ABSTRACTS AND PRESENTER BIOGRAPHICAL INFORMATION
POSTER PRESENTATIONS

Abstracts for poster presentations and biographical information for presenters are listed alphabetically below by presenting author's last name. Abstracts and biographical information appear unmodified, as submitted by the corresponding authors. A poster identification number is provided next to the presenter's name.

Adam, Ezza (Poster #5)

Ezza Adam, Miss, Researcher. leader of conservation of medicinal and aromatic plants project.

Effect of natural fire on germination and seed storage behavior of Blepharis linariifolia

This study was conducted in Blepharis linariifolia seeds collected from areas subjected to fire to study the short and long term effect of fire on germination. Results from this study showed that response of B.linariifolia seeds to the effect of fire varies in the different stages of maturity, and under different storage conditions and storage duration. However both of mature and pre-mature seeds of B.linariifolia showed secondary dormancy after fire, pre mature seeds storage behavior (dormancy\germintion rhythm) seemed to be more affected by fire than mature seeds, and also seeds under cold storage conditions are most affected. No germination was recorded at zero time of storage, then germination was monitue for duration of 18th months..

Ager, Alan (Poster #76)

Alan Ager is an Operations Research Analyst at the Western Wildland Environmental Threat Assessment Center. His interests include wildfire simulation modeling, landscape planning, and the application of risk cience applications to fuel management planning

Analyzing the transmission of wildfire risk on fragmented landscapes

Large wildfires in the US and elsewhere burn over long distances and typically cross many ecological and anthropomorphic boundaries. When conditions in one parcel strongly affect wildfire risk factors (likelihood, intensity) in an adjacent parcel, risk is potentially transmitted from one to the other. Current wildfire simulation methods limit the practicality of estimating transmitted E(L) primarily because processing pixel-specific intensity maps for a large number of fires would be overwhelming. Estimating transmitted P is, however, possible using recent modeling enhancements that allow efficient calculation and storage of simulated wildfire perimeters. In this paper we describe initial work to quantify the transmission of wildfire risk, focusing on the exposure (likelihood and intensity) component of risk. We studied transmission on and around a typical national forest that was divided into numerous land designations as part forest planning efforts. We used simulation modeling to examine the transmission of wildfire exposure among the land designations, and the effect of fuel treatments to reduce it. We built transmission network diagrams with social networking software (CASOS) and used graph theory to characterize land designations in terms of their network properties. The results of the study will be discussed in the context of fuel management planning and conservation planning.

Agne, Michelle (Poster #26)

Michelle Agne, Graduate Student, Oregon State University I am a second year master's student studying forest disturbance ecology at the College of Forestry at Oregon State University with Dave Shaw. I am a Rick Strachan Fellow and a graduate representative to my department. I have spent the last three summers working in the mountain pine beetle disturbed lodgepole pine forests of Central Oregon.

The effect of mountain pine beetle and dwarf mistletoe on canopy structure and fire behavior in Oregon lodgepole pine forests

Mountain pine beetle (Dendroctonous ponderosae), lodgepole pine dwarf mistletoe (Arceuthobium americanum), and fire are three important agents of disturbance in lodgepole pine forests in Central Oregon. Both mountain pine beetle and dwarf mistletoe have impacts on stand structure that may have significant importance to fire potential, and specifically may impact the likelihood of an active crown fire. Although recent mountain pine beetle epidemics in British Columbia and the Rocky Mountains have incited research regarding changes in fire behavior post-epidemic, studies accounting for the structural impacts of dwarf mistletoe have not been conducted. Because both mountain pine beetle and dwarf mistletoe are widely distributed and often occur simultaneously in lodgepole pine forests, their combined impacts on canopy struc-

ture must be investigated to create more accurate fuel models to inform fire behavior models for use in these areas. The broad aim of the proposed research is to gain a better understanding of the predictive power of fire behavior models in disturbed lodgepole pine. This goal will be met by two objectives: (1) Understanding differences in canopy structure between lodgepole pine stands influenced by dwarf mistletoe and mountain pine beetle and those that are not, and (2) predicting fire behavior in these stands using information about canopy structure. To meet these objectives I hypothesize that (i) stands severely infected with dwarf mistletoe have a significantly lower canopy base height than uninfected stands and (ii) the difference in canopy base height significantly increases the likelihood of crown fire in infected areas as predicted by a fire behavior model when compared with uninfected areas. Measurements taken will lead to more accurate prediction of fire behavior in areas disturbed by mountain pine beetle and dwarf mistletoe. Improvement of these models is needed to determine areas of high fire risk and potential areas for fuels treatments.

Alvarado-Celestino, Ernesto (Poster #65)

Ernesto Alvarado Celestino studied forestry in Mexico, and then obtained a Ph. D. from University of Washigton, where he is now part of the faculty.

Physical Properties of Downed Woody Debris in Mexican Ecosystems

Down Woody Debris include all branches and trunks that fall into the ground, constitute an important component of forest floor fuels, and together with litter duff constitute the combustion environment. In 2004, The Mexican Forestry Commission launched a new protocol for the National Forest Inventory (NFI), which is intended to record information on all different terrestrial ecosystems in Mexico through the repeated measurement of vegetation plots every five years. As part of such inventories, data on Downed Woody Debris are being measured in a subset of those plots, to document fuel loads and to use that information towards a more adequate planning of countrywide fire management strategies. However, Van Wagner's basic equation to estimate DWD loads from line census data, requires information on physical properties, particularly on mean diameters of particles and specific gravity of fuels. Here we report a literature analysis of data available on physical properties for fuels in Mexican ecosystems. Our objectives were to provide adequate estimates of physical properties for those ecosystems where enough information existed, and to identify forest ecosystems where this information is scarce, and hence more research is needed. We classified the major forest ecosystems found in Mexico into six major classes, which in turn were divided into 17 forest type categories. We found 65 references with useful information. Most information was available on wood specific density for 1000 hr particles. Pine forests had by far the most information, but even fire prone ecosystems such as broad leaved temperate forests had few quantitative reports. Most information on seasonally dry and wet tropical forests came from reports of tree species densities. Clearly, descriptive research on physical properties of DWD in most Mexican ecosystems is needed for the NFI fuel information to serve its intended purpose.

Andrews, Garren (Poster #46)

Garren M. Andrews California Polytechnic State University, San Luis Obispo Graduate Research Assistant Master of Science in Forestry Sciences candidate

Developing post-fire mortality predictive models for the major overstory tree species in the Santa Cruz Mountains of California

We investigated how fire severity impacts the mortality of multiple species in the Santa Cruz Mountains of coastal California, including coast redwood (Sequoia sempervirens), Douglas-fir (Pseudotsuga menziesii), and tanoak (Lithocarpus densiflorus. During August 2009 the Lockheed fire burned nearly 3,160ha of mixed-conifer stands with variable severity. Data from 37 Continuous Forest Inventory (CFI) plots were collected immediately before and for the following 2 successive years following the 2009 Lockheed Fire. This research quantified post-fire mortality of trees that vary in species, size, and fire severity. We developed logistic regression models that predict post-fire mortality from a combination of fire severity and tree physiological measures for Coast redwood, Douglas-fir and tanoak. Understanding the relationship between burn severity and mortality can allow for better post-fire predictive services and management. This research can support forest managers in determining the best management practices to facilitate long-term sustainability and protection of environmental infrastructure within Coast redwood/Douglas-fir forests.

Arsenault, André (Poster #43)

André Arsenault, Forest Ecologist, Canadian Forest Service

Response of the understory plant community to prescribed fire, screefing, grazing and logging in dry interior Douglas-fir forests of southern British Columbia.

Dry forests of British Columbia's southern interior are considered ecosystems of conservation concern due to a long history of habitat loss and the presence of species at the northern extent of their range. A wide variety of management systems have been used to direct vegetation succession for range and timber objectives over the last century. More recently other management systems also aimed at directing succession in these forests have emerged i.e. ecosystem restoration and fuel reduction treatments. Surprisingly, very few experiments have been done to evaluate the success, trade-offs, and costs of such treatments. The Isobel project near Kamloops, British Columbia, was initiated in 2001 to develop and assess prescriptions to maintain prolonged open canopy conditions in dry Douglas-fir forests. The experiment involves three levels of harvesting removal (0% (control), 50–60% and 75–80%), three site preparation treatments site preparation treatments (no site preparation, mechanical spot screefing, prescribed fire) nested in and out of livestock exclosures. Vegetation response was monitored at 2160 1 m2 vegetation plots distributed in the 72 treatment units. Species composition generally fell into three main groups following harvest: increasers such as pinegrass (Calamagrostis rubescens); decreasers such as rattlesnake plantain (Goodyera oblongifolia); and species such as common snowberry (Symphoricarpos albus) whose response appears to be more closely associated with site factors such as soil moisture than understory light. Few species were only associated with prescribed burns which suggest that the plant community is well adapted to a variety of disturbance agents and is not "fire dependent". The severity and number of disturbance types which overlap are key in predicting vegetation response. These results will assist in developing tools for directing succession in dry forests to achieve a variety of objectives in sustainable and cost-effective manner.

Assal, Timothy (Poster #12)

Timothy J. Assal U.S. Geological Survey and Colorado State University Tim is a graduate student in the Graduate Degree Program in Ecology at Colorado State University and an ecologist with United States Geological Survey Fort Collins Science Center. The focus of his graduate research is detection, assessment and monitoring of disturbance in temperate forest and woodland ecosystems. My work attempts to quantify vegetation and landscape change over time and elucidate the mechanisms responsible for change.

Assessment of Burn Severity and Post-Fire Araucaria-Nothofagus Regeneration in Tolhuaca National Park

Araucaria araucana is a long lived evergreen conifer tree that forms both pure and mixed stands with several deciduous species of Nothofagus in the Andean cordillera of southern Chile and Argentina. Fire is a primary disturbance agent in this forest type and its ecological legacy (both frequency and severity) is manifested on the current landscape through the mosaic of Araucaria-Nothofagus forest patches. During the fire season of 2001-2002, over 60% of Tolhuaca National Park (Chile) was impacted by wildfire. Our research attempts to quantify the impact of this high severity fire on forest mortality and regeneration within the park. Specifically, we evaluate the performance of the Normalized Burn Ratio as a measure of burn severity of the canopy of Araucaria-Nothofagus forest type and characterize post-fire regeneration. The Normalized Burn Ratio was calculated from two Landsat Enhanced Thematic Mapper scenes that were acquired before and after the fire. The change in the Normalized Burn Ratio was classified into four categories of burn severity. A field assessment was conducted in a portion of Tolhuaca National Park in March 2012 to collect data on pre-fire stand characteristics and post-fire regeneration over the last decade. Results suggest that burn severity as a function of Araucaria-Nothofagus mortality can be mapped accurately using remote sensing data. Furthermore, the classification identified a steep severity gradient on the landscape which was confirmed by the field data. Results on Araucaria-Nothofagus regeneration with respect to burn severity, landscape position and competition from other species will also be presented. The study uses an existing metric to quantify burn severity in a novel forest type. Furthermore, the study highlights the value of the remote sensing archive to fill data gaps and provide resource managers with inexpensive, spatially explicit data of disturbance events.

Balog, Cameron (Poster #112)

Cameron M Balog Owner, Fire Management LLC Los Alamos, NM

First Order Fire Effects Burning Invasives along the Rio Grande River, TX

In August 2012, National Park Service fire and resource management personnel implemented the first phase of an adaptive management project to reduce invasive giant cane (Arundo donax) and salt cedar (Tamarix spp.) along the Rio Grande River in Big Bend National Park. It is believed that reducing the density of these exotic species will allow the Rio Grande to return to more normal flow patterns. The objective of the burn was to reduce biomass of these species allowing for resource crews to follow closely in the future with herbicide application. A total of 180 acres were treated over 9 river miles.

Balog, Cameron (Poster #113)

(See biographical information, above.)

The National Fire Plan Build-Up: A Good Deal?

The National Fire Plan, enacted in 2000, resulted in a rapid build-up of federal wildland fire suppression resources with promises of landscape-level fuels treatments and containment of fire suppression costs across the United States. During the same period of time, fire suppression costs have skyrocketed as record-breaking fire seasons regularly burn more acres than ever. This analysis will examine whether the public has received a good return on their investment in federal firefighting resources. In this era of declining government agency budgets, it the current firefighting force sustainable?

Barbero, Renaud (Poster #56)

Renaud Barbero Postdoctoral Researcher University of Idaho, USA My research focuses on the mechanisms underlying climate variability and fire activity. Specific interests include wildfires and antecedent climate conditions, atmosphere-ocean processes in relation to different types of El Niño Southern Oscillations (ENSO), Pacific Decadal Oscillation (PDO) and their teleconnections to rainfall variability over SW Pacific. My current research is on the relationships between megafires, weather and climate in the eastern United States.

An Objective Examination of Santa Ana Wind Events and Wildfires in Southern California

Santa Ana winds (SAW) are among the most notorious fire-weather patterns in the United States and have resulted in widespread impacts over the last decade in southwestern California. Whereas SAW have widely been documented as contributing to the bulk of wildfire area burned in southern California, the lack of an objective means of diagnosing SAW over an extensive fire history has limited a full evaluation. This study employs an objective approach to identify SAW through synoptic-scale dynamic and thermodynamic factors using National Centers for Environmental Prediction (NCEP)/ National Center for Atmospheric Research (NCAR) reanalysis. Specifically, we find that a strong northeastward gradient in sea level pressure aligned with strong cold air advection in the lower-troposphere can be used in a two-parameter threshold model to identify days with extreme fire weather. Our SAW diagnostic is validated using fifteen years (1996-2010) of surface data from twenty-two Remote Automated Weather Stations across southwestern California. Results show strong agreement between synoptic factors and realizations of surface-based SAW characteristics and extreme fire weather as viewed through the Fosberg Fire Weather Index. This methodology is used retrospectively (1948-2010) to examine relationships between SAW events and wildfire in southwestern California over the past 63 years.

Bates, Jon (Poster #68)

Jon Bates, Rangeland Ecologist, USDA-ARS. Jon Bates has been with a ARS for 13 years with a research emphasis in post-fire ecology in sagebrush steppe and western juniper woodlands as well as evaluating post-disturbance grazing systems.

Livestock grazing after fire in the sagebrush steppe

Prescribed fire in rangeland ecosystems is applied for a variety of management objectives including increasing the productivity of forage species. Information on the impacts of grazing to community dynamics following fire in big sagebrush steppe is limited. We evaluated cattle grazing impacts over 10 growing seasons following prescribed fire on Wyoming big sagebrush steppe in eastern Oregon. Treatments have included timing of grazing after fire and grazing intensity (light, moderate, heavy). Timing of grazing treatments after fire included no grazing, two summer grazing applications, and two spring grazing applications. Treatment plots were burned in the fall of 2002. Timing treatments were applied from 2003-2007 (moderate grazing only), and grazing intensity trials were applied from 2007-2012. Vegetation responses in the treatments were evaluated by quantifying herbaceous canopy cover, density, standing crop and annual yield. With moderate grazing (30-50% utilization) herbaceous response variables did not differ among grazed treatments, regardless of when livestock were reintroduced after fire, when compared to the ungrazed burned treatment. All burn-grazing treatments had greater herbaceous cover, standing crop, and annual yield than unburned controls. Herbaceous cover, standing crop, and annual yield were greater in light (15-30% utilization) and moderate grazing treatments than heavy grazed (70% utilization) treatments. The results demonstrated that light to moderate livestock grazing after fire will not hinder the recovery of herbaceous plant communities in big sagebrush steppe. Heavy grazing reduces ground cover and herbaceous productivity within a 5–year period.

Battaglia, Mike (Poster #102)

Mike Battaglia is a Research Forester at the USFS Rocky Mountain Research Station in Fort Collins. His research focuses on developing and implementing innovative management strategies that address the challenges and issues faced by forest managers including forest restoration, fuels mitigation, and forest resilience across multiple spatial scales.

Short-term ecological effects of mastication fuels reduction treatments in Colorado

Over the past decade, fire managers have increased their use of mastication treatments, the on-site disposal of shrubs and small-diameter trees through chipping and shredding. Mastication is a relatively untested management practice that alters the chemical and physical conditions of the forest floor and may influence vegetation regrowth and fuel development for years or decades. Mulch additions increase both the load and continuity of surface fuels, and create a new forest floor layer that may act as a physical barrier to plant germination or as a nutrient sink that retards plant growth. Plant inhibition by mulch layers could be short-lived, and, with time plant growth might be stimulated by changes in soil resources and site conditions as mulch layers age. The long-term effectiveness of mulch treatments will depend on physical and chemical conditions of the mulch layer, how these influence forest floor and soil resources and the recovery of herbaceous and ladder fuels. Our study includes 18 sites in 4 forest types distributed across the southern Rocky Mountains and Colorado plateau. We apply a common study design to assess factors that control mulch treatment longevity and quantify how the ecological responses to mastication vary with mulch quantity and arrangement and through time. Our approach combines multi-year observational studies, which will identify temporal patterns in plant and soil responses to mastication treatments, with carefully designed manipulation experiments, which will help to elucidate the mechanisms responsible for the trends observed.

Bauer, Elizabeth (Poster #21)

Elizabeth A. Bauer B.S. degree in Fire Ecology and Management B.S. degree in Forest Resources 5th year at the University of Idaho 2012 Research Experience for Undergraduates (REU) Award Recipient

Removal of native seeds after wildfire in sagebrush habitat

The redistribution of seed post-fire is an integral part of reestablishing plant communities and is likely facilitated by granivorous animals, including rodents. However, the associations between rodents and seeds after fire have not been well established. Large, intense fires could affect rodent seed interactions through rodent mortality, changes in habitat structure, or seed availability. We examined patterns of seed removal for bluebunch wheatgrass (Pseudoroegneria spicata), Indian ricegrass (Achnatherum hymenoides), and Lewis flax (Linum lewisii) seed species, which are used in Emergency Stabilization and Rehabilitation treatments, following a wildland fire. In the recently burned Kinyon Fire near Castleford, ID, we selected three Artemisia and three grass patches to evaluate seed removal patterns. At each patch, we offered 20 seeds of each species in Petri dishes in the center of the unburned patch, edge of burn, and 20 and 30 m into the burned. After four nights, dishes were collected and the numbers of seeds removed were quantified. Seed removal was higher in Artemisia than in grass patches. For Artemisia patches, the center, edge and 30 m into the burn had similarly high amounts of seed removed, while seed removal at 20 m into the burn was relatively low. For grass patches, the center and 30 m into the burn had similarly high amounts of seed removed, slightly decreasing 20 m into the burn, while the edge had a minimal amount of seed removed. Our results show that rodents are actively foraging for seeds post fire, particularly in nearby Artemisia patches. However, no clear patterns have emerged for distance into unburned or burned areas. Granivorous rodents may significantly influence plant recovery post fire through redistribution of seed species in this particular fire.

Blankenship, Kori (Poster #80)

Kori Blankenship is an ecologist with The Nature Conservancy. Currently, Kori works on the LANDFIRE project applying its tools and data to solve conservation problems.

LANDFIRE Data for Land Management

LANDFIRE is a nationwide, multi-partner project designed to map and model vegetation, fire regimes and fuel characteristics for the entire United States. LANDFIRE products include a suite of more than 20 geospatial layers and vegetation dynamics models describing reference conditions for every ecological system mapped in the country. The comprehensive nature of the products and the consistent methods used to produce them make LANDFIRE datasets valuable for land management, conservation planning and treatment prioritization activities. LANDFIRE products were designed to work at national, regional and large sub-regional landscapes (such as fire management units) but tools and guidance are available to help users review and modify the data as needed for finer scale applications. In addition to explaining the LANDFIRE

process and products, this poster highlights real-world examples of applying the products for calculating nation-wide conservation risk, assessing state-wide forest conditions and supporting fire management activities.

Bonine, Holly (Poster #30)

Graduate Student at the University of Texas, member of SAFE

Central Texas Student Association for Fire Ecology

The Central Texas Student Association for Fire Ecology was founded in September 2012 by graduate students at the University of Texas at Austin with the aims of creating an interdisciplinary network of fire ecologists throughout the central Texas region.

Bova, Anthony (Poster #77)

Anthony Bova is a research associate at The Colorado State University Department of Forest & Rangeland Stewardship. He earned an M.S. in Environmental Engineering from the Ohio State University, where he received a NASA Fellowship, and has over ten years of experience as a modeler and experimentalist in the fields of wildland fire, fire effects and atmospheric dispersion.

Development and Evaluation of the Physics-based WIldland-Urban Interface Fire Dynamics Simulator

Given the state of current computer technology, physics-based fire models generally cannot provide simulations wildland fire spread quickly enough for operational use. However, because of their high physical fidelity, due especially to the coupling of fire and atmospheric dynamics, the utility of validated, physics-based models lies in their use to create "numerical experiments" that can then inform computationally faster, empirically-based models. As important, physics-based models can be used to develop new hypotheses regarding fire behavior that can assist in the design of future experiments. The open-source model suite, Wildland-Urban Interface Fire Dynamics Simulator (WFDS), contains a physics-based model of wildland fire that is built upon the structure fire model, FDS, developed by the National Institute of Standards and Technology. WFDS contains a boundary fuel model for simulating unresolved surface vegetation, and a fuel element model for simulating individual trees or vegetation canopies. Because it employs well-validated numerical models of combustion, fluid dynamics and thermal radiation, it is particularly suited for simulating fire spread and the effects of fire on flammable structures. WFDS validation uses measurements from laboratory-scale fire spread experiments and field-scale prescribed burns and wind measurements. Here, we discuss completed and ongoing validation efforts of the component models in WFDS (e.g., radiation) and of the complete model (e.g., fireline behavior).

Butler, Benjamin (Poster #81)

Ben Butler is the Wildland Fire Decision Support System GIS Specialist, Based in Boise, ID at the National Interagency Fire Center (NIFC) Ben's position is within the Wildland Fire Management RD&A (WFM-RD&A). His responsibilities include the management of WFDSS geospatial data, integration of disparate interagency data sources into single data sets, and technical GIS support within the WFM-RD&A and to WFDSS. Ben holds an undergraduate degree in Environmental Geography and a Master of Natural Resources degree with a concentration in fire ecology. His interests and experience emphasize leveraging technology to solve natural resource and wildland fire issues. He spends his time with his wife and young son camping, fishing, hunting and enjoying the outdoors in the great state of Idaho.

Wildland Fire Decision Support System – Spatial Data Acquisition, Integration, and Management

The Wildland Fire Decision Support System (WFDSS) is a "data rich" application bringing spatial data to the forefront of decision-making on wildland fires. WFDSS leverages more than 45 disparate sources of geospatial and tabular data; ranging from building clusters to LANDFIRE fuels data and beyond, to support strategic fire management decisions. The Wildland Fire Management RD&A-WFDSS works collaboratively with interagency partners to assemble geospatial data from an array of sources to create and maintain merged data sets. These data sets are then utilized within the WFDSS application to paint a visual picture of the location, type, and number of values and/or assets within close proximity to a fire incident. By providing timely, accurate, and complete data sets the WFM RD&A and WFDSS strive to provide the right data at the right time to help raise situational awareness and better inform decision makers.

Caplan, Todd (Poster #110)

Todd Caplan is a restoration ecologist based in Albuquerque, New Mexico with GeoSystems Analysis, Inc. He has spent the past 18 years implementing and monitoring floodplain habitat restoration projects along the Rio Grande and more recently along the Lower Colorado River. He has also served as principal investigator on several post-fire vegetation recovery monitoring projects, including projects to evaluate aerial seeding success following the Rodeo-Chediski Fire (AZ) and Paradise Fire (CA). Mr. Caplan currently provides technical scientific and habitat restoration management support to federal, state, tribal and non-profit clients throughout the southwest.

Post-Fire Rehabilitation of the Sacramento Wash Fire, Havasu National Wildlife Refuge, AZ

The Sacramento Wash Fire occurred in October 2008 on a densely vegetated alluvial fan abutting the Lower Colorado River near Topock Marsh, AZ. The fire burned approximately 240 acres of dense tamarisk (Tamarisk ramosissima and T. aphylla) and approximately 41 acres of emergent wetland vegetation. Post-fire site assessments were peformed to document soil types (Order 2 survey), map soil salinity (EM-38 survey) and map pre-fire vegetation distribution. These data were used to prioritize restoration areas, to design a soil salinity mitigation strategy and develop a revegetation plan. Extensive site preparation was required to remove dead and down T. aphylla trees from the proposed salinity mitigation / revegetion zone. A groundwater well and solid set irrigation system were utilized on a 22-acre area to leach salts and bring salinity levels below the upper thresholds for growing screwbean mesquite trees. Once salinity levels were lowered to the desired level, the site was planted with 1700 potted trees and shrubs, and the site was seeded with salt-tolerant shrubs and grasses. This poster presents the sequence of major restoration planning and implementation steps, provides first year results, and discusses lessons learned.

Cassell, Brooke (Poster #2)

Brooke A Cassell is a graduate student in the University of Washington's School of Environmental and Forest Sciences with the Pacific Wildland Fire Sciences Laboratory. She completed her master's thesis in June 2012 and is beginning her PhD studies this fall. Her research interests include fire ecology, dendrochronology, restoration ecology and using tropical hurricane debris as feedstock for biochar. She is also an ardent fungophile and co-owner of an urban gourmet mushroom farm.

Fire History of the Sierra de Manantlán Biosphere Reserve in Western México

A dendropyrochronological study was conducted in the Sierra de Manantlán Biosphere Reserve in western Mexico. Fire has been attributed as one of the most influential factors in vegetation and succession in the reserve with fire regimes ranging from frequent, low severity to infrequent, high severity across its heterogeneous, mountainous landscape. This study reconstructs fire frequency in the pine-dominated forests across 740 hectares in and around the Las Joyas Scientific Research Station, part of a core protected area of the reserve. A master tree-ring width chronology spanning 1881 – 2009 was compiled, and crossdating was used to create a composite fire history of 17 fire years between 1938 – 2009. This study establishes Pinus douglasiana as a viable species for tree-ring studies, despite its high occurrence of false, missing and diffuse rings, and serves both as a foundation for development of scientifically informed restoration and fire management plans and as valuable background for future fire ecology studies in the region.

Castillo, Maria (Poster #8)

María Faviola Castillo, MSc PhD Student, University of Guadalajara I have been working with fire ecology and fire management for 10 years with diverse research projects focusing on development of management strategies and designing action plans for a natural protected area combining social and environmental needs. Lately I have focused more on conducting research on fire effects on vegetation in order to identify consequences of management on community assemblages, combining effect of fire regime shifts and fire management policies. Some publications in colaboration with Enrique Jardel: Villers-Ruiz L. and J. López-Blanco. 2004. Incendios forestales en México, métodos de evaluación. Flores-Garnica G. 2009. Regímenes de fuego en ecosistemas forestales de México. Also presentations at national and international conferences.

Tree species response to fire: a morpho-functional approach from a mountainous forest in the Sierra de Manantlan, Biosphere Reserve

Research on fire effects on vegetation has focused on individual species, making it difficult to achieve in high species richness areas, such as the mountainous pine-broadleaved forests of Sierra de Manantlán, western Mexico. It is central for fire management to understand and anticipate to spatial and temporal changes in species composition as a response to specific fire regime attributes, i.e. time since last fire and severity. The functional types approach has been recently applied to describe vegetation response to fire and it is based on a selection of life history attributes needed for survival, dispersal, estab-

lishment and maintenance in periodically burned areas. We selected 16 attributes for 52 tree species and grouped them into five morpho-functional types, using multivariate techniques of classification and ordination. After identifying three main types, conifers, oaks and broadleaved, the later was further classified into tolerant and persistent to fire. This sub-grouping indicates a gradient of tolerance to fire within the attributes and species considered. The resulting morpho-functional types suggest that the selected attributes could help to describe species assemblages responding to fire regime attributes. Classifying in large groups the high biodiversity of mountainous forests of México, not only allows summarizing the numerous species responses to fire, but also provides a mean to model and forecast the effect of altering fire regimes or the effect of different management strategies.

Chappell, Linda (Poster #73)

Linda M. Chappell, Fire Ecologist, Dixie and Fishlake National Forests. Linda has assisted developing, implementing and monitoring managed fires in southern Utah on federal lands. She is interested in long-term vegetation monitoring and ecosystem health across the many fire-adapted ecosystems there.

How do you get the monitoring done? Use a Partnership.

How do we get the monitoring done? Use a Partnership. A partnership (contract) between the Student Conservation Association (SCA) and the Dixie and Fishlake National Forests allows both forests to inexpensively gather quality fire/fuels data while simultaneously training students. An SCA three-person crew is hired annually. The forests' fuels specialists prioritize projects and coordinate their data needs with the fire ecologist and fire ecologist intern. Our fire ecologist intern is the crew's liaison throughout the season and is often in the field with them. They camp out on most projects which reduces costs, increases safety through reduced travel time and maximizes time spent collecting and processing data. The partnership's intent is to: Provide an affordable and practical way to plan and collect fuels and vegetation data. Assess this data to meet fuels monitoring objectives Provide a quality work and educational experience Develop SCA student leadership, fuels inventory and monitoring skills, data collection, and wildland fire management and monitoring skills. At season's end, SCA students summarize data in FEAT/Firemon Integrated. Forests and districts may use these to refine burn prescriptions, adjust cutting/thinning parameters, etc. This is the crew's 6th year; we are now able to compare pre- and post-treatment fire and fuels effects.

Chavardes, Raphael (Poster #10)

Raphael D Chavardes, MSc Student, University of British Columbia Author in recently published peer reviewed journal: Chavardes, R.D., L.D. Daniels, P.O. Waeber, J.L. Innes, and C.R. Nitschke (2012) Unstable climate-growth relations for white spruce in southwest Yukon, Canada. Climatic Change

The sensitivity of tree species at the site and landscape level to disturbance and climate change in the southwest Yukon, Canada

In the southwest Yukon, concerns of local forest managers to climate change include an increase in fire occurrence, a repetition of the recent spruce bark beetle epidemic and increasing failures in forest establishment. Over the 21st century, the cold and dry boreal forest landscape of the southwest Yukon is anticipating increasing precipitation and temperature. In our study multiple scales were considered to understand impacts of climate change and ecosystem processes on transient dynamics and interactions between tree species and disturbance. Site-level direct effects of climate change on species were not detected at the landscape-level; however, climate change interacting with fire directed species response. Using a stochastic landscape model (LANDIS-II) and a mechanistic species distribution model (TACA), our findings suggest white spruce will remain the dominant tree species in the Champagne and Aishihik Traditional Territory over the following 200 years even under high climate warming scenarios. Modeled changes to the region's fire regime indicate fire increases forest sensitivity to climate change, which is likely to reduce the dominance of white spruce in the landscape in favor of tree species with pioneer characteristics such as trembling aspen, balsam poplar, and lodgepole pine. Climate change will likely place ecosystems at greater risk to wildfire; however, it may reduce the landscape's susceptibility to future spruce bark beetle epidemics due to increases in landscape heterogeneity. Our study identified the need to consider the interaction between species, edaphic conditions, climate and fire when assessing the impacts of climate change on forest landscapes. Our study also illustrated that landscape structure will change more rapidly then its composition due to transient dynamics and species inertia.

Comfort, Emily (Poster #86)

Emily Comfort is a PhD candidate at Oregon State University. She studies management options for wildfire risk reduction and wildlife habitat protection.

Northern Spotted Owl use of fire created and managed forest edges in southwest Oregon dry conifer forests

Loss of habitat from wildfire in the dry forest region of southwestern Oregon is a concern for the regional persistence of northern spotted owls (NSOs), a federally-listed, threatened species. However, NSOs in this region may be adapted to the historic mixed-severity fire regime. They may prefer "edge" habitat where prey species such as woodrats have access to both open grass and shrubs for foraging and forests with multiple canopy layers for cover and nesting. The historic mixed severity fire regime would likely have created abundant edges of this type. Previous research has suggested the amount of "edge" to be an important habitat variable for NSOs. However, in studies in which edge is used as a habitat variable, it is generally broadly characterized as the interface between suitable habitat (old forests) and "non-habitat." Non-habitat can include many different landscapes, from managed second growth forests to rock outcroppings. Because it is likely that NSOs use some types of edges more than others, this research project attempts to better characterize the types of edge that NSOs select for in a landscape with both managed edges and fire-created edges. Telemetry data was collected on 23 NSOs following the 11,000 ha Timbered Rock fire. The fire burned through both a checker-board landscape with BLM and private timber lands and more contiguous Forest Service land, so there is an opportunity to observe use at a range of both managed and fire-created edges.

Comfort, Emily (Poster #87)

(See biographical information, above.)

Collaboration and fire management: creating new trajectories for disturbed landscapes.

The Applegate Valley in southern Oregon, USA has experienced many changes in the last three hundred years. For approximately 4,000 years, Native American management likely included fire as a tool for protecting oaks from conifer encroachment, enhancing acorn crops, and improving hunting grounds by maintaining open grasslands, shrub fields, and oak savannahs and woodlands. During the early settlement periods, fire was likely used as a tool to clear land for grazing and mining. Since the late 1800's fire has generally been excluded from the landscape, first with a reduction in anthropogenic fire and finally with effective fire suppression by the 1950's. This change in fire regime, coupled with other changes in land management such as agriculture, grazing, and timber harvests have altered the composition and structure of the landscape. The current landscape has higher tree density and more homogenous tree composition. This structure is more likely to promote more severe, less complex, and larger fires in the future. In addition to these ecological concerns, the landscape has a complex socio-economic history that has left managers with multiple, conflicting mandates. The area is currently designated under the Northwest Forest Plan as an adaptive management area, which allows for management that tests alternative approaches to meet the goals of the plan. However, there are other restrictions that also direct the BLM to manage for northern spotted owl protection and for timber harvest to create income for counties. The Pilot Joe project was implemented in 2012 after considerable public involvement, outreach, and scientific research as a demonstration project to test ecological forestry practices that can potentially balance the multiple management directives. Monitoring research is continuing to measure the effectiveness of the demonstration for achieving the ecological and socio-economic goals of the project.

Condon, Lea (Poster #7)

Lea A. Condon is a PhD student in Botany and Plant Pathology at Oregon State University. Her masters thesis examined plant succession in a pinyon-juniper woodland following fire.

An examination of biological soil crust recovery following fire across the sagebrush steppe of the Intermountain West: Do they follow successional patterns?

Cheatgrass often dominates following fire in the Great Basin resulting in changes to nutrient and water balances. Water and nutrient availability are also affected by biological soil crusts, although little is known about biological soil crust recovery following fire. The primary objective of this study is to determine if biological crust species, specifically moss and lichen components, follow successional pathways after fire. We explore four hypotheses in this study: (1) the occurrence of biological soil crust species is primarily determined by the amount and timing of precipitation following fire as well as the nutrient composition of the soil and grazing intensity at the site, (2) associations between crust species are likely to show decreased similarity and increased diversity at the drier end of the precipitation gradient, (3) biological soil crust species

will show a range of tolerances to fire as demonstrated by abundance relative to unburned areas after accounting for abiotic conditions, fire severity and time since fire, (4) associations between crust species and plant species will indicate facilitation effects between the two. We are working at the regional scale, across a range of precipitation gradients while remaining within the sagebrush /salt desert scrub vegetation types and loamy soils. Findings will enable land managers to include the biological soil crusts in their prioritization of restoration efforts following fire. Preliminary work showed a greater decrease in the cover of moss species when compared with lichen species following fire. This might be due to observed associations between moss species and common woody species: Artemisia tridentata ssp. vaseyana (Rydb.) Beetle, Juniperus occidentalis Hook., and Purshia tridentata (Pursh) DC.

Cordell, Susan (Poster #60)

Susan Cordell received her MS (1996) and PHD (1999) degrees in Botany from the University of Hawaii at Manoa. In 1999 she began a post doc, and now as a research ecologist, with the USDA FS, Institute of Pacific Islands Forestry. The focus of most of her professional career has been related to the conservation, preservation, and restoration of Hawaii and Pacific Island Ecosystems.

Practical tools for managing fire and restoring tropical dry forest landscapes on military lands in the Pacific

Tropical dry forest landscapes on military lands in the Pacific are declining at alarming rates, largely a result of fire that originates with invasion of native ecosystems by fire-prone invasive grasses and shrubs. These novel fire regimes have serious impacts to cultural and natural resources, and the health and safety of the region's citizens. We suggest that scientifically based tools developed to strategically inform natural resource management may be the most cost-effective approach to protect and restore native biodiversity, and reduce fuel loads, fire danger, and fire impacts while also controlling invasive species establishment and spread. We have combined newly developed remotely sensed information with field-based studies on the Island of Hawai'i to: 1) define the current condition and historical changes to tropical dry forests, 2) develop technology for restoration planning and ecosystem monitoring, 3) quantify restoration potential and develop restoration prescriptions for remnant dryland ecosystems, and 4.) develop effective fire risk reduction measures that protect forest fragments and initiate succession of degraded grasslands into native woody communities. Remotely sensed data have provided insights on historical dryland communities; aerial photography analysis indicate forest change over time; high-resolution ecosystem mapping has informed natural resource management planning efforts; and near real time web based satellite monitoring provides land managers an effective tool to evaluate fire danger. Field-based methods address the potential for restoration of native species to alter ecosystem structure to reduce fuel loads and fire danger, the major barriers to restoration across remnant native community types, and test the effectiveness of a firebreak design that incorporates traditional fuel-breaks grading into "greenstrips" planted with fire resistant native species. Results from this project benefit the military mission in the Pacific by increasing capacity and knowledge to restore native forests, thereby reducing wildfire and enhancing habitat for threatened and endangered species.

Creighton, Janean (Poster #116)

Janean Creighton is an Associate Professor and Extension Specialist at Oregon State University College of Forestry. Janean's position focuses on increasing the information delivery and technology transfer capabilities of the U.S. Forest Service Pacific Northwest Research Station (PNW) fire and fuels researchers, and to integrate PNW station and other wildfire and fuels management into existing and emerging extension curricula, publications, and educational programs. Janean received her M.S. in Wildlife Biology and her Ph.D. in Environmental and Natural Resource Sciences, both from Washington State University. She is currently the Administrative Director for the Northwest Fire Science Consortium.

The Northwest Fire Science Consortium: Facilitating knowledge exchange and collaboration

The frequency of large wildfires in the forests and rangelands of the Pacific Northwest has increased over the past 50 years, and is expected to further increase in a changing climate. The number and types of managers and practitioners involved in wildfire management has also grown. Government agencies, land managers, air quality regulators, nonprofit organizations, community leaders, and others have diverse fire biophysical and social science needs. To protect and restore fire-adapted human and ecological communities and natural resources in the Northwest, we need a fire science delivery system to effectively disseminate and accelerate user adoption of pertinent information, knowledge, tools, and expertise. We also need a better system providing researchers with information about the needs of fire science users. The Northwest (NW) Fire Science Consortium is a comprehensive fire science delivery system designed to enhance the exchange of existing fire science and technologies throughout the region, and encourage fire and land management stakeholders to evaluate and adopt relevant fire science. The NW Consortium offers unique opportunities to increase cross disciplinary collaboration and

facilitate the delivery of fire science to diverse stakeholders and serve the diversity of needs in the Pacific Northwest. The effectiveness of the NW Consortium will be determined in large part by the degree to which new communication networks are established and existing ones strengthened. Methods and metrics for measuring these changes will involve both formative and summative evaluation. Once implemented, the activities and outcomes of the Consortium will be monitored and evaluated using a suite of approaches that will measure the short-, mid-, and long-term impacts.

Creighton, Janean (Poster #117)

The Joint Fire Science Program (JFSP) goal is to accelerate the awareness, understanding, and adoption of wildland fire science information by federal, tribal, state, local, and private stakeholders within ecologically similar regions. Our vision is a national collaborative science delivery network.The Regional Consortia are local experts that help you get connected with other managers, practitioners and scientists working in your area. They not only provide the best fire information for your area, they demonstrate new knowledge in the field and much more.

Joint Fire Science Program: Knowledge Exchange Consortia

The Joint Fire Science Program's (JSFP) Knowledge Exchange Consortia Network is actively working to accelerate awareness, understanding, and adoption of wildland fire science information by federal, tribal, state, local and private stakeholders within ecologically similar regions. Our network of 14 regional consortia provides timely, accurate, and regionally relevant science-based information to assist with fire management challenges.

Cullinane Anthony, Bridget L. (Poster #19)

Bridget L. Cullinane Anthony, Graduate Student, Biology Department, Central Michigan University.

Bird diversity patterns within remnant patches of biological legacies in jack pine dominated landscapes of northern Lower Michigan

The use of jack pine (Pinus banksiana Lamb.) plantations for Kirtland's warbler (Setophaga kirtlandii Baird) breeding habitat management has had the inadvertent consequence of creating a stand structure with conditions that are significantly different than the structure created by wildfire, the natural disturbance agent. This is partly because biological legacies are usually not maintained in these artificial systems or not maintained within the natural range of abundance. In the jack pine ecosystem of the northern Lower Peninsula of Michigan, biological legacy patches (stringers) are a unique landscape feature left behind after stand-replacing wildfire. With the Kirtland's warbler population levels exceeding set recovery limits for almost a decade, land managers have the opportunity to focus on the importance of stringers as refugia within the ecosystem and manage jack pine habitats more closely within their natural range of structural variability. The goal of this research is to examine the ecological value of stringers by comparing the avian community, vegetation structure, and arthropod abundance between stringers and the surrounding forest/plantation. Do stringers have unique bird communities relative to the surrounding habitat and is there seasonal variation? Can the variation in bird communities be explained by differences in the insect communities and/or the variation in vegetation structure and composition? These questions are being addressed by sampling across the northern Lower Peninsula of Michigan. The bird communities are being sampled using acoustic recorders and point counts. Insects are being sampled using pitfall traps and yellow sticky traps. Vegetation surveys were completed at each site to assess structural variability. Field work started in December 2011 and will be completed in August 2013. Preliminary data suggests a difference in bird community composition between stringers and the surrounding non-stringers and between the seasons. Preliminary vegetation data shows differences in structure and composition between stringer and non-stringers.

Davis, Raymond (Poster #62)

Raymond J. Davis Old Forest and Northern Spotted Owl Monitoring Lead US Forest Service, Pacific Northwest Region Responsible for monitoring status and trends in old forests, spotted owl habitat, and spotted owl populations on federally manged lands within the Northwest Forest Plan area. Recent publication - Davis, Raymond J.; Dugger, Katie M.; Mohoric, Shawne; Evers, Louisa; Aney, William C. 2011. Northwest Forest Plan—the first 15 years (1994–2008): status and trends of northern spotted owl populations and habitats. Gen. Tech. Rep. PNW-GTR-850. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 147 p.

Habitat for Large Wildfires versus Habitat for Northern Spotted Owls

Monitoring since 1994 has shown that wildfires are the leading cause for loss of northern spotted owl nesting and roosting habitat on federally managed forests in the Pacific Northwest. This has sparked much interest on where within the range of the northern spotted owl do large wildfires usually occur, and how do those areas overlap with good owl habitat. To help answer this question, we used the same species distribution modeling (SDM) software that we used to model habitat suitability for northern spotted owls. But, instead we used it to model and map an environmental gradient of "wildfire suitability". The term "wildfire suitability", first coined by Drs. Marc-André Parisien and Max Mortiz in 2009, represents a gradient from low to high of a multivariate combination of environment conditions, including topography and climate, which relate to the likelihood of occurrence for large wildfires. A combination of steep slopes, hot and dry summer months in remote forested mountainous areas where lightning ignitions are common is more likely, through time, to incur large wildfires, as opposed to gentle, cool and moist areas within close proximity to roads and human access for fire suppression. This novel approach to mapping the fire environment has validated well in predicting where large wildfires, exceeding 1,000ac in size, have occurred within the owl's range over the last nine years. Perhaps it can inform managers on where to expect the next large wildfires?

Dean, Alison (Poster #63)

Central Oregon Fire Management Monitoring Program Coordinator

In and Out: Opportunistic Rapid Monitoring Ahead of the Pole Creek Fire

The Pole Creek Fire began on September 8, 2012, between the Three Sisters Wilderness of the Deschutes National Forest and the town of Sisters, Oregon. To reduce fire risk to the town, the incident management team decided to use a network of forest roads as containment lines. A variety of fuels reduction treatments had been done over prior years within the proposed burnout area, which presented the question of how those treatments would influence fire behavior and effects. We established Firemon monitoring plots ahead of burnout operations in treated and untreated plantations and older natural stands of ponderosa pine. Some plots were affected by drip torch ignition, but most experienced natural fire progression. We installed photo points and collected data on surface fuel load and tree vigor. Immediately post-burn, we replicated the photos and recorded first order fire effects including bole char and canopy scorch. The poster will show photos from this project, describe the fuel treatments and effects, and discuss the possible standardization of this kind of "quick and dirty" monitoring on large fires.

Defossé, Guillermo (Poster #47)

Guillermo E. Defossé is a University of Patagonia professor of Forest Ecology, and researcher at the Patagonian Forest Research and Extension Center in Esquel, Province of Chubut, Argentina. He holds a degree as an Agronomist Engineer (1979), earned at the University of La Plata in Argentina, and a MSc. in Range Sciences (1987) and a PhD in Forestry (1995), both earned at the University of Idaho in the United States. His main research interest is in range and forest fire ecology and management, productivity of rangelands, forest restoration, and CO2 emissions mitigation through forest practices. He has directed or co-directed 6 PhD dissertations and 7 MSc thesis, and published over 50 refereed publications and about a hundred technical reports in these areas of interest.

Wildfire history and prospective changes in fire regimes of Patagonia, Argentina

There are evidences that fire has always been present in all three main phytogeographical provinces of Patagonia, being more visible in the Andean forests than in the Monte or in the Patagonian Steppe. In the Andean Forest, fire scars present in old trees have been used to determine fire occurrence and frequency. In the Monte and the Patagonian steppe, historic reports of early explorers and settlers, and recent studies about the ecology of its vegetation, helped reconstruct former fire regimes. In the Monte region, old reports narrate that different areas were usually burned by Indians, who used to set fires for hunting and communication purposes. Recent studies also demonstrate that besides Indian ignitions, summer lightning may have played an important role in igniting fires in the whole region. In the Patagonian steppe and in the steppe-forest ecotone, fires were more frequent and less severe than in the Andean Forest. Fires were rather infrequent (return intervals of about 200 yr) but extremely severe, in the upper Nothofagus pumilio forests. In this region, there is evidence of fire 10,000 years B.P. in the early Holocene, where great magnitude fires took place in pure Nothofagus forest types. Further in the mid Holocene, precipitations increased towards the east and then the vegetation changed toward mixed Nothofagus dombeyii – Austrocedrus chilensis forests, changing also fire regimes to more frequent fires. Recent unprecedented changes in land use and climatic variation may have altered part of the natural balance in terms of fire frequency, continuity, severity and effects. The interaction among these factors is complex, and could make the comprehension of further fire responses of individual plants to this changing environment difficult. More studies will be necessary to understand how these unprecedented changes may affect future survival and growth of Patagonian native plants affected by wildfires.

Defossé, Guillermo (Poster #90)

(See biographical information, above.)

Post-Fire Ecological Restoration in Southern Temperate Forests of Nothofagus pumilio in Patagonia, Argentina

Patagonian forests in Argentina cover about 3 million ha. Of them, 800 thousand ha correspond to Nothofagus pumilio (southern beech) forests. Nothofagus forests protect most watersheds of the region, and are exposed to grazing and fire disturbances. The re-establishment of Nothofagus after wildfire is negligible, because of the scarcity of seeds and the harsh post-fire environmental conditions. The objective of this study was to evaluate the potential of plantations to restore former N. pumilio landscapes. Three fire-disturbed sites, located in a latitudinal gradient (Esquel, 42° 56´ S - 71° 30' W, Monte Zeballos, 46° 49' S -71° 54' W, and Río Turbio, 51° 29' S - 72° 19' W), were selected for the study. The three sites receive less than 500 mm/yr of precipitation. In 2009, similarly grown, 3 years old N. pumilio seedlings were planted in 1 ha, large herbivores exclosures in Esquel (n=384) and Rio Turbio (n=352), in 2 x 2 rows of 24 seedlings each. In 2010, other plantations were done in Rio Turbio (n=352) and in Monte Zeballos (n=250), using 4 years old N. pumilio seedlings. To avoid browsing damages by the introduced European hare, each individual plant was protected by either polypropylene tubes (P), metallic mesh (MM), or plastic mesh (PM), leaving some plants unprotected as controls (CP). The different protection devices were randomly assigned among rows. The first growing season after plantation (2010) survival was similar (71%) for seedlings protected by P, MM, and PM in Esquel and Rio Turbio, respectively. In 2011, survival in Monte Zeballos was 65, 80 and 93 % for MM, P and PM, while in Rio Turbio it was 80, 90, 95, and 100 % for CP, MM, P, and PM, respectively. Results showed that seedling plantation may be a viable alternative to restore former Nothofagus pumilio landscapes.

DeJuilio, Jena (Poster #31)

Jena DeJuilio, Fire Ecologist, BLM, hooked and landed a chinook salmon on a fly rod.

Monitoring fuels treatments in southern Oregon mixed chaparral and oak woodlands

Mixed chaparral and oak woodlands dominated by white leaf manzanita, buck brush ceanothus, and multi-aged Oregon white oak are a prominent plant community in southwestern Oregon. Historically, Native Americans had a hand in maintaining these plant communities, particularly oak woodlands. For 4,000 years, native people used fire to promote natural processes, such as acorn production, stimulating forage for large animals, and promotion of food and medicinal plants. Settlement by Europeans significantly altered the way fire was used across the landscape. Frequent high-intensity fire became an effective tool to clear the land for grazing and mining.Pre Euro-American fire histories in these plant communities are less understood than in coniferous forests, though with lightning acting as a reliable ignition source, presumably fire suppression has changed the interaction of fire with all plant communities.The absence of fire has resulted in greater fuel loading and more homogenous vegetative patterns across the landscape, increasing the likelihood of large high-severity fires. In chaparral encroached oak woodland/savannah, the probability for a stand replacing high severity fire event is great. For this reason, and due to their characteristic proximity to populated areas, oak woodlands are frequently targeted for hazardous fuel treatments by the Bureau of Land Management (BLM) in southwest Oregon with mechanical and manual techniques. In 2010 Medford District fuels monitoring plots (i.e. FIREMON) were re-visited approximately five years after treatment in four different oak woodland units in the Ashland Resource Area. The plots were stratified for analysis into two treatment groups, Mechanical mastication (M-M) and Handpile and Burn (HPB). We look to see how fuel models differ 5 years after treatment and if objectives for reducing surface, ladder and crown fuels are still effective. We also present changes in vegetative responses in dominant forb, herb, shrub and tree species, including seedling and shrub regeneration.

DeSiervo, Melissa (Poster #25)

My name is Melissa DeSiervo. I am a first year graduate student in the Biology Department at Humboldt State University. Before coming to Humboldt State I worked on a wetland restoration project at Point Reyes National Seashore, and was a co-author on a poster presentation at the California Native Plant Society Conference entitled "Post-Restoration Plant Community Assembly Patterns on the Giocomini Wetland Restoration Project".

Inventory and monitoring of postfire forest succession on serpentine and non-serpentine soils of the Rich Fire, Plumas National Forest. 2012.

Wildfire is one of the most important ecological disturbances throughout California and plays a major role in the diversity and structure of many plant communities. While the effects of fire are well-documented in many ecosystems, the relationship between wildfire and plant communities on ultramafic (i.e., "serpentine") soils remains poorly understood. Serpentine ecosystems are characterized by their nutrient-poor soils which support lower levels of community productiv-

ity, but a high proportion of rare and endemic plant taxa. Our study aims to fill in gaps in our understanding of fire and serpentine ecosystems, using post-fire data from the 2008 Rich Fire in the Plumas National Forest. The Rich Fire burned approximately 2400 hectares in the Feather River Canyon, including 1200 hectares of mixed conifer forest on serpentine substrate. To collect data on trees, vegetation composition, surface cover and downed woody materials, we employed the Common Stand Exam plot protocol established by the U.S. Forest Service. We also collected data on seedlings, saplings and hardwood resprouts using the Forest Service Regeneration Plot protocol. A total of 89 plots were established within the fire perimeter, 46 on serpentine substrate, and 43 on non-serpentine substrate. Burned plots were categorized based on a fire intensity scale 1-5. We also include data from 24 unburned sites immediately outside the fire perimeter, 12 on each substrate type. Preliminary results show a variety of differences in vegetation community structure on serpentine and nonserpentine substrates. As predicted, serpentine sites contained less tree density and average tree height was significantly shorter. On both soil types, fire severity was an important indicator of plant community change. Shrub and hardwood resprout percent cover increased dramatically on both soil types with increasing fire intensity, however the dominate species differed significantly based on soil type. Quercus spp. hardwood resprouts for example, constituted a larger proportion of nonserpentine sites, whereas serpentine sites were dominated by seed-recruiting species such as Ceanothus cuneatus. Forb and graminoid cover were also were distinguished by soil type and fire severity. Our study shows that there are substantial differences in the way that serpentine vegetation responds to fire, and management of these ecosystems needs to be tailored accordingly.

Dillon, Gregory (Poster #38)

Gregory K. Dillon is a spatial fire analyst with the USDA Forest Service's Fire Modeling Institute in Missoula, MT. Prior joining FMI in 2011, Greg was the team lead for potential vegetation mapping on the National LANDFIRE project, and also worked on research focused on examining the influences of topography and climate on burn severity in the western U.S. He has a B.S. in Geography from James Madison University (Harrisonburg, VA), and an M.A. in Geography from the University of Wyoming. Information about publications and current projects can be found at: http://www.firelab.org/staff-directory/153.

Potential for high severity fire: a new 30m raster dataset for the western United States

The Fire Severity Mapping System project (FIRESEV) is geared toward providing fire managers across the western United States critical information about the potential ecological effects of wildland fire at multiple levels of thematic, spatial, and temporal detail. A major component of FIRESEV is a comprehensive map of the western U.S. depicting the potential for fires to burn with high severity if they should occur. Developed as a 30m-resolution raster dataset, the map is intended to be an online resource that managers can download and use to evaluate the potential ecological effects associated with new and potential fire events. Using satellite-derived burn severity data from over 7,000 fires that burned from 1984 to 2007, together with geospatial topography, fuel moisture, and vegetation data, we produced statistical models using the Random Forest machine learning algorithm. We developed Random Forest models separately for forested and non-forested settings in each of 17 mapping regions. For each model, we selected the set of predictor variables (i.e., landscape characteristics) that provided the best possible predictions of high severity fire occurrence. Cross-validated classification accuracies for individual models ranged from 65% to 83% for forest models, and 69% to 82% for non-forest models. We used the Random Forest models to predict, for every 30m pixel in the West, the potential for high severity fire, conditional on that pixel experiencing fire at a particular percentile level of a 1000-hour fuel moisture index (where higher percentiles equal dryer conditions). The products representing the potential for high severity fire at the 90th percentile are now complete and will be available online by December 2012 at http://www.firelab.org/research-projects/fire-ecology/128-firesev.

Drury, Stacy (Poster #58)

Stacy Drury has been active in applied research for the past 20 years. He has worked for research organizations including the Fire and Environmental Research Applications (FERA), Instituto de Silvicultura e Madera (ISIMA), and the Missoula Fire Lab. Stacy has experience investigating fuel consumption, smoke emissions, and fire occurrence throughout North America. Stacy is the Senior Fire Ecologist at Sonoma Technology, Inc. Stacy's projects include Senior Science lead on the Interagency Fuels Treatment Decision Support System (IFTDSS), Co-PI on the Real Time Assessment of Fire Weather Accuracy project, and Senior Scientist on the Smoke Emissions Modeling Intercomparison Project (SEMIP).

Real-Time Analysis of Fire Weather Prediction Accuracy: Year 2 Progress

Fire weather forecasters, fire planners, and decision makers do not have easy access to information needed to verify the accuracy of fire weather forecasts and the products that rely on them to predict ignition potential. The Joint Fire Science

Program (JFSP) funded development of a system that produces intuitive, easily understandable meteorological model performance assessments and provides end users with real time information about meteorological model bias, model reliability, and overall performance of fire weather forecasts. We have produced a system that ingests data from RAWS and ASOS weather stations; analyzes the difference between observed and forecasted weather data to identify accuracy, bias, and uncertainty; and displays the analysis in an online map system. Users can view current, historical, and forecast weather data from WRF, NAM, NDFD, and GFS weather models for each weather station. In addition, observed and forecasted fuel moisture and fire danger rating indices using the National Fire Danger Rating System (NFDRS) and the Canadian Forest Fire Danger Rating System (CFFDRS) are displayed. Simple statistical analyses allow users to identify model bias and model accuracy. We have found that fire weather accuracy can be improved locally by using a simple mean bias measure. Every day for each station, the system calculates a mean bias measure over the past seven days. We apply this bias measure to the forecasted fire weather variables, such as air temperature and relative humidity, to adjust the fire weather metrics spatially and temporally in light of local model performance.

Duerkop, Peter (Poster #15)

Peter Duerkop is a graduate assistant at St. Cloud State University in St. Cloud, MN. He earned a B.S. in Wildlife Ecology & Management in 2009 from the University of Wisconsin – Stevens Point, which is also where he received his initial wildland firefighter training. Since then, he has worked for 5 different units of the National Park Service and the U.S. Fish and Wildlife Service in Wisconsin, Minnesota and Texas as a biological science technician and/or fire crew member. A professional goal of his is to integrate fire science and fire operations. Pete's hobbies include music, camping, craft beer, hunting ruffed grouse and canoeing.

Quantifying the Effectiveness of Prescribed Fire Regimes to Restore Midwestern Oak Savanna

Remnant Midwestern oak savanna is present in only 0.02% of its former range due to conversion to agriculture, the extirpation of native browsers (elk, bison) as well as fire suppression. Sherburne National Wildlife Refuge (Zimmerman, MN) has some of the best oak savanna remnants in existence today and is working to restore most of its uplands to a savanna habitat type. Prescribed fire has been the primary management tool used in this process. Management units are burned every 2-6 years based on prescribed weather conditions and personnel requirements. Vegetation data has been collected beginning in 1993 according the National Park Service's Fire Monitoring Handbook. Sample plots in the refuge are divided into three strata: grassland, savanna, and forest. Herbaceous cover, as well as tree size and species measurements is taken 1 and 5 years after burn treatments. Frequency is the most often used aspect of fire history used to quantify fire regime and is usually applied as a number of treatments over time. This study attempts to determine whether the variability in the amount of time between treatments has an impact on vegetation response. It is expected that the more variable the fire interval, the higher the plant diversity values will be. Vegetation response measures (e.g. % native grasses/forbs/shrubs, basal area) are used to observe whether restoration goals are being met. Abundances of non-desirable species are also measured to determine whether degraded habitats are improving.

Fairbanks, Rich (Poster #105)

The authors have worked in a variety of fire-related positions in the U.S. Forest Service, National Park Service, California FireSafe Councils, and nonprofit conservation organizations focused on fire ecology and management.

Firefighters United for Safety, Ethics, and Ecology (FUSEE): Torchbearers for a New Fire Management Paradigm

Firefighters United for Safety, Ethics, and Ecology (FUSEE) is a nonprofit organization promoting safe, ethical, ecological wildland fire management. FUSEE members include current, former, and retired wildland firefighters, other fire management specialists, fire scientists and educators, forest conservationists, and other citizens who support FUSEE's holistic fire management vision. FUSEE's primary mission is to provide public education and policy advocacy in support of a new, emerging paradigm that seeks to holistically manage wildland fire for social and ecological benefits instead of simply "fighting" it across the landscape. We seek to enable fire management workers to perform their duties with the highest professional, ethical, and environmental standards. Our long-term goal is the creation of fire-compatible communities able to live safely and sustainably within fire-permeable landscapes. Inspired by Aldo Leopold's "Land Ethic," FUSEE advocates for a new "Fire Ethic" in fire management policies and practices: A thing is right when it contributes to the safety of firefighters and the public, ethical use of public resources, environmental protection of fire-affected landscapes, and ecological restoration of fire-dependent ecosystems. It is wrong when it tends otherwise. This poster will display FUSEE's philosophy, mission, research, education, and advocacy projects. Elaboration of some key FUSEE concepts will be featured, including: the FUSEE triad of safety, ethics and ecology; re-identifying firefighters as fire-guiders; expanding community

wildfire protection programs into more inclusive goals of community fire preparation; recreating fire-compatible communities and restoring fire-permeable landscapes.

Fornwalt, Paula (Poster #74)

Paula Fornwalt has been a Research Ecologist with the USDA Forest Service's Rocky Mountain Research Station since 2010. Her research examines how natural and human disturbances impact plant populations and communities in Rocky Mountain forests.

The Front Range Forest Reconstruction Network: Reconstructing Forest Structure and Fire History in Front Range Montane Forests to Inform Forest Restoration Activities

Quantitative data on historical forest structure (species composition, density, basal area, size and age distributions, and spatial arrangement) are rare or nonexistent for ponderosa pine – dominated forests of the Colorado Front Range. In response to this lack of quantitative data and also to the need to implement a proactive forest restoration program to reduce the risk of uncharacteristically severe wildfires, a project was initiated in spring 2012 by the Arapaho - Roosevelt and Pike - San Isabel National Forests, Boulder County Parks and Open Space, Rocky Mountain Research Station, Colorado Forest Restoration Institute, and Rocky Mountain Tree-Ring Research. The main goal of this project – The Front Range Forest Reconstruction Network – is to develop these historical metrics for Front Range montane forests and to tie them to environmental gradients so that ongoing ecological restoration efforts can be better informed. We are using a consistent sampling protocol to map all pre-settlement tree evidence in 0.5-ha plots, to age subsamples of pre- and post-settlement trees in the plots, and to collect fire-scar evidence when encountered in or near the plots. During the first field season in summer 2012, almost 80 plots were sampled, primarily in the northern end of the Front Range. An additional field season in 2013 is planned for the southern end, with a final goal of ~150 total plots to capture the range of variability across the elevational, latitudinal, moisture, and productivity gradients present in the region.

Gdula, Eric (Poster #29)

Eric Gdula, Fire GIS Specialist, Grand Canyon National Park. I have worked at Grand Canyon for the past 12 years. Previous work includes being the GIS Coordinator for the Southeast Utah group of parks (Arches, Canyonlands, and Natural Bridges), as well as being the GIS specialist at Isle Royale National Park. A portion of my work includes burn severity mapping. I've developed some techniques at Grand Canyon that have lead to customizing the Monitoring Trends in Burn Severity data which result in very accurate maps.

Innovative Uses of Monitoring Trends in Burn Severity (MTBS) data at Grand Canyon National Park.

Grand Canyon National Park has an active fire program. The current 10 year average annual fire activity is 11,200 acres per year. To date, the Monitoring Trends in Burn Severity (MTBS) program and Grand Canyon National Park staff have mapped burn severity for 50 fires, totaling over 116,000 acres. A critical part of the fire program has been using the MTBS data to assist with fire management decisions. The park uses this severity data in a number of interesting ways, including pre fire planning, at the inception of fires, during protracted events, and post fire analysis. Examples of each of these uses will be discussed during this talk.

Godwin, Daniel (Poster #28)

University of Missouri - Columbia SAFE Chapter Poster

Mizzou SAFE started in 2011 and has since been focusing on providing training opportunities for students, providing support for local fire management agencies, and improving the quality of our fire science education. We have assisted on a number of prescribed fires and have a small but growing fire cache.

Goodfellow, Stepehen (Poster #34)

Stephen F. Austin State University SAFE Chapter

This poster highlights the Stephen F. Austin State University Chapter Activities and members

Goolsby, Reginald (Poster #104)

Reginald Goolsby is a fire ecologist trainee on the Francis Marion and Sumter National Forest in South Carolina. He received his B.A. in communications from Furman University and his Masters in Forestry Resources from Clemson University.

Providing science to managers: the Francis Marion and Sumter National forest prescribed fire prioritization model

As targets increase, so do the demands on fire management officers (FMOs) to prioritize treatment areas. Prescribed fires accomplish multiple objectives including reducing hazardous fuels, improving wildlife habitat, aiding listed species and increasing resource access. Researchers have provided guidance to help FMOs reintroduce fire into the landscape most appropriately; yet dialogue between scientists and managers is still not what it should be. FMOs need knowledge in a format understood by the "boots on the ground" rather than the scientific community. At the request of its FMOs, The Francis Marion and Sumter National Forest developed a fire prioritization model founded on fire science and understood by management to answer the questions of "when to burn, where to burn, how to burn, and why to burn." The burn prioritization model ranks treatment areas on ecological and logistical scores and allows users to set optimal burning constraints such as days since rain, KDBI, relative humidity, temperature, and season of burn to achieved desired resource goals. The goal of many burns is ecological restoration therefore some criteria such as percent of fire-dependent vegetation, departure from desired condition, and presence of listed species were factored in. Some logistical score criteria factored in were ignition patterns, fireline construction and holding, road closures, smoke management and personnel requirements. The model allows managers to enter day of burn environmental conditions which the model provides the user with the optimum location to burn to achieve desired management results. The advantages of this model over others is that it closes the gap that has divided researchers and science from the on the ground technicians actually managing the land. Researchers now have an interactive way to descriptively describe the best optimal way to achieve resource objectives in a format that easy to understand by the managers applying the tool.

Haffey, Collin (Poster #13)

Collin Haffey MS Student Environmental Science and Policy Northern Arizona University Flagstaff, AZ I have been working in the Southwest US for the last five years, since graduating from the University of Iowa. My work has focused broadly on forest and arid landscape ecology. I recently presented, "Spatial Patterns of a Jemez Mountains Fire Scar Record," at the Southwest AFE meeting in early 2012. I am interested in vegetation responses following high severity fire. Currently I am pursuing a MS in Environmental Science and Policy at Northern Arizona University.

Conceptual Model of Tree Regeneration Following Stand Replacing Fires in Arizona and New Mexico Forests

Since the 1970s the size of high-severity forest fires has increased in the Southwest United States, resulting in a proliferation of large, continuous treeless areas with few remnant live trees to provide seed sources for regeneration. These larger patches of tree-killing fires likely are due to a variety of factors including historical forest densification, natural drought cycles, and recent warming due to climate change. The few available studies of tree regeneration over the past ~50 years in historic post-fire treeless areas have shown mixed results when examining whether or not these landscape patches returned to the pre-fire forest vegetation type. Given ongoing and projected future climate change stresses, a return to pre-fire forest types may be unlikely in coming decades. We examine drivers of post-high-severity wildfire recovery in two parts. First, we examine several recent large wildfires and categorized the treeless area patch differences according to several abiotic factors, including distance from seed source, normalized elevation range index (elevation of the patch divided by the elevation range for a species), and aspect. We examine regenerative characteristics of pre-fire dominant tree species to create a conceptual model that predicts the extent of forest regeneration over the next century. In cases where published data are not available, the regeneration parameters are based on expert opinion. Our conceptual model takes into account recent climate change research suggesting a more rapid shift of the climate window for dominant tree species than was previously anticipated. Using a preliminary version of this model, we create maps showing the predicted extent of regeneration for several hypothetical fire scenarios. Forest managers may be interested in this approach because it addresses post-fire conservation issues, including reforestation and future wildlife habitats, in a testable, predictive framework.

Hamman, Sarah (Poster #106)

Sarah is the Restoration Ecologist for the Center for Natural Lands Management. Her work is aimed at restoring rare species habitat in PNW prairies using rigorous science and careful conservation planning. Sarah holds a B.A. in Biology from Wittenberg University and a Ph.D. in Ecology from Colorado State University. Most of her training and experience has

been in ecosystem ecology, with a focus on fire effects on forest and grassland soils. She is also an adjunct professor at The Evergreen State College, where she teaches Fire Science and Society and Restoration Ecology for the Master's of Environmental Studies program.

The Washington Prescribed Fire Council: Developing opportunities for collaboration and cooperation to enhance the safe, effective and appropriate use of prescribed fire throughout Washington

A century of fire suppression and exclusion in many ecosystems throughout the United States has led to altered fuel types and hazardous fuel loads, increasing the risk of high severity wildfire and leading to altered ecosystem structure and functioning. Managers have identified that carefully applied prescribed fire can be an effective approach for safely reducing fuel loads and restoring native habitat; however, practitioners still face major challenges with prescribed fire implementation. Sufficient trained personnel, funding, supportive air quality regulations, general public support and accurate information on fire effects are lacking. Because of this, effective re-introduction of fire requires cross-agency and cross-border collaborations that provide shared resources, mutually beneficial gains in knowledge and a common powerful voice to garner social and political support. The newly formed Washington Prescribed Fire Council (WA PFC) provides an educated, active body to assist fire practitioners, policymakers, regulators and citizens with issues surrounding smoke management, public outreach and education, access to resources, cross-agency collaboration and political support. The first annual WA PFC conference brought over 130 people from 46 different organizations together to discuss the direction and goals of the Council and to identify priority needs for the Washington prescribed fire community. The Council is currently forming its Steering Committee and will be hosting another conference in spring 2013 to develop strategies for addressing current challenges to using prescribed fire across the state.

Heide, Sarah (Poster #107)

Sarah Crocker Heide Fire Ecolgist/Fuels Specialist Bureau of Land Managment - Boise Idaho Graduate of University of Wyoming and University of Idaho - BS and MS in Rangeland Ecology and Management

Developing and Implementing a Neighborhood Fuelbreak in the Foothills North of Boise Idaho

The Warm Springs Mesa Neighborhood Association, in partnership with Homer Wise & Sons, the City of Boise, the Bureau of Land Management, and the Southwest Idaho Resource Conservation and Development Council have been working towards making the Warm Springs Mesa subdivision in the foothills north of Boise less susceptible to the devastating effects of a fast-moving wildfire. One of the many projects initiated by this neighborhood, a nationally recognized Firewise Community, includes the creation of a fuelbreak surrounding the subdivision. Neighborhood meetings, newsletters, flyers, signs, and newspaper notices were used to inform and educate the neighbors and the general public about the need for a fuelbreak, the tools to be used for its' creation, and the timing of various activities. Invasive annual grasses (cheatgrass and medusahead wildrye) had invaded the native plant community surrounding the subdivision creating a continuous bed of fine fuel ripe for ignition and a fast moving wildfire. The neighborhood fuelbreak is an average of 500 feet wide starting at the end of individual homeowners' properties along the outside of the subdivision and stretching out towards the wildland. The exterior boundary of the fuelbreak is defined by roads, trails, topography, and land ownership. Annual grass control was achieved with an application of the herbicide Plateau® (imazapic) using all-terrain vehicles mounted with boomless sprayers in the fall of 2011. Seeding of native grasses and forbs that stay green longer into the fire season occurred in the fall of both 2011 and 2012 using broadcast spreaders in rougher terrain and a rangeland drill where topography allowed. In the spring of 2012, a herd of goats was used to reduce vegetation and annual grass seed in the 150 foot wide strip immediately adjacent to homes where the herbicide could not be used due to safety and liability concerns. Free curbside pick-up of vegetation, cut and removed from individual properties by homeowners while creating defensible space, was provided to the neighborhood in the summer of 2012 with plans to continue this service in 2013. Vegetation monitoring plots established in the fuelbreak prior to implementation will be re-read into the future. Other potential firewise projects include a retaining wall along Warm Springs Avenue, an emergency notification system for the neighborhood, and a firewise demonstration garden.

Helmbrecht, Don (Poster #71)

Don has worked for the USFS TEAMS Enterprise Unit as a wildland fire analyst since 2010. Prior to this Don worked as a geospatial analyst at the USFS Fire Sciences Laboratory, GIS program manager at the University of Montana's National Center for Landscape Fire Analysis, and as a member of an Interagency Hotshot Crew. Don holds a Master of Science in Forestry from the University of Montana.

Assessing Wildfire Risk to Diverse and Resilient Vegetation on the Bridger-Teton National Forest

Wildfire risk assessment quantifies the expected threat or benefit of wildfire to highly valued resources and assets. Both market (e.g., residential structures, campgrounds) and spatially discrete nonmarket (e.g., old growth, spotted owl core habitat) resources and assets are commonly assessed. Characterizing and quantifying landscape-level ecological resources such as diverse and resilient vegetation, which are not as easily spatially defined, requires integrating multiple assessment methodologies. We quantified the risk to diverse and resilient vegetation from wildfire on the Bridger-Teton National Forest by integrating an assessment of landscape-level vegetation condition with an emerging wildfire risk assessment framework. To assess vegetation condition, we compared the current distribution of vegetation succession classes to a reference distribution representing the historical range of variation using the Fire Regime Condition Class Mapping Tool. The risk assessment framework included modeling wildfire hazard with the FSim large fire modeling system, and developing expert-based response functions that characterize how the status (i.e., deficit, similar, or surplus) of vegetation succession classes within individual biophysical settings and different fire intensity levels may jointly influence fire effects. From these efforts, we were able to then derive spatially resolved estimates of expected net value change to diverse and resilient vegetation. Results suggest that large areas of the landscape are expected to have a net benefit from wildfire. This information can prove useful for a range of fire management planning activities, in particular response to wildland fire incidents.

Hernandez, Adam (Poster #36)

Adam Hernandez,District Prescribed fire Specialist/US Forest Service Dr. Bob Loveless, Professor and Technical Specialist/Washington Institute

Are we Safer?

Responding to a perceived need to reduce firefighter death and injury through cognitive recognition of human errors in decision-making, a human factors/leadership (HF/L) training program (L-courses) was initiated in 2000 by the National Wildfire Coordinating Group. This training has attempted to reduce human errors within the wildland fire culture, effectively leading to an expected outcome of reducing the likelihood of injuries, entrapments and fatalities. A series of six courses are available during a firefighter's career. Using available data sources, at the end of 2009, over 40% of federal wildland firefighters have had at least one L-course but only 0.11% of firefighters had completed all six courses. Firefighters take successional L-courses on average every two years. Using Poisson regression, the annual rate of wildfire entrapments (number/1000 person-hours exposed on the fireline) was examined for six years prior and ten years after program implementation. Since program inception, rate ratio estimates indicate an 80% (0.49-0.92, =0.05) reduction in the annual entrapment rate for all (federal and non-federal) wildland firefighters after controlling for variation in annual acres burned and exposure time. A similar 73% (0.13-0.92) reduction was observed for federal firefighters. While HF/L training was primarily implemented to reduce human errors and increase safety, other changes during the time period examined could account for the observed entrapment decreases but were not included in this study. These include improved weather forecasts, increased oversight in qualifications standards, departure from full perimeter control tactics and implementing assignment turndown protocols.

Hoff, Valentijn (Poster #35)

University of Montana

University of Montana Chapter of SAFE

The members of the student chapter of AFE at the University of Montana have been busy this year. They organized social events for students and fire professionals, did defensible space counselling for private landowners and participated in several prescribed burns. The well attended monthly meetings are used to prepare for another productive year in 2013.

Holland, Colleen

Colleen Holland, Assistant Lead Fire Effects Monitor at Evergaldes National Park, graduated from the University of Wisconsin-Stevens Point with a bachlor Wildlife Ecology and Management.

The Role of Fire in a Changing Ecosystem: Investigating the Interaction between Fire and Lygodium microphyllum in Everglades National Park

In Everglades National Park, Old World Climbing Fern (Lygodium microphyllum) is invading the coastal prairie habitat on the west coast of the park. L. microphyllum creates dense mats in the marshes and tree islands, shading out native species

and limiting the spread of fire, a natural disturbance regime in these prairies. In 2011, the Fire and Exotic management programs at Everglades NP created an inter-departmental working group to coordinate and expand monitoring projects to further understand the interaction between fire treatments and L. microphyllum response. Additional protocols were added to existing fire effects monitoring plots in the coastal prairies to assess landscape level changes in L. microphyllum cover. Because these plots were not designed to compare similar burned and unburned areas, the working group initiated a two-year, paired plot, monitoring study to better understand L. microphyllum response in burned versus unburned areas. In the paired plot study, initial results in line intercept and ocular cover estimation methods show conflicting trends in L. microphyllum cover between burned and unburned plots. L. microphyllum occupation of available habitat was higher in unburned areas as compared to burned areas. Fecundity, as measured by amount of fertile leaves, was higher in burned areas immediately post burn, but these plots experienced a more dramatic decline following peak spore production than unburned plots. To complement ongoing field studies, Everglades NP is working with a research professor at Florida International University who will compare biomass and fecundity changes between burned and unburned plants, and test spore viability after heat exposure in controlled lab experiments.

Hudec, Jessica (Poster #95)

Jessica Hudec is a Natural Resource Specialist working in fuels and fire ecology on the Gifford Pinchot and Mt. Hood National Forests of the Pacific Northwest Region, USA. Jessica started her Forest Service career in 2003 as a firefighter and still enjoys going out on 20-person handcrews. Jessica completed a Master of Science degree in Forest Resources at the University of Washington in 2011. Jessica's graduate research is documented in the 2012 Forest Ecology and Management publication "Fuel variability following wildfire in forests with mixed severity fire regimes, Cascade Range, USA".

Landscape-level fuels treatment strategies in the Pacific Northwest, USA

National Forests of the Pacific Northwest Region have created Strategic Fuels Treatment Plans to address the need for landscape-level fuels management. Objectives of the plans include 1. Establishing strategies for fuels programs that are useful in out-year planning and help guide the purpose and need for interdisciplinary projects. 2. Designing forest landscapes with networks of fuel breaks and natural openings that, in the event of a wildfire, will promote a. Increased public and firefighter safety. b. Decreased management costs. c. Increased suppression effectiveness in protecting private and federal improvements, timber, and sensitive natural resources. d. Use of prescribed natural fire to restore forest health, resilience, and condition class. e. Disturbances in block sizes representative of the natural disturbance regime. Strategic Fuels Treatment Plans prioritize community protection from wildfire and restoration and maintenance of ecosystem resilience. Furthermore, Plans aim to support management activities that work toward the desired future condition of Pacific Northwest forests: healthy, diverse, and resilient landscapes that can adapt to future disturbances with minimal negative effects to ecosystems. Strategic Fuels Treatment Plans spatially identify fuels treatments in two major areas: 1. Buffers to private lands and high value resources including timber, infrastructure, critical habitat, and municipal watersheds that a. Create opportunities for safe and effective fire suppression. b. Add depth to private land boundaries. 2. Fuelbreaks on roads, ridges and around wilderness areas that a. Compartmentalize the landscape into blocks that are spatially representative of natural disturbances. b. Facilitate indirect fire suppression and reduce wildfire costs. c. Enable landscape restoration that adds depth to fuelbreaks using fire and other vegetative treatments. Local fire management personnel and resources specialists were consulted at each district to create maps of suggested treatment areas.

Huffman, Mary (Poster #100)

Mary Huffman serves as Landscape Conservation Network Director in The Nature Conservancy, as part of the Fire Learning Network. Mary has enjoyed working with people and fire in collaborative land management, research and education since joining the Conservancy in 1986. Having worked in fire from the arctic to the tropics in the Western Hemipshere, and from coast to coast in the continental US, Mary's next conquest is learning more about fire in the Eastern Hemisphere. She asks, "What is your next learning adventure?"

"Building the Airplane while You're Flying It" - What today's fire planners say about their profession and the training they want.

As fire management in the US becomes increasingly complex, so does the work of people who are charged with developing plans for landscape-scale management, including restoration of fire-adapted ecosystems and on-site wildfire response. For fire management planners, this includes weaving together layers of ever-changing policy with sophisticated modeling applications and cross-boundary collaboration. Fire planners must master a variety of dissimilar competencies to be successful in this multi-dimensional environment; however, no formal training curriculum or learning pathway for fire manage-

ment planners exists. Amid this complexity, planners arrive at their positions through a variety of career paths including dispatch, GIS, fire operations and ecology. Adopting a single-tream, linear training curriculum is likely to be ineffective. To address the need for a state-of-the-art training approach for fire planners, the Interagency Fire Planning Committee of NWCG conducted a needs assessment in 2011. How do fire planners currently learn what they need to know to become proficient in their work? How they prefer to train, and what kinds of learning pathways would they find helpful for career development? Using focus groups and semi-structured interviews, we studied the responses of sixty participants from the five federal fire agencies. Participants included planners currently working in different geographies and levels of agency management (e.g., site level planners to agency fire directors). Qualitative analysis of interview transcripts revealed seven themes that are guiding the IFPC's current efforts to develop flexible, learning pathways for fire planners in conjunction with the Wildland Fire Institute of the National Wildfire Coordinating Group.

Jardel-Pelaez, Enrique (Poster #40)

Enrique J. Jardel Pelaez, Profesor of Forest Ecology and Management, University of Guadalajara-CUCSUR, Mexico.He conducts research on landscape patterns and dynamics, disturbance regimes and ecological succession and has been working for almost 30 years in community based forest management, biological conservation and forest restoration in the Sierra de Manantlán Biosphere Reserve and other areas of Mexico. Is member of the executive comittee of the Mexican Long Term Ecological Research Network, the Mexican Council for Sustainable Silviculture and the National Council of Natural Protected Areas.

Potential fire regimes and fire management in Mexico

Knowledge and understanding of fire regimes is fundamental to design sound fire management practices. The high ecosystem diversity of Mexico offers a great challenge to characterize fire regimes. A conceptual model was developed considering the main factors controlling fire regimes at the landscape scale: climate and vegetation cover. We classified landscape units combining bioclimatic zones from the Holdridge life-zone system and actual vegetation cover. Since bioclimatic conditions control primary productivity and biomass accumulation (potential fuel), each landscape unit was considered as a fuel bed with a particular fire potential (fire intensity and behavior). Climate is also a determinant of post-fire recovery rates of fuel beds, and climate seasonality (length of the dry and wet seasons) influences fire probability (available fuel and ignition efficiency). These two factors influence potential fire frequency. Potential fire severity can be inferred from fire frequency, fire intensity and behavior, and vegetation composition and structure. Based in the conceptual model, an exhaustive literature review and expert opinion, we developed rules to assign a potential fire regime (PFR) defined by frequency, intensity and severity (i.e. fire regime) to each bioclimatic-vegetation landscape unit. Three groups and eight types of potential fire regimes were identified. In Group A are fire-prone ecosystems with frequent low severity surface fires in grasslands (PFR type I) or forests with long dry season (II) and infrequent high-severity fires in chaparral (III), wet temperate forests (IV, fire restricted by humidity), and dry temperate forests (V, fire restricted by fuel recovery rate). Group B includes fire-reluctant ecosystems with very infrequent or occasional mixed severity surface fires limited by moisture in tropical rain forests (VI) or fuel availability in seasonally dry tropical forests (VII). Group C and PFR VIII include fire-free environments that correspond to deserts. Application of PFR model to fire management is discussed.

Jenkins, Katelynn (Poster #24)

Katelynn Jenkins is completing her Bachelor of Science degree in Forestry at Northern Arizona University (NAU) and is an Undergraduate Research Assistant for the Ecological Restoration Institute. In addition to her academic achievements, Katelynn is President of NAU's Student Chapter for the Society of American Foresters and an active member in Xi Sigma Pi Forestry Honor Society and the Student Association for Fire Ecology. Michael Johnson is completing his Bachelor of Science degree in Forestry at NAU and is the Administrative Assistant and Forestry Technician for NAU's Centennial Forest. In addition to Michael's academic achievements, he is Forester (President) for Xi Sigma Pi Forestry Honor Society.

Aspen regeneration and stand dynamics on the Schultz Fire, Coconino National Forest, AZ

The June 2010 Schultz Fire north of Flagstaff, AZ, burned over 15,000 acres on the Coconino National Forest (CNF), including several quaking aspen (Populus tremuloides) stands. In an attempt to protect regeneration success of burned aspen stands within the Schultz Fire, CNF managers are implementing jackstraw treatments to limit ungulate movement through the regenerating aspen stands. Little is known about the success of jackstraw treatments on aspen regeneration, the long-term ecological effects, or ecological restoration implications. We have established permanent plots for future use by the Forest Service, Northern Arizona University (NAU) School of Forestry, and NAU Ecological Restoration Institute, to monitor stand dynamic and regeneration changes over time. In our study, we are measuring aspen regeneration, under-

story cover, overstory development, and downed woody debris decay pre- and post-treatment to determine if jackstrawing is a successful management tool for protecting aspen seedlings and suckers. We expect to see more understory productivity, fewer signs of elk and deer, and taller aspen regeneration in treated areas.The purpose of this project is to explore jackstrawing as a viable management option and lay the groundwork for future research in this arena. As a point of interest, we have observed multiple aspen seedlings growing alongside suckers which may assist aspen's ability to adapt to climate change and remain a functional component of northern Arizona forest ecosystems. As of September 9th, 2012, our pre-treatment data is fully collected. The jackstraw treatments were completed in July by the Forest Service and throughout the next month we will revisit our plots to collect post-treatment data. Data compilation and analysis will be completed by mid-October and the poster will be ready for submission by mid-November.

Johnson, Michael (Poster #53)

Michael Johnson, Fire Geospatial Analysis and Ecology Intern, US Fish and Widlife Service/Student Conservation Association (SCA). Michael is the author of the Fire Atlas Development document. The document provides guidance on how to create a fire atlas for other National Wildlife Refuges in the US Fish and Wildlife Service. This is part of a nationwide effort to capture the location and extent of past fires on refuge lands dating back to 1984.

Fire Atlas Development - US Fish and Wildlife Service Southwest Region

The Fire Atlas project records past fire occurrence on and near National Wildlife Refuge lands dating back to 1984. Fire perimeters are mapped for all fires on record greater than or equal to 10 acres. The fire atlas for a refuge is given to the Fire Management staff responsible for managing wildfires and prescribed fires in the area. The information may be used to aid in planning and monitoring prescribed fires as well as making tactical decisions for suppressing or managing wildfires. The information may also be made available for researchers and other interested parties. The Fire Atlas Development document outlines the steps to create a fire atlas using Landsat satellite imagery, ArcGIS, and ERDAS Imagine software. This poster highlights parts of the Fire Atlas Development document and shows some examples from the Texas Mid-Coast Refuge Complex fire atlas.

Johnson, Morris (Poster #78)

Morris C. Johnson is a Research Fire Ecologist with the Pacific Northwest Research Station, Pacific Wildland Fire Sciences Laboratory located in Seattle, Washington. He began his Forest Service career as a Forest Ecologist CO-OP student on the Prospect Ranger District, Rogue River National Forest in 1994. He was a member of the 1999 Redmond Interagency Hotshot crew (Redmond, Oregon) and 2001 Redding Interagency Hotshot crew. In 2002, he joined the Pacific Wildland Fire Science Laboratory as a Fire Ecologist. Morris Johnson received his B.S. in Urban Forestry from Southern University, Baton Rouge, Louisiana in 1996; M.S. in Silviculture and Forest Protection from the University of Washington; 2002, and Ph.D. in Forest Ecosystem Analysis from the University of Washington in 2008.

Linking the Forest Vegetation Simulator and the Fuel Characteristic Classification System to improve fuel quantification and fire behavior predictions

To evaluate fuel treatment efficacy on fire behavior at multiple spatial scales, fuel and fire managers depend on fire decision-support tools with inherent limitations and assumptions. Current tools do not compute fire behavior with real fuels data, but instead use stylized fuel models as substitutes to characterize and quantify the structural complexity and variability of wildland fuels found across diverse forest and nonforest ecosystems in the United States. We developed a Forest Vegetation Simulator (FVS) post-processor as an alternative decision-support tool that incorporates the best available science to assess fire hazard and fire behavior at multiple spatial scales.

Karau, Eva (Poster #89)

Eva Karau is a biological scientist with the Fire Modeling Institute at the Forest Service Rocky Mountain Research Station, Fire Sciences Laboratory. She has B.S.in Geology from the University of Montana and an M.S. in Forestry from the University of Montana. Her work involves spatial analysis for a system that helps to inform hazardous fuels prioritization and allocation decisions on a national scale. Before joining FMI, Eva was an ecologist in the Fire Fuels and Smoke program, where she evaluated burn severity mapping techniques and used succession and disturbance simulation models to explore landscape ecology questions and assess the ecological benefits of wildfire.

Hazardous Fuels Prioritization and Allocation System

The Hazardous Fuels Prioritization and Allocation System assists the Forest Service (FS) Washington Office Fire and Aviation (WO-FAM) staff by helping inform the distribution of hazardous fuels funding among FS Regions. Members of the Fire Modeling Institute, FS WO FAM and the FS Pacific Northwest Research Station collaborate each fiscal year to complete the analysis at national and regional scales. The decision process takes into consideration the following factors: wildland fire potential, population density, smoke emissions, water supply, and performance measures. These data elements are compiled at a national spatial extent for input into the Ecosystem Management Decision Support (EMDS 4.2) system which incorporates a logic model (Netweaver) and a decision model (Criterium Decision Plus). EMDS assigns priority scores to each region based on the importance assigned to the data elements by an expert panel. Data and models are now available to regional level managers who wish to use it to help inform fuels funding allocation within individual regions.

Kertis, Jane (Poster #67)

Jane A. Kertis, Ecologist, Northwest Oregon Ecology Program (USFS) Ecologist working in fire ecology in western forests for over 20 years. She has tracked post-fire conditions in the Charlton and Warner Creek fires for over 15 years.

Tree recruitment following wildfire in a mountain hemlock forest, Oregon Cascades

Wildfire is the predominant large-scale disturbance of mountain hemlock forests in the Pacific Northwest; fires tend to be infrequent and of high severity. We studied recruitment of tree seedlings (stems < 1.37 m tall) and saplings (>= 1.37 m tall and < 5 cm dbh) in 12 0.1 ha plots for 15 years following the 1996 Charlton wildfire in the Cascade Range of Oregon, comparing unburned areas to areas with varying fire severity. We sampled three plots in unburned areas and each of three fire severity levels: high mortality (<10% surviving trees)--tree crowns consumed by fire, high mortality--crowns scorched by fire, and partial mortality (>10% and <90% surviving trees). We also tracked numbers of live and dead trees (stems >=5 cm dbh, including survivors and post-fire recruits), downed wood and seedbed conditions. One year after fire, live trees were absent for high mortality--crowns consumed and sparse for high mortality--crowns scorched (0 to 50/ha), variable for partial mortality (50 to 830/ha) and abundant on unburned plots (320 to 2050/ha). Two years after fire, seedlings were sparse where there was high mortality (0 to 500/ha for crowns consumed and 700 to 1600/ha for crowns scorched) compared to partial- mortality (> 1900/ha) and unburned (>3500/ha). However, fifteen years after the fire, neither seedling density (overall median 5100/ha) nor sapling density (overall median 70/ha) were statistically distinguishable between fire severity levels. After 15 years, live trees were sparse on high-mortality plots (0 to 10/ha for crowns consumed, 0 to 50/ha for crowns scorched), variable for partial mortality (40 to 850/ha) and abundant on unburned plots (290 to 2040/ha). Though recruitment of seedlings was abundant at all levels of fire severity 15 years after the fire, there has been little recruitment of saplings or trees.

Kinney, Kealohanuiopuna (Poster #50)

Kealohanuiouna M Kinney PhD Student, Department of Geographical Sciences, University of Maryland at College Park Department of Geographical Sciences, University of Maryland, 2181 LeFrak Hall, College Park , MD, 20742 My overarching interests are in understanding how land use, climate change, and natural disturbances affect the structure, composition and functioning of ecosystems, and how these changes alter services provided by ecosystems to human societies. I am particularly interested in using records from fossilized wood and macroscopic charcoal, plant microfossils, and stable isotopes to improve our understanding of interactions between natural and anthropogenic fire, climate, and vegetation during the previous ten thousand years within dry-land ecosystems on the Island of Hawaii.

Fire regime facilitates unexpected nutrient limitation in Hawaiian subalpine dry forest?

We used measurements from airborne imaging spectroscopy and LiDAR to quantify the structure and composition of vegetation on a dryland substrate age gradient in Hawaii. We excavated soil pits on Pleistocene-aged substrates to search for macroscopic charcoal as an indicator of prehistoric fire. We did this to determine whether ecosystem retrogression was prevalent in subalpine drylands, and whether the replacement of dry forests by grasslands was associated with a history of fire. The structure and composition of vegetation changed during primary succession. Tall-stature Metrosideros polymorpha woodlands dominated on the youngest substrates, and were replaced by the tall-stature endemic tree species Myoporum sandwicense and Sophora chrysophylla on intermediate-aged flows. The oldest substrates were dominated by the short-stature native shrub Dodonaea viscosa and endemic grass Eragrostis atropioides. We excavated 18 macroscopic charcoal fragments. Mean radiocarbon age was 2002 and ranged from < 200 to 7,730years BP. Genus identities from four fragments indicate that Osteomeles spp. or M. polymorpha once occupied the Pleistocene-aged substrates, but neither of these species is found there today. These findings indicate that retrogressive patterns are prevalent on substrates long before P-limitation is known to occur, and that fires in this system unambiguously predate the arrival of Polynesians in the

Hawaiian Islands. This raises the possibility that these systems may be responses to both recent anthropogenic fires and the deeply embedded volcanic history of the landscape. These findings provide a framework for understanding contemporary ecosystem dynamics and inform adaptive management in Hawaiian dryland ecosystems.

Kitchen, Stanley (Poster #59)

Stanley Kitchen is a Research Botanist at the USDA Forest Service, Rocky Mountain Research Station. Dr. Kitchen's research focuses on the drivers of fire regime variability and consequences of fire regime change in forest, woodland and shrubland ecosystems of the Great Basin and Colorado Plateau of western North America.

Historic Quaking Aspen Fire Regimes in Utah (USA) Forests

Quaking aspen (Populus tremuloides) is the most widely distributed tree species in North America. In the Intermountain West, aspen occurs across a broad range in elevation and is found in relatively pure stands and in association with various conifer species. Reproduction is primarily asexual (root suckering) resulting in long-lived, spatially-stable clones that benefit from periodic disturbance. Our objective was to characterize historic aspen fire regimes in Utah, a state with abundant aspen across a broad range of forest types. We extracted fire-scar and tree-recruitment data for 122 plots (aspen present) from 11 sites in which plot grids were designed to span a broad range in elevation and vegetation type (299 total plots). Aspen plot elevation ranged from 2340 to 3204 m for southern sites and from 2255 to 3172 m for northern sites. Based upon pre-Euro-American (1860) reconstructions, the proportions of plots that were aspen (≥ 50 percent stem density) versus conifer-dominated were approximately equal across all sites. Plot evidence of non-lethal, surface fires in the form of annually-dated fire scars (on conifers) was sufficient to estimate mean fire intervals for 19 plots. Estimates ranged from 7 to 109 years with a mean of 32.4 years (1650-1900). We inferred fire severity using criteria that took into account the presence (or absence) of fire scars and recruitment cohorts and tree mortality patterns. Plots were classified as 10 percent low-, 25 percent mixed- and 20 percent high-severity, with 45 percent unclassified. Results suggest that historically, aspen in Utah persisted in both aspen- and conifer-dominated stands, the composition and dynamics of which varied in response to temporal and spatial variation in fire regime parameters.

Kline, Tim (Poster #109)

Tim Kline has been the coordinator of the California Fire Science Consortium since the organization was funded in March 2011. In addition to his fire science outreach work, Tim likes to make wooden spoons and climb.

California Fire Science Consortium - Poster

The California Fire Science Consortium (CFSC) is part of a national coalition of regional consortia established by the Joint Fire Science Program to facilitate awareness, understanding, and integration of wildland fire science information between researchers and federal, state, tribal, local, and private land managers and stakeholders. As a network of scientists, managers, and outreach experts across the state, the CFSC seeks to ease communication and collaboration across the state's many agencies, universities, governments, tribes, and citizens.

Kooistra, Chad (Poster #20)

Chad earned his B.S. in Natural Resource Recreation and Tourism from Colorado State University in 2005, and his M.S. in Natural Resources from the Conservation Social Sciences (CSS) Department at the University of Idaho in 2011. Currently working towards his PhD in the CSS Department, his research is part of an interdisciplinary NASA sponsored project aimed at better understanding the socio-ecological characteristics of 'extreme' wildfires and what it means for fostering more resilient social and natural communities. His first publication was with Dr. Gary Machlis in the Journal of the Office of Strategic Services (OSS) Society writing about how applying science during crises can be inspired by the work of the OSS intelligence agency during WWII.

Understanding landscape change and recovery chronosequences after wildfires: A proposed interdisciplinary approach

We describe proposed research to triangulate different types of data related to landscape recovery trajectories after wildfire events. Peoples' health and well-being are often impacted by the surrounding landscape, and perceptions of landscape change can affect support for forest and rangeland management. However, research integrating biophysical and social components of landscape change is limited. Considering the dynamic nature of the earth and climate systems and the increasing potential for widespread forest disturbances, it is important to understand the implications of landscape changes, and perceptions of changes, on managing dynamic landscapes. Our research will focus on viewsheds near communities

affected by wildfires within the past decade, particularly where different viewsheds exhibit different levels of recovery after a wildfire event. Remote sensing data (LandSat) will be used to assess pre-and post-wildfire vegetation biomass and cover. Degree of recovery will be assigned to portions of the viewsheds based on the remotely sensed images by comparing pre-fire vegetation conditions to post-fire conditions. Field data will be collected to validate conclusions drawn from the imagery. Vegetation sampling will measure post-fire vegetation biomass, cover, and diversity at several sites where we have pre-fire vegetation data. Social science research, using questionnaires and semi-structured interviews, will present respondents with maps of prominent viewsheds in the area featuring varying degrees of post-fire recovery to solicit perceptions of landscape recovery. The social science will examine what factors influence perceptions of landscape recovery and the implications for forest and rangeland management on public and private land. The three data sets will create a unique understanding of recovery chronosequences integrating social and biophysical data for wildfire events of different levels of severity. This research will add a temporal understanding to the relationship between biophysical attributes of a landscape after a disturbance over time and residents' sense of place.

Kremens, Robert (Poster #39)

Robert L Kremens, Research Professor, Rochester Institute of Technology I am a physicist by training who is now studying combustion and basic physical phenomena of wildland fires. I have developed in-fire and airborne instrumentation to observe the radiant and convective energy release from fires. Equipment I have developed is used in collaborative efforts with the USFS Rocky Mountain, Northern and Southern research stations and with several universities. I published a review paper in 2010 in AFE Fire Ecology on the challenges of measuring radiant heat release from wildland fires..

Estimation of the total radiant heat release from a wildland fire using temporally undersampled airborne infrared observations

Observing the total radiant energy from a wildland fire is difficult because of the large spatial and short temporal scales involved. Wildland fire covers large areas and moves over the landscape relatively quickly. Practical limitations limit high time resolution in-fire sampling to a few points (<20) within the fire. These observation points may not be representative of the fire because of the high spatial variability of most wildland fires. Satellite or airborne observations can spatially sample the entire fire ground, but these observations are limited temporally because of return time limitations of satellites (>¼ day) and aircraft (~5 minutes). We have developed a method to use temporally undersampled time-sequence airborne data to measure the average total radiant energy from wildland fires. This method involves selecting pixels that have complete temporal histories (cold ground to cold ground), time integrating and averaging the radiant output from these pixels, and then applying this average value over the entire fire ground for any pixel that was hot at some point during the fire. We capture 40 to 60 frames during the course of the fire. Temporal interpolation of the data is not required because the 1/e cooling time of the soil has shown to be on the order of 3-5 minutes which matches our observational sampling period. We will show examples of this method using ground-truth calibrated airborne long wave infrared data collected using the Rochester Institute of Technology WASP sensor system.

Kreye, Jesse (Poster #48)

Jesse Kreye is a Postdoctoral Research Associate in the Department of Forestry at Mississippi State University. He recently completed his PhD at the University of Florida in the School of Forest Resources and Conservation.

Towards a mechanism for eastern deciduous forest mesophication: the role of litter drying

Long-term fire exclusion has altered ecological functions in many ecosystems in North America. The invasion of fire-sensitive tree species into pyrogenic upland forests in the southeastern USA has resulted in shifts in fuelbeds and reductions in ecosystem pyrogenicity. Enhanced moisture retention in surface fuels would result in lower probabilities of ignition and fewer opportunities for burning, thus enhancing conditions for fire-sensitive mesophytic species to invade and persist. In order to evaluate a potential mechanism of the mesophication of these forests, we quantified the moisture retention (response time and initial moisture capacity) of foliar litter beds from 17 southeastern tree species. Analyses revealed four clusters: a rapidly drying cluster of eight species; a five species group that absorbed little water, but also lost it slowly; a two species group that absorbed substantial moisture and lost it rapidly; and a two species cluster that absorbed substantial moisture and also dried slowly. Fire-sensitive species fell in the slow moisture loss clusters while fire-resistant species tended to cluster in the rapid drying groups. Principle Components Analysis indicated that several leaf characteristics correlated with absorption capacity and drying rates. Thin-leaved species with high surface area:volume had the greatest moisture content, while those with large, curling leaves had the fastest drying rates. The dramatic shifts in litter fuels as a result of invasion by fire-sensitive species generates the positive feedback that eliminates pyrogenic species in the uplands of the southeastern US.

Krezek-Hanes, Chelene (Poster #82)

Chelene Krezek-Hanes is a physical scientist with the fire and climate change group at the Great Lakes Forestry Centre, a laboratory of Natural Resources Canada. She conducts studies in fire behaviour using spatial analysis tools including remote sensing and geographic information systems.

Improving the Canadian Forest Fire Danger Rating System Fuel Moisture Codes with RADARSAT-2 data

Each year in Canada, approximately 18,500 km2 of forests are burned by wildfires. This number can escalate to as high as 75,000 km2 in an extreme fire year. The prediction of when and where these fires will occur is extremely important, especially with the expansion of the urban wildland interface into more remote areas and predictions of greater fire potential with climate change. The current fire danger rating system has had proven success operationally in Canada. Despite its proven utility efforts to improve upon the Canadian Forest Fire Danger Rating System (CFFDRS) over time are required, especially with new technology. Currently, the fuel moisture codes within the CFFDRS are calculated using point source meteorological data. Studies in Alaska and the North West Territories, using Synthetic Aperture Radar (SAR) remote sensing have established relationships between SAR backscatter and the fuel moisture codes, initiating the possibility of predicting the codes spatially. Of particular interest is the prediction of the spring start-up values for the Drought Code (DC). The DC is the memory of pre-fire season conditions, requiring a spring adjustment dependent on winter precipitation totals. The methods of adjustment vary across the country and rely heavily on local knowledge and educated estimates. A scientifically rigorous adjustment to the DC based on remote sensing would be of great benefit. To achieve this goal we have been expanding on the previous SAR, fuel moisture code work using jack pine forests, in north central Ontario. This has been done using advances with polarimetric SAR data and field based duff moisture measurements from 2010 to 2012. Relationships have been established between polarimetric indices and the fuel moisture codes of the CFFDRS.

Kropp, Rachael (Poster #61)

Rachael Kropp is currently a Conservation Intern through the Student Conservation Association at the Missoula Fire Sciences Laboratory. She recently graduated from the University of Minnesota, Twin Cities, receiving an undergraduate degree in Environmental Sciences, Policy, and Management and a minor Chemistry.

Monitoring Seasonal Variation of Foliar Heat Content in Big Sagebrush

Seasonal variation of foliar heat content of Big Sagebrush (Artemisia tridenta) was studied at two sites near Missoula, Montana between the months of July and September 2012. Foliar samples were randomly chosen from the terminal tips of new shoots once per week throughout the study period. Samples were oven dried and their heat content was determined using an IKA 200 Oxygen Bomb Calorimeter. Additionally, their foliar moisture content and crude fat were also determined in the laboratory. Heat content did not vary significantly by location, but did vary seasonally. Foliar heat content increased 3MJ/kg over the study period from a low around 18 MJ/kg in early July to a high of 21 MJ/kg in late September. These changes occurred concurrently with decreases in their foliar moisture content and increases in their crude fat content. These results suggest sagebrush have a higher potential heat yield when new foliage has completely matured. This information will aide in the refinement of fire behavior predictions for sagebrush throughout the Interior Western United States.

Labosier, Christopher (Poster #3)

Chris Labosier PhD Candidate Department of Geography Texas A&M University Chris is working on his dissertation in southeastern wildfire climatology. His interests include hydroclimatology, applied climatology, and links between ecosystem processes and climate. In the spring of 2012, he was awarded 1st place in the Climate Specialty Group paper competition at the Annual Meeting of the Association of American Geographers.

Relationships between Spatial Patterns of Precipitation and Wildfire Occurrence in the Southeastern United States

Wildfire plays a critical role in some ecosystems and a variety of factors influence the spatial patterns of wildfire across landscapes. This preliminary study examines how the hydroclimatology of the southeast United States influences spatial patterns of wildfire. Because the southeast is a humid climate, it is hypothesized that drier locations and locations with more variable precipitation regimes will be more prone to wildfire activity in the region. Station data from the National Climatic Data Center (NCDC) are used to characterize precipitation regimes within national forests. Mean daily precipitation and daily coefficient of variation (CV) are calculated for each national forest in order to examine both mean conditions and variability. Wildfire occurrence data for each of the 26 national forests is obtained from the National Interagency Fire Management Integrated Database (NIFMID). Mean annual wildfire density (fires/400,000 ha/year) and mean annual area burned (area burned/400,000 ha/year) are calculated and analyzed alongside both mean daily precipitation and the

CV of daily precipitation for each national forest. Results suggest that both mean daily precipitation and daily precipitation variability influence spatial patterns of fire activity in the region. Station data is potentially limiting when characterizing precipitation regimes in higher elevations as many stations are located at lower elevations and therefore may not accurately represent precipitation throughout an entire national forest. Furthermore, there are a variety of factors beyond precipitation that influence wildfire occurrence, including topography, vegetation, proximity to human settlement, and fire management policies. Consequently, future research will entail the use of gridded precipitation data that takes into account elevation and fire danger ratings that are less influenced by the factors previously mentioned.

Lahm, Pete (Poster #103)

Pete Lahm is the Air Resource Specialist for the USDA Forest Service, Fire and Aviation Management, in Washington, DC. Starting in 2004, Pete has led the Forest Service's smoke management efforts developing technical approaches and policies related to smoke impacts from prescribed fire and wildfire. Since 2009 he has chaired the National Wildfire Coordinating Group's Smoke Committee. Prior to 2004, Pete managed the Arizona Interagency Air Resource and Smoke Management Program. He chaired the Western Regional Air Partnership's Fire Emissions Joint Forum from 1996-2004 where numerous national and regional scale smoke management policies and technical approaches were developed. Pete also owns a small business consulting in automotive rally racing and holds a Master's of Environmental Management from Duke University.

Linking Visual Range, PM2.5 Concentrations, and the Air Quality Index - What do we tell the PUblic in Smoke-Filled Wildfire Situations?

Many states are investigating or already implementing a methodology developed in the arid intermountain west where concentrations of particulate matter with aerodynamic diameter less than or equal to 2.5 micrometers (PM2.5) are estimated from an observed visual range (VR) measurement. The PM2.5 concentration estimate is then linked to the EPA public health warning scale called the air quality index (AQI) to inform the public about potential health impacts from smoke from wildfire. Important caveats are: 1) the method only applies when relative humidity (RH) < 65%, and 2) the atmosphere must be predominantly impacted by smoke (i.e. low concentrations of PM2.5 from other anthropogenic sources). In this work, the Interagency Monitoring of PROtected Visual Environments (IMPROVE) light extinction equation was applied to investigate the correlation of VR and PM2.5 as an atmosphere becomes more smoky. This was done for various parts of the country where background anthropogenic concentrations can be more significant than in the arid inter-mountain west and where RH can typically exceed 65%. Results show that for regions where RH > 70% and non-negligible background anthropogenic concentrations exist, this VR/PM2.5/AQI methodology developed in the arid inter-mountain west may not apply. A national health-based air quality standard does not exist for short-term PM2.5 impacts, but the Environmental Protection Agency (EPA) has included this VR/PM2.5/AQI methodology in its Wildfire Smoke, A Guide for Public Health Officials and Canada has also developed a multi-pollutant (PM2.5, ozone, NO2) 3-hr based air quality health index (AQHI). The various state, EPA and international approaches to informing the public about potential health impacts from wildfire smoke will be presented along with the technical analysis of PM2.5 and VR based on the IMPROVE light extinction equation.

Lapham, Kyle (Poster #99)

Kyle Lapham Loess Hills Fire Coordinator The Nature Conservancy - Iowa Being able to bring people together from every side of the fence to advance the use of fire globally.

Neighbors Helping Neighbors: Fire Training Exchanges Spread Like Wildfire

"Through the Fire Learning Network (FLN)—a project of The Nature Conservancy, US Forest Service and Department of the Interior agencies—partners have worked together to develop strategies to scale up the use of fire for over 10 years. One such strategy has been the development of an innovative live-fire, experiential learning program called prescribed fire training exchanges (TREX). Originating in the Great Plains, where most land is privately owned and firefighting capacity is limited, we have built upon the age-old ethos of neighbors helping neighbors. We have expanded the concept to include not only a rancher in Nebraska helping a neighbor across the fence, but also neighbors as far-flung as the US Forest Service in California or the Ministry of the Environment in Spain, working together to-advance the use of fire globally.

Lee, Kristine (Poster #98)

Kristine M. Lee is the Director of the Fire Modeling Institute and the Deputy Program Manager for the Fire, Fuel, and Smoke Science Program with the Fire Research Laboratory, U.S Forest Service, Rocky Mountain Research Station. She has been with the U.S. Forest Service for over 20 years, working on both the research and management sides of the agency.

The Fire Modeling Institute: a Success Story in the Integration of Fire Science into Management

The Fire Modeling Institute (FMI) brings the best available fire and fuel science and technology developed throughout the research community to bear in fire-related management issues across the nation. Because of the increasing number and complexity of wildland fire computer tools and the large, growing body of fire research, land managers are challenged to stay current with the skills and knowledge needed for resource management. The three branches of FMI - Application Team, Information Team, and Modeling Team - provide different roles and assistance to managers and scientists in the application of fire science, including physical fire processes, fuel dynamics, smoke emissions & dispersion, fire ecology, and fire & fuels management strategies. Working with management one-on-one or with teams, provides FMI staff and fire scientists the opportunity to learn from the management community as much as managers learn from FMI analysts and interactions with research scientists. FMI is a national resource that provides a fundamental role in integrating science and management in the application of the latest technology and information to address fire management issues.

Leis, Sherry (Poster #108)

Sherry A Leis is the Coordinator for the Great Plains Fire Science Exchange and a Fire Ecologist for the Heartland Inventory and Monitoring Network of the National Park Service. She has been working on fire and grassland ecology information needs for ten years. She was recently awarded the Outstanding Young Professional Award from the Society for Range Management for her work.

Great Plains Fire Science Exchange

Although fire plays and important role in maintaining ecosystems in the Great Plains, managers, fire operations, private landowners, and researchers working with fire are often disconnected. We are developing a Great Plains Fire Science Exchange Consortium that will join a nationwide network of regional consortia funded by Joint Fire Science Program (JFSP). The knowledge exchange vision is to build collaborative science delivery networks to accelerate the awareness, understanding, and adoption of wildland fire science information. The approach will be to improve communication between researchers, managers, and private landowners. The Great Plains Fire Science Exchange is focused on mid-continent grassland resources with a long evolutionary history of grazing including both working landscapes and conservation lands in both public and private ownership. The Exchange plans to increase the availability and application of fire science information for natural resource management and to serve as a conduit for fire managers to share research needs with the research community. Consortium products will be developed using feedback and suggestions directly from the Great Plains fire community. We plan to achieve a more cohesive community of fire users by providing a web based clearinghouse for information, developing a network of demonstration sites, and a variety of research synthesis products.

Livingston, Amy (Poster #64)

Amy Livingston is a Master's candidate in the Forestry and Wildland Resources Department at Humboldt State University. Her research interests include: invasive species effects on fire regimes, and understanding the effects of conifer encroachment on understory plant diversity in fire-dependent Oregon white oak woodlands in Northern California. Her adviser is Dr. J. M. Varner of Mississippi State University.

Fuel moisture differences in a California mixed native/ non-native grassland: Implications for fire regimes

Non-native invasion can have a broad array of effects on disturbance regimes. In fire-prone grasslands, one consequence of non-native grass invasion is alteration of fuelbed characteristics that determine ignition, intensity, and spread rates of surface fires. To better understand this phenomenon in California grasslands, we sampled fuel moisture content and stature of grasses in the Bald Hills of Redwood National Park. We sampled fuel moisture and plant stature of four native and four non-native grasses monthly during the 2012 fire season. Moisture contents were compared between native and non-native groupings, among species, and across collection periods using Welch two sample t-test and ANOVA. Mean moisture content for native and non-native grasses was significantly different across the sampling period ($P < 0.01$). Species also differed ($P < 0.001$) across all sampling months. Harding grass, Phalaris aquatica, an aggressive invasive, had the highest mean moisture content for all months, while California fescue, Festuca californica, a prominent native bunchgrass, had the lowest mean moisture content. Harding grass moisture contents were significantly higher than all the native grasses across all fire season sampling dates ($P<0.001$). Among species, the prevalent non-native Cynosurus echinatus was the first species to dry below moisture of extinction (06 August). Our results suggest that some non-natives function to increase fire hazard (e.g. Cynosurus echinatus) while others may abbreviate the fire season (Phalaris aquatica). The degree to which non-natives affect fire behavior depends on the density and extent of their occurrence. Our results underscore the importance of understanding the potential effects of non-native species on contemporary fire regimes.

Llamas-Casillas, Paulina (Poster #9)

I'm a graduate student from the University of Guadalajara, I have 7 years working in forest ecology applied to management. I won a award from the Botany Society of México for my research about stand-repleacement fire in western México and I'm a coautor in a publication about fire research priorities in México.

Fire Regime in pine-oak and mixed conifer-hardwood forests of The Sierra de Manantlán in Western México.

Climate, geomorphology and vegetation are main factors controlling the variation in fire regimes at landscape-scale. In the Sierra de Manantlán Biosphere Reserve (west-central México, 19°35' northern latitude), we compared the fire history of four sites located in two landscape conditions (1) pine-oak forests in mountain ridges and upper slopes and (2) mixed conifer-hardwood forests in depressions and ravines, and two bioclimatic zones (1) warm temperate (1950-2200 masl) and cool temperate (2700-2800 masl). We obtained 118 cross-sections of live trees and stumps from conifer species (Pinus douglasiana, P. pseudostrobus, P. durangensis, Abies guatemalensis and A. religiosa). After developing a master chronology of 207 year length (1804-2010), fire scares were cross-dated and mean fire intervals (MFI) calculated from the first to the last recorded fire in each site. The MFI was shorter in the pine-oak forest of mountain ridges and slopes of the warm temperate zone (3.6 years) than in the cool temperate zone (6.3 years). In the mixed conifer-hardwood forest the MFI was longer in the warm temperate zone (28 years) in relation to the cool temperate zone (16.5 years). These results agree with previous studies in the area in which, from characterization of climate, geomorphology and fuel beds, it has been inferred that pine-oak forests have a potential frequent low severity surface fire regime, while the mixed conifer-hardwood forests is characterized by a relatively infrequent mixed severity fire regime. Changes in land use and forest management have influenced fire regimes. The results are being applied in designing fire management practices in the biosphere reserve.

Logan, Dustin (Poster #4)

Dustin Logan is a MS graduate student at Oklahoma State University in the Natural Resource Ecology and Management Department studying forest resources. He received his B.S. degree in Biological Science with a minor in Chemistry from Bowling Green State University in December 2009. His current research interests are the effects of prescribed fire on soil carbon.

Prescribed burning effects on soil carbon in upland oak forests

Carbon sequestration has become a major concern in recent years due to elevated carbon dioxide in the atmosphere that has a potential to affect global climate. Fully understanding how to reconcile use of prescribed fire to control invasive species and maintain historical stand structures with the potentially negative effects of fire on carbon storage will be important for land managers concerned with carbon sequestration. Forest management often includes a prescribed fire program and the effects of fire on carbon storage are important to know in order to create the optimal system. We studied effects of low intensity prescribed fire on soil carbon (C) and nitrogen (N) in upland oak forests in three wildlife management areas (WMA) in Oklahoma. Prescribed fire treatments ranged from 0–5 fires per decade and 1–25 years since last fire. Soil samples were collected from 0–5 cm and 5–20 cm from 15 plots within 5 treatments per WMA. In addition, litter was collected from a 0.5 x 0.5 m quadrat. All litter and soil samples were ground, homogenized and analyzed for total C and N and litter samples were analyzed for lignin content. Soil N and C at 0–5cm were 0.07–0.34% and 1.17–4.62%, respectively. Soil N and C at 5-20cm were 0.03–0.18% and 0.35–2.32%, respectively. Prescribed fire had a significant effect on soil C and N at 0–5cm at all three WMAs and 5–20cm at two WMAs. Preliminary analyses showed soil C and N were greatest at intermediate fire frequencies. These results suggest both fire suppression and too frequent prescribed burning may reduce soil carbon in upland oak forests.

Long, Alan (Poster #83)

Alan Long is Professor Emeritus with the School of Forest Resources and Conservation, University of Florida. His teaching, extension and research activities focused on fire ecology and management, forest operations, forest stewardship and management opportunities for nonindustrial private forest landowners, and continuing education for professionals. He currently works with Tall Timbers Research Station as Administrative Director of the Southern Fire Exchange, a Joint Fire Science Program regional consortium for fire science technology transfer. Over the last 10 years, Alan has focused both research and outreach on WUI fire hazard assessments and issues. He received the AFE Herbert Stoddard Sr Lifetime Achievement Award in 2008.

Southern Fire Exchange: Putting Fire Science on the Ground

The Southern Fire Exchange (SFE) is a regional program for fire science delivery, funded by the Joint Fire Science Program (JFSP) as part of the national knowledge exchange network. The SFE is directed by a partnership of the University of Florida, North Carolina State University, Tall Timbers Research Station, and the USFS Southern Research Station. The SFE covers the southern pine ecosystems across eleven states and places a heavy emphasis on prescribed fire. Consortium activities focus on four programmatic areas: 1) a 'first-stop' web-based Resource Center (www.southernfirescience.org) that consolidates southern fire information and links to a wide variety of additional resources; 2) technology transfer through the Fire Lines newsletter, fact sheets, research summaries and presentations; 3) direct communication between scientists and fire managers through webinars, workshops and research highlights at Prescribed Fire Council meetings; and 4) fact sheets about prescribed burning and wildfire that can be used to enhance public education. All our programs rely on a wide variety of partners who assist with program delivery and SFE governance. Details about each of these program components will be presented in the poster.

Long, Jonathan (Poster #96)

Jonathan Long is an ecologist with the Fire and Fuels Program of the USDA Forest Service Pacific Southwest Research Station in Davis, California. He coordinates several research integration projects to help land managers address important challenges in ecological restoration of forest and wetland ecosystems. He has published articles and book chapters on projects to monitor and treat wetlands damaged by wildfires undertaken through a seventeen-year collaborative relationship with the White Mountain Apache Tribe and members of the community of Cibecue in Arizona.

Synthesizing science to promote long-term socio-ecological resilience in the Sierra Nevada Bioregion

The Pacific Southwest Research Station has led an innovative one-year effort to synthesize and distill recent scientific research to guide revision of land and resource management plans on the National Forests of the Sierra Nevada. Through a collaborative, transdisciplinary effort, the science team is producing an integrated report on strategies to promote long-term socio-ecological resilience in the Sierra Nevada Bioregion in the face of climate change, increases in wildfire severity and extent, demographic changes, and other expected stressors. The synthesis was developed to serve the National Forests of the bioregion in response to a request from the Region 5 planning staff and keen interest from stakeholders in the environmental community and forest products industry. The report expands upon recent PSW station reports by considering more social and economic values as well as a broader range of forest and aquatic ecosystems in the Sierra Nevada. In addition to a general lack of research that integrates socio-ecological issues, there is a mismatch between the long-term, landscape scale of management challenges in the region and the relatively short-term and small spatial scales addressed by much existing ecological research. One of the strategies developed in the synthesis builds upon the approach of fireshed modeling and other modeling efforts by considering how to analyze landscape conditions and design treatments that reduce the extent of undesirably severe wildfire, avoid impacts to sensitive species, consider opportunities to promote resilience of local communities, and incorporate adaptive management to evaluate outcomes. Other fire-related topics discussed in the synthesis include treatments to promote heterogeneity in forest structure, fuels, and post-fire conditions; treatments to emulate traditional indigenous burning practices; and the research gap concerning long-term post-fire outcomes and restoration strategies.

Meyer, Marc (Poster #51)

Marc is an ecologist with the USDA Forest Service Pacific Southwest Region and serves the Sierra, Inyo, and Sequoia National Forests and Giant Sequoia National Monument. His work focuses on integrating science information into land management decisions for the national forests of the southern Sierra Nevada. Marc has a Ph.D. in ecology from the University of California Davis and has nearly 20 years of experience studying the effects of fire and fuel management treatments on California's flora and fauna. He is currently an Associate Editor for the journal Fire Ecology.

Post-fire vegetation change in singleleaf pinyon pine woodlands of the eastern Sierra Nevada

There is a critical need to understand post-fire vegetation changes in the eastern Sierra Nevada, where recent increased wildfire activity and cheatgrass (Bromus tectorum) invasions are impacting post-fire vegetation recovery in arid woodlands and shrublands. Our objective was to examine patterns of vegetation recovery nine years following the 1030-ha Birch Fire (2002) in singleleaf pinyon pine (Pinus monophylla) stands of the Inyo National Forest. We sampled a total of 39 regeneration plots (30 burned, 9 unburned) and 10 stand exam plots (8 burned, 2 unburned). Approximately 97% of burned plots burned at high severity. Live singleleaf pinyon pine basal area and overstory cover were significantly lower in burned plots (mean = 0.5% cover) compared to unburned controls (32% cover). Singleleaf pinyon pine regeneration was more than two orders of magnitude greater in unburned than burned plots, and regeneration was positively related to live pinyon pine

basal area. Species richness of shrubs was greater and shrub cover was marginally greater in burned than unburned plots. Cover of native herbaceous plants was 6.4 times greater in burned than unburned plots, although species composition was similar between sites. Cheatgrass cover was 38 times greater in burned plots. Cheatgrass was absent or in trace coverage (≤0.1%) in 89% of unburned plots, but 50% of burned plots had >25% cheatgrass cover. Cheatgrass cover was negatively related with native herbaceous plant cover, shrub cover, and live basal area of pinyon pine. Plots exceeding 20% cheatgrass cover tended to occur in the mid to upper topographic position of slopes. Our results are consistent with previous studies in the Interior West documenting high pinyon pine mortality, virtual absence of pinyon pine regeneration, increases in understory cover and diversity, and cheatgrass invasion following wildfire.

Miller, Kristen (Poster #97)

Kristen Lee Miller is a senior Forest Recreation major at the University of Wisconsin Stevens Point. She is a second-generation fire manager and has participated in over 14 burns on over 5,000 acres. She currently serves as the Crew Leader for the UWSP Fire Crew and was the Crew Secretary for the 2011-12 school year. She plans to graduate in December 2013 and go on to earn a masters in Wildland Fire Management. The high point of her fire career so far was serving as a Public Information Officer on the Honey Prairie Fire on the Okefenokee National Wildlife Refuge in 2011.

UWSP Fire Crew: A Mechanism for Restoration, Suppression and Preparing the Next Generation of Fire Managers

The University of Wisconsin Stevens Point (UWSP) developed a Fire Crew in 1986, making it the first fire crew directly associated with a university. The UWSP Fire Crew is a para-professional organization that assists with fire management throughout the state of Wisconsin. The Fire Crew assists both public and private landowners with prescribed burns, often for prairie and oak savannah restoration. Many of the agencies managing public lands in Central Wisconsin call upon the Fire Crew members to augment their own personnel during prescribe burns UWSP's Fire Crew also assists suppression agencies whenever their own resources are overwhelmed, or whenever a hand crew is required for suppression. For the past twenty-five years, perhaps the greatest impact the UWSP Fire Crew has had may be the hundreds of students who completed their basic fire training and gained valuable experience through their participation in Fire Crew. By already having their basic fire training completed, students have a competitive edge when seeking summer employment. In an average year, the Fire Crew has 100 members; the majority of these members spread across the nation for summer jobs in fire management. Many also move into permanent, fire –related jobs upon graduation. The spread of Fire Crew members throughout the country has established a legacy that the current Fire Crew strives to build upon.

Miller, Mary (Poster #72)

Mary Ellen Miller is currently working as a research engineer at Michigan Tech Research Institute. Her educational background is Environmental Engineering, Imaging Science and Physics. She enjoys utilizing remotely derived image data in physically based environmental models. She has a strong interest in fire science especially fire effects and mitigation. Recent projects include mapping historical fires in North American Tundra, development of a physical model of post-fire dry ravel, reducing noise in LiDAR waveforms for determining forest biometrics, mapping wetlands and prioritizing fuel reduction treatments. She would love to work on BAER Teams (Burned Area Emergency Rehabiliation) as a hydrologist or GIS specialist. Her most recent accomplishment was modeling potential post-fire erosion for the High Park fire in Colorado.

Modeling Post-fire Erosion: Linking Remote Sensing and a Process-based Hydrological Model for Post-fire Remediation: High Park Fire, CO

BAER Teams must rapidly assess burn scars and determine where and if to apply remediation treatments. BAER teams commonly rely on satellite derived burn severity maps and post-fire erosion modeling tools. In this poster we demonstrate how to combine these two tools to support the BAER Team for the High Park fire that burned 87,200 acres in Larimer County, Colorado. Spatial soil, land cover and DEM layers were prepared ahead of time along with a methodology for rapidly merging satellite derived burn severity maps with the soil and vegetation data layers. The entire burn scar for the High Park fire was modeled in less than three days allowing the predictions to be available for operational use by the BAER Team.

Mishra, Bikash (Poster #44)

BIkash Kumar has a M.Phil in Environmental Sciences (M.Sc. Env. Sc.); Jawaharlal Nehru University, New Delhi, India and a Masters Degree in Environmental Sciences (M.Sc. Env. Sc.). He earned his Bachelors in Environmental Sciences (B.Sc. Env. Sc.)at Tribhuvan University Nepal. He is a research scholar, School of Environmental Sciences, JNU, New Delhi.

Effects of fire on ability of seedlings to grow into saplings in Sal (Shorea robusta Gaertn. F) Forest in Sabaiya Collaborative Forest, Parsa, Nepal

The effects of fire on ability of seedlings to grow into saplings were studied. It was found that fire had negative impact on seedlings ability to grow into saplings and later stage. Despite having satisfactory regeneration of seedlings of Sal (16960 stem/ha), very few (120 stem/ha) saplings were recorded. Similar was the case with other tree species. Each year occuring mild fire enriched the soil but it also destroyed the delicate seedlings. The forest had the dominance of Sal (68.8%) followed by Mallotus philipensis (6.8%), Syzygium cumini (4.8%), Terminalia tomentosa (4%), Semecarpus anacardium (4%) & other less than 4% each. Phytosociological study of the forest was carried out and Species Diversity, Importance value index, Basal Area, density & Regeneration status were accessed. Edaphic charecteristics were also studied which revealed that soil was sandy loam to loamy sand, slightly acidic to near neutral (pH 5.34-6.88), soil nitrogen moderate (0.12-0.25%) & Organic carbon moderate (1.5-3.0%). The study thus revealed that despite having other conditions favourable for the Sal forest, fire had greatly affected the seedlings to be able to grow into saplings and later stages. Keywords: Fire, Sal, Regeneration, Seedlings, Saplings

Mohr, Helen (Poster #92)

Thomas A. Waldrop, Research Forester, USFS Southern Research Station

SCIENCE DELIVERY IS A TWO-WAY STREET – DEVELOPMENT OF THE CONSORTIUM OF APPALACHIAN FIRE MANAGERS AND SCIENTISTS (CAFMS)

"We have a lot of information but it is scattered and too difficult to find." "Managers should read our publications, all the information is there." "Research publications are too specific and difficult to read, especially when units are metric." "I do not have time to meet and greet every land manager to sell my science." "I am uncomfortable calling a scientist that I do not know." These are just a few of the more common comments expressed at three regional workshops in the fall of 2009 to plan the Consortium of Appalachian Fire Managers and Scientists (CAFMS). Over 75 participants from across the Appalachian region were introduced to the topic of Science Delivery and asked what forms of delivery they were familiar with and which of these work well for them. Answers were diverse, reflecting the wide range of cultures and management problems encountered in the Appalachian region. The overall result of Consortium planning was a clear indication that managers and scientists do not communicate well and that both groups could gain much knowledge by increasing interaction. Suggestions were made for almost 50 types of science delivery but most managers and scientists were looking for very similar products. This poster will introduce the CAFMS and the topic of science delivery. It will also describe some of its unique plans for improving communication between scientists and fire managers. KEYWORDS: prescribed fire, southern Appalachian Mountains, technology transfer.

MontBlanc, Eugenie (Poster #88)

Eugenie MontBlanc, Great Basin Fire Science Delivery Coordinator, University of Nevada, Variation in ant populations with elevation, tree cover, and fire in a pinyon-juniper-dominated watershed.

Great Basin Fire Science Delivery

The Great Basin Fire Science Delivery project assists field-level land managers in identifying and accessing the best fire and resource science information available. The goal is to improve technical and policy decision-making through enhanced communication and information sharing. This project is part of the Joint Fire Science Program's national network of regional knowledge exchange consortia established in 2010 to address current challenges in fire and fuels management due to increased land use, invasive species, shifting climate, and complexities with differing agency missions and policies. To determine specific technical information and delivery needs for the Great Basin, the Fire Science Delivery project conducted a needs assessment of 111 federal land management agency personnel in Nevada, Utah, Idaho, and Oregon. Land managers requested information syntheses, online training, a web-based clearinghouse of information, networks of experts, and field workshops. To address these needs, the fire science delivery project established a list serve and sends newsletter updates about fire and resource science information and events, established a website of fire and resource science information, hosts webinars and field days, funds and develops needed syntheses for our region, supports online class development and training opportunities, and has developed an interagency restoration cadre. We expect public and private land managers to benefit from this project by having a place and a person to turn to for answers to technical questions, leads to research contacts, and a forum to communicate technical needs. We expect research scientists to benefit from this project by gaining new ideas and partnerships for research and by providing new methods of outreach for research results.

Moriarty, Kevin (Poster #32)

Kevin Moriarty-CSU SAFE President; Research Assistant; Colorado State University

Colorado State University Student Association for Fire Ecology

The Colorado State University(CSU) Student Association for Fire Ecology(SAFE) consists of students from diverse disciplinary backgrounds ranging from ecology, engineering, economics, fire science and resource management. Outreach and collaboration have provided the CSU SAFE chapter with extended opportunities to explore fire ecology sciences in the classroom and hands on experiences in the field. In 2012, CSU SAFE organized a field trip to the Four Mile fire site, hosted a graduate level seminar in fire ecology and brought five students to Nebraska to conduct 2,500 acres of prescribed fire.

Mueller, Joshua (Poster #49)

Joshua R. Mueller, Graduate Research Assistant, Kansas State University

Relative Role of Fuel Source Fluctuations on Disturbance Fire Regimes within Mesic Deciduous and Oak-Savannah Forests in Southern Wisconsin, USA

Fire is a result of interactions between climate (precipitation and temperature), vegetation (fuel availability and fuel taxonomy) and ignition (lightning or human), but understanding the individual effects of these variables on fire regimes can be challenging due to the substantial ecological complexity among them. Several studies have suggested that climate variability is the primary driver of changes in vegetation throughout the upper Midwestern USA. However, long-term studies suggest that fire may be more of a significant driving force on vegetation and available fuel bed fluctuation than previously suggested. To address the relative roles of climate and fire in the long-term composition of deciduous forests, a transect of four study sites were investigated across the prairie/forest boundary. Sediment cores were analyzed to understand the sensitivity of vegetation as fire regime and moisture availability changed over the past 10,000 years. High-resolution charcoal analysis from lacustrine sediment of Butler Lake, Lake Seven, Comstock Lake, and Lake George characterized fire activity and fuel source fluctuation across a moisture gradient from wet southern Mesic forest towards dry Prairie Oak Savannah over the last 10,000 years. Fire frequency ranged from 1 to 8 fire events per 1,000 years across sites during the Holocene. Changes in fire frequency were more synchronous at the two sites with higher moisture availability.Fire intensity was likely varying over time between stand-replacing crown fires and low-intensity surface fires as reconstructed from the charcoal morphology classification method. Both climate and fire were shown to influence long-term vegetation composition through feedbacks between fire and fuels.

Northway, Jennifer (Poster #94)

Jennifer L Northway Alaska Fire Science Consortium Coordinator Bureau of Land Management – Alaska Fire Service
Jennifer has been actively involved in the fire management community in Alaska for over 10 years. She brings a wealth of knowledge and experience in fuels and fire ecology, fire management and research collaboration to the Alaska Fire Science Consortium.

The Alaska Fire Science Consortium: Bridging the Gap in Fire Science Delivery

The need for awareness, understanding and application of wildland fire science information has grown immensely as managers are faced with ever challenging decisions in today's fire environment. The "best available" science is often not readily accessible, written in a digestible format, or presented in a context relevant to fire management plans and projects. The Alaska Fire Science Consortium (AFSC) is one of fourteen regional consortia that have formed a national collaborative science delivery network with the goal of accelerating the understanding and adoption of fire science research by stakeholders. The AFSC strives to strengthen the link between research and on-the-ground application by promoting two-way communication between managers and scientists, providing an organized fire science delivery platform, and facilitating collaborative scientist-manager research development. To achieve these goals, the AFSC hosts a variety of events including both Alaska-wide and topic specific workshops, webinars and field site visits. Topics of discussion range from fuel treatments to fire and climate interactions to fire modeling. Videos and presentations are available on the on-line archive for easy access. Additional products include research summaries and project factsheets written for use by managers, monthly newsletters, fire science highlights blog, Alaska Fire Reference Library, help desk, and website (http://akfireconsortium.uaf.edu). Using both formal and informal feedback, we continually refine and improve our products to meet the needs of our stakeholders in Alaska. Our focus for the next two year period will be on actively enhancing communication between fire scientists and fire and land managers who work in boreal forest and tundra ecosystems.

Ohnishi, Masahiro (Poster #14)

I am Masahiro Ohnishi, a current graduate student working as a graduate research assistant for the Borderlands Research Institute under Sul Ross State University. My current contributions include my thesis project and working with the South Texas Native under the Caesar Kleberg Wildlife Research Institute. Both jobs are strongly related to environmental restoration and have made me consider different approaches to managing landscapes from various disturbances. I was a teacher's assistant for the senior level Range Inventory course in Spring 2012. I previously worked as a project assistant at the Chihuahuan Desert Research Institute for three years and helped facilitate the CDRI grassland restoration and various other projects. I am also a current member of the Texas Master Naturalists.

Influence of fire and succession of microbial communities after disturbance in the Chihuahuan Desert grasslands

A historical major wildfire known as the Rock House Fire occurred April 9, 2011. The fire burned through 90% of the Mimms Ranch and the west side of Marfa and continued to burn to the Davis Mountains which are more than 20 miles away. Lack of natural resources for animals and plants because of the wildfire and exceptional drought has caused considerable environmental changes in West Texas. Evaluating the composition of microflora in soil-surface communities is essential to overall rangeland health. Microflora of soil-surface communities create roughened surfaces, which increase rainfall infiltration, decrease water runoff volume and velocity, and hold seeds and organic matter. The most dominant species in the soil communities are bacteria and archaea. some species have roles for biogeochemical cycles such as the nitrogen, carbon, and iron cycle. Four major objectives for this research are; 1) Describe the microflora of the soil surface to genus level on burned, unburned, and trampled sites, 2) Examine recovery processes of the microflora of the soil surface after fire, 3) Evaluate mechanisms of recovery and growth of the microflora of the soil surface in the Chihuahuan Desert, and 4) Examine relationships between the microflora and herbaceous plants. A total of 18 samples of the soil from 3 burned, 3 unburned, and 3 trampled sites across the Mimms Ranch were collected in early and late summer. There are 3 major research procedures; 1) extract and amplify total DNA from soils; 2) measure N, C, Fe, pH, and salinity levels; and 3) vegetation transects for basal and canopy cover using a ⅛ m^2 Daubenmire quadrat transect, belt transect, and line intercept method. Mean of salinity and pH level of late summer was lower than results of early summer. Concentration of DNA and number of vegetations of late summer increased significantly.

Olson, Diana (Poster #45)

Diana L. Olson FRAMES Project Manager University of Idaho My background includes fire history research and fuels research, and my current focus is technology transfer.

Boreal Forest Fire History in Alaska: Review, Synthesis and Data Compilation

The goal of this project was to compile and synthesize existing Alaska boreal forest fire history literature and datasets. This includes a literature review and synthesis of 378 references related to fire regimes in boreal forests in Alaska, including individual summaries for 28 fire history studies. The review and synthesis is currently in draft form ("Fire Regimes of the Alaskan Boreal Forest") and is organized by fire regime components, spatial distribution of regimes by vegetation type, and temporal variability of fire regimes across multiple scales. Fourteen existing published and unpublished fire history (or stand age) datasets were compiled (and as necessary, processed) into the standardized Alaska Fire History Database, totaling 2,786 plots and 13,585 samples. The database includes summarized fire dates, possible fire dates, and estimated tree establishment dates. Additionally, plots were assigned to an ecoregion and a climatic zone. Data summarized by plot are available through a dynamic map interface (within the Alaska Fire and Fuels Research Map). Finally, some of the project funds were used to clean up and improve data within the Alaska Large Fire Database, a database initiated in the early 1990s that includes reported fire locations since 1939 and fire perimeters since 1942. Improvements resulted in indentifying and digitizing 417 missing fire perimeters, and 5.8 million additional acres of burned area were represented. Please visit www.frames.gov/alaska/borealfirehistory to access the draft literature review, the databases, and the online map. Project funding was provided by the Joint Fire Science Program (Project No. 06-3-1-26: Compiling, Synthesizing and Analyzing Existing Boreal Forest Fire History Data in Alaska).

Oram, Gary (Poster #22)

As a former staff reporter at the Dillon Tribune, Gary Oram became an accredited member of the Montana Newspaper Association, and won honors for best Montana sports column, 2010. At present, he is working closely with The National Council of Science and the Environment, to produce a series of presentations during the 13th National Conference on Science, Policy and the Environment, January 15-17, 2013, in Washington D.C. As a Master's candidate at the University of

Montana, he works in wildland fire, and with alternate sources of energy. He is a Firefighter Type, and has preformed initial and extended attack on over 50 Class A and B forest fires.

Using the carbon cycle to inhibit global warming: the environmental and economical benefits to burning biomass.

Viewing the charts and graphs demonstrating the consumption of electrical energy, oil, natural gas, and coal world-wide the earth suddenly becomes finite. Viewing this information concerning only the United States demonstrates a frightening aspect. Viewing this information on a 24" by 34" posterboard at ten feet away, along with possible means to stall or inhibit global warming, continue to supply the growing demand for energy, and understand how all this is closely related to forest fire, was my goal when I assembled the posterboard I am prepared to present.

Palmer, Karen (Poster #23)

Karen Palmer is currently the Lead Fire Effects Monitor at Yosemite National Park. She also recently graduated (May 2012) with an M.S. degree in Forestry from Northern Arizona University. Areas of interest include fire and fuels management, fire modeling, and identifying ways to make long-term monitoring successful through implementation of the adaptive management cycle. This winter she will be working with her major professors to publish work from her Master's thesis.

Modeling long-term changes to the ponderosa pine forests of Grand Canyon National Park

Grand Canyon National Park's fire management program has utilized prescribed fire and wildland fire for over 20 years to reduce fuel loading and the potential for extreme fire behavior in order to obtain desired conditions of the forest. However, a better understanding of the long-term changes in stand structure and fuel characteristics following management activities is needed for the continued support of fire as a land management tool in Grand Canyon National Park. This study compares the long-term effects of several possible management scenarios across Grand Canyon National Park's ponderosa pine (Pinus ponderosa) forests on the South Rim. The Fire and Fuels Extension (FFE) of the Forest Vegetation Simulator (FVS), a forest growth and yield model, was employed using data from Grand Canyon's fire effects monitoring program. Simulations were run in FFE-FVS using various management and regeneration scenarios to understand the possible trends in fuels characteristics, stand structure, and potential fire behavior for 50 years into the future. The scenarios included a no-treatment (control) scenario, an 8-year burn interval (the current interval employed), a 16-year burn interval, and a scenario which alternated the burn interval between 8 and 16 years for the length of the simulation. We further simulated the natural variability of ponderosa pine regeneration in the Southwest by manually entering in low and high regeneration rates of the dominant tree species obtained from Grand Canyon's fire effects monitoring program data. These results have key management implications for Grand Canyon's fire management program. The modeling results suggest that under a low regeneration rate burning every 8 years will produce stand structures, total surface fuel loadings, and potential fire behavior or fire effects that are within desired conditions for almost all of the variables we analyzed. The FFE-FVS modeling results also suggest that the long-term effects of the differing burn scenarios may be heavily dependent on the potential for high or low regeneration rates post-fire. Therefore, we recommend that a good management strategy be guided partly by the observed post-fire regeneration rates and we advocate for the use of all available information to guide the adaptive management cycle.

Peterson, Laura (Poster #69)

Name: Laura Peterson Title: Fire Ecologist Affiliation: Dixie and Fishlake National Forests I was recently converted from a fire ecologist intern position to a Fire Ecologist for the Dixie and Fishlake National Forests. I have collected and summarized fire effects monitoring data for the past five years on the two forests.

What do I monitor? How to use your objectives effectively.

Creating measurable objectives before both wildfires and prescribed burns can show short and long term fire effects and help set and achieve future fuels/fire management goals. Objectives for the 2007 Toad wildfire in southwestern Utah were used to create a monitoring plan to collect pre-burn and post-burn fire effects data. Data collected from random plots by district fuels crews and the Student Conservation Association crew show changes in fuel loading and tree species composition from the Toad wildfire. The data summary shows if and when objectives were met, allowing resource managers better insight for future burn plans or wildfire objectives in similar ecosystems.

Pickett, Elizabeth (Poster #85)

Elizabeth has worked with Hawaii Wildfire Management Organization since 2008. As Executive Director, she manages a staff of four and is leading the organization forward on numerous community outreach and education projects. Recently, she contributed to and helped coordinate a multi-partner planning process to create the Pacific Fire Science Consortium. Elizabeth earned a master's degree from the Yale School of Forestry in 2007, and a bachelor's degree from UC Berkeley in 2000.

Pacific Fire Science Consortium - The Hottest Partnership in the Pacific

The Pacific region is generally underrepresented in fire science and technology despite an urgent need for detailed, relevant and accessible information. While initial efforts have been made in understanding fire dynamics, ecological impacts, and fuels mitigation there is a growing need for additional region-specific fire research. To maximize the value of this next generation of fire science, effective communication and bidirectional information transfer must be expanded and formalized so that future research is guided by manager needs, and knowledge and tools gained from the science are efficiently transferred back to end-users. The Pacific Fire Science Consortium was recently formed and funded to address this need for a collaborative and regionally specific approach toward effective fire prevention, mitigation, and management, and to stimulate and utilize "best available" research to reduce wildfire management costs and enhance our ability to effectively protect natural, cultural, and community resources from wildfire. The consortium is working to develop a means of transferring knowledge among scientists, resource managers, decision-makers, fire suppression agencies, and communities in Hawaii and the U.S. affiliated Pacific through the following initial deliverables: consortium website, calendar of Pacific-based wildfire-related trainings, searchable bibliography of journal articles relevant to the region, wildfire-focused decision support tools, support of a wildfire management-focused outreach liaison, and the creation of a fire science-focused University of Hawaii Extension Specialist position. The consortium is part of the national network of Joint Fire Science Program Knowledge Exchange Consortia.

Ramsey, Rebecca (Poster #17)

I am Rebecca Ramsey, an undergraduate student at the University of Idaho. I have participated as a technician in stream, rangeland, wildlife, forest, and fire ecology research throughout my college career. This last summer I had the opportunity to work with a member of the Northern Rockies IGERT team which studies the effects of climate change on disturbances in forest ecosystems. My senior thesis is a part of this larger project.

Post-fire microsite selection of Pseudotsuga menziesii seedlings as influenced by burn severity, aspect, and elevation

Extensive areas of lower montane forests across the Pacific Northwest burned in the year 2000. We studied how the burn severity, aspect, and elevation of these fires affected P. menziesii post-fire tree regeneration by comparing characteristics of microsites with established seedlings to those generally available in the same location. We randomly selected 49 plots with varying combinations of low, moderate, and high burn severity, northeastern and southwestern aspects, and low, mid, and high elevations in locations that burned in 2000 within Idaho and Montana wilderness and adjacent areas that had not been planted. Within each location, we sampled three 1 m X 1 m quadrats placed at 0 m, 30 m, and 60 m along a transect, measuring fractional cover of rock, bare soil, litter/duff, moss, tree bole, and vegetation in addition to percent cover of grass, forb, shrub, and tree vegetation. Percent overstory tree canopy cover was also measured at each quadrat. The same measures were made at three additional quadrats placed around the closest P. menziesii seedlings. We analyze the paired plots to test our hypothesis that microsites with seedlings have higher fractional cover of bare soil, litter, and tree bole with less grass cover, and that this will be most pronounced on south aspects and on high severity burns. Understanding the microsite conditions under which P. menziesii seedlings successfully regenerate will help determine areas in which post-fire regeneration will be most (and least) successful, particularly if future fires in the region are larger and more severe. This study is part of a larger project which focuses on forest resilience to climate change with effects likely most pronounced following high severity fires, on drier aspects, and at lower elevations.

Ranseen, Susanne (Poster #11)

My name is Susanne Ranseen I am second year graduate student at Oregon State University. I am currently working on my Masters of Interdisciplinary Studies combining the fields of ecology, forest management, and history.

The Schultz Fire: A look at historic management effects of fire severity in dry forested systems.

In June of 2010, the Schultz Fire burned in the Coconino National Forest outside of Flagstaff Arizona. Only one of several fires burning in the area that month, the Schultz fire eventually burned 15,000 acre, 13,000 of these in the first four hours of

the fire. Started by an abandoned campfire, the Schultz fire would ultimately cost $10 million in suppression and $58 million in damages and repairs due to the flooding that followed the fire during the annual monsoon. The Schultz fire may be able to shed light on the ever-growing concerns on the state of fire in dry forested systems, particularly those dominated by Ponderosa Pine. Was the Schultz fire a stand-alone event of high severity fire, or is it an example of increasing high severity fires in a system thrown out of balance? How do such areas recover after such a disturbance? How has past management affected these types of fires and how can future management restore balance and avoid such large high severity fires in the future?

Reid, Sharon (Poster #18)

Sharon Reid is currently undergoing Masters by research in the fire ecology field at Monash University, Victoria Australia. Sharon began her ecology career as a field researcher for local goverment but this was placed on hold with the advent of children. She has worked in the areas of reptile behaviour and ecology and waterways health along with an earlier career in oral health and has two publications to her name so far.

Habitat suitablility for rehabilitated wildlife after fire.

Fire, a common occurrence in Australia, has an enormous impact on habitat but also results in large numbers of injured fauna needing care. Post release follow up research on rehabilitated possum sp. has rarely been undertaken and in the few studies available the survival rates have been poor. Narrowing down the specific requirements for a successful release site in relation to its fire history has not been attempted. This study aims to investigate whether fire history can be used as a reliable indicator of the suitability of release sites for rehabilitated possum sp. Habitat and fauna surveys have been carried out in areas of Lowland forest with differing fire histories and results are being investigated to determine which appear to be suitable release sites. Wildlife carers will be surveyed to investigate their release site selection criteria and priorities. Rehabilitated possums are intended to be released into areas deemed suitable and their progress followed to determine the success of the release. The information gathered is intended to aid wildlife carers when selecting release sites and also should be useful in relation to planned burning by government agencies.

Rogers, Michael

Michael J. Rogers started his career with the US Forest Service in June of 1957 as a firefighter on the Chilao Hot Shot Crew located on the Angeles National Forest. He graduated from the School of Forestry at Oregon State University in 1966. Although he served in a variety of positions after becoming a Forester he always maintained his interest in fire. In 1967 he attended a workshop on prescribed burning and remained involved in the application of prescribed fire to the present. After retiring at the end of 1999 he went to work as a consultant with Firewise 2000, Inc. and started his own firm, Fire Management Consulting. He has co-authored Protecting Life and Propety from Wildfire, published in 2005 by NFPA and co-authored a Fire Technology article entiled Protecting Lives and Property in the Wildland-Uran Interface in April 2011.

A New Hghly Effective Tool for Prescribed Burners

ICL Performance Products has developed a highly effective, easy to apply Gel Concentrate for treating highly flammable adjacent fuels on Prescribed Fire Projects. This new recently approved product, PHOS-CHEK Insul-8 gel, when mixed with water at the rate of 1 gallon of Insul-8 to 100 gallons of water provides a highly effective inflammable barrier for up to an hour or more after application. This very economical product was just used to burn plots within the middle of a highly flammable, continuous cover of thick perennial grasses on San Clemente Island in southern California. Our session will include a power point presentation that describes the mixing, application and visual results that clearly show the effectiveness of this new product. The product does not diminish the need for clear objectives for a proposed burn and a prescription that determines the burning window. The PHOS-CHEK Insul-8 did give us a distinct advantage by rendering the highly flammable adjacent fuels unavailable to ignition sources (airborne brands, embers, radiant heat, direct flame impingement, spilled burning drip torch fuel, etc.). We will conclusively demonstrate the effectiveness of this product by showing what occurred when we flagged a large circle in a stand of cured, highly flammable perennial grasses without any other firelines and sprayed the outer perimeter of the flag line with Insul-8 and then lit the interior of the flagged circle under the following conditions: full sun, RH 54,wind NW, wind speed 4mph, fine fuel moisture 7 at 1:14 PM, PDST.

Saperstein, Lisa (Poster #70)

Lisa Saperstein has been working with fire ecology in Alaska since 1989, when she started her Master's work on tundra fire and caribou at the University of Alaska Fairbanks. She has been with the U.S. Fish and Wildlife Service in Alaska since

1993 serving as a refuge wildlife biologist and, since 2010, the regional fire ecologist. Publication note: Maier, J.A.K., J.M. Ver Hoef, A.D. McGuire, R.T. Bowyer, L. Saperstein, and H.A. Maier. 2005. Distribution and density of moose in relation to landscape characteristics: effects of scale. Canadian Journal of Forest Research 35:2233-2243.

Alaska Wildfire Research Needs: Connecting Scientists and Managers

The mission of the Alaska Wildland Fire Coordinating Group (AWFCG) is to provide a forum that fosters cooperation, coordination, collaboration, and communication for wildland fire management and related activities in the State of Alaska. The AWFCG is comprised of state and federal agencies and Native organizations involved in fire management activities, and it sponsors a number of committees that focus on specific topics of fire management and science. The Fire Research, Development, and Application Committee (FRDAC) is chartered to identify and prioritize fire research needs in Alaska and facilitate the development and exchange of information and applications to meet the needs of AWFCG member agencies. The FRDAC is tasked with developing and prioritizing a detailed description and analysis of fire management research needs and identifying options and partnerships that best address these needs. To accomplish this, the FRDAC generates a prioritized Fire Research Needs List every two years. Topics are solicited at the AWFCG Fall Fire Review, which is attended by fire and land management personnel from AWFCG member organizations. Committee members also solicit topics from other employees within their organizations who may not have attended the fall meeting in order to obtain a comprehensive list of fire research topics. Although funding is not specifically allocated to address the topics, the top research needs have been submitted to the Joint Fire Science Program by the Alaska Fire Science Consortium for use in developing annual Requests for Proposals, and the list is often cited as justification in research proposals. AWFCG will provide letters of support for select proposals that address research needs and meet the following criteria: have direct management application, are of use to multiple agencies, and have a high likelihood of tech transfer. In some instances, individual agencies have been able to provide funding for projects.

Schupp, Eugene (Poster #66)

Eugene W. "Geno" Schupp is a Professor of Plant and Restoration Ecology in the Department of Wildland Resources and the Ecology Center at Utah State University. His research focuses on seed and seedling ecology and seeks to understand what limits recruitment of new plants in the Intermountain West of the USA and in southern Spain. Subjects of research range from invasive species with little apparent limits to recruitment to federally listed endangered plants. His publications are diverse, but he is best known for developing the widely used framework of Seed Dispersal Effectiveness.

Effects of Sagebrush Fire and Fire Surrogate Treatments on a Great Basin Seed Bank Community

The influence of sagebrush fuels and restoration treatments on Great Basin vegetation dynamics has been well documented but the impacts of treatments on the seed bank community has received little attention. The effects of fuels reduction/restoration treatments (prescribed burn, tebuthiuron herbicide, and imazapic herbicide) on seed bank community composition and dominant seed bank species densities were evaluated. In addition we determined whether the pre-treatment seed bank or the aboveground vegetation was more similar to the vegetation following the fuels/restoration treatment. Alyssum desertorum, Bromus tectorum, Ceratocephala testiculata, and Poa secunda dominated the seed bank community; the first three are exotics. The seed bank community shifted after restoration treatments, especially in the tebuthiuron and Plateau treatments. Prescribed burn was the only treatment that affected seed density. The post-treatment vegetation community was more similar to the pre-treatment vegetation than to the pre-treatment seed bank community, and perennial comparisons were as similar as the annual comparisons. Results suggest seed bank community composition and seed density were temporally and spatially highly variable. Furthermore, tebuthiuron and imazapic may have altered community composition whereas prescribed burn affected seed density. This research also implies that the pre-existing vegetation may be a better indicator of the vegetation community following fuels/restoration treatments than is the seed bank community.

Shaff, Scott (Poster #75)

Scott E. Shaff is an Ecologist for the U.S. Geological Survey at the Forest & Rangeland Ecosystem Science Center. His research focuses on fire and fire surrogate treatment effects on arid ecosystems, restoration ecology, and invasive plant species impacts. He completed his Forestry Science degree from Northern Arizona University. Scott has worked as a Forest Ecologist and a wildland firefighter for the Department of Defense at Fort Lewis Military Base in Washington. He currently manages the day-to-day operations of nine SageSTEP study sites.

Short-term results from arid SageSTEP (Sagebrush Steppe Treatment Evaluation Project) fuel treatments

Land managers throughout the Intermountain West are acutely aware of the growing problem of Bromus tectorum (cheatgrass) invasion into sagebrush steppe ecosystems. Both scientists and managers are searching for ways to combat this problem and to find indicators of invasion potential. Part of the solution is to understand how sites respond to disturbances. SageSTEP is a regional experiment designed to evaluate different methods to maintain sagebrush habitat while reducing fire fuel loads in this region. Fuel treatments being evaluated at the whole-plot level are prescribed fire, mechanical thinning of Artemisia tridentata ssp. Wyomingensis (sagebrush) by mowing, and aerial application of the herbicide tebuthiuron (Spike 20P®) to thin sagebrush. Additionally, the pre-emergent herbicide imazapic (Plateau®) was applied to subplots within fuels treatments to reduce cheatgrass. Preliminary results revealed that prescribed fire reduced perennial tall grass cover immediately post fire (9% to 4%), but cover recovered quickly. Distances among perennial plants increased within the fire treatment from 200 cm to 330 cm. Fire was the only treatment to reduce total fuel load through the combustion of shrubs and downed woody debris (DWD). Cheatgrass cover increased twofold in the fire and mowing treatment by year 3 post-treatment, while the application of Plateau® significantly reduced cheatgrass cover (19% to 6%) and annual forb cover (10% to 5%) in all treatments for up to three years. Mowing reduced shrub cover and biomass at all sites, but converted biomass to DWD, which may have increased fuel continuity. The application of Spike 20P® had no sizable effect on fuel load or vegetation community composition. Most vegetation trends indicate that these plant communities are still adjusting to the disturbance. These preliminary results highlight the importance for long-term monitoring to fully understand ecosystem resilience as well as fuel dynamics after fuel treatments in arid sagebrush steppe.

Smith, Jane (Poster #93)

Jane E. Smith Research Botanist Pacific Northwest Research Station Research in my lab explores the impact of severe wildfire and timber harvesting on soil bacterial and fungal communities and other measures influencing soil productivity. Such information is essential to fine-tune post-fire treatment methods and speed the forest recovery process. Jennings TN, Smith JE, Sulzman EW, Cromack K Jr., McKay D, Caldwell BA, Beldin SI. 2012. Impact of postfire logging on soil bacterial and fungal communities and biogeochemistry in a mixed-conifer forest in central Oregon. Plant Soil 350(1): 393–411.

Soil microbes undaunted, soil nutrients reduced by postfire salvage logging

It is well established that severe wildfire negatively impacts soil nutrient pools; however, the effect of postfire timber removal on soil productivity is not well understood and its application remains controversial among land managers, scientists, and the interested public. Postfire logging recoups the economic value of timber killed by wildfire, but whether such forest management activity supports or impedes forest recovery in stands differing in structure from historic conditions remains unclear. The aim of this study was to determine the impact of postfire logging on measures influencing soil productivity. We compared soil bacterial and fungal communities and biogeochemical responses of 1) soils compacted, and 2) soils compacted and then subsoiled, to 3) soils receiving no mechanical disturbance, across seven stands in a mixed-conifer forest in central Oregon, 1-3 years after postfire logging. Soil strength of the sandy loam volcanic soils was greatest in the compacted treatment and least in the subsoiled treatment. Compaction decreased plant-available nitrogen (N) on average by 27% compared to no mechanical disturbance, while subsoiling decreased plant-available phosphorus (P) on average by 26% compared to the compacted and non-mechanically disturbed treatments. Neither bacteria nor fungal richness significantly differed among treatments. A shift in bacterial communities corresponding with an increase in plant available N and P suggests that soil microbes in these postfire landscapes are resilient to mechanical disturbance. Results suggest that nutrients critical to soil productivity were reduced by mechanical applications used in timber harvesting, yet soil bacteria and fungi, essential to mediating decomposition and nutrient cycling, appeared resilient to mechanical disturbance. Management decisions about whether or not to harvest fire-killed trees should be balanced with the recovery potential of a site, and the potential for high densities of fire-killed trees to increase the area of severely burned soil in the event of future fire.

Spaul, Hannah (Poster #91)

Hannah Spaul currently serves as the Director of Land Management for The Nature Conservancy in Wisconsin. In that capacity she also serves as a Co-PI for the Tallgrass Prairie and Oak Savannah Fire Science Consortia. She was a founding member of the Wisconsin Prescribed Fire Council and currently serves on the board. With more than 14 years of experience in prescribed fire in the upper Midwest she is committed to bringing a heightened national awareness to the unique opportunities and challenges of implementing fire at scale in the region, and brining partners together to address those challenges collectively.

Tallgrass Prairie and Oak Savanna Fire Science Consortium

Despite general recognition of the importance of fire to prairies and savannas of the central United States, significant impediments exist to using fire as widely and effectively as possible. Fire science information development and exchange is limited. To this end, we have developed the Eastern Tallgrass Prairie and Oak Savanna Fire Science Consortium to identify existing fire science networks and delivery capabilities in the region, and to enhance the communication and evaluation of fire science information beyond current capabilities. The effort is funded by the Joint Fire Science Program Consortia effort. Specifically, the consortium proposes to (1) facilitate improved information exchange among fire practitioners to identify regional fire science needs, (2) develop a framework for evaluating fire management practices, and (3) develop a network by which fire science information will be accumulated, synthesized, and disseminated. Initially, our organization has dedicated itself to understanding the needs of the regional fire community, and determining how to best structure the consortium to meet these needs.

Stambaugh, Michael (Poster #54)

Michael Stambaugh, Assistant Research Professor, University of Missouri - Columbia, He has documented historic fire regimes throughout the eastern U.S.

The Trace of Fire in Eastern Native America

Written in the rings of trees is a history of fire in eastern Native America that tells of humans, drought, and their interactions. Based on thousands of fire scars on oak and pine trees, these quantitative fire histories move through generations and territories. Each fire scar has a date, location, and often an associated human culture and population. Here we examine the connections between the occurrence of wildland fires and populations of eastern Native Americans including the Cherokee, Chippewa, Osage, Menominee, and others. The geography of fire history sites includes Appalachia, the Great Lakes, the Great Plains, the Southeast, and the Midwest. Many fire regimes in eastern North America are found to have a human 'footprint' reflected as a temporally abrupt or rapid change in fire frequency. Interactions among drought, human migrations, and ignitions are detected in the fire scar record. In years where many sites are burned drought is often a predisposing factor and human ignitions are an inciting factor.

Stambaugh, Mike (Poster #101)

Michael Stambaugh is the PI for the Oak Woodlands and Forests Fire Consortium.

Sharing fire science information about eastern oak woodlands and forests

Sharing fire science information about eastern oak woodlands and forests Michael Stambaugh, Joseph Marschall, and Keith Grabner Covering much of the Central Hardwoods Forest Region, the Oak Woodlands & Forests Fire Consortium (OWFFC) is one of fourteen Joint Fire Science Program consortia across the U.S.. The OWFFC mission is to provide fire science information to resource managers, landowners, and the public about the use, application, and effects of fire. Fire science dissemination efforts include activities such as workshops, symposiums, newsletters, demonstration site visits, and literature syntheses. Each activity focuses on topics identified by regional fire practitioners as needing credible and accessible scientific information. Consortia efforts are guided by principles emphasizing inclusiveness, neutrality, and innovation. Fire science needs of oak ecosystems in eastern U.S. are primarily related to management and restoration as opposed to protection. These characteristics set a unique stage for the types of fire topics addressed and activities offered by the consortium.

Stan, Amanda (Poster #41)

Amanda B. Stan, Research Associate, School of Forestry, Northern Arizona University My work often applies tree-ring methods to address questions concerning past forest conditions and tree responses to disturbances. Currently, I am a USDA National Institute of Food and Agriculture Post-Doctoral Fellow, leading a collaborative project that aims to link research on forest fire ecology with educational and extension activities to assist the Hualapai Tribe (Arizona) in adapting and managing forest ecosystems on their lands for the changing environment of the coming decades.

Evaluating the probability of fire in a ponderosa pine forest in the southwestern U.S. using logistic regression and multi-model inference

Previous research has shown a link among fire, site characteristics such as those influenced by past land-use history, and drought conditions in ponderosa pine forests in the southwestern U.S. We used fire-history data from sites located in a ponderosa pine forest on the Hualapai tribal lands in northwestern Arizona to explore possible variables associated with

fire on the landscape between 1702 and 2007. We developed logistic regression models and used multi-model inference to assess the probability of a site burning in a particular year and land-use period (historical, suppression, modern) as a function of site characteristics and drought conditions. Variables representing both fuels-related (i.e., bottom-up) and climatic (top-down) controls of fire were present in the models. As time since fire increased, the probability of burning increased for all land-use periods; however, the effect of time since fire varied by period. A higher number of other sites burning increased the probability of burning for all sites; however, the magnitudes of the coefficients varied according to the spatial arrangement of the sites, i.e. the effect of other sites burning was greater for grouped sites compared to isolated sites. Drier conditions in the year of fire and wetter conditions one year prior to the year of fire increased the probability of burning. The logistic regression modeling approach allowed us to simultaneously assess the relative influence of predictor variables on the probability of a site burning in a particular year and period, providing a comprehensive understanding of the fire regime over time and space. Overall, results suggest a fuels-limited, climate-driven fire regime at Hualapai and reflect variability in land uses over time, including past fire suppression and the reintroduction of fire in the most recent decades through prescribed burning.

Steen-Adams, Michelle (Poster #55)

Michelle Steen-Adams, Ph.D., is Associate Professor of Environmental Studies at the University of New England (Maine) and Visiting Scientist, USDA Forest Service, Pacific Northwest Research Station. Her research provides a long-term perspective to natural resource issues by integrating environmental history, historical ecology and landscape ecology. Her current work contributes to a multi-investigator project in the Eastern Oregon Cascades that employs a coupled human and natural system (CHANS) approach. She has published several papers in environmental history and landscape ecology journals, including the following: Steen-Adams MM, Mladenoff DJ, Langston NE, Liu F, Zhu J (2011) Influence of biophysical factors and differences in Ojibwe reservation versus Euro-American social histories on forest landscape change in northern Wisconsin, USA. Landscape Ecology 26 (8): 1165-1178.

Environmental History of Fire-Prone Ecosystems across Ownerships in the Eastern Oregon Cascades (1905-2010): Effects of Past Land-Use, Management, and Fire Culture on Current Forest Condition and Fire Risk

Fire managers often confront two issues when promulgating policy and implementing management directives; these constitute spatial and temporal dimensions of management problems. One, fire management is fragmented across ownerships, while this is a whole landscape problem: fires often begin on federal or state agency land then spread onto private parcels, each of which is constrained by distinct management objectives. Two, the definition of appropriate, effective landscape-scale fire management is often confounded by land use history legacies, tribal history, and socioeconomic conditions that have changed at heterogeneous rates, ranging from slow in some ownership regions to rapid in others. We address this need by developing a comparative environmental history among ownerships (USDA Forest Service, tribal, private), and at the whole landscape scale in the Eastern Cascades of Oregon. This study contributes to an integrative team project that examines human adaptation to living in fire-prone ecosystems as a coupled human and natural system (CHANS) using systems models to improve fire policy. We address two questions: 1) How have vegetative conditions, management practices, social networks, values (cultures), and perceptions of fire risk interacted through time (ca. 1905-2010), including possible system governance by feedbacks, at ownership and whole landscape scales?; 2) Have feedbacks from these interactions produced intended and/ or unintended (perhaps adverse) consequences? Our research design focuses on the evolution of five factors: ecological community change; management practices/ objectives; social networks; environmental values, including "fire cultures"; and perception of fire risk. We employ a mixed-method approach, consisting of archival document examination, oral history interviews, and GIS technology, to conduct this analysis. We anticipate our retrospective analysis results will enable team scientists to link project model elements, such as system actors and landscape metrics, to their historical context. We expect to thereby augment understanding of this system and contribute to fire policy refinement.

Steffen, Anastasia (Poster #42)

Dr. Steffen received her Ph.D. from the University of New Mexico in 2005. She now is Cultural Resources Coordinator at the Valles Caldera National Preserve and adjunct faculty in the Anthropology Department, University of New Mexico. She has worked in the Jemez Mountains since 1990 and has led archaeological inventory and research at the Preserve since 2001. Her research interests include prehistoric lithic technology, obsidian sourcing and hydration analyses, forest fire effects for archaeological resources, and landscape-scale management of cultural resources. Dr. Steffen is a past President of the International Association for Obsidian Studies.

ArcBurn: Linking field-based and experimental methods to quantify, predict, and manage fire effects on cultural resources

Wildfires can threaten cultural resources through direct effects that are obvious and immediate, such as destruction of structures; or may be harder to recognize, such as thermal alteration of surface artifacts. Such fire-induced changes affect survey, excavation, and interpretation of the archaeological record. Because cultural resources are non-renewable, fire damage to artifacts and sites constitutes a permanent loss of knowledge. Fuel treatments have been shown to reduce fire severity, but success is constrained by poor information on the range of fire effects on cultural resources, incomplete understanding of how magnitude and duration of heating interact to cause damage, and linkage between fire effects and operational fire models. Managers need to plan fuels treatments to minimize costs while maximizing effectiveness, make defensible "go/no-go" decisions, and triage post-fire response and rehabilitation efforts. Our project integrates cultural resources information into the fire management decision processes. Our objectives are to link field and laboratory data and experiments on fire effects to provide guidelines for best management practices for cultural resources in fire-prone landscapes. The study will quantify the impacts of wildland and prescribed fires on archaeological stone tools, architectural stone, and ceramics, synthesize available information on impacts of fire on cultural resources, and integrate project results into operational and decision support tools. We focus on the Jemez Mountains of northern New Mexico, an area that contains an extraordinarily rich array of cultural resources and diverse vegetation communities and fire regimes. Our field study area is designed to encompass the 2011 Las Conchas Fire. Methods include field-based sampling to characterize the range of environmental conditions under which archaeological resources were exposed to fire and laboratory experiments to quantify the effects on artifacts across the range of heating levels characteristic of wildland and prescribed fires.

Thode, Andrea (Poster #84)

Andrea E Thode (Andi) – Associate Professor of Fire Ecology and Fire Science in the School of Forestry at Northern Arizona University Andi Thode grew up in Los Alamos, New Mexico. She completed her B.S. (1996) and later her Ph.D. (2005) in fire ecology through the Ecology Graduate Group at the University of California, Davis. She has been heavily involved in the Association for Fire Ecology (AFE) since its' inception. In 2001 Andi started working as a fire ecologist for the Pacific Southwest Region of the U.S. Forest. In 2005 she left the U.S Forest Service to work at Northern Arizona University (NAU). She is currently an associate professor of fire ecology and fire science in the School of Forestry at NAU. Her research focuses on fire effects, fire monitoring and landscape level fire severity effects. Andi is the PI for the Southwest Fire Science Consortium.

Southwest Fire Science Consortium

The Southwest is one of the most fire-dominated regions of the US. Currently, in the Southwest, there are several localized efforts to develop fire science information and to disseminate it to practitioners on the ground in a practical manner. However, many of these efforts are moving in parallel, without thoughtful interaction among projects. Managers and scientists are often not aware of each other or of the external resources available. A consortium is needed to bring these parallel efforts together to be more efficient and inclusive, allowing future fire science issues to be addressed from a broader perspective with more information, more partners, and more resources. With support from the Joint Fire Science Program (JFSP), we have initiated the Southwest Fire Science Consortium to promote communication and meet fire knowledge needs of scientists and managers. We have organized the Southwestern Fire Science Consortium around three key questions: (1) What do people need to know? Information needs are assessed through workshops, surveys, and organization of a community of practice of wildland fire professionals; (2) What information is already known? Synthesis of existing science; and (3) What are the key information gaps between what we need to know and what is already known? This question leads to the identification of critical areas for new research and management experiments. By focusing on these key questions we hope provide a mechanism for managers, scientists, and policy makers to interact and share science in ways that can effectively move new information to management practices and facilitate new research based on management needs.

University of Idaho Student Association for Fire Ecology (Poster #16)

The University of Idaho SAFE chapter is dedicated to exploring the role of fire in ecosystem processes. SAFE hopes to bring awareness of the role of fire to our local ecosystems and to describe the ways in which the public can benefit from education and through prescribed and natural fire. UI SAFE has successfully collaborated in a Service Learning trip which entailed burning within the Nebraskan landscape over spring break in 2011 and 2012.

University of Idaho S.A.F.E. Nebraska Service Learning Trip Spring 2012

In March of 2012, twelve University of Idaho Student Association for Fire Ecology students got the opportunity to assist The Nature Conservency with the burning of a total of 2,500 acres conducted within Bassett, Nebraska. This service learning trip provided participating students with the opportunity to meet fire professionals from widely diverse backgrounds,

as well as, time and training to complete task books. Students got the oppurtunity to learn first-hand about ecologically based fire management, effects of fire and grazing in prairie ecosystems, and how fire affects species composition. Students learned how to work together and how multiple agencies are able to collaberatelly work together.

Vaillant, Nicole (Poster #118)

Nicole Vaillant is a fire ecologist at the Western Wildland Environmental Threat Assessment Center which is part of the Forest Service Pacific Northwest Research Station

Fuel treatment effects on carbon stocks in Californian coniferous forests over time

Globally forests store about half of terrestrial carbon. Forest management, land use change, and natural disturbances all significantly affect forest carbon balance. In dry forests of the western US, wildfire is one of the largest threats to forest carbon. While fuel treatments result in initial reductions of stand carbon, they have a potential to reduce the severity of wildfires and therefore losses of carbon due to emissions from combustion and decomposition of fire-killed biomass. To better understand the impact of fuel treatments on carbon stocks, we quantified aboveground carbon stocks before and up to eight years after fuel treatments (fire-only, mastication, and thinning plus surface fuel treatment) and compared field-derived to FFE-FVS modeled values. Surface fuel and forest floor carbon stocks were significantly different among at least two treatment types 1 and 2-yr post-treatment. Live tree aboveground carbon in the fire-only treatments exceeded the pre-treatment level within 2 years of treatment. Total carbon stocks in fire-only treatment returned to 98% of pre-treatment levels after 8 years. Mastication and thinning plus surface fuel treatment total carbon stocks were still declining 5-yr post-treatment. Field-derived and modeled total carbon stocks differed by about 7% with the highest variability in carbon stored in snags.

Vaillant, Nicole (Poster #119)

(See biographical information, above.)

The JFSP Crown Fire Behavior Synthesis Project Wants Your Input!

The Joint Fire Science Program (JSFP) is supporting a project aimed at synthesizing the currently available information on crown fire behavior in conifer forests (e.g., the onset of crowning, type of crown fire and the associated spread rate and fire-line intensity). The JFSP 09-S-03-1 project website is: http://www.fs.fed.us/wwetac/projects/alexander.html. In addition to summarizing the existing scientific and technical literature on the subject, we are actively seeking assistance from individuals in the form of field observations of crown fires and related experiences as well as still pictures and video footage; for example, do you have a favourite YouTube presentation? We are looking for firsthand experiences of rare or perhaps unusual observations like independent crown fire runs or specific cases of conditional crown fire activity and crown fire cessation as well as instances of long-distance spotting (>2 km) from active crown fires along with the associated environmental conditions: What was happening climatically? What were the fuel types? Was there anything out of the ordinary? Did suppression play a role? Finally, we are interested in hearing from you as to your opinions on the subject of crown fires and any specific questions and/or research needs/knowledge gaps or areas in fire behavior training that you would like to see addressed in this crown fire behavior synthesis project. For example, when implementing mastication fuel treatments how much material can be left onsite or how long after a mastication treatment is the potential risk of crown fire alleviated? Are there gaps in knowledge pertaining to crown fire such as the desire for better assessments methods for assessing crown fire risk in pinyon-juniper woodlands. Finally, we would really like to hear your general thoughts and experiences pertaining to crown fire. So please take the time to stop by our poster area for a good old fashion "chin wag".

Vaillant, Nicole (Poster #120)

(See biographical information, above.)

Fuel Treatment Planning with the Landscape Treatment Designer (LTD)

The Landscape Treatment Designer (LTD) program is a multi-criteria spatial prioritization and optimization system to help design and explore landscape fuel treatment scenarios. The program fills a gap between fire model programs such as FlamMap, and planning systems such as ArcFuels10, in the fuel treatment planning process by providing a systematic way of planning spatially explicit fuel treatments. The LTD uses inputs on spatial treatment objectives, activity constraints, and treatment thresholds, and then identifies optimal fuel treatment locations with respect to the input parameters. The input data represent polygons that are attributed with information about expected fire behavior and the polygon's overall con-

tribution to one or more landscape management objectives. Outputs include an attributed polygon with suggested treatment locations and various summary files. Fuel treatment plans can either be dispersed breaking the continuity of fuels or aggregated which is ideal for restoration planning. The LTD program, demonstration data, and tutorial are available for download at: www.fs.fed.us/wwetac/ltd/

Verble-Pearson, Robin (Poster #57)

Dr. Verble-Pearson completed her Ph.D. at the University of Arkansas at Little Rock in 2012. She is currently employed as an Assistant Professor of Fire Ecology at Texas Tech University, where her research interests include fire effects on insects, plant combustibility and flammability, and ash toxicity.

Fire and Ants in Ozark Forests

Fires burn heterogeneously on landscapes, and variation in temporal and spatial intensity may be important determinants of post-fire community composition. Differences in fire intensity, even within a single fire, can significantly influence the structure of insect communities, e.g., by altering microhabitat availability and ecosystem processes such as decomposition rates. Faunal recovery periods also vary with fire intensity. We hypothesized that local arthropod community structure is influenced by small-scale variation in local fire intensity. We measured focal arthropod species richness and abundance pre- and post-fire in patches of leaf litter experimentally burned at different intensities. Immediately post-fire, abundance of focal taxa declined sharply and differed among intensities. Post-fire activity and recovery of target arthropods did not differ among fire intensities. We show that arthropod abundance is reduced by prescribed burning in the short-term, but, for most taxa, local fire intensity appears to have no effect on arthropod community parameters. These results have direct implications for the study of fire effects on arthropod communities.

Vogler, Kevin (Poster #33)

Kevin Vogler is a graduate research assistant at Oregon State University where he is studying to complete his MS in Silviculture and Fire Management.

Oregon State University SAFE Chapter

The OSU chapter of safe "The Pyromaniacs" contains a diverse and active group of students studying all aspects of fire management and fire ecology from modeling post fire habitat availability with LiDAR data to the use of biomass from fuel reduction treatments in biofuel conversion. The OSU chapter of SAFE meets weekly to collaborate on research projects and discuss recent journal articles. In addition, the chapter has sponsor field trips to tour recent wildfires and has helped with pile burns on the school forest. The OSU chapter is currently sponsoring the Words on Fire symposium on November 1st with author and fire historian Stephen Pyne.

Vogler, Kevin (Poster #79)

(See biographical information, above.)

Quantifying the availability of woody biomass from fuel reduction and forest health thinning on federally owned land in Oregon, Washington, Montana, and Idaho

One barrier to investment in biomass infrastructure is the uncertain availability of a suitable feedstock source. A model was developed in order to generate estimates of potential biomass availability on federally owned land in Oregon, Washington, Montana, and Idaho using current forest inventory data. Estimates were generated by performing silviculturally sound forest health and fuel reduction thinning to overstocked stands. This information will be used to help inform a larger economic model for the region and the impacts of several policy measures including subsidizing biomass generation and max diameter cut limits will be analyzed.

Watson, Brett (Poster #37)

Brett Watson Student Researcher Humboldt State University SAFE National Co-Chair 2008-2009

Wind-driven fire spread and flammability characteristics of eight northern California species

Wildfires are fueled by an inherent component of plants: flammability. Chemical and physical variation in litter may dampen or promote flammability resulting in differential flammability among species. Little work has united traditional metrics

of flammability with how fires spread in these fuels. Wind and slope increase spread rates, and in ecosystems dominated by vertical fuels (e.g., chaparral and many grasslands), sustained fire spread is hampered without wind. Wind can change fuel moisture by introducing drier air, as well as the rate of stored energy release by adding oxygen to the combustion process. Wind can also play an important role in determining vegetation patterns. Wind is clearly important to fire behavior and fuelbed flammability. Here we examine the wind-driven fire spread and flammability characteristics of eight northern California species.

Wells, Ashley (Poster #1)

Ashley, an Idaho native, graduated from the University of Denver with a B.A. in Environmental Science. She is currently pursuing an M.S. in Natural Resources from the Department of Forest, Rangeland, and Fire Sciences at the University of Idaho. Working with Penelope Morgan, and with help from the NASA Extreme Fire Project, her research on fire history in the Selway Bitterroot Wilderness Area is focused on analyzing the changes in proportion of area burned severely and the spatial patterns of high severity patches through time. Ashley is most interested in researching post-fire vegetation regeneration in large, high severity patches from extensive fires in 2000.

Burn severity and vegetation response in the Selway-Bitterroot Wilderness Area, 1900-2007

Quantifying how the proportion of area burned severely has changed over time is critical to understanding trends in the ecological effects of fire. Most assessments over large areas are limited to 30 years of satellite data, while historical and contemporary fire return intervals are often longer. Although increases in wildfire extent and number of large fires are well documented, we know little about multidecadal trends in burn severity, patch size and implications for species diversity. We analyze the change in proportion of area burned severely across 542,747 ha in the Selway Bitterroot Wilderness Area in Idaho and Montana, USA using 30-meter fire perimeters and burn severities inferred from 1984-2007 satellite imagery from the Monitoring Trends in Burn Severity project and 1900-2000 aerial photography. We hypothesize that the proportion of area burned severely has increased over time. We also analyze field data that was collected from 20 sites burned in 2000, a year of widespread fires in the region, to quantify vegetation response within severely burned patches at 10 m, 40 m and 80 m distance from an unburned edge. We expect that as burn severity increases so will the patch size with implications for plant species diversity. We hypothesize that conifer seedlings will be less dense but that species diversity will not change as the distance from edge increases. Vegetation response has been found to be greatly impacted by burn severity and patch size, but the effect of patch size has not been widely studied and longer-term studies are needed. Understanding how proportion of area burned severely is changing over time, using a large spatial scale and long temporal scale, will help ecologists and land managers to better understand vegetation response post fire, and will help to inform predictions for future fire effects that may be extreme under changing climate conditions.

Whann, Alexandria (Poster #27)

Alexandria Whann and Josh McCafferty, *University of Florida SAFE Chapter, 2012-2013*

The University of Florida chapter of SAFE is dedicated to informing Florida about the use of prescribed fire in many Southern ecosystems. We have co-hosted several local events, continued to aid students in obtaining fire certifications and conducted several prescribed burns. We hope to host more outreach events through the 2013 school year and establish a research plot at the school forest to further the group's understanding of Florida fire ecology.

Witter, Marti (Poster #52)

Dr. Marti Witter has been the fire ecologist for the National Park Service's Mediterranean Coast Network since 2001. Marti's work focuses on using current fire science information about southern California shrublands to guide fire management practices in the three Mediterranean Coast parks, Channel Islands NP, Santa Monica Mountains NRA and Cabrillo NM. A major focus of her work is to find effective strategies to reduce fire threats to the local communities, while minimizing impacts to the natural resources of the park and surrounding open space areas. She works as Implementation Coordinator for the Central and Southern California Fire Science Consortium. Marti received a BS in Biology from UC, Irvine, a MS in Forestry from VPI&SU and a PhD from the University of Hawaii.

Fire effects in coastal sage scrub in Channel Islands National Park

Fire has frequently been proposed as a tool to control invasive species and restore native California grasslands and shrublands. In 1997 the Old Ranch prescribed burn was conducted on Santa Rosa Island to promote native shrub recovery

following cattle removal the year before. Fire was detrimental to coastal sage scrub recovery. Ten years after the burn, there was significant recovery of the dominant shrub, Artemisia californica (ARCA), in unburned transects. Cover increased an average of 195%, from 19% to 42%. In burned transects cover decreased an average of 18%, from 35% to 27%. There was no significant change in Artemisa density in the control plots so the increase in cover is attributed to individual plant growth, rather than recruitment of new individuals. Postfire data were also collected in coastal sage scrub following a 2006 14-acre wildfire on Santa Cruz Island. Artemisia mortality was high with resprouting rates of 0-9% among plots. ARCA seedling recruitment was 174:1 seedlings: resprouts in the first year post fire. Seedling recruitment in year 2 dropped to 1.6% the rate in year 1 and was absent in year 3. The endemic species Eriogonum grande (ERGR) was a strong facultative resprouter with 70% of plants resprouting. Seedling recruitment was 1:1 seedlings: resprouts in the first year but increased 270% in year 2 and was absent in year 3. Three years following the fire ARCA density in 4 of the 6 plots exceeded pre-fire densities, but only 2 of the six plots were dominated by native cover. High native cover was due to the presence of subshrubs such as Mimulus auriantiacus, Eriogonum grande, Lupinus albifrons and Lotus dendroides, while the remaining plots were dominated by non-native grasses. In recovering island scrub communities, fire, at a minimum, sets the demographic recovery clock backwards and facilitates the spread of non-native invasive species.

Wright, Clinton (Poster #114)

Clinton S. Wright, Research Forester, USFS - Pacific Wildland Fire Sciences Laboratory. Conducted research to document the relationship between volume and biomass for hand-constructed piles in the West. Paige C. Eagle, Database and Web Programmer, University of Washington - School of Environmental and Forest Sciences. Developed numerous user-friendly, web-based applications for natural resource management, including the Digital Photo Series, the Northwest and Alaska Fire Research Clearinghouse, and The Piled Biomass and Emissions Calculator.

The Piled Fuels Biomass and Emissions Calculator

Land managers throughout the West pile and burn surface fuels to mitigate fire hazard in dry forests. An estimate of the weight of the piled debris to be burned is necessary to assess potential smoke emissions and air quality impacts associated with this practice. Research to characterize the biomass present in machine- and hand-constructed piles was incorporated into a calculation tool for use by fire, fuel, and air quality managers. The Piled Fuels Biomass and Emissions Calculator is a simple-to-use, web application that uses the formulas for different geometric shapes to estimate pile volume, and empirically-derived relationships between volume and biomass to estimate pile weight for different piles types (machine vs. hand) composed of different material (different types of coniferous material for machine piles, and coniferous vs. hardwood/shrub material for hand piles). Emissions (PM, PM10, PM2.5, CO, CO2, CH4, and non-methane hydrocarbons) are estimated by calculating the consumable tonnage and multiplying by a fire-averaged emission factor. Input data can be entered manually through the graphical user interface or in a batch mode by uploading a properly formatted text file. Data inputs and calculation results are available within the user interface and also in a downloadable format. The Pile Calculator is executed by using standard web browser software (e.g., Microsoft Internet Explorer, Mozilla Firefox, etc.) so no software installation is necessary, and users will always have the most up to date version for use at their disposal.

Wright, Clinton (Poster #115)

Measuring the effects of slash pile burning and how fire effects change as piles age

Typical hazardous fuel reduction treatments target small diameter trees for removal producing large amounts of woody material, much of which is piled and burned on site. Little is known about how physical characteristics and the environmental conditions under which piles are burned affects atmospheric emissions, carbon pools and fluxes, soils, and vegetation. We are conducting experimental pile burns in the Pacific Northwest (Okanogan-Wenatchee National Forest) and the Southwest (Santa Clara Pueblo) to provide managers in these regions with new information documenting the effects of burning piles of increasing age under different environmental conditions. Specifically we are measuring combustion rate and duration, fuel consumption, charcoal production, burn intensity (above and below ground heat fluxes), changes in soil properties (nutrient levels and hydrophobicity), adjacent tree damage, surface vegetation responses, and changes in invasive species prevalence after pile burning. We are burning piles at six-month intervals to test the effects on the above-listed measures of increasing pile age (0, 0.5, 1, 1.5, and 2 years since piling) under two different seasons (spring vs. fall). Providing fuel and fire practitioners with detailed, quantitative information about the effects of pile burning will inform key management decisions about when to burn and how to minimize potential negative emissions, soil, carbon, and vegetation impacts.

Wright, Vita (Poster #111)

A social science analyst specializing in fire science application, Vita Wright works in a shared position between the Rocky Mountain Research Station (RMRS) Human Factors & Risk Management RD&A and the NPS Branch of Wildland Fire. Her research focused on individual and organizational influences to the success of fire science delivery. Vita currently serves as PI for the Northern Rockies Fire Science Network. Prior to that, she developed the Aldo Leopold Wilderness Research Institute's Research Application Program. Both efforts aim to improve the communication of scientific information between scientists and managers by increasing accessibility to scientific tools and knowledge.

The Northern Rockies Fire Science Network—Enhancing science delivery and application

Effective science communication is critical to science-informed management. Despite the rich history of fire research, fire and fuels managers struggle to sort through available scientific information; find the right tools, models, and applications to make management decisions; and access expertise relevant to fire and fuels management questions. Sponsored by the Joint Fire Science Program, the Northern Rockies Fire Science Network (NRFSN) is being developed as part of a national knowledge exchange network that enhances fire science delivery and application. The NRFSN is working to become the go-to resource for reliable, relevant, and timely information to meet the needs of managers and scientists involved in fire and fuels management in Rocky Mountain forests of north and southeast Idaho, western Montana, and northwest Wyoming. To ensure that NRFSN activities are responsive to the needs of managers, the NRFSN gathered feedback using a survey and focus groups of approximately 200 managers and decision makers in the Northern Rockies. Respondents were asked about obstacles to using research, methods used to access research, research topics for which they need better access, and priority NRFSN activities. Based on the needs assessment results, the NRFSN helps managers access the latest knowledge and tools that support fire and fuels management through an electronic newsletter, a web portal that links to Northern Rockies relevant fire science resources, and research briefs and syntheses of key topics in fire and fuels management. The NRFSN also identifies and communicates regional research priorities to scientists, and organizes workshops and fieldtrips to build and strengthen relationships among managers and scientists in the region. This poster describes NRFSN goals, summarizes needs assessment results, and provides examples of NRFSN activities.

Wyatt, Katherine (Poster #6)

Katherine Hoglund Wyatt is a second year graduate student at the School for Environmental and Forest Sciences, University of Washington. She focuses on riparian fire ecology, but remains engaged in forest ecology throughout the Pacific Northwest. Building on her professional experience in collaborative conservation and academic experience in ecology, she hopes to continue to do field research and work collaboratively with governmental and nonprofit partners.

Riparian vegetation and water quality changes in response to prescribed fire on the east side of the Cascades, Washington.

Quantifying vegetation and water quality response to fire severity within riparian corridors is paramount to understanding and managing these sensitive ecosystems. Across a landscape, riparian areas connect upland to lowland habitats and aquatic to terrestrial ecosystems. They disproportionately contribute to landscape diversity and heterogeneity (Naiman and Décamps 1997). Riparian vegetation and deciduous vegetation in particular protects water quality for fish and other aquatic species by filtering sediment, regulating temperature, stabilizing stream banks and providing large woody debris (Liquori and Jackson 2001, Wissmar 2004). In the Nile Creek Watershed in the Okanagan-Wenatchee National Forest on the east side of the Cascades, Washington active fire suppression has reduced the frequency and size of fires (Everett et al. 2003). Dendrochronology work from the east-slope of the Cascade Mountains suggests that fire historically maintained riparian vegetation, by promoting fire resistant, early successional, and deciduous species (Camp et al. 1997, Everett et al. 2003, Messier et al. 2011). In an effort to restore the riparian and aquatic integrity and to reduce fuel loads, a prescribed fire was completed in summer of 2012. The primary objective of this study was to determine the effect of fire severity on riparian vegetation. In addition, I sought evaluate the effect of the prescribed fire on fuel loads and water quality. To meet these objectives I established100m transects beginning at bank-full height, running perpendicular to Nile Creek in the spring of 2012. I scored fire severity along each transect based on percent soil scorch and percent crown scorch. I determined fuel loads using Brown's fuel transects. Along each transect, I quantified shrub and overstory species composition and abundance before and after the fire. I monitored water quality throughout the summer with data loggers installed along Nile Creek and in a neighboring creek unaffected by fire.