



UNIVERSITY *of* WASHINGTON

School of Forest Resources

RESEARCH NEWSLETTER ISSUE TWO, VOLUME 1

October 10, 2010

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Opportunities

NSF: Hydrologic Sciences 09-538; Due December 5

SYNOPSIS

Hydrologic Sciences focuses on the flow of water and transport processes within streams, soils, and aquifers. Particular attention is given to spatial and temporal heterogeneity of fluxes and storages of water, particles, and chemicals coupling across interfaces with the landscape, microbial communities, and coastal environments, to upscaling and downscaling given these heterogeneities and interfaces and how these processes are altered by climate and land use changes. Studies may address aqueous geochemistry as well as physical, chemical, and biological processes within water bodies. These studies commonly involve expertise from many basic sciences and mathematics, and proposals often require joint review with related programs.

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13684&org=NSF&sel_org=NSF&from=fund

NSF: Dynamics of Coupled Natural and Human Systems (CNH) 10-612; Due December 9

SYNOPSIS

The Dynamics of Coupled Natural and Human Systems (CNH) Program promotes interdisciplinary analyses of relevant human and natural system processes and complex interactions among human and natural systems at diverse scales.

EDUCATIONAL OPPORTUNITY

This program provides educational opportunities for Undergraduate Students, Graduate Students, K-12 Educators . Individuals interested in applying for funding should see the program guidelines.

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13681&org=NSF&sel_org=NSF&from=fund

NSF: **Program Title:** Advancing Digitization of Biological Collections (ADBC) 10-603; Due December 10

Synopsis of Program: This program seeks to create a national resource of digital data documenting existing biological collections and to advance scientific knowledge by improving access to digitized information (including images) residing in vouchered scientific collections across the United States. The information associated with various collections of organisms, such as geographic distribution, environmental habitat data, phenology, information about associated organisms, collector field notes, tissues and molecular data extracted from the specimens, etc. is a rich resource for providing the baseline from which to further biodiversity research and provide critical information about existing gaps in our knowledge of life on earth. The national resource will be structured at three levels: a national hub, the maticnet works based on collaborative groups of collections, and the physical collections. This resource will build upon a sizable existing national investment in curation of the physical objects in scientific collections and contribute vitally to scientific research and technology interests in the United States. It will be an invaluable tool in understanding the biodiversity and societal consequences of climate change, species invasions, natural disasters, the spread of disease vectors and agricultural pests, and other biological issues.

http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf10603

NSF: **Discovery Research K-12** 10-610; Letter of intent due November 5, 2010; full proposal due January 6, 2011

SYNOPSIS

The Discovery Research K-12 (DR K-12) program seeks to enable significant advances in student and teacher learning of the STEM disciplines. Projects funded under this solicitation begin with a research question or hypothesis about how to improve preK-12 STEM learning and teaching and then develop, implement, and study effects of innovative educational resources, models, or technologies.

The DR K-12 program accepts proposals for exploratory projects, full research and development projects, and synthesis projects, as well as for conferences and workshops related to the mission of the program.

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=500047&org=NSF&sel_org=NSF&from=fund

Awards

Application Number: A51565

Faculty Member: Gregory Ettl

Role: Principal Investigator

Title: **The Western Mountain Initiative: Vulnerability and Adaptation to Climate Change in Western mountain Ecosystems**

Agency: USDI US Geological Survey

Period: 7/15/2009 - 12/31/2013

Amount: \$181,000

Supplement and Extension

Climate warming is affecting Western mountain ecosystems, directly through changes in water dynamics and indirectly through altered disturbance regimes. The Western Mountain Initiative team explores the effects of climate change on ecological disturbance, responses of forest vegetation, mountain hydrology, and the coupled hydro-ecological responses that determine vulnerability of Western mountain ecosystems to change. Extensive data sets, empirical studies, surveys, and monitoring programs are linked via models to hindcast and forecast the effects of changing climate on forest dynamics, distribution, and productivity; fire occurrence and insect outbreaks; recovery of vegetation after disturbance; hydrologic changes and glacier dynamics; and the consequences of an altered water cycle for terrestrial and aquatic ecosystems and chemistry. We will address the extent to which climate drivers are mediated by regional- or watershed-scale controls on ecosystem processes, thus quantifying vulnerability to climate change in mountain ecosystems. Region-specific results and emergent West-wide patterns will be shared with resource managers through workshops and a comprehensive web-based toolkit on climate-change science and adaptation management.

Application Number: A59993

Faculty Member: Gregory Ettl

Role: Principal Investigator

Title: **The Western Mountain Initiative: Vulnerability and Adaptation to Climate Change in Western mountain Ecosystems**

Agency: USDI US Geological Survey

Period: 9/15/2010 - 9/15/2012

Amount: \$160,000

Supplement and Extension

Climate warming is affecting Western mountain ecosystems, directly through changes in water dynamics and indirectly through altered disturbance regimes. The Western Mountain Initiative team explores the

effects of climate change on ecological disturbance, responses of forest vegetation, mountain hydrology, and the coupled hydro-ecological responses that determine vulnerability of Western mountain ecosystems to change. Extensive data sets, empirical studies, surveys, and monitoring programs are linked via models to hindcast and forecast the effects of changing climate on forest dynamics, distribution, and productivity; fire occurrence and insect outbreaks; recovery of vegetation after disturbance; hydrologic changes and glacier dynamics; and the consequences of an altered water cycle for terrestrial and aquatic ecosystems and chemistry. We will address the extent to which climate drivers are mediated by regional- or watershed-scale controls on ecosystem processes, thus quantifying vulnerability to climate change in mountain ecosystems. Region-specific results and emergent West-wide patterns will be shared with resource managers through workshops and a comprehensive web-based toolkit on climate-change science and adaptation management.

Application Number: A58218

Faculty Member: Jerry Franklin

Faculty Member: Van Kane

Role: Principal Investigator

Role: Co-Investigator

Title: **Lidar applications for detection of fuel characteristics at Mount Rainier National Park**

Agency: USDI National Park Service

Period: 7/1/2010 - 6/1/2012

Amount: \$40,962

New

This Task Agreement details the steps by which the National Park Service (NPS), and the University of Washington (UW) will collaborate in developing fine-scale LiDAR data layers and methodology in support of a fuel mapping project at Mount Rainier National Park (MORA). The LiDAR data will be used to link NPS field plots to canopy characteristics for eventual mapping throughout the park. The fuel mapping project will support fire and vegetation management planning efforts at MORA, as well as assisting in development of fuel mapping methodology to be used at other Pacific Northwest NPS units. Deliverables will include regression and imputations of predictive variables, and digital spatial data layers of LiDAR derived canopy characteristics. One or more jointly authored papers are expected, including methods for mapping fuel loads, and analysis of the contribution of LiDAR to fuel load mapping.

Application Number: A57966

Faculty Member: Robert Harrison

Role: Principal Investigator

Title: **Management of PNW Forest Plantations: Additional Site Characterization and Instrumentation for MSC/CIPS paired-Tree Fertilization Projects**

Agency: USDA Forest Service

Period: 6/30/2010 - 12/31/2012

Amount: \$25,000

Non-Competing Supplement

This proposal addresses seven top priority R&D needs identified in the Agenda 2020 roadmap with ranked priorities (in order of relative ranking) as follows:

- 1) update growth and yield models to account for changes in stand conditions, management practices and environmental variables,
- 3) Develop rapid, cost-effective methods for measuring wood properties that affect end uses,
- 4) Develop new fertilizer formulations, application practices, and diagnostic techniques to enhance the economic and environmental performance of forest fertilization programs and
- 6) determine how key measures of wood quality are affected by site factors, stand conditions, management practices, and genetics.

The proposed work includes new efforts to increase the impact of existing and planned studies of forest management and fertilization being carried out by Center for Intensive Plantation Silviculture (CIPS) and Stand Management Cooperative (SMC) on intensively-managed forest plantations in the PNW. Current funding limits the scope of these studies being installed by the CIPS/SMC using a combination of industry and other funding. The proposed additional work would provide expansion and additional utility of the current study design by better characterizing site parameters that could predict inherent site quality, including soil sampling and characterization, installing continuous rainfall, temperature and soil moisture monitoring and collection equipment. We will also add to the extent possible evaluation of site and treatment impacts on wood quality, stand mortality and density. Though the paired-plot design utilized has significant limitations in terms of predicting long-term response on an area basis, data from these studies will be incorporated into current growth and yield models in the PNW to the extent possible, particularly in terms of predicting potential for response based on site and characterization, as development and refinement of G&Y models is a priority for both coops.

Application Number: A61059

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

Amount: \$24,000

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: A57746

Faculty Member: Joshua Lawler

Role: Principal Investigator

Title: **Assessing the vulnerability of species and ecosystems to projected future climate change in the Pacific Northwest**

Agency: USDI US Geological Survey

Period: 11/1/2009 - 3/31/2012

Amount: \$197,459

New

Project goal is to model potential shifts in the distributions of at least 12 focal animal species (chosen in discussions with land managers) and assess the vulnerabilities of species and managed lands to future climate change. These models will assist conservation and natural resource managers in developing effective adaptive management plans. Project will summarize the projected changes in climate and biota for the entire study region as well as for specific land management units including 1) national parks, 2) fish and wildlife refuges (both state and federal), and 3) The Nature Conservancy owned and managed sites. The research contributes to USGS Science Strategy science directions, "Understanding Ecosystems and Predicting Ecosystem Change" and "Climate Variability and Change" and USGS contributions to the U.S. Climate Change Science Program Strategic Plan by enhancing understanding of potential climate-change effects on important ecological systems.

Application Number: A61288

Faculty Member: Sarah Reichard

Role: Principal Investigator

Title: **Shrub Steppe/Sage-Grouse Habitat Restoration**

Agency: USDI Bureau of Land Management

Period: 1/1/2010 - 9/30/2011

Amount: \$29,982

Non-Competing Supplement

The objective of this project is to contribute field and lab information on restoration techniques and research that leads to more successful restoration projects and an increased availability of restoration materials crucial to the restoration of shrub-steppe habitat that support threatened/endangered (T/E) species on public lands. Under this project, we will investigate and evaluate selected sites for restoration

and conservation priorities, collect field data from existing restoration sites, and research and summarize state-of-the-art restoration techniques that can be applied to current restoration problems. We will also investigate selected species through lab and greenhouse research to develop protocols for development of these species for restoration materials including seed production.

Proposals

Application Number: A62249

Faculty Member: Jonathan Bakker

Role: Principal Investigator

Title: **Grazing and Afforestation Effects on Understory Community Composition and Diversity in Uruguayan Grasslands**

Agency: Weyerhaeuser Company

Period: 5/1/2009 - 4/30/2012

Amount: \$15,000

Non-Competing Supplement

The landscape of Uruguay is dominated by the South American Campos ecoregion, 85% of which is considered natural grassland and composed primarily of perennial grass and herb species, although shrubs and trees can be sparsely present. The Campos is important for the country's livestock production; currently, it supports 10 million head of cattle and 13 million head of sheep. Although its climate is suitable for forest development, the Campos has not been forested. Grazing is the primary factor maintaining the Campos as grassland, essentially creating an herbaceous pseudoclimax phase. Afforestation efforts began a few decades ago. To date, little research has been conducted on the effects of afforestation or the combined effects of grazing and afforestation on vegetation community dynamics. The objectives of this research are to:

1. Quantify changes in vegetation structure and function associated with afforestation,
 2. Examine community composition and response to management over multiple scales and grazing histories: across regions and between similar sites within regions,
 3. Determine if grasslands are able to re-establish following tree harvest, and
 4. Compare the vegetation responses of Uruguayan and Pacific Northwest grasslands to afforestation and tree harvest.
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Application Number: A61854

Faculty Member: David Briggs

Role: Principal Investigator

Title: **Bureau of Land Management - Stand Mgt Coop**

Agency: USDI Bureau of Land Management

Period: 10/1/2010 - 9/30/2011

Amount: \$80,000
Supplement and Extension

Bureau of Land Management membership dues for 2011 in the UW Stand Management Cooperative.

Application Number: A60690

Faculty Member: Sally Brown

Role: Co-Investigator

Title: **Archaeal Influence on Nitrogen Transformations in Soil and Root Systems of Bioenergy Crop Species**

Agency: US Department of Energy

Period: 2/1/2011 - 1/31/2014

Amount: \$2,078,045

New

The potential environmental impacts of intensive bioenergy agriculture extend far beyond the areas of cultivation, impacting generally earth systems. Thus, a thorough understanding of ammonia oxidizing soil microbiota is essential for developing strategies to maximize plant availability and minimize environmental impacts. The most general objectives of this research are to resolve the relative contributions of ammonia-oxidizing archaea (AOA) and ammonia-oxidizing bacteria (AOB) to nitrification and production of atmospherically active gases, evaluate biotic and abiotic variables that determine their distribution and activity, and identify control methods through amendment with selective inhibitors or land management practices. Improved systems level and predictive understanding of the relative contributions to nitrification mediated by AOA and AOB will be achieved through structured analysis of open environmental and controlled laboratory systems. Supporting analyses will include a combination of molecular (quantitative PCR, stable isotope probing, deep metagenomic sequencing) and activity (ammonia oxidation rates, N₂O/NO emissions, nitrate leaching) measures to relate microbiological structure and activity to nitrogen form and flux in soils.

Application Number: A61086

Faculty Member: Ivan Eastin

Role: Principal Investigator

Title: **The Northwest Advanced Renewables Alliance (NARA): A New Vista for Green Fuels, Chemicals and Environmentally Preferred Products (EPP)**

Agency: Washington State University

Period: 1/1/2011 - 12/31/2015

Amount: \$4,567,331

New

This research module is part of a larger regional group research project. It will provide a definitive assessment of the technical, economic, environmental, and social impacts of using woody biomass for the production of jet fuel. Understanding the consequences of this technology is necessary if forest biomass is to be widely used for jet fuel. In addition, an LCA on greenhouse gas emissions will be necessary to qualify jet fuel made from forest based biomass under the Energy Independence and Security Act (EISA) of 2007 and the EPA guidelines promulgated to meet the new requirements of the act (EPA 2009). To meet this objective we will combine biomass growth/yield models, engineering process models and Life Cycle Assessment (LCA) models to develop life cycle environmental profiles for specific woody biomass feedstocks matched with the proposed jet fuel processing technology. These integrated models will be used to develop LCAs for green house gases (GHG) and other environmental risk indices for comparisons between cellulosic jet fuel and fossil fuels. We will also compare energy uses of the feedstock and alternative wood product uses against their fossil intensive product substitutes. Alternative technologies, with their impacts on the value chain, will be compared for different forest treatments, harvesting and collection equipment and processing alternatives. Feedstock qualities will be matched with processing alternatives and regional feedstock scales of availability matched with efficient scale processing infrastructure. Alternative configurations and policy assumptions covering a range of scenarios will be used to project potential regional reductions in GHG emissions and energy dependence as well as rural economic impacts. The impacts of different policies and other alternatives will be characterized as sensitivity scenarios to better inform the adoption of appropriate policies, marketing, and investment strategies to reach energy independence goals with reduced GHG emissions while effectively managing cellulosic resources.

Application Number: A61583
Faculty Member: Christian Grue
Role: Principal Investigator
Title: **Biodiversity Inventory Project**
Agency: WA Department of Fish and Wildlife
Period: 3/22/2010 - 3/31/2011
Amount: \$25,000
New

This project is designed to assist the Washington Department of Fish and Wildlife to develop and implement the "Biodiversity Inventory Project." The project will be designed to fit/inform the WDFW conservation framework, and provide performance measures for the Governor's Priorities of Government Processes.

Application Number: A61328
Faculty Member: Richard Gustafson
Role: Principal Investigator
Title: **System for Advanced Biofuels Production from Woody Biomass**

Agency: USDA

Period: 7/1/2011 - 6/30/2016

Amount: \$45,695,354

New

The overall goal of this proposal is to ready the Pacific Northwest for a 2015 introduction of a 100% infrastructure compatible biofuels industry that meets the region's pro-rata share of RFS2 targets using sustainably grown regionally appropriate woody energy crops, thereby helping to revitalize the region's agriculture/forestry sectors with establishment of a sustainable advanced biofuels industry that supports both large and small growers and brings jobs to rural communities in the region. We propose a three prong integrated program of research, extension and education to achieve this goal. Capstone activities for the project are:

- GreenWood Resources, the Nation's larger grower of hybrid poplar, will establish and operate four 200-acre energy farms managed with low-input silviculture
- ZeaChem Inc., a leading biorefinery developer, will modify its 10 ton(dry)/day biorefinery in Boardman, OR to produce multiple 8,000 gallon truck loads of biobased gasoline and jet/diesel, which will be distributed to consumers on a test basis by Tesoro Corporation.
- Deployment of sustainability, extension and education programs by world-class regional institutions will lead to the establishment of a critical mass of well-trained growers and workers.

Successful completion of these activities will lead to the desired actions of adequate risk reduction to allow the financing, construction, and operation of multiple biorefineries in the region. The proposed program addresses the following four AFRI Priority Areas: 1) Plant Health and Production and Plant Products; 2) Renewable Energy, Natural Resources, and Environment; 3) Agriculture Systems and Technology; and 4) Agriculture Economics and Rural Communities.

Application Number: A61504

Faculty Member: Charles Halpern

Role: Principal Investigator

Title: **Can the physiological traits of bryophytes explain population- or community-level responses to forest management?**

Agency: UW Royalty Research Fund

Period: 1/15/2011 - 1/15/2012

Amount: \$37,366

New

Management of public forests in the Pacific Northwest is increasingly focused on manipulating young coniferous stands, not only for wood production, but for ecological objectives including habitat complexity and biological diversity. Bryophytes (mosses and liverworts) make important contributions to the diversity and productivity of these forests, but their responses to forest management are poorly understood. It is commonly assumed that they respond like vascular plants. However, basic aspects of their biology impose different behaviors (e.g., dormancy) in response to changes in habitat quality or

environmental stress. The objective of this study is to determine whether desiccation tolerance and related measures of physiological performance can explain observed changes in the abundance and distribution of forest bryophytes following silvicultural thinning. Specifically, we will (1) use chlorophyll fluorescence to measure photosynthetic efficiency (indicative of stress) of selected moss and liverwort species in forests in which microclimatic conditions differ; (2) quantify microclimatic conditions at these locations, including direct and indirect radiation and seasonal patterns of temperature and humidity; and (3) subject the same species to different levels of humidity and periods of drying in the lab to assess desiccation tolerance and capacity to recover photosynthetic function. Analyses will jointly explore relationships among microclimate, desiccation tolerance, and stress responses, and whether these relationships are consistent with changes in the abundance and distribution of forest bryophytes after silvicultural thinning. Results have the potential to highlight the ways in which organisms that are sensitive to drought may respond to forest management in a changing climate.

Application Number: A61371

Faculty Member: Joshua Lawler

Role: Principal Investigator

Title: **Collaborative research: Simulating integrated impacts of climate and land-use change on species, systems, and processes**

Agency: National Science Foundation

Period: 9/1/2011 - 8/31/2016

Amount: \$442,311

New

Land-use change and climate change are likely to be the two greatest drivers of environmental transformation in the coming century. Both of these drivers have the potential to greatly alter ecosystems and the provision of ecosystem services. To date, most attempts to forecast climate and land-use impacts have focused on single systems or groups of species. Few have attempted to integrate models to capture a wide range of processes, systems, and species, and even fewer have modeled the interacting effects of climate and land-use change. Forecasting these impacts requires an integrated modeling approach that draws on extensive monitoring data and that considers the potential interactions between the major drivers of change. This project develops and applies an integrated modeling approach to forecast the potential effects of climate and land-use change on vegetation, faunal species distributions, invasive species risk, carbon storage, and fire regimes. The project will produce projections of the potential combined impacts of climate change and land-use change on the ecological systems and species of the Pacific U.S. states (Washington, Oregon, and California). More specifically, it will provide predictions of changes in fire regimes, carbon storage capacity, vegetation types and patterns, and animal species distributions.

Application Number: A61659

Faculty Member: Joshua Lawler

Role: Principal Investigator

Title: **Managing the matrix for carnivore connectivity: Risks in agricultural landscapes**

Agency: Society for Conservation Biology (SCB)

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

Amount: \$174,090

New

Landscapes which are somewhat permeable to wildlife movement, such as agricultural lands, could potentially play a role in helping animals move across landscapes. Agricultural lands may function as an ecological trap: wildlife drawn in to agricultural areas may be exposed to risks such as pesticide exposure. This project will combine modeling with field work to quantify risks to mammalian carnivores in agricultural landscapes. I will use broad-scale surveys of mammalian carnivore scat to quantify pesticide exposure as well as indicators of health, and combine this with a geographic analysis of landscape variables to produce models which predict places to manage as wildlife movement zones.

Application Number: A61795

Faculty Member: L. Monika Moskal

Faculty Member: Kathy Wolf

Role: Principal Investigator

Role: Co-Investigator

Title: **Geospatial Relationships of Urban Forest Conditions, Stewardship Activity and Environmental Equity**

Agency: UW Royalty Research Fund

Period: 3/28/2011 - 12/31/2011

Amount: \$27,777

New

Urban forest ecosystems need human intervention to enhance health condition and sustain production of goods and services. Few cities have adequate staff or budget resources that are needed to achieve urban forestry planning and management goals. The City of Seattle accomplishes 95% of its urban forest restoration projects through community volunteer activity. Citizen stewards often choose to volunteer at locations based on emotive connections or proximity to their homes. Thus urban restoration activities are volunteer focused, and may not be distributed equitably across the socioeconomic populations of a city. This research will examine urban forest structure and health condition in relation to stewardship activity, and assess the allocation of urban forest resources and stewardship activity for geographic, demographic, and social equity across the pilot location of the City of Seattle. The research will leverage recently completed, high spatial resolution, remotely sensed canopy structure data, spatial statistics, and U.S. Census demographic variables to bridge the gap between quantitative canopy assessment and socio-economic neighborhood characterization in the pilot area of Seattle. The results will aid agencies and organizations to strategically plan where and how stewardship recruitment and projects should happen to benefit both forest ecosystem restoration and community building. We propose an innovative approach to coupled human and natural systems that acknowledges the positive dynamics of stewardship and its consequences for both neighborhood and forest systems in cities. This work will

lead to new hypothesis and collaborative research agenda focused around these topics across any number of cities regionally, nationally and internationally.

Application Number: A61207
Faculty Member: Sarah Reichard
Role: Principal Investigator
Title: **Rare Plant Monitoring 2011**
Agency: National Fish and Wildlife Foundation
Period: 1/1/2011 - 12/31/2011
Amount: \$18,354
New

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 recruits, trains 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: A61288
Faculty Member: Sarah Reichard
Role: Principal Investigator
Title: **Shrub Steppe/Sage-Grouse Habitat Restoration**
Agency: USDI Bureau of Land Management
Period: 1/1/2010 - 9/30/2011
Amount: \$29,982
Non-Competing Supplement

The objective of this project is to contribute field and lab information on restoration techniques and research that leads to more successful restoration projects and an increased availability of restoration materials crucial to the restoration of shrub-steppe habitat that support threatened/endangered (T/E) species on public lands. Under this project, we will investigate and evaluate selected sites for restoration

and conservation priorities, collect field data from existing restoration sites, and research and summarize state-of-the-art restoration techniques that can be applied to current restoration problems. We will also investigate selected species through lab and greenhouse research to develop protocols for development of these species for restoration materials including seed production.

Application Number: A61934

Faculty Member: Stuart Strand

Faculty Member: Sharon Doty

Role: Principal Investigator

Role: Co-Investigator

Title: **Phase 2 Sustainable Range Management of RDX and TNT by Phytoremediation with Engineered Plants**

Agency: US Department of Defense-Strategic Environmental Research and Development Program

Period: 9/12/2010 - 9/11/2013

Amount: \$995,554

Supplement and Extension

Decades of military activity on live fire training ranges has resulted in severe contamination of land and groundwater by recalcitrant high explosives, in particular, TNT and RDX. TNT and its transformation products are highly toxic, but these invariably bind to soil particles and are largely contained at the site of contamination; however, RDX is a major concern, because of its high mobility through soils and subsequent contamination of ground water. RDX contamination of live fire training ranges is now proving to be a threat to aquifers such as those close to the Massachusetts Military Reservation. RDX is not as toxic as TNT, but it still presents an immediate and future health problem to society. Currently, there are no cost effective processes to contain RDX or remediate large areas of contaminated vegetated land on training ranges.

Application Number: A61674

Faculty Member: Eric Turnblom

Role: Principal Investigator

Title: **Digital Point Sampling: Tools and Methods**

Agency: UW Royalty Research Fund

Period: 1/15/2011 - 1/15/2012

Amount: \$28,202

New

Forest managers are charged with achieving stated objectives with their forests. Management actions and activities undertaken are conditioned on the current state of the forest with a view to the goal state. Accurate data reflecting the current state is critical for sound management decisions. The costs associated with data collection ("cruising") are significant and must be paid today, where its returns may be realized in the distant future. Therefore, the benefits of sampling must be weighed against their costs; for some ownerships this means less-frequent inventories, or less-precise surveys, or both. The

effect of less precise and/or frequent timber cruises on the achievement of management objectives is uncertain, but invariably leads to increased reliance on assumptions, which may or may not be verified over time. This proposal introduces digital tools and methods that directly substitute for current analog "cruising" methods while yielding additional information than would otherwise be obtained. The proposed tools and methods are expected to reduce acquisition costs by at least 40 percent.

Application Number: A61073

Faculty Member: Kristiina Vogt

Role: Principal Investigator

Faculty Member: Daniel Vogt

Role: Co-Investigator

Title: **A Synergistic Approach to Biofuel Production: Tribal Natural and Human Resources, New Technology, and Innovative Planning**

Agency: USDA

Period: 3/16/2011 - 3/15/2016

Amount: \$40,192,095

New

Faculty Member: Sandor Toth

Role: Co-Investigator

This proposed project addresses the challenge to improve on a regional scale (1) the transition from fossil fuels to green fuels, (2) the environment represented by the atmosphere, hydrosphere, biosphere and the soil, and (3) the economy and all of these will be linked via (4) education. Commonly the critical needs relative to energy, environment, and economy are considered separately. In sharp contrast, this proposed project addresses these three pressing problems aggressively in a comprehensive manner. It is also designed to integrate existing agricultural and forest systems by using regional resources to supply regional energy demand. This project represents collaboration of two tribes with abundant forest and agricultural lands that have the potential to provide the feedstock for specific biofuels, which in turn are tailored to reduce greenhouse gases as well as the dependence of foreign energy supplies, in accordance with the slogan that "every molecule counts." The other basic ingredient is the technology in terms of evaluating, acquiring, and converting the feedstock, and developing the necessary infrastructure that will result in viable, thriving businesses in the areas of the tribes and beyond. This technology is to be provided by a blend of academic and other non-profit researchers, together with instructors for training, and experts in the various aspects of the business of biofuels and energy parks. Educational and training materials will be used to develop tribal and community college institutional capacity to deliver energy-planning training. A 'new generation coop' will be used to manage all aspects of this project as well as the future commercialization opportunities of the energy parks.

Application Number: A61321

Faculty Member: Daniel Vogt

Role: Co-Investigator

Title: Work Plan for the University of Washington (Washington Cooperative Fish and Wildlife Research Unit) in Managing and Facilitating A Scientific Review Process for CMER by the Independent Scientific Peer Review Program

Agency: WA Department of Natural Resources

Period: 7/1/2010 - 6/30/2011

Amount: \$51,877

New

The Forest Practices Adaptive Management Program's Cooperative Monitoring, Evaluation and Research Committee (CMER) needs to have an independent review process for evaluating research designs and research and monitoring reports that may be used in support of future forest practices rule changes or the creation of new rules. This agreement is for the continuation of an Independent Scientific Peer Review program that will manage and facilitate scientific review for CMER.
