



UNIVERSITY *of* WASHINGTON

School of Forest Resources

RESEARCH NEWSLETTER ISSUE THREE, VOLUME 1

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News

Indirect cost comparison

Indirect costs are essential to the operation of any research university – research enterprises are not free and the cost (at the unit, college and university level) for the administrative support required to move the intellectual endeavor forward continues, even as the available dollars for research hold steady or even shrink. For Forest Resources, the costs are also increasing as the College of the Environment share is scheduled to continue going up annually until it reaches 25% of the indirect costs that are returned to us. To help demonstrate the impact of the various rates of return and the several taxes imposed on our research return, please see the chart below. It is designed to be an illustration of the impact of some of the parameters that go into the bottom line calculation, and may be useful in considering which sponsor to apply to, all other things being equal.

The figures below are for comparison purposes only and are based on approximations, assuming an on-campus project of \$100,000 with a \$40,000 subcontract, \$12,070 in tuition, and a piece of equipment priced at \$4,000. The Dean's tax will increase by 5%/year to a maximum of 25%; presently it is 15%,

assessed on the IDC return to SFR. The IDC return rate varies, depending on a wide range of criteria; 31.793% is a figure commonly applied to SFR projects.

Agency	Indirect Cost Base	F & A rate	Indirect costs	Total Award	2011 Dean's tax (15%)	Current Net to SFR
NSF	MTDC	54%	\$37,222	\$137,222	\$ 1,775	\$10,059
USDA	TDC	28.21%	\$28,205	\$128,205	\$1,345	\$ 7,622
CESU	TDC	17.50%	\$17,500	\$117,500	\$ 835	\$ 4,729
X Foundation	TDC	10%	\$10,000	\$110,000	\$ 477	\$ 2,702
Z foundation	MTDC	10%	\$ 6,893	\$106,893	\$ 329	\$ 1,863
Forest Service	MTDC	0%	\$ 0	\$100,000	\$ 0	\$ 0

Online Budget Reconciliation

As part of the continuing effort to modernize how the University delivers administrative support services to researchers, online budget reconciliation and review has become a reality, including faculty signoff on the reconciliation. You will shortly receive an email from the one who manages your budgets, with a PowerPoint explanation of the process and the time line to get on board. We hope this will be a big time-saver, although in the short term, probably the first thing we'll notice is that we have much less paper to keep track of, wait at the printer for, file away, etc. The thing that makes it possible, in terms of remaining compliant with federal research budget regulations, is that once you are properly signed in, your UW ID because an auditable signature.

Research Training

The Office of Research is offering a series of Brown Bag training sessions beginning in October to follow up on the New Faculty Orientation that takes place this Friday. Faculty are welcome to attend the Brown Bags in person, but if that's not convenient (or if you are a staff member), they will also be web cast and streaming video will be available on the OSP web site to view on your own schedule. There are going to be two tracks: Compliance and Building Your Research Program. A flyer with more information is available here: <http://www.washington.edu/research/.SITEPARTS/.documents/.osp/faculty-orientation-flyer.pdf>, and the webcast information will be distributed as soon as it becomes available.

Opportunities

Due January 13, 2012

USDA National Institute of Food and Agriculture and Food Research Initiative: Agriculture and Natural Resources Science for Climate Variability and Change. Modification 1 (pushing due date back from December 16). Award ceiling \$10,000,000.

<http://www07.grants.gov/search/search.do?&mode=VIEW&oppld=123893>

Due December 15, 2011, for either single-function or multi-functional integrated project. Award ceiling \$10,000,000.

USDA National Institute of Food and Agriculture and Food Research Initiative: Sustainable Bioenergy Modification 1

<http://www07.grants.gov/search/search.do?&mode=VIEW&oppld=123813>

Due January 19, 2012 USDA Pre- and Postdoctoral fellowships up to \$130,000.

USDA National Institute of Food and Agriculture and Food Research Initiative: NIFA Fellowships Grant Program Grant

<http://www07.grants.gov/search/search.do?&mode=VIEW&oppld=123794>

Awards

Application Number: A69729

Faculty Member: Jonathan Bakker

Role: Principal Investigator

Title: **Regional Native Seed Project**

Agency: Center for Natural Lands Management (CNLM)

Period: 8/1/2011 - 12/31/2012

Amount: \$8,000

New

This is the third phase of a multi-year project building on more than a decade of habitat restoration in native westside prairies. It specifically supports and improves the burgeoning native seed development efforts to restore habitat for rare plants and butterfly species in these prairies. It has three components: 1) Seeding technique and rate assessment, 2) Seed production, coordination and development, and 3) Planting technique development for golden paintbrush.

Application Number: A69602

Faculty Member: Gordon Bradley

Role: Principal Investigator

Title: **Pacific NW Coop Ecosystem Studies Unit Program Support**

Agency: USDI National Park Service

Period: 9/30/2007 - 9/29/2012

Amount: \$31,096

Non-Competing Supplement

The purpose of this supplement is to provide continued financial assistance to support the Pacific Northwest Cooperative Ecosystem Studies Unit, co-led by SFR faculty Gordon Bradley, and the NPS Research Coordinator, to provide high-quality research, technical assistance and education to federal natural-resources managers.

Application Number: A69462
Faculty Member: Sally Brown
Role: Principal Investigator
Title: **Biosolids information and education program**
Agency: Northwest Biosolids Management Association
Period: 7/1/2006 - 6/30/2012
Amount: \$173,000
Non-Competing Supplement

UW staff will continue to provide public information, regulation development, and technical support to the King County Biosolids program. As detailed in the Scope of Work, this will include the following: 1) providing public information through committee support, a community assistance/resource information center, information gathering, and assisting in the BW Biosolids Conference; 2) regulation development, including committee support and regulatory interpretation; 3) research and demonstrations to include W-170 group interaction and projects involving A. the fate of organic compounds in biosolids amended soils, B. Canola growth using biosolids, and C. lead arsenic and compost; 4) continuing special research projects with the King County Biosolids Program on Canola for Biodiesel, gravel pit, biosolids basics, Class A soil mixes, and organic contaminants; 5) attending NBMA general and board meetings.

Application Number: A69776
Faculty Member: Douglas Deur
Role: Principal Investigator
Title: **Cultural Landscape Inventory of the Chulitna River-Sixmile Lake Area**
Agency: USDI National Park Service
Period: 8/15/2011 - 10/30/2012
Amount: \$19,000
New

This project is a collaborative effort to conduct consultation, planning, and completion of a Cultural Landscape Inventory (CLI) for the Chulitna River-Sixmile Lake area within Lake Clark National Park and Preserve (LACL). The Chulitna-Sixmile Lake cultural landscape is important to present-day Dena'ina and may be threatened by proposed development in the immediate area. For the past 100 years, the people of Nondalton have largely derived their subsistence fish, game, and water fowl from the Chulitna River and Sixmile Lake drainages. Archeological sites in the nearby Kijik National Historic Landmark Archeological District document sites associated with at least 900 years of Dena'ina history. A CLI will be undertaken to document the entire array of historic and contemporary resources of cultural significance to the Dena'ina in the Chulitna and Sixmile drainages, including the Tazimina River and the upper Newhalen River. This effort will be supported by a current partnership between LACL and the Nondalton Tribal Council to complete an Integrated Resource Management Plan for the study area. National Park Service (NPS) staff will work with University of Washington (UW) in planning the initial consultation with the state of Alaska, Nondalton Tribal Council, the Kijik Corporation, and other interested tribes. UW staff will be responsible for data collection and analysis, and will produce a final report in collaboration with NPS. The CLI can be used by park associated tribes to support their efforts to identify and preserve

traditionally significant resources. The project report and products can be used by other NPS units and other resource management agencies as a template to help inventory important ethnographic landscapes.

Application Number: A63311

Faculty Member: Ivan Eastin

Role: Principal Investigator

Title: **Developing the international marketing capacity of Native American tribes**

Agency: US Department of Commerce

Period: 3/1/2011 - 8/31/2012

Amount: \$176,423

New

Faculty Member: Indroneil Ganguly

Role: Co-Investigator

Project goal is to help develop the marketing and managerial capacity within the Native American communities targeted in this proposal to enter and compete in international markets by 1) assessing the technical and marketing capabilities of tribal forest operations (both log and lumber producers), 2) identifying potential niche markets where tribal forest products would be competitive, 3) providing workshops on export topics such as international marketing, export logistics, and export financing, 4) working with tribal cooperators to develop strategic business plans for export markets, 5) linking tribal managers with potential customers in international markets through trade missions, 6) providing outreach and communication service with tribes and students at Salish-Kootenai College, and 7) supporting graduate level training for tribal students in the areas of international marketing and logistical management to develop and expand the marketing capacity of tribes and tribal associations.

Application Number: A68334

Faculty Member: Jerry Franklin

Role: Principal Investigator

Faculty Member: Jim Lutz

Role: Co-Investigator

Title: **Relationship between Fire History and Forest Structure at Crater Lake National Park Using LiDAR**

Agency: USDI National Park Service

Period: 10/1/2011 - 12/31/2013

Amount: \$48,512

New

Faculty Member: Van Kane

Role: Co-Investigator

There is a strong need for research at Crater Lake National Park and other parks aimed at quantifying long-term effects of fire on forest structure across broad spatial scales to facilitate the development and evaluation of fire management objectives. The goal of this research is to use existing LiDAR data to understand how time-since-fire (TSF) and fire severity controls patterns of forest structure development across elevation and compositional gradients. This research directly addresses three key impediments

related to the successful implementation and monitoring of fires for resource objectives. First, the data will provide the basis for evaluating the effectiveness of contemporary fires at restoring and/or maintaining landscape-scale forest structures. Secondly, it allows fire managers to develop relationships between burn severity signatures and long-term successional probabilities for modeling future landscape patterns. Third, spatially explicit data on forest structure will be useful for managing for a wide variety of resource goals such as wildlife habitat or watershed health for endangered fisheries.

Our specific research objectives are: (1) Determine how post-fire development of forest structure varies along gradients of elevation, fire severity, and TSF by directly mapping stand development stage, canopy height, height to live crown, canopy vertical structure, basal area, and gap and patch size; (2) Compare forest and patch structures created by contemporary wildland fires with pre-20th century fires; (3) Develop park-wide atlases of fire severity measurements and forest structural attributes.

Application Number: A68086

Faculty Member: Charles Halpern

Role: Principal Investigator

Title: **Long-Term Responses of Vegetation to Variable-Retention Harvests in the PNW**

Agency: USDA Forest Service

Period: 6/16/2008 - 6/15/2013

Amount: \$65,000

Non-Competing Supplement

In the Pacific Northwestern region of the US, structural or "green-tree" retention has replaced clearcut logging on federal forest lands subjected to timber harvest. The Demonstration of Ecosystem Management Options (DEMO) experiment was established in 1994 to examine the responses of diverse groups of forest organisms to structural retention harvests in mature forests of the Pacific Northwest. Studies of vegetation response form the foundation of this experiment. Our goals are threefold: (1) to elucidate the 10-yr responses of overstory and understory communities to varying levels and patterns of retention; (2) to provide basic information on changes in forest structure that can aid in understanding the responses of other groups of forest organisms to structural retention; and (3) to assess the need for, and desirability of, future silvicultural treatments based on the distribution and density of regenerating trees.

Application Number: A68603

Faculty Member: Robert Harrison

Role: Principal Investigator

Title: **Effects of Organic Matter Retention & Management on Long-Term Productivity of Pacific Northwest Coastal Douglas-Fir Plantations**

Agency: National Council for Air and Stream Improvement

Period: 7/16/2011 - 3/31/2012

Amount: \$40,000
Non-Competing Supplement

The goal of this project is to gain a better understanding of the long-term consequences of various levels of organic removals, nutrient allocation, and soil compaction, as well as the appropriate ameliorative or growth enhancement treatments that can be used to sustain productivity through multiple rotations on the Pacific Northwest's most productive soils. Although N fertilization is commonly used in Pacific Northwest Douglas-fir stands for enhancing, it is not known to what extent organic matter will be enhanced by N fertilization through successive applications, or how it compensates for the nitrogen removed from the system through harvest. This study will begin to fill this critical data gap in the Pacific Northwest Region.

This amendment is to extend the MOA and supplement this project.

Application Number: A65069
Faculty Member: Thomas Hinckley Faculty Member: Jim Lutz
Role: Principal Investigator Role: Co-Investigator
Title: **Annually resolved impacts of fire management on carbon stocks in Yosemite and Sequoia & Kings Canyon National Parks**
Agency: USDI National Park Service
Period: 8/5/2010 - 1/29/2013
Amount: \$57,575
Non-Competing Supplement

Forest biomass on Sierra Nevada landscapes constitutes one of the largest carbon stocks in the state of California, and the stability of that carbon stock is tightly linked to fire and the ecological factors that drive the fire regime. Recent research suggests that over a century of fire exclusion and fuel accumulation in Western forests have actually reduced the amount of carbon that such suppressed landscapes store, while increasing the likelihood of catastrophic, stand-replacing fire. For over 30 years, fire management at Yosemite (YOSE) and Sequoia and Kings Canyon (SEKI) National Parks has led the nation in restoring fire to park landscapes, however the impacts of that restoration on the stability and magnitude of carbon stocks are not yet known. This work proposes to quantify these effects over a 30 year timescale by leveraging detailed fire history, vegetation, and fuels datasets at YOSE and SEKI to quantify biomass in areas where fire has been suppressed vs. areas where fire has been restored.

Our dynamic approach to quantifying the carbon contained in trees will also involve dendrochronological analyses of recent tree growth. Although the dynamic approach will likely yield the best accounting of carbon pool dynamics over time, both the static and dynamic approaches need to be included in this project for the following reasons: 1) much of the information developed from the static approach (A51771) underpins the dynamic approach; 2) conducting the more complex dynamic approaches will allow us to evaluate how much more information is generated given the greater expenditure of time and funding required for the latter; and most importantly 3) the static approach is very feasible for any land management unit that has archived comprehensive vegetation plot data (e.g. FMH and FIA plots), and by "validating" this approach through the dynamic approach in our proposed

study, potential users of these methodologies in other places can better decide which approach is best for their situation.

Application Number: A69177
Faculty Member: Thomas Hinckley
Role: Principal Investigator
Title: **2011 McIntire Stennis**
Agency: USDA
Period: 10/1/2010 - 9/30/2011
Amount: \$549,430
New

The McIntire-Stennis act of 1962 provides the basis for federal funding in forestry research and graduate education programs at state-certified schools of forestry in the United States. The School of Forest Resources, University of Washington, is eligible for McIntire-Stennis funding. This is a long-standing program, formerly administered by the Cooperative State Research, Education and Extension Service (CSREES); effective 10/1/2009, the program has been administered through the National Institute of Food and Agriculture (NIFA). Funds are used to conduct research in areas such as: (1) ecological restoration, (2) catastrophe management, (3) valuing and trading ecological services, (4) energy conservation, biomass and bio-based materials development; and (5) ways of fostering healthy forests and a globally competitive forest resources sector. At the University of Washington research will focus on: Forest management, coarse woody debris, and soil processes, wildlife use of managed forests, modeling branch dynamics in coastal Douglas-fir and western hemlock plantations as affected by silvicultural treatments, understanding the systematics of commercial ornamental plants, and natural stand development in western coniferous forests. A proportion of the funds will be used for program administration.

Application Number: A69211
Faculty Member: Thomas Hinckley Faculty Member: Ken Bible
Role: Principal Investigator Role: Co-Investigator
Title: **Wind River Canopy Crane Decommissioning**
Agency: USDA Forest Service
Period: 9/1/2011 - 7/31/2012
Amount: \$72,645
New

For over 15 years, the U.S. Forest Service in cooperation with the UW has supported forest canopy and ecosystem research at the Wind River Canopy Crane Research Facility in the T.T. Munger RNA in the Wind River Experimental Forest (WREF). Demand for crane time has dwindled in the last several years. In view of current and anticipated future budget constraints, the PNW Research Station will no longer be

able to support operation of the crane gondola, but is committed to supporting the tower- and ground-based monitoring activities at the site in the form of a restructured facility called the Wind River Field Station.

This proposal is to confirm payment arrangements to dismantle the former Wind River Canopy Crane Research Facility's mobile portion of the HC550 Liebherr tower crane. Load and counter jibs, operator's cab and two gondolas are to be removed via mobile crane and low-boy carrier to the open field adjacent to the T.T. Munger RNA for sale. Work is to be performed by Northwest Tower Crane Service in the most environmentally responsible means available.

The University of Washington owns the Wind River Canopy Crane which is to be decommissioned due to budget constraints to reduce future operating expenses. The Forest Service owns the land that the Canopy Crane sits on, and also wants to decommission the crane to reduce expenses. The Forest Service and the Cooperator are willing to combine resources to accomplish the decommissioning. The proposed project will benefit both entities by reducing future costs and liability.

Application Number: A69069
Faculty Member: Soo-Hyung Kim
Role: Principal Investigator
Title: **Modeling Particle Film Effect on Photosynthesis**
Agency: USDA
Period: 7/1/2011 - 12/31/2011
Amount: \$10,000
New

Research has demonstrated that the white, reflective particle film used to repel a wide range of insects also reduces plant temperature and heat stress, while reflecting UV radiation and altering the phytochrome-sensitive wavelengths of visible light. Field studies have documented that the reduction of plant temperature results in increased photosynthesis and often, water use efficiency, and the reduction of UV radiation has reduced oxidative stress. Research will identify critical plant growth stages and mechanisms by which the particle film increases photosynthesis, water use efficiency and improved food quality.

This fundamental knowledge will be incorporated with particle film application for insect control in order to effectively time and apply the particle film materials in a commercial setting. The results will enhance the multi-functionality of particle film technology for use in a broad range of crops.

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: A62583

Faculty Member: Sarah Reichard

Role: Principal Investigator

Title: **Rare Plant Monitoring**

Agency: USDI Fish and Wildlife Service

Period: 4/1/2011 - 3/31/2012

Amount: \$52,298

Competing Supplement

The rare plant monitoring project is a successful multi-year effort initiated in 2001 to document the status of rare native plant species in Washington State. Over 300 of Washington's native plants are considered to be endangered, threatened or sensitive to decline. Declining levels of public funding over the last several decades for basic monitoring and inventory have resulted in a dearth of information on

the status of these species. Consequently, the status of these species and their populations is poorly documented, which, in the short term hinders accurate assessments of impacts of proposed land use actions and in the long-term hinders our ability to understand the conservation needs for preserving plant biodiversity. Under this proposal, Washington Rare Plant Care and Conservation proposes to recruit, train and coordinates a corps of volunteers monitor rare plant populations on public lands in Washington State. The project is conducted in partnership with the Natural Heritage Program (WANHP) and data collected by rare plant monitors is provided to WANHP and to state and federal agencies who own the land where the populations occur. In 2011 approximately 120 populations will be revisited and reported on by Rare Care, and approximately 20 new volunteers will be trained in rare plant monitoring techniques.

Application Number: A69207
Faculty Member: Sarah Reichard
Role: Principal Investigator
Title: **2011 USFS Seed Collection**
Agency: USDA Forest Service
Period: 5/26/2011 - 1/20/2012
Amount: \$9,000
New

Project goal is to collect and store seeds of sensitive plant species on U.S. Forest Service lands. The current project is a part of a multi-year collaboration with the U.S. Forest Service to develop germplasm resources of sensitive plant species on Forest Service lands. The Forest Service is mandated to manage threatened and endangered species to achieve their recovery and sensitive species to avoid trends toward listing and avoid loss to species viability. Collection of seed for long term storage has been part of the strategy to achieve these objectives for threatened, endangered, and sensitive plants. Collection and storage of seed not only preserves genetic variation but can be used to re-establish historic populations or rehabilitate existing populations. The University of Washington Botanic Garden has been designated by the Center for Plant Conservation as the Pacific Northwest regional seed bank for rare vascular plants and has provided support in this capacity to both the Forest Service and the Bureau of Land Management in Washington.

Application Number: A69452
Faculty Member: Sarah Reichard
Role: Principal Investigator
Title: **2011 USFS Seed Collection**
Agency: USDA Forest Service
Period: 6/1/2011 - 4/30/2012
Amount: \$5,000
New

The U.S. Forest Service is mandated to manage threatened and endangered species to achieve their recovery and sensitive species to avoid trends toward listing and avoid loss to species viability (FS 2670). It has been a number of years since a rare and endangered plant conference has been held in the Pacific Northwest. UWBG is coordinating a conference focused upon rare and endangered plants to be held March 13-14, 2012 at their on-campus facility. The conference is entitled "Conserving Plant Biodiversity in a Changing World: 4. View from Northwestern North America." The purpose of this conference is to bring together practitioners, consultants, and experts in the field of rare plants and plant conservation to share and update their findings on the distribution, abundance and threats to plant biodiversity in the Pacific Northwest. The conference offers an opportunity to share new information and collaborate with regional botanists and plant population biologists to find solutions to sustaining plants for the long-term in the face of a changing climate. USFS Region 6 has been involved in the conference planning and through this purchase order will be officially "sponsoring" the conference with financial assistance.

Application Number: A69117
Faculty Member: Luke Rogers
Role: Principal Investigator
Title: **Oregon LiDAR processing**
Agency: USDA Forest Service
Period: 8/1/2011 - 7/31/2016
Amount: \$30,000
New

Project goal is to process LiDAR point data and canopy surfaces to derive descriptive statistics for land managed by the Bureau of Land Management (BLM) in Oregon covered by LiDAR data acquired by the Oregon Department of Geology and Mineral Industries and to use previously computed statistics and ground measurements for plots on the Deschutes National Forest to develop models describing forest inventory variables. Airborne laser scanning (LiDAR) data can be used to characterize vegetation structure across large land areas. Data layers derived directly from the point cloud provide information describing vegetation size, density, and spatial distribution. When combined with appropriate ground plots, descriptive statistics computed from the point cloud can be used to model and predict forest inventory variables and structure. Specific tasks include 1) develop procedures to organize and process LiDAR data covering areas managed by the BLM in Oregon to produce canopy height models and compute descriptive statistics for the canopy surface and LiDAR point cloud; 2) develop models relating LiDAR metrics to forest inventory variables for the Deschutes National Forest; 3) use the models to map forest inventory variables across the Deschutes National Forest (portions of the forest included in the 2009 and 2010 LiDAR acquisitions); and 4) assess the accuracy of the mapped results using independent data (stand exams from the National Forest and photo-interpreted information from other PNW Station scientists).

Application Number: A69195
Faculty Member: Kathy Wolf
Role: Principal Investigator
Title: **Stewardship Mapping Geocoding for the Seattle Green Cities Research Alliance**
Agency: USDA Forest Service
Period: 8/1/2011 - 3/31/2013
Amount: \$46,000
New

The objectives of this cooperative effort are to construct a comprehensive geocoded representation of the organizations that are conducting civic environmental stewardship concerning urban forest and urban ecosystems in the Seattle metro region. Why is this research important? Local governments, public agencies, and environmental NGOs are increasingly interested in sustainability and green infrastructure. Parks, natural areas, forests, and natural waterways that are well managed offer many public benefits - environmental, social, and economic. Funding is limited for resource management; the efforts of stewardship groups and organizations are critical to fill the gap. Organized, well-trained groups of citizens can work to restore nearby natural areas, and in their work, help to build stronger, healthier socio-ecological communities. A 2010 pilot study determined that about 700 organizations, NGOs, and groups conduct environmental stewardship projects in King and Pierce counties. This citizen-based activity is a considerable resource for addressing the environmental issues of our urban areas. Yet we know little about the patterns, scope, and outcomes of environmental stewardship. This project will provide the first phase of a detailed assessment of stewardship activity and locations, focusing on the metro Seattle area. We will conduct a geospatial mapping analysis of programs and participant densities, in association with an organizational network analysis that is now underway. The work is a replicate of the Stewardship Mapping research that has been done by the USDA Forest Service in New York City and is also underway in the cities of Chicago and Baltimore. The project findings will provide a “footprint” of stewardship activity and its correlation to environmental mitigation need (such as priorities identified in the Puget Sound Action Agenda). Results will enable organizations, agencies, and project sponsors to build more effective programs, and engage greater numbers of stewardship participants.

Proposals

Application Number: A69558
Faculty Member: Ernesto Alvarado
Role: Principal Investigator
Title: **Fire, Climate, and Smoke Research**
Agency: USDA Forest Service
Period: 7/19/2010 - 6/30/2013
Amount: \$297,800
Supplement and Extension

This Joint Venture Agreement will support the USFS Atmosphere and Fire Interactions Research Team (AIRFire) research to improve understanding of the role of weather and climate in fire and other ecological disturbances and to develop decision support tools for ecosystem management, fire operations, planning, and smoke management based on meteorology, air quality engineering, and climate dynamics.

The purpose of this agreement is to advance climate, fire, and smoke science in support of building a better understanding of how fire is affected by and affects the atmosphere, including weather and climate, and how this knowledge can be used to develop scenarios and tools to better inform land managers.

Specific objectives for this joint venture agreement are:

Specific Tasks for this agreement:

- To continue participating in the development of the next generation of a Wildland Fire Scenario Builder.
 - To analyze the relationship between fire season ending event and climate in coordination with the USFS Region 6 and the USFS PNW Research Station.
 - To analyze fire–weather, climate, vegetation relationships using gathered and modeled indices to determine statistical relationships that can utilize these indices for predicting the likelihood of fire occurrence in various fire size classes, as well as overall fire size.
 - To improve existing wildland fire modeling capabilities for fuel consumption, emissions, and smoke impacts, for example as developed in the BlueSky Smoke Modeling Framework.
 - To develop and improve tools for use in wildland fire decision support as part of the Wildland Fire Decision Support System smoke component.
 - To support the growth, development, and research of graduate students and undergraduates at the School of Forest Resources as their research pertains to fire, climate, and smoke research.
 - To support high-end computer modeling and analysis of large data sets of fire, climate and smoke at the Pacific Wildland Fire Sciences Laboratory.
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Application Number: A69684

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: 4/1/2009 - 3/31/2014

Amount: \$503,421

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.

Application Number: A69729
Faculty Member: Jonathan Bakker
Role: Principal Investigator
Title: **Regional Native Seed Project**
Agency: Center for Natural Lands Management (CNLM)
Period: 8/1/2011 - 12/31/2012
Amount: \$8,000
New

This is the third phase of a multi-year project building on more than a decade of habitat restoration in native westside prairies. It specifically supports and improves the burgeoning native seed development efforts to restore habitat for rare plants and butterfly species in these prairies. It has three components: 1) Seeding technique and rate assessment, 2) Seed production, coordination and development, and 3) Planting technique development for golden paintbrush.

Application Number: A69602
Faculty Member: Gordon Bradley
Role: Principal Investigator
Title: **Pacific NW Coop Ecosystem Studies Unit Program Support**
Agency: USDI National Park Service
Period: 9/30/2007 - 9/29/2012
Amount: \$31,096
Non-Competing Supplement

The purpose of this supplement is to provide continued financial assistance to support the Pacific Northwest Cooperative Ecosystem Studies Unit, co-led by SFR faculty Gordon Bradley, and the NPS Research Coordinator, to provide high-quality research, technical assistance and education to federal natural-resources managers.

Application Number: A69462
Faculty Member: Sally Brown
Role: Principal Investigator
Title: **Biosolids information and education program**
Agency: Northwest Biosolids Management Association
Period: 7/1/2006 - 6/30/2012
Amount: \$173,000
Non-Competing Supplement

UW staff will continue to provide public information, regulation development, and technical support to the King County Biosolids program. As detailed in the Scope of Work, this will include the following: 1) providing public information through committee support, a community assistance/resource information center, information gathering, and assisting in the BW Biosolids Conference; 2) regulation development, including committee support and regulatory interpretation; 3) research and demonstrations to include W-170 group interaction and projects involving A. the fate of organic compounds in biosolids amended soils, B. Canola growth using biosolids, and C. lead arsenic and compost; 4) continuing special research projects with the King County Biosolids Program on Canola for Biodiesel, gravel pit, biosolids basics, Class A soil mixes, and organic contaminants; 5) attending NBMA general and board meetings.

Application Number: A69776
Faculty Member: Douglas Deur
Role: Principal Investigator
Title: **Cultural Landscape Inventory of the Chulitna River-Sixmile Lake Area**
Agency: USDI National Park Service
Period: 8/15/2011 - 10/30/2012
Amount: \$19,000
New

This project is a collaborative effort to conduct consultation, planning, and completion of a Cultural Landscape Inventory (CLI) for the Chulitna River-Sixmile Lake area within Lake Clark National Park and Preserve (LACL). The Chulitna-Sixmile Lake cultural landscape is important to present-day Dena'ina and may be threatened by proposed development in the immediate area. For the past 100 years, the people of Nondalton have largely derived their subsistence fish, game, and water fowl from the Chulitna River and Sixmile Lake drainages. Archeological sites in the nearby Kijik National Historic Landmark

Archeological District document sites associated with at least 900 years of Dena'ina history. A CLI will be undertaken to document the entire array of historic and contemporary resources of cultural significance to the Dena'ina in the Chulitna and Sixmile drainages, including the Tazimina River and the upper Newhalen River. This effort will be supported by a current partnership between LACL and the Nondalton Tribal Council to complete an Integrated Resource Management Plan for the study area. National Park Service (NPS) staff will work with University of Washington (UW) in planning the initial consultation with the state of Alaska, Nondalton Tribal Council, the Kijik Corporation, and other interested tribes. UW staff will be responsible for data collection and analysis, and will produce a final report in collaboration with NPS. The CLI can be used by park associated tribes to support their efforts to identify and preserve traditionally significant resources. The project report and products can be used by other NPS units and other resource management agencies as a template to help inventory important ethnographic landscapes.

Application Number: A70005

Faculty Member: Ivan Eastin

Role: Principal Investigator

Title: **Development of a Bio-based Epoxy**

Agency: Washington State University

Period: 7/1/2012 - 6/30/2015

Amount: \$111,059

New

Faculty Member: Indroneil Ganguly

Role: Co-Investigator

Federal legislation calls for the reduction in the emission of volatile organic compounds from epoxies and coatings. To date, the vast majority of VOC emissions in this area are the result of petroleum-based waterborne epoxies and polyurethane coating resins. The long-term goal of the proposed research is to develop a viable technology to replace (or partially replace) these petroleum-based waterborne epoxy and PU coating resins with rosin-based counterparts largely derived from pine resin. The LCA component of this research will investigate the environmental performance of rosin-based epoxies and coatings relative to their petroleum-based counterparts. CORRIM's research on wood products LCI/LCA's demonstrates clearly that there are many ways to improve production efficiency while reducing environmental burdens through the proper selection and use of materials, processes and designs. The results of the project will document LCA benefits of rosin-based epoxies and coatings while providing quantitative measures of environmental performance differences for alternative petroleum-based products. By contributing data to the National LCI database maintained by NREL as well as CORRIM's website, research products will be widely available for multiple uses.

Application Number: A69565

Faculty Member: Ivan Eastin

Role: Principal Investigator

Faculty Member: Elaine Oneil

Faculty Member: Indroneil Ganguly

Role: Co-Investigator

Role: Co-Investigator

Title: **Environmental implications of innovative building practices in US residential construction**

Agency: National Science Foundation

Period: 5/1/2012 - 4/30/2014

Amount: \$494,246

New

In recent years the scientific community has expressed concern over the environmental externalities associated with rapid infrastructure development and urbanization. Residential and commercial buildings contribute more than 25% of global CO₂ emissions. The Intergovernmental Panel on Climate Change (IPCC) in its 2007 report categorically identified the role of residential and non-residential energy usage and construction as one of the major sources of anthropogenic greenhouse gas emissions. The third party certified Green Building Programs (GBPs), which provide eco-labels to constructions with lower carbon footprint, have gained market acceptance and governmental patronage in North America, Europe and Asia. These points-based certification systems assign scores for adoption and usage of sustainable and energy efficient building practices, products and technologies. The focus of these GBPs has been the operational energy usage and carbon dioxide emissions from homes. Though embodied energy can account anywhere between 10 to 22 times the annual energy consumption of the residential house, depending on the nature of the house and its geographic location, this aspect of the building materials play a relatively insignificant role in these GBPs.

Utilizing advancements in the field of Life Cycle Assessment (LCA), this research proposes to correlate the embedded energy of 20 basic and innovative building materials with their respective energy savings information during the functional life of the house. With the analytical LCA boundaries defined as the source of the material (e.g., forest, mine) to the end of the functional life of the material (demolition of the house), this research will provide a more complete picture of the carbon footprint of the building materials under consideration and will look at the long term environmental implications of practical substitutability (consequential LCA) among and between the basic and innovative building materials to help answer the question: 'how can practical substitutions between basic (e.g., wood, concrete and steel) and innovative (e.g., engineered wood products, recycled steel, concrete with fly ash) building materials help reduce the overall carbon footprint of the US residential sector, above and beyond the functional life of the house?

Using location specific attributional LCA (ALCA) estimates and product specific geo-climatic energy efficiency/effectiveness estimates, we will compare the overall carbon footprint of each of the building materials under consideration in 8 distinct climate zones subdivided into 16 different geo-climatic regions in the U.S. to help answer the research question: 'how does the overall carbon footprint of the basic and innovative building materials vary across the different geo-climatic regions of the country?' In addition, the project will apply a temporally and spatially explicit life cycle assessment approach to evaluate the economic and environmental viability of the constructed residential construction practices, within the purview of the selected building materials, helping answer the research question: 'what are the optimal economically and environmentally viable building practices in each of the 16 geo-climatic zones of the country?'

Application Number: A69868
Faculty Member: Gregory Ettl
Role: Principal Investigator
Title: **Ectomycorrhizal fungal species in Red Alder Stands**
Agency: Pending - OSP to be notified
Period: 9/1/2011 - 8/31/2012
Amount: \$1,475
New

This research is focused on determining which ectomycorrhizal fungal species are present in a mature red alder stand, and specifically if fungal communities vary along a soil moisture gradient and if seasonal patterns of fungal assemblages are apparent. Over the 2011 growing season, I will be collecting soil parameters and performing DNA analyses on root tips to answer these questions. I will also be collecting mushrooms on my site and working with Dr. Ammirati to identify species. My goal for my research is to illuminate two somewhat ignored and hard to study systems: forested wetland structure and function and the factors that govern ectomycorrhizal fungal distribution.

Application Number: A69177
Faculty Member: Thomas Hinckley
Role: Principal Investigator
Title: **2011 McIntire Stennis**
Agency: USDA
Period: 10/1/2010 - 9/30/2011
Amount: \$549,430
New

The McIntire-Stennis act of 1962 provides the basis for federal funding in forestry research and graduate education programs at state-certified schools of forestry in the United States. The School of Forest Resources, University of Washington, is eligible for McIntire-Stennis funding. This is a long-standing program, formerly administered by the Cooperative State Research, Education and Extension Service (CSREES); effective 10/1/2009, the program has been administered through the National Institute of Food and Agriculture (NIFA). Funds are used to conduct research in areas such as: (1) ecological restoration, (2) catastrophe management, (3) valuing and trading ecological services, (4) energy conservation, biomass and bio-based materials development; and (5) ways of fostering healthy forests and a globally competitive forest resources sector. At the University of Washington research will focus on: Forest management, coarse woody debris, and soil processes, wildlife use of managed forests, modeling branch dynamics in coastal Douglas-fir and western hemlock plantations as affected by silvicultural treatments, understanding the systematics of commercial ornamental plants, and natural stand development in western coniferous forests. A proportion of the funds will be used for program administration.

Application Number: A69708
Faculty Member: Joshua Lawler
Role: Principal Investigator
Title: **Protecting the ecological stage: applying and testing a land-facet-based approach to conservation planning in a changing climate**
Agency: Yale University
Period: 1/1/2012 - 6/30/2012
Amount: \$93,382
New

Climate change provides a clear challenge to the process of conservation planning. To date, systematic conservation planning has largely focused on identifying areas that protect current patterns of biodiversity. Although these areas may provide protection for today's biodiversity, they may not provide adequate protection for biodiversity in a future world that looks very different from that of today. One potentially promising strategy for protecting biodiversity in a changing climate is based on the idea of protecting the diversity of abiotic conditions that influence patterns of biodiversity. Although the idea of using abiotic variables as surrogates for biodiversity in the conservation-planning process is not new, the application of the concept to climate-change adaptation planning has only recently drawn interest. Thus, not surprisingly, there is limited evidence that the approach can be used in diverse regions to select areas that can capture current biodiversity, that the results of land-facet based analyses are robust to particular methodologies and data choices, or that the approach will be effective at protecting biodiversity in a changing climate. Additionally, it is not clear to what degree current protected lands already represent a diversity of land-facets (i.e., the "ecological stage"). We propose to address these questions by identifying and mapping land facets across multiple ecoregions in the Pacific Northwestern United States. We will then determine how sensitive the facets are to the methodological and data choices, use these land facets to identify priority conservation areas, evaluate how well land facets are represented in current protected areas, test the ability of land facets to capture current biodiversity.

Application Number: A69641
Faculty Member: Sarah Reichard
Role: Principal Investigator
Title: **National Arboretum Collections**
Agency: USDA
Period: 9/1/2010 - 8/31/2013
Amount: \$14,000
Non-Competing Supplement

The US Department of Agriculture, Agricultural Research Service has requested the assistance of the Otis Douglas Hyde Horticultural Herbarium to collect and ship specimens of horticultural interest to US National Arboretum. Upon review of the national collection, the USNA determined that cultivated plants of the Pacific Northwest are grossly underrepresented in their holdings. Specimens from and number of gardens, including the Washington Park Arboretum, Center for Urban Horticulture and Union Bay

Gardens, Hill-Crest, the residence of the UW President, and Windcliff, a private garden owned by horticulturist Dan Hinkley will be visited to obtain specimens of their horticulturally significant plants.

Application Number: A69082

Faculty Member: Clare Ryan

Role: Principal Investigator

Title: **Integrated "All Lands" Approach to Public Land Use Planning: A Case Study of Prince William Sound**

Agency: USDA Forest Service

Period: 10/1/2011 - 9/30/2013

Amount: \$29,001

New

The purpose of this project is to investigate an "all lands approach" to planning that is being used by Chugach National Forest (CNF) to develop a visitor use plan for Prince William Sound in Alaska. Using Prince William Sound as a case example, the PI will collaborate with PNW scientists:

- (1) Work with the CNF to develop an interdisciplinary, issue-based planning approach for managing visitor use in Prince William Sound. This will include providing editorial advice on the presentation of the PWS visitor use plan and one trip to the CNF to meet with planning staff and the Forest Leadership Team to discuss and present the results of the PWS plan.
 - (2) Evaluate the value of the CNF planning approach and use the results to contribute to a general conceptual model for future planning efforts in other National Forests.
 - (3) Investigate implementation of the new planning rule with the goal of integrating collaboration, social science and the "all lands" approach to planning. This will include an up-to-date review of the proposed/new planning rule and a review of the Forest Service's new Recreation Sustainability Framework, in order to provide an analysis of these documents and related requirements in the context of Forest Service planning activities.
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Application Number: A69608

Faculty Member: Miranda Wecker

Role: Co-Investigator

Title: **MERHAB: An early warning system for Pseudo-nitzschia HABs on Pacific Northwest outer-coast beaches**

Agency: National Oceanic and Atmospheric Administration

Period: 9/1/2012 - 8/31/2017

Amount: \$1,966,181

New

The neurotoxin domoic acid (DA), produced in Pacific Northwest (PNW) coastal waters by blooms of the diatom *Pseudo-nitzschia* (PN), bioaccumulates in razor clams and other shellfish, causing amnesiac

shellfish poisoning if consumed. Razor clams support tens of millions of dollars annually in coastal tourism, and are essential to the Quinault Nation and other Washington tribes for subsistence and commercial income. This proposal supports the development of a monitoring- and modeling-based forecast system for PN and particulate DA (pDA) on beaches from Cape Flattery, WA to Heceta Head, OR, in partnership with existing Washington and Oregon monitoring programs [Olympic Regional Harmful Algal Blooms (ORHAB) and Oregon Dept. of Fish and Wildlife].

Application Number: A69436
Faculty Member: Miranda Wecker
Role: Principal Investigator
Title: **Data entry and Committee Facilitation Support**
Agency: Clallam County
Period: 7/1/2011 - 6/30/2012
Amount: \$11,554
New

The North Pacific Coast Lead Entity (NPCLE) requires technical assistance for entering new and historical project information into the Habitat Work Schedule (HWS) program it utilizes as a monitoring and public access portal for its contracted activities with the Salmon Recovery Funding Board.

The North Pacific Coast Marine Resources Committee (NPC MRC) requires public meeting facilitation support for researching and preparing meeting materials and documenting and preparing meeting records.

Olympic Natural Resources Center (ONRC) will provide NPCLE with professional services necessary to compile historical watershed and salmon restoration project records undertaken in WRIA 20 and to enter this information into the HWS on-line data portal. They will also provide meeting facilitation support in the form of researching and compiling meeting documents and assisting in documentation of meeting proceedings for the North Pacific Coast Marine Resources Committee.

Application Number: A69881
Faculty Member: Sandy Wyllie-Echeverria
Role: Principal Investigator
Title: **NPS Water Quality extension**
Agency: USDI National Park Service
Period: 7/20/2011 - 12/31/2012
Amount: \$7,497
New

The National Park Service and the UW-Friday Harbor Laboratories cooperated in 2006 to perform an "Assessment of Coastal Water Resources and Watershed Conditions at San Juan Island National Historical Park" (SAJH). That assessment recommended establishment of coastal water quality monitoring protocols in Garrison Bay at English Camp and in Jackle's Lagoon at American Camp. In 2008, NPS and the UW cooperated in "A Preliminary Investigation of Water Quality Conditions in Garrison Bay." Experience obtained during that project has enabled NPS and the UW to establish standard operating procedures for the Hydrolab sonde and sensors, and to agree on monitoring protocols for the local coastal environment. A primary objective of this Task Agreement is for UW staff to establish long-term monitoring locations in the park and to collect a 2011 and 2012 data set that will serve as the baseline for subsequent years of monitoring. Another objective is for NPS staff to collaborate with UW on data collection and learn from UW water quality specialists how to perform data collection. Additionally, students at the Oregon Museum of Science and Industry (OMSI) summer camp will assist with data collection in Garrison Bay, with the objective of having future students continue monitoring.