Name of principal investigator:
Name: Roger Bales  Phone: 209-724-4348  Email: rbales@ucmerced.edu

Name of institution represented:
University of California, Merced

Co-Investigators:
Name: Robert Rice  Phone: 209-228-4397  Email: rrice@ucmerced.edu

Project title:
Spatial properties of snowcover

Purpose of study:
The purpose of this project is to develop strategies to accurately measure and model water and carbon fluxes in forested areas across the rain-snow transition and extending to the tree-line using a blend of remotely sensed and ground-based information. This will result in more-accurate estimates of snowpack, snowmelt and the partitioning of snowmelt into runoff, infiltration and evapotranspiration, plus the interaction of the water cycle with bi-directional fluxes of carbon between forests and the atmosphere. Our basic hypothesis is that strategically placed instrument clusters, designed to compliment satellite remote sensing information, provide the basis for more accurately and efficiently measuring and scaling water balance components, and hence basin-scale fluxes, than does an approach that relies on widely distributed snowpack and weather-station point measurements of the type now available. A corollary to this is that water balance estimates provided by the measurement system will improve forecasts of snowmelt runoff and other water balance components using emerging hydrologic models, and thence provide a more-accurate projection of mountain water supply and the timing of its runoff. It is expected that this new information will also provide significantly improved indices that will enable better management of forest and aquatic habitats, as water storage amounts and fluxes provide important indicators of how the systems can and do respond to climate variability and change.

Subject/Discipline:
Water Quality

Locations authorized:
Tioga Pass Road (Hwy 120) within 200 feet of the road between Merced Grove and Tioga Pass. Specifically, Gin Flat (37.765 degrees N and 119.773 degrees W), Quarry (37.811 degrees N and 119.509 degrees W), Smokey Jack (37.816 degrees N and 119.713 degrees W), and Merced Grove (37.764 degrees N and 119.843 degrees W).

Instruments will be deployed in a 1-km2 area around the central point. In addition, an instrument will be deployed in Moss Creek where it crosses the Big Oak Flat Road (37.779 degrees and 119.833 degrees W, 1765 m elevation). Vegetation in the Moss Creek Drainage is classified by Yosemite National Park as White Fir-Incense Cedar-Sugar Pine Super association. The forest near Doghouse Meadow also includes a Jeffrey Pine-White Fir and White Fir-Sugar Pine association, plus some White Fir Super association, and Red Fir-White Fir association.

Transportation method to research site(s):
By car when road is open. By skis when road is closed.

Collection of the following specimens or materials, quantities, and any limitations on collecting:

n/a
Specific conditions or restrictions (also see attached conditions):

Park contact for this permit is Jim Roche 209-379-1446

This permit is valid thru December 2011. Park entrance fees are waived while conducting the research. Each member of the investigator's team (i.e. field crews) must carry a copy of this permit and NPS conditions at all times while conducting the research and show to park staff when requested.

This permit is valid as a wilderness use permit, if research needs to be conducted in the Yosemite Wilderness. Researcher agrees to comply with all park regulations. Researcher agrees to NPS General Conditions for Scientific Research and Collecting Permit, Superintendent’s Order: Flagging and Temporary Demarcation Guidance, and Warning: Disease Threat (Equipment Decontamination Protocol for Researchers Working In Yosemite National Park) (attached). Researcher agrees to NPS, Yosemite National Park, Wilderness Use Permit guidelines. A Minimum Requirement Analysis document (if required) for research in Yosemite’s Wilderness is on file in the individual researcher’s hard file of the Research Permit Coordinator’s office in Resources Management and Science.

Researcher must submit an Investigators Annual Report at the end of each permit year through the NPS Research Permit and Reporting System (RPRS) website. In this case, the researcher needs to submit a report for 2011.

This permit is only valid until December 31, 2011. The researcher will need to apply for a renewal permit early in 2012 (January or February), if wanting to continue the study as it is NOT automatic. This is submitted in the RPRS website by following the links under the heading, Submit applications for research permits. After typing in your last name, the website finds all of your permits in all NPS units. You can find your Yosemite permit and click on the link. Apply for permission to continue this study at this park (a renewal request).

Yosemite requires that you have both your IAR and renewal application in the website before your application for the New Year can be reviewed. Please also note: Before your permit will be issued, any Repository Agreement for Collected Specimens (included as appendix pages in the final application sent to you after your application submittal by the RPRS website) must be signed by the responsible official at the repository institution and faxed in to Mitzi Thornley (209) 379-1131.

Researcher will NOT collect special status plants or animals.

DRIVING ON RESTRICTED-USE ROADS IS NOT ALLOWED.

Cultural Resources in Yosemite are protected by the Historic Preservation Act of 1966, as amended (16 U.S.C. 470). Archaeological resources in the park are also protected and the Archaeological Resource Protection Act of 1979, as amended (16 U.S.C. 470aa), which carries criminal and civil penalties for removing or damaging archaeological resources. The Permittee shall provide adequate supervision of its employees, clients, and team members to ensure that the park’s historical and archeological resources are not disturbed. The Permittee is responsible for informing its employees, clients, and team members of park regulations.

Any ground disturbance must be cleared with the Chief, Resources Mgmt. and Science.

Researcher will send two (2) copies of the final report and one copy of all documentation including data, maps, photos, reports and publications to the Yosemite Museum. Miriam Luchans, Museum Registrar, is the contact at 209-372-0281.
Researcher is required to send to Yosemite National Park Resources Management and Science Division all relevant spatial data that was collected within the park. The preferred format for the data is ESRI Arc (vector or grid), either shapefiles, coverages, geodatabases, or grids. It is also preferable to have the data projected in UTM zone 11 North, North American Datum 1983. Digital data must also include a full metadata file that describes the data, including spatial reference system, contact information, abstract of data collection and purpose, information on the data itself, and all other relevant information. Metadata should adhere to the Federal Geographic Data Committee standard.

Researcher or park staff can contact the Yosemite Research Permit Coordinator, Mitzi Thornley (209) 379-1060 if there are any questions.

Recommended by park staff (name and title):
Research Permit Committee

Reviewed by Collections Manager:
Yes ☑ No

Date Approved:
4/19/2011

Approved by park official:
Mitzi Thornley

Title:
Research Permit Coordinator

I Agree To All Conditions And Restrictions Of this Permit As Specified
(Not valid unless signed and dated by the principal investigator)

(Principal investigator's signature)                                      (Date)

THIS PERMIT AND ATTACHED CONDITIONS AND RESTRICTIONS MUST BE CARRIED AT ALL TIMES WHILE CONDUCTING RESEARCH ACTIVITIES IN THE DESIGNATED PARK(S)