



## ***UC Science Team updates for SNAMP 2014 First Quarter (Q1)***

Main project findings and work accomplished since 2013 Q4 updates on January 23, 2014

~April 16, 2014~

### **Project Integration and Management (PIM) Team**

#### *Quarterly financial update*

We completed the 2013 calendar with \$17,920 in carry-forward (Table PIM-1). Most teams spent close to their budget targets. The Fire and Forest Ecosystem Health Team saved money on housing associated with field work thanks to the logistical support of the Bass Lake Ranger District and the UC Center for Forestry. The Public Participation Team carry-forward represents a slight delay in projects and associated personnel from the Fall 2013 semester to the Spring 2014. The slight deficit in the Wildlife Fisher Team budget will be absorbed by the PIM budget, and the 2013 deficit in the Spatial Team absorbed in the 2014 Spatial Team budget.

#### *Integration*

In addition to the financial, administrative, and logistical support that PIM provides to the UCST, we also are responsible for leading the SNAMP integration component that will result in the final integrated assessment in December 2014. During the 1st quarter of 2014, we coordinated interaction between teams to ensure the smooth flow of integration products between teams, essential for the success of the final assessment.

This quarter, we also coordinated with session speakers regarding abstracts for the oral session on adaptive management at the Ecological Society of America (ESA) annual meeting in Sacramento in August 2014. The PIM team also wrote the abstract for its session presentation. All abstracts were delivered on time and accepted by the ESA.

#### *UCST Coordination*

PIM continues to plan and budget for successful project completion in December 2014.

- Administration: assisting teams with planning, budget reporting, publication fees, animal use protocol, fisher outreach product development, software license renewal, and access

to SNAMP data server; maintaining SNAMP publications list; maintaining bSpace archive and secondary UCST archive

- Logistics: coordinating monthly UCST conference calls and other interteam communication
- Keeping track of adherence to SNAMP and UC science team agreements (e.g., neutrality, data-sharing agreements)
- Helping teams to follow 2014 integration timeline and maintain consistent spatial products
- Started writing, and coordinating other teams' writing of, introductory sections of the final report
- Participated in PPT team meeting regarding final report
- Coordinated interteam communication regarding SNAMP site vegetation maps
- Wrote abstract for PIM talk at ESA oral session on adaptive management and coordinated abstract submission for other session speakers
- Coordinating UCST team updates for MOUP 2014 Q1 conference call in April
- Assisted editor with article on SNAMP for UC Berkeley publication
- Assisted PPT with journal manuscript
- Began planning peer-review process for SNAMP final report
- Began planning for UCST scientists meeting in August
- Participated in PPT IT webinar in April

#### *Communication with MOU Partners (MOUP) and stakeholders*

- Represented UCST on MOUP 2013Q4 conference call in January
- Produced notes for MOUP 2013 Q4 conference call in January
- Coordinated with MOUP on planning for MOUP 2014 quarterly meetings and SNAMP Annual meeting
- Coordinated with MOUP on agenda development for MOUP 2014 Q1 conference call in April
- Helped PPT finalize Integration newsletter, available on the SNAMP website: <http://snamp.cnr.berkeley.edu/documents/584/>
- Communicated with MOUP regarding recently published UCST scientific publications
- Communicated with MOUP and stakeholders regarding ESA session on adaptive management
- Coordinated with PPT regarding UCST participation in agency monitoring workshop
- Assisted in communication between Forest Service Ranger Districts and Fire and Owl teams
- Communicated with State Resources Agency regarding SNAMP funding

**Table PIM-1.** Summary of expenditures of the Sierra Nevada Adaptive Management Project for Year 7 (budget period: 1/1/13 - 12/30/13). Obligated amounts reflect actual transfers of funds to the contracting institutions. Balance reflects account balance as of 12/31/13. Encumbered amounts reflect funds already committed to pay salaries (as specified in hiring agreements) and ordered supplies/services. Projected balances are the difference between available funds and encumbered funds. All amounts in USD(\$).

<b>Research Theme</b>	<b>Contracting Institution</b>	<b>Obligated</b>	<b>Encumbered thru 12/31/13</b>	<b>Balance 12/31/13</b>
Spatial	UC Berkeley	181,792	183,894	-2,102
	UC Merced	66,080	66,080	--
Fire and Forest Ecosystem Health	UC Berkeley	129,598	119,738	8,860
Wildlife	UC Berkeley (fisher)	417,000 <sup>4</sup>	417,549	-549
	U Wisconsin (owl) <sup>2</sup>	98,139	98,139	--
Water <sup>1</sup>	UC Merced <sup>2</sup>	99,492	99,492	--
Project Integration	UC Berkeley	124,200	121,867	2,333
Public Participation	UC Cooperative Ext <sup>2,3</sup>	82,000	82,000	--
	UC Berkeley	59,756	50,378	9,378
<b>TOTAL</b>	<b>UC Science Team</b>	<b>1,258,057</b>	<b>1,239,137</b>	<b>17,920</b>

NOTES

1. The Water Team is jointly funded by California Department of Water Resources (DWR) and the USFS. The DWR funding is direct award to UC Merced on a different annual cycle. Only the USFS funding is reported here.

2. We cannot track subaward finances (UC Merced, University of Wisconsin, UC Cooperative Extension) as closely as the awards held at UC Berkeley. Invoicing lags by approximately a fiscal quarter.
3. The Public Participation Team subcontract with UC Cooperative Extension lags one quarter from other teams (1 May 2012 to 30 April 2013).
4. In addition, the USFS provided \$289,000 in dedicated air support for SNAMP fisher project. Does not include potential savings from down-time in flight operations during the November/December transition period.

## **California Spotted Owl Team**

*Worked on during January-March*

- Retrospective analysis (effects of habitat change, timber harvest, and wildfire on owl demographic rates): We responded to reviewer comments and resubmitted the manuscript to *Ecological Applications*.
- Integrated population model (Doug Tempel's dissertation): We received reviewer comments for the manuscript that we submitted to *Ecological Modelling*. We will revise the manuscript in April.
- We began the field season for the Eldorado Density and Regional Study Areas on April 7. No owl surveys will be conducted on the SNAMP study area in 2014.
- Fire risk collaboration with FFEH: We are waiting for fire modeling results on the Last Chance and Sugar Pine study sites.
- Ricka Stoelting's (one of Zach's PhD students) manuscript on spotted owl reproduction cycle and the cost of reproduction is in review at *Oecologia*.

## **Fire and Forest Ecosystem Health (FFEH) Team**

*Q1 2014 Activities*

- We have manipulated and error-checked most of the post-treatment forest inventory plot data from both sites. As expected, there are challenges in accounting for all the trees we measured, considering the treatment impacts and the 5-6 years between surveys.
- We have received and reviewed the updated treatment polygons from Last Chance. These GIS files are necessary to accurately assign post-treatment plot data to our stand

polygons. We have *not* received all of the updated treatment polygons from Sugar Pine. They are currently upgrading their computer software and are unable to access GIS files. This will certainly delay our fire behavior analysis for the Sugar Pine study site.

- We are currently working on the fire modeling analysis, starting with Last Chance to help the Owl team have as much time as possible to analyze their data with our information. Our decision to use Farsite software to model fire behavior instead of FlamMap presents some challenges. It's sensible to use a "real" fire scenario to estimate flame lengths, which will be incorporated into FVS to modify forest structure and growth. However, thus far we have been using FlamMap, and it will take some time to calibrate the model parameters in Farsite.

## **Spatial Team**

### *Update*

We have received the discrete and waveform lidar for the Southern site and the Northern site (total: about 4T byte space). We are contacting with NCALM with respect to the hyperspectral data for the Northern site being flown last year.

### *Analysis*

The UC Berkeley Spatial team is focusing on an uncertainty analysis of lidar data used for forest modeling (FARSITE). This is in collaboration with the FFEH team.

The UC Merced Spatial team has been actively working on the following:

1. Finishing classifying the vegetation classes for both sites at the plot level.
2. Finishing the vegetation change detection product for both sites in collaboration with the FFEH team.
3. Communicating actively with NCALM re: lidar data issue and hyperspectral data.
4. UCM Spatial is actively working on modifying the SNAMP data server to meet data sharing needs.

### *Presentations/Workshops*

Guo, Q. Simulating forest landscape: a lidar approach. 13th International Conference on LiDAR Applications for Assessing Forest Ecosystems. Beijing, October 9-11. 2013

## *Publications*

### Published:

Jakubowski, MK, L Wenkai, Q Guo, and M Kelly. 2013. Delineating individual trees from lidar data: a comparison of vector- and raster-based segmentation approaches. *Remote Sensing* 5, 4163-4186; doi:10.3390/rs5094163

Jakubowski, M. K., Q. Guo, B. Collins, S. Stephens, and M. Kelly. 2013. Predicting surface fuel models and fuel metrics using lidar and CIR imagery in a dense, mountainous forest. In Press in *Photogrammetric Engineering and Remote Sensing* 79(1):37-49

### New or In Process:

Tao et al. Using volume metrics calculated from airborne Lidar for aboveground biomass estimation: a comparative assessment. In review *Agriculture and Forest Management*

Li et al. Lidar with multi-temporal MODIS provide a means to upscale predictions of forest biomass. To be submitted to *Remote Sensing of Environment*

Di Tommaso et al. Uncertainty analysis of Simulated Fire Behavior in a Sierran Mixed Conifer Forest. To be submitted to *Forest Ecology and Management*

## **Public Participation Team (PPT)**

- PPT Integration Team meeting April 2, 2014, via webinar.

## *Outreach*

### Both sites:

- Finalized the training modules developed to train managers and stakeholders in Collaborative Adaptive Management (CAM) and posted the workbook on the SNAMP website available on-line: <http://snamp.cnr.berkeley.edu/documents/574/>.
- Scheduled public participation schedule for the last year of SNAMP including an Integration Team meeting/webinar for each team and a field trip to see the American Fire impacts.
- Presented SNAMP as a way to integrate technically and socially at a landscape scale to the Statewide Watershed Forum, February 26, 2014.

### Northern site:

- Published a UC Green blog entitled “When a wildfire sweeps through your study area – lessons from SNAMP”, February 2014.
- Maintained the UC Collaborative Tools site for CAM trainings – on-going.
- Facilitated a session at the Sierra Cascade Dialog meeting on February 27, 2014.
- Gave a SNAMP presentation to the Sacramento chapter of the Audubon Society, March 20, 2014.

- Assisted in creation of a Project Integration newsletter for publication in March 2014.
- Held the first of a 2 day CAM/facilitation workshop in South Lake Tahoe on March 18, 2014, and the final follow-up CAM/facilitation workshop in Jackson on March 26, 2014.
- Scheduling final presentations locally.

#### Southern site:

- Attended the fisher sections of the Western Section of the Wildlife Conference in Reno, January 21, 2014.
- Attended the Coarsegold Resource Conservation District's meeting to share emerging news on the poisoning of fisher by rodenticide, February 27, 2014.
- Continue to support a newly emerging Volunteering on Public Lands group locally. Attended their Symposium, February 7, 2014.
- Provided a fisher-centered wildlife photo display for the library in Oakhurst, February 2014.
- Developing fisher outreach notecards with our wildlife team's photos, March 2014.
- Developing a fisher calendar for outreach/awareness purposes for the fisher IT meeting in July.
- Planning for our final fisher Integration meeting on July 31, 2014.
- Scheduling final presentations locally.

#### *Assessment*

- Archiving SNAMP materials – on-going.
- Analysis of online survey, interview, and observational data – on-going.
- Program evaluation matrix refinement – on-going.
- Paper studying the effect of social network on the collaboration resilience – on-going.
- Paper tracking information flow in adaptive management – on-going.
- Paper analyzing the discussions in SNAMP public meetings – preparing for submission.
- 31 final interviews completed at the end of March; interviewing now complete.
- Integration analysis begun based on final interviews.

#### *Web*

- Maintained and updated site regularly.
- Sent out Web Updates.
- Maintained server health and backed up data.
- Updated SNAMP Facebook page regularly.
- Uploaded SNAMP related videos and photos to YouTube and Flickr, respectively.
- Continued citations tracking: Total number of citations for all publications is 190.
- Continuing network-based research.
- Support newsletter and science brief production.

#### **Fisher Team**

- The SNAMP / Sugar Pine fisher team has been actively trapping during the first quarter of 2014, attempting to recollar all resident fishers in the core treatment watershed and in

the vicinity of surrounding forest treatment projects. Trapping ended in the first week of February to insure no impact to reproducing females.

- As of March 31, seven adult females had denned with the den trees identified. Den trees are currently equipped with motion-sensitive cameras in order to document litter size when the female decides to move her young.
- Aerial telemetry is ongoing, with flights occurring on average four days per week. Two adult male mortalities were recovered, with predation being the likely cause of death for one of them and necropsies pending.

## **Water Team**

### *First quarter updates (2014)*

#### *Data Analysis*

- Collection of water quality and water quantity field data is complete. The QA/QC of the WY 2013 snow and met station data is near completion, with the soil moisture data following shortly. All data will be then be compiled and turned over to the Department of Water Resources.

#### *Water Quality Analysis*

- A manuscript on bedload movement from scour pan data is in progress. Results are showing stream beds within the catchments tend to be stable over the long term, but disturbance and recovery cycles exist on yearly and weekly/monthly scales that seem to correspond to high background snowmelt flows of the annual hydrograph and to high flows associated with individual storm/melt events.
- Final QA/QC of water chemistry data is being completed with detailed analysis to follow.

#### *Hydrologic Modeling*

At the watershed scale, the initial model runs of the final parameter sets shown in Table Water-1 have been completed. However, we expect these to change slightly with the incorporation of the new vegetation map. Following the methods of several previous publications, instead of choosing one “best” set of parameters, we will use the model with the top 1% of all parameter sets tested (i.e., have the highest statistical match to observed data), which will provide an uncertainty range of model results.

Preliminary results of a high correlation between the headwater stream discharge and the next closest gaging station downstream and similarity of bedrock geology show the potential for the fireshed-scale models to use the same sets of calibrated parameters as the headwater basins. The next step in the upscaling process is to test the model results of the larger basin scale model with all the test parameter sets that were run through the headwaters to determine the success of this approach.

**Table Water-1.** Calibration parameters used in calibrating and evaluating the Regional Hydro-Ecological Simulation System.

<b>Calibration Parameter</b>	<b>Description</b>
sk	horizontal saturated hydraulic conductivity, $\text{m day}^{-1}$
svk	vertical saturated hydraulic conductivity, $\text{m day}^{-1}$
sm	decay of saturated hydraulic conductivity with depth below surface
po	soil pore size index, $\text{m}^{-1}$
pa	soil air entry pressure, m
gw1	fraction of soil infiltration routed to groundwater storage
gw2	fraction of groundwater storage routed to streamflow