SNAMP Science Team Updates

- Project integration – John Battles & Zack Peery
- Fire and Forest Ecosystem Health – Scott Stephens
- Wildlife (Owl and Fisher Teams) – Rocky Gutiérrez and Rick Sweitzer
- Spatial Team – Maggi Kelly
- **Water Team** – Roger Bales and Martha Conklin

LUNCH BREAK

- Public Participation Team – Lynn Huntsinger, Kim Rodrigues, Maggi Kelly

---

**Water Team**

- Work Plan Highlights
- Research Highlights – water quality
- Research Highlights – water quantity/modeling
- Integration
- Water Team Metrics
Work-plan Highlights

Released report *Sierra Nevada Adaptive Management Project Water Team Field Activities, Methods, and Results* to DWR

(link available at [http://snamp.cnr.berkeley.edu/teams/water](http://snamp.cnr.berkeley.edu/teams/water))

Installed v-notch plate at Speckerman

Currently installing wireless sensor networks surrounding Last Chance met stations to better capture snow-depth variability (leveraged)

Synoptic water-chemistry surveys for characterizing sub-surface flow input to streams

---

Research Highlights – Water Quality

Elevational trends for water chemistry
Hypothesis 1:
Changes in water chemistry will be a function of changes in streamflow.

Observations:
- Often largest seasonal flush at initial rains
- Looks like there is a seasonal depletion of sediment, especially following multiple storm events

Research Highlights – Water Quality

Increased turbidity will be a function of changes in streamflow
Research Highlights – Water Quality

Current analysis: comparing streamflow to turbidity to analyze sediment transport patterns

Water Quality - Findings

- Some differences in water chemistry between N and S sites but the paired sites are comparable.

- We are trying to understand source of water going into streams and the controls on isotope and ion chemistry of the stream water.

- Turbidity a function of both streamflow and history of prior high-flow events.
### Hydrologic Modeling

**Water Balance & Energy Balance**

RHESSys – Regional Hydro-Ecological Simulation System

Mountain hydrology – water fluxes
- evapotranspiration
- precipitation
- infiltration
- snowmelt
- sublimation
- runoff
- ground & surface water exchange

**Research Highlights – Model Analysis**

- model snowpack
- observed snowpack
- model root zone storage
- observed soil moisture
- model streamflow
- observed streamflow

**Graph**

- Bear Trap Creek

*Sierra Nevada Adaptive Management Project*  
*snamp.cnr.berkeley.edu*
Research Highlights – Model Calibration

Snow/rain input (red) simulates better than single precipitation (blue)

KREW-P301 Basin

Nash-Sutcliffe (NS) values:

<table>
<thead>
<tr>
<th></th>
<th>Precip</th>
<th>Snow/Rain</th>
</tr>
</thead>
<tbody>
<tr>
<td>P301</td>
<td>0.50</td>
<td>0.82</td>
</tr>
<tr>
<td>P303</td>
<td>0.50</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Water Quantity - Findings

- Using multiple measurements to constrain model: snow, soil moisture, streamflow, evapotranspiration (KREW-CZO).

- Separation of precipitation inputs to snow and rain proved critical to accurately model melt timing and streamflow.

- Preliminary forest thinning model scenarios shows streamflow increasing in both wet and dry years, due in part to the concentrated winter-time period of precipitation.
Increase in risk of higher in-stream sediment due to potential increase in streamflow.

Reduction in sediment removal risk due to decreased risk of catastrophic fire.

High risk

Low risk

Baseline level at time T_0

Pre-tx

SPLAT implemented

30 years post-tx

TIME

Risk with no SPLAT

Risk with SPLAT implemented

Return to baseline level

Risk of increase in stream turbidity

Sierra Nevada Adaptive Management Project

snamp.cnr.berkeley.edu
Working Lunch
Breakout groups by team.
What suggestions do you have that can inform the next discussion section on integrations as a whole?