Sagehen Hydrology Meeting: August 18, 2003

After morning presentations and lunch break, the group met for informal discussion concerning hydrology research at/near Sagehen Creek Field Station. The discussion centered on three questions posed by Jim Kirchner:

What cooperative opportunities exist for/between researchers?

1) Public involvement by local watershed councils can be extremely useful for:
   a) Meeting the goals of both agency and council.
   b) Grant funding of projects.
   c) Good community P.R.
   d) Pre- & post-project monitoring data collection (an area of huge deficiencies--agencies are not set up to do this & many "restoration" projects are so lacking in this area as to call into question their value):
      i) Readily available evaluation tools (i.e. BLM product) can help groups to identify locations that will be most likely to receive future research attention.
      ii) Photo studies of high-priority (or all) water courses in basin can help with future studies of channel morphology, vegetation, etc.
      iii) Some data requirements are specific to project, but other standard elements can be identified: macroinverts? GIS layers? Stream chemistry? Transect grids? Soil samples?

How does hydrology research mesh with USDA-Forest Service land management?

2) Agencies are seeking partnerships with universities/researchers for:
   a) Ongoing monitoring of restoration projects (groundwater, wildlife effects, etc.). *Group comments indicate that this is a better match for community groups than academia.
   b) Cumulative effects analyses.
   c) Recruitment of new agency staff (population is graying); education & training opportunities for staff.
   d) Groundwater discharge & basic water supply data & info. Most water supplies originate on Forest Service or BLM land.

Which questions/issues need attention?

3) Why do hydrology research at Sagehen? *50 year data set; relatively stable & unimpacted; small enough.

4) How representative of region is Sagehen basin? *Very representative of north-central (low-elevation) Sierras, as well as high meadows of southern Sierra.

5) Continued & expanded basic data collection & location/accumulation is needed as foundation to future research.

6) Restoration/climate data guidelines:
   a) Appropriate data presented to decision-makers in usable form concerning:
      i) Climate
      ii) Fires & fuels
      iii) New models (under development)
      iv) Ecosystem impact, taking into consideration assumed values (redesertification of Reno—sure it's natural, but is that really what we want?)

7) Collection of pre-project baseline data (see 1) & 2) above).
   a) Sagehen hydrology data needs--GIS layers--include (Forest Service national electronic

data archive coming on line next year):
   i) 5m DEMs
   ii) Vegetation maps
   iii) Soil maps
   iv) Geology layers
   v) Fire history maps
   vi) Groundwater wells (deep) with continuous monitoring
b) Archived soil samples: 200g, sieved, dried & sealed, climate-controlled.
c) Shallow seismic work to determine "what's down there?": soil depth, bed-rock identity & integrity, glaciation effects, etc.
d) Parameterization of basin characteristics:
   i) Canopy characteristics to address energy balance (thinning, Land-sat image comparisons).

8) Some good questions & projects:
   a) What are the impacts of groundwater on surface systems?
   b) What are the impacts of climate change on groundwater?
   c) Interaction of fire & thinning on water supply, habitat & water quality.
   d) What is required to close the water balance (groundwater & surface)? *Some controversy within the group about the feasibility of this!
   e) Chloride balance. *Ditto.
   f) Input:Output ratio of basin & larger watershed (DRI: 30% based on eddy-correlation data from east meadow in 2002).
   g) Ways to address larger-scale watersheds through small watershed studies.
   h) Incised channels & their restoration: changes in nutrient processing, water table, chemical constituents.