Sierra Nevada Adaptive Management Project Spatial Integration Team Webinar
May 1, 2014, 10am to Noon
Webinar recording: http://snamp.cnr.berkeley.edu/events/may-1-2014-spatial-it-webinar

See **power point presentation** at:
http://snamp.cnr.berkeley.edu/static/documents/2014/05/01/Presentation_Spatial_IT_Webinar_20140501.pdf

In Attendance:
Sue Britting – Sierra Forest Legacy
John Buckley – Central Sierra Environmental Resource Center
Carol Clark – USFS Remote Sensing Lab
Dannion Cunning
Matt Dunnahoe – Placer Res. Cons. District
Pat Flebbe – USFS Region Five
Quingua Quo – UC Merced
Peter Hopkinson – UC Berkeley
Kim Ingram - UC Cooperative Extension
Marilyn Jasper – unaffiliated
Susie Kocher - UC Cooperative Extension
Maggi Kelly – UC Berkeley
Kelly Larvie – Calfire
Anne Lombardo – UC Cooperative Ext
Carlos Ramirez – USFS Remote Sensing Lab
Ram Ray – UC Merced
Joe Sherlock - USFS Region Five
Ben Solvesky – Sierra Forest Legacy
Craig Thomas – Sierra Forest Legacy

I. Welcome and Overview: Attendees introduced themselves and shared one of their expectations for the webinar. Susie Kocher then provided details for a smooth webinar experience.

II. Overview of the Spatial chapter of the SNAMP Final Report: Dr. Maggi Kelly of the UC Berkeley Spatial Team shared their plans for the final chapter in SNAMP's final report to include the following chapters: Data Description, Methods, Results, Discussion – to include recommendations, Appendices

III. Overview of the SNAMP Lidar Component: Maggi gave an overview of Lidar including its components, justification, collection, challenges and surprises. SNAMP teams have been working on various scales and Lidar is being used to provide a common spatial framework. Details on the timing of SNAMP's Lidar acquisition as well its costs were shared.

IV. (Re-) Introduction to the Lidar Technique: Maggi gave a brief reintroduction to Lidar including a brief history of improvement in remote sensing and the ability of discrete Lidar to provide a better picture of vertical forest structure. She shared some of the various products derived from Lidar: Digital El-

evation Models, Digital Terrain Models, Digital Surface Models, Canopy Height Models as well as individual trees.

***Question**: Can someone define "individual trees" and "canopy fuel"?*
***Answer**: Individual trees are trees that we pull from the lidar point cloud. We can derive tree height, x,y location, and crown size. Canopy fuels refers to the layer of data used by fire behavior models like FARSITE or FLAMMap that approximate the fuel content in a forest stand*

V. Lidar Algorithms for Extracting Forest Parameters such as tree height, diameter at breast height (DBHO, canopy cover, leaf area index (LAI) and fuel were discussed by Qinghua Guo, from the UC Merced Spatial Team, as well as the Lidar algorithms used to map vegetation types. How attributes were chosen or combined as well as the team's pixel and object based vegetation mapping results and how they detected change.

***Question**: Can you tell us more about homogeneity measurements? Is it the similarity of a pixel to the next pixel?*
***Answer**: We use measures of homogeneity to develop our "object-based" map of forest structure. This method looks at how one pixel is similar or dissimilar to its immediate neighbors, and merges pixels in order to create an "object". The main rule used is that the internal variation within an object is smaller than the variation between it and its neighbors. The methods make use of many variables - spectral, textural, shape, size - to create and then classify objects.*

VI. Use of Lidar Products to Integrate SNAMP: Maggi shared how the Water, Forest Fire, Fisher and Owl Teams are using the Lidar products the Spatial Team is producing in their modeling efforts as well as the complicated information flow involved between teams.

***Question**:*
How does the wildlife team compare the assurance of an outcome from a forest treatment compared to a possible, unproven outcome from a possible fire in the future?
***Answer**: This is a great question and should be addressed to the wildlife teams.*

***Question**: Van Kane and others used LIDAR to develop a vegetation classification – open, sparse, shorter, multi-story top story that they are using to evaluate vegetation structure to include gaps and clumpiness. Do you have any plans to create a classification based on this type of structure?*
***Answer**: We do have plans to develop classification of vegetation based on structure, and on species structure. We are going to work on this with the Fisher team. Already we have the object-based map talked about in the question above, classified by tree size, for example.*

***Question**:*
One proxy for important structure for marten and perhaps fisher is the size and abundance of large snags and large downed logs... are those now being considered?
***Answer**: We wrote one paper that mapped downed logs using lidar, but this was in a forest stand that had been burned over, and there was clear visibility of the logs from above. In dense forests, discrete*

lidar does not map fuel or logs on the forest floor. Waveform data might also be better at getting at the forest floor. We haven't tested the ability to map standing snags with lidar yet.

VII. Lidar Lessons Learned: Maggi reviewed Lidar, LANDSAT and NAIP imagery for their forest attribute estimation and assessment capabilities; their shortcomings for understory detection and hopes for waveform Lidar: did a cost and point density evaluation and how to best incorporate Lidar into wild-life concerns.

***Question**: Homogeneity and heterogeneity of forest structure require an understory understanding. How to get at this?*
***Answer**: Poly-*
gons have been used for fire modeling. We could see if polygon layers with structure would be useful to t he Fisher Team. What is the most important structure info? We will share the object-based map, classi-fied by tree size, with the Fisher Team.

***Question**: Will waveform be analyzed for SNAMP?*
***Answer**: We will be analyzing the waveform data in the next few months.*

VIII. Wrap up and Evaluations: Susie Kocher did a verbal evaluation of what went well and what could have gone better with the webinar. Participants said that the webinar was well organized with clear presentations. Most webinars always have limited time to answer the questions; this seminar had excellent time management to answer all questions. Nine participants took the online evaluation survey. All of them agreed that the content of the webinar met their expectations and the goals and objectives were clearly stated.