required to estimate benefits and costs to land owners and managers. Knowledge gaps and research needs of forest managers and landowners conducting restoration activities in the region will also be examined. Washington and Oregon will be the study area.

Application Number: A67479

Faculty Member: Clare Ryan

Role: Principal Investigator

Faculty Member: L. Monika Moskal

Role: Co-Investigator

Title: **Stewardship Footprints for Healthy Coastal Ecosystems: Assessing the Consequences of Environmental Action**

Agency: National Sea Grant Office (NSGO)

Period: 2/1/2012 - 1/31/2014

Amount: \$228,194

New

Faculty Member: Stanley Asah

Role: Co-Investigator

This research will address the question: How do we assess the consequences of citizen-based environmental stewardship activities on ecosystem restoration and function? The objectives of our research are to develop and test methods and models to better understand, assess, and forecast the consequences of citizen-based environmental stewardship activities on ecosystem restoration and function. Human influences in such ecosystems are often described as separate and negative. However, effective remedies for degraded ecological systems must involve and be integrated with human systems and activities. In the face of limited and declining financial and human resources for ecosystem recovery, our research will contribute 1) knowledge about how the consequences of stewardship activities can be included in predictive models of ecosystem dynamics, and 2) knowledge about how understanding motivations for stewardship activities can be included in organizational programs, goals, and activities to build social capacity for effective restoration.

Application Number: A67614

Faculty Member: Daniel Vogt

Role: Principal Investigator

Title: **Proof of Concept Center: Moving Beyond a Clearinghouse Approach for Clean Technology Entrepreneurialism**

Faculty Member: Kristiina Vogt

Role: Co-Investigator

Agency: Affiliated Tribes of Northwest Indians Economic Development

Period: 9/1/2011 - 8/31/2013

Amount: \$389,084

New

Clean Technology Entrepreneurialism (CTE) is a multi-regional group of tribes, tribal economic development organizations (CEDCO, Coquille Tribe; ATNI EDC/Financial Services), three universities (University of Washington, Eastern Washington University, University of North Dakota), National Renewable Energy Laboratory (NREL) Tribal Energy Program, and an initial portfolio of clean technologies varying from liquid fuels, algal inoculums production for biofuels, aviation fuels, conversion of fish wastes to secondary production and the production of mushroom growth medium using natural materials. CTE will: (1) identify what are the most compelling areas of innovation and what are the potential market impacts; (2) identify what is the current status of each technology, provide an engineering assessment and what is required to advance each into the market; (3) mine Universities and National laboratories for emerging innovations in new technologies and become a clearinghouse that can filter and identify which technologies have the greatest potential to provide culturally/environmentally sustainable tribal businesses in the short- and in the long-term; (4) assess commercialization barriers or opportunities with technologies included in our portfolio; (5) link developers of clean technology with centers focusing on technology commercialization to tribal consumers, developers or investors; (6) develop a business plan that incorporates tribal laws and is capable of balancing the intellectual property of non-tribal technology developers; (7) develop a New Generation Coop to allow the center to become self-sustainable and capable of providing loans or start-up funds to new clean technologies identified by the CTE or our Advisory Support group; (8) our economic development partners will link investors to the clean technologies included in our portfolio; and (9) workshop training and education to tribes wanting to develop business enterprises using any of the clean technologies in our portfolio or other identified technologies. CTE has a goal of developing employment opportunities in rural areas facing higher unemployment rates by stimulating the commercialization of clean technologies consuming resources available from rural tribal and adjacent non-tribal lands. Furthermore, CTE is designed to facilitate the replication of clean technology industries for a consortium of tribes where technologies are developed that are most appropriate for each region using local resources.