UNIVERSITY OF CALIFORNIA MERCED
SIERRA NEVADA RESEARCH INSTITUTE
WAWONA FIELD STATION
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OUTLINE:

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UCM Chancellor visit July, 2007 in the refurbished station director residence. Front row (left to right): Wilson Yang (YLP Intern), Omar Chowiiki (YLP Intern), Jim Ebright (YLP Intern), Eric Berlow (Wawona Field Station Director), Kristine Hutchinson (Yosemite Park Ranger). Back row (left to right): Samuel Traina (Vice Chancellor for Research), Steve Kang (Chancellor), Steve Shackelton (Yosemite Chief Ranger), Sonny Grunloh (YLP Intern), Jesse Chakrin (Yosemite Park Ranger) Kathy Dimont (Yosemite Branch Chief of Education), Alvera Luna (YLP Intern), PJ Solomon (YLP Intern), Chelsea Dompeling (YLP Intern) Miguel Mansala (YLP Intern), Mia Kang (Associate to the Chancellor)
When the UC Merced opened in September 2005, the celebration involved even more than the launch of the first new research university of the 21st century. It also marked the ongoing success of some early partnerships -- partnerships had already begun to offer incredible and visionary opportunities for UCM students. One, with Yosemite National Park, had resulted in a memorandum of understanding (MOU) that provided the foundation for an in-park presence for university scientists and students. That MOU had led to the establishment of the first UCM SNRI field station. Everyone knew that the work had just begun, but the level of excitement was immeasurable and the shared enthusiasm didn't allow for failure.

As the first SNRI Wawona field station Director, I am proud of what we have accomplished in the first 18 months of operation. There were many challenges involved in running a 'start-up within a start-up,' but the opportunities involved in working with a blank slate were exciting and the rewards were many.

When I arrived in March 2006, the UC Merced SNRI field station in Wawona consisted of a bare, unfurnished renovated house that was to be used as our office building and 3 other houses in varying stages of disrepair that were to become residences. The offices had no active phone or internet service, and the office kitchen had no means of cooking, refrigerating, or serving food. There was no clear mechanism in place at UC Merced to efficiently purchase essential items for a remote off-campus facility. The station director residence was uninhabitable and filled with old junk and torn, stained mattresses. As the first Wawona field station director, I spent three months sleeping in the office and cooking on a camp stove while waiting for residence renovations to meet fire codes. I worked every angle I could to move purchases and renovation contracts forward. All the staff on campus did their best to help, but campus emergencies took priority. It was frustrating, but energizing. The potential of the place was obvious from the very beginning.

The offices are now fully furnished and in full use during the summer field season, 2 of the 3 guest houses are fully refurbished and furnished, and total station use from March 2006 to August 2007 has surpassed 5000 user days. The opportunity to start from scratch and create a welcoming and comfortable work environment are clear in the positive reactions of first time users of the field station. The demand for space during the summer field season already far exceeds our capacity, and we have solid external funding for two undergraduate summer internship programs that many other well-established field stations can only imagine. The rapid development of educational programs, research projects, and interdisciplinary partnerships at SNRI’s new field station in Yosemite are a testimony to the critical role this facility plays in UC Merced's unique reputation as an environmental science campus that lies at the 'gateway to Yosemite'. It is all very exciting, and I impatiently anticipate the content of our annual report in 2008.
II. UNIQUE OPPORTUNITIES AND ISSUES FOR OPERATING A FIELD STATION IN YOSEMITE

Unlike most of the UC Natural Reserve field stations, both the Wawona Station facilities and the surrounding land are property of the National Park Service (NPS). UCM operates the facilities under a long term Special Use Permit with Yosemite National Park. Through this agreement, as well as the Memorandum of Understanding with the NPS, UCM is responsible for all costs related to operating, maintaining, and repairing the facilities, including meeting fire code and other requirements. UCM is also permitted to charge a nominal recharge fee to station users to help support the costs of operating the facilities. All research conducted inside Yosemite must have an official research permit issued by the park. The Wawona Field Station Director facilitates this permitting process by helping individual researchers align their projects to meet the park’s research priorities and restrictions which are designed to balance research and resource preservation.

Operating a field station inside Yosemite National Park creates both opportunities and obstacles that are not encountered at other university field stations. Yosemite, being an American national park icon, is also unusual among parks in the extent to which it has developed educational and other programs, services, and infrastructure for visitors. This infrastructure creates unique educational opportunities for SNRI in Wawona. We provide office space at the Wawona field station for Yosemite’s Education Branch Chief Kathy Dimont, as well as her seasoned assistant, Kristine Hutchinson. Through Kathy’s long-time commitment to educational collaborations with UCM (beginning with the signing of the MOU in 1999), she has acted as an academic coordinator for SNRI and worked with park and UCM staffs to create the Yosemite Leadership Program (YLP) summer internship for UCM undergraduates (see ‘Description of Programs’ below). Kathy, Kristine, Jesse Chakrin (the Yosemite seasonal employee working on the UCM campus at the Wilderness Center), and other park staff immerse UCM students in wilderness and interpretive training to prepare them for their summer internships. This infrastructure of educational and wilderness training in Yosemite is critical to providing internship opportunities to students from ethnic and economic backgrounds that typically do not include these experiences. Similarly, Yosemite’s extensive visitor infrastructure creates unusually diverse internship opportunities that may include being an interpretive ranger, working with bear-human interactions, working on the Search and Rescue team, and many other diverse non-science positions in addition to more traditional environmental science and resource management internships.

The National Park Service’s concerns about visitor experience create challenges for conducting research. The research permitting process can be lengthy and arduous, because park managers are extremely cautious about allowing ‘installations’ (e.g., data-loggers, weather towers, plot markers, etc.) that might alter the wilderness experience of a park visitor. They are also concerned about the conservation and resource management impacts of allowing ‘collections’ (e.g., destructive sampling of park flora or fauna). For any research that requires soil disturbance, the soil must undergo extensive archeological review to protect park cultural resources. Together these constraints mean that it is extremely difficult to conduct research that involves manipulative experiments, destructive sampling, or visually conspicuous long-term installations. Some approaches for researchers to address these challenges and to facilitate the research permitting process include:

1) Carefully considering the goals of any destructive sampling, manipulations, and/or installations and asking, “Can the core research questions be answered using alternative methods?” If collections and or installations are absolutely necessary, making clear in the early stages of permitting exactly where, how many, and why it is essential.

2) Fostering experimental research just outside the park wilderness boundary. For example, the Wawona field station currently serves as one base for the Sierra Nevada Adaptive Management Project (SNAMP), a long-term collaborative project that is investigating the environmental
impacts of different mechanical fire control practices. The large-scale manipulations for this project take place in the Sierra National Forest just south of the Yosemite boundary. Since the Wawona field station’s location near the southern entrance of the park, it is well situated to facilitate this kind of experimental research. Another example includes the newly funded multi-institution project (which includes UCM) investigating the effects of experimental climate warming at tree line. The manipulations for this study will take place just outside the east entrance of Yosemite near Lee Vining.

3) Encouraging observational studies that include remote-sensing, geographic information systems, and nondestructive field sampling. Examples include investigating snow hydrology using remote sensing and snow surveys, investigating the causes of declines in the Yosemite toad (*Bufo canorus*) using field surveys and GIS, and investigating the causes of tree invasion of subalpine meadows in Yosemite.

4) Encouraging large scale data synthesis projects as well as cutting edge “knowledge-base” research. This research would place UC Merced as a lead player in novel environmental applications of new data mining and data visualization technology.

III. SNRI WAWONA FIELD STATION MISSION

The mission of the SNRI Wawona field station is to facilitate multiple synergistic links among science, education, resource management, conservation, and the arts. For example, the educational value of a student doing science is likely to be greatly enhanced if that project has immediate, real applications to resource management and conservation. Similarly, the conservation applications of an academic research project would be much more effective if a visual artist helped creatively communicate the results to a general audience.

To achieve this mission, the SNRI Wawona field station provides logistical support (office space, internet access, lab and classroom space, and housing) for research, education, and collaborative workshops inside Yosemite National Park. It also provides programmatic support by acting as a liason between the university and the science and education divisions of Yosemite.

IV. SNRI WAWONA FIELD STATION STAFFING

UCM has guaranteed at least five years of funding for the following salaried positions to manage and operate the SNRI Wawona field station:

1) **Field Station Director** – funded at 75% time as a Step II Project Scientist by the core budget of SNRI, the duties of the station director include: 1) serving as a daily liaison between the SNRI Director and Yosemite National Park (YNP) staff, 2) providing daily management for the field station facilities in Wawona, 3) developing budget and standard operating procedures for station operations, 4) working with researchers to facilitate and carry out research in YNP and Sequoia Kings Canyon National Parks, 5) assisting in the coordination of outreach programs of SNRI in cooperation with outreach professionals at YNP and UC Merced, 6) assisting the SNRI Director in preparing extramural proposals for the enhancement of station facilities, and 7) conducting research under the auspices of the SNRI.

2) **Facilities Maintenance Coordinator** – funded at 50% time by the UCM Facilities Management Department, this position reports to the SNRI Building Manager and is responsible for coordinating and/or performing periodic maintenance functions, basic repairs, and minor improvements on the facilities'
structures, mechanical systems, equipment and furnishings. This position is also responsible for assuming the weekly custodial responsibilities for the facilities.
V. DESCRIPTION OF FACILITIES

As mentioned above, the buildings are inside Yosemite National Park, are on park land, and belong to the National Park Service. They are managed by the UC Merced under special use permits, which require that the UCM rehabilitate and maintain the structures and use them only for the research, education, and outreach purposes outlined in the permit.

Facilities include:
1) Office Building – This historic building (built in 1934) has office space for 8 people and additional temporary space for 2-3 more. It also houses a small laboratory space, and a communal kitchen. It was rehabilitated before being turned over to the UCM through a $170,000 Yosemite Fund grant. (Fig. 1a)

2) Detached Classroom and Workshop – This historic stable/garage contains one class/meeting room space and a general use workshop and storage space. The class/meeting room can accommodate groups of 12-15 people. It has wireless internet connectivity and can be used for additional temporary office space. (Fig. 1a)

3) Station Director’s Residence – This 3 bedroom, 3.5 bath house was refurbished in the spring/summer of 2006. (Fig. 1b. See ‘Accomplishments’ below)

4) Two Guest Houses –
   a) Vincent House – This 2 bedroom, 1 bath house was refurbished in the spring/summer of 2006. (Fig. 1c. See ‘Accomplishments’ below)

   b) Livingston House – This spacious 5 bedroom, 3 bath house has the potential to sleep 15 people. The 3 upstairs bedrooms can accommodate 2 people each, and 2 downstairs rooms will be renovated to accommodate 9 students in dormitory-style bunk beds. It has a very large kitchen/living room and an expansive deck. This house will require major renovations to be safe and habitable (Fig. 1d. See Current Needs and Priorities).

5) Other resources –
   a) Through a partnership with the Yosemite Association, we have access to 3 additional houses in Wawona that can accommodate up to 17 students. These houses are currently used to house the UC Merced undergraduate students participating in the Yosemite Leadership Program summer internship.

   b) For larger gatherings (e.g., lectures), SNRI has access to the Wawona Community Center, which can accommodate ~80 people.

   c) The direct T1 internet connection to the UCM campus makes the SNRI Wawona field station the only place in the park with access to the UC California Digital Library

   d) For remote winter fieldwork (e.g., snow hydrology), SNRI researchers can use the backcountry Ostrander hut in Yosemite.
Figure 1 a) The SNRI Wawona field station office building and “Detached Classroom-Workshop.” The detached building still needs renovation work to be fully functional. b) The Station Director residence before and after renovation work. c) The “Vincent House” 2 bedroom guest house after renovation work. d) The “Livingston House” 5 bedroom, 3 bathroom guest house. This house still needs asbestos abatement, roof repair, and other fire code compliance renovations.
VI. DESCRIPTION OF CURRENT PROGRAMS

While the Wawona field station is primarily meant to be a physical place that facilitates investigator-initiated projects or class field trips, we have established the following long-term partnerships and programs to encourage K-12, undergraduate, and graduate education and research at SNRI:

* **SNRI Scientific Visualization Summer Fellowship** – This $2,300 fellowship provides 4 months of housing and office space and a $500 stipend to support an art student interested in applying his/her skills to help creative visualization and communication of scientific information. The first SNRI Scientific Visualization Fellow for 2007 was Jennifer Parks, a graduate student in Scientific Illustration at UC Santa Cruz. Her illustrations of the impacts of non-native trout to the food webs of alpine lakes web in the Sierra Nevada (Fig. 2a) will be used in a new SNRI-Yosemite collaboration to create visitor displays in the park that help interpret university science for the public.

* **SNRI Graduate Student Summer Fellowship** – This $1,800 fellowship provides 4 months of housing and office space to support graduate research that has important applications for resource management and conservation in the Sierra Nevada. The first SNRI graduate fellow for 2007 was Susan Roberts, a Ph.D. candidate at UC Davis who is studying the effects of prescribed fire on the California spotted owl in Yosemite National Park. (Fig. 2b)

* **Yosemite Leadership Program (YLP) undergraduate summer internship** – Funded by Toyota, the Doherty Fund, Morgan Stanley, the Yosemite Association, and other donors, this internship program provides UC Merced undergraduates with diverse internship opportunities in Yosemite that range from serving as bilingual interpretive rangers and leading tours of the giant sequoia grove to working on the wilderness Search and Rescue (SAR) team. Students are provided housing, uniforms, books, a small stipend, and a $2000 scholarship upon completion. The Wawona Station Director is working with the Yosemite Branch Chief of Education to develop an academic curriculum for the interns that includes: 1) independent student research projects, 2) student-led interpretive programs that communicate about university science to park visitors, and 3) weekly group discussions and research seminars to create a 'learning community.' (Fig. 2c and d).

* **Research Experience for Undergraduates (REU) Program** – Funded by the National Science Foundation for 2008-2010, this program will complement the YLP non-science internships by providing opportunities for undergraduates to conduct independent research projects at the interface of science and natural resource management.

* **Yosemite High School (Oakhurst, CA) AP Environmental Science program** – This partnership with Yosemite High School is funded by the school district and has been supplemented by a $10,000 Toyota Tapestry Grant. The AP Environmental Science class is conducting a long-term fire ecology study to investigate the effects of prescribed fire on forest soil and invertebrates. SNRI and the park fire ecologist assisted with the study design and the research permitting process. The SNRI scientific visualization fellow provided illustrations for all the terrestrial invertebrates that the students collected in 2006-2007. (Fig. 2c)

* **Environmental Science Academy (Merced Union High School District)** – This program is funded by MUHSD. 25-35 high school students come every summer and study a range of topics inside Yosemite. Classes are provided by park scientists and resource managers as well as by UCM SNRI scientists. Already, some of the graduates of the program have gone on to UCM and have returned to Wawona as summer interns and as seasonal park rangers. (Fig. 2d)
EXAMPLES OF SNRI PROGRAMS AT WAWONA

Figure 2 a) Illustration of the impacts of introduced trout to alpine lakes in the Sierra Nevada, by Scientific Visualization Fellow Jennifer Parks. b) Graduate Fellow Susan Roberts is studying the effects of prescribed fire on breeding success of California spotted owls. c) UCM YLP interns. d) Janet Melgoza first visited Yosemite in the Env. Science Academy as a 9th grader. She was a YLP intern in 2006 and a seasonal ranger in 2007. e) Yosemite High School students are conducting a long-term investigation on the effects of prescribed fire on the forest invertebrate community. This project is funded by Toyota.
VII. STATION USE PATTERNS

Station user days from March 2006 to August 2007 totaled 5,038. Total use by year was 2,282 and 2765 for 2006 and 2007 respectively. The annual monthly averages were 228.2 and 344.5 for 2006 and 2007 respectively. Use levels peaked in the summer months, and summer use in 2007 was approximately double that for 2006 (Figure 1). Station users came from the following universities, organizations, and agencies:

**Universities:**
UC Merced
UC Berkeley
UC Davis
UC Santa Cruz
UC San Diego
Humboldt State University
California State University Monterey
San Francisco State University
University of Colorado
Idaho State University
Macquarie University (Australia)
University of Sheffield (UK)
Darmstadt Technical University (Germany).

**Organizations:**
Yosemite Fund
Oakland Museum,
Pacific Ecoinformatics and Computational Ecology Lab

**State and Federal Agencies:**
NASA Ames
US Geological Survey
US Forest Service
National Park Service
California Department of Water Resources
Lawrence Berkeley Laboratory
Australian Antarctic Data Centre

Figure 1. Total SNRI Wawona field station user days per month for the first 1.5 years of operation.
VIII. 2006-2007 ACCOMPLISHMENTS

Facilities:

* Furnished and equipped the office building and detached classroom

* Renovated and furnished two residences
  
  a) Vincent house improvements included: painting the interior, staining the exterior, installing new flooring, installing new counters and sink, installing all new appliances, replacing water heater and furnace, repairing/replacing leaky faucets and toilets, replacing broken light fixtures, and furnishing it completely.

  b) Station director’s residence improvements included: replacing the roof and adding a layer of rigid insulation, painting the exterior and interior, installing new flooring, installing new kitchen counters and sink, installing all new appliances, repairing/replacing leaky faucets and toilets, replacing/repairing broken light fixtures, installing a new central furnace and AC and new water heater, completing renovations to meet the fire codes, and purchasing basic furnishings.

* Negotiated a partnership with the Yosemite Association for access to 3 additional houses (maximum capacity 17 people).

* Negotiated an agreement with UCM Facilities Operations for more efficient and cost effective building management. This agreement is unique among UC field stations and could serve as a model for other campuses.

* Helped create and hire a position for a half-time ‘maintenance coordinator.’ Tim Rumble was hired in July 2007 and has assumed duties that include regular cleaning of the offices and guest houses, fire control clearing around all station buildings and landscaping around the office building as required by our official MOU with Yosemite, minor and emergency repairs, and maintenance of all station buildings.

* Submitted a proposal to the Yosemite Fund in July 2007 for $80,000 to renovate the detached classroom and workshop space. Initiated the process of being accepted for membership in the UC Natural Reserve System to be eligible for 100% state matching funds (from Prop. 84) for any facilities improvement grants awarded.

Administration:

* First Standard Operating Procedures for the Wawona field station

* First emergency procedures for the Wawona field station

* First recharge plan for the Wawona field station

* First purchasing plan for the Wawona field station (i.e., mechanisms to efficiently purchase items from a remote off-campus location)

* SNRI and Wawona field station websites

* Online user application and scheduling system (linked to the UC Natural Reserve System)
* Served as a liaison between UCM and Yosemite National Park and developed good working relations with YNP staff to initiate collaborative projects in research, education, and outreach.

**Science/Conservation:**

The following research projects now use the Wawona field station as a base for part or all of their work:

* Sierra Nevada Adaptive Management Project (SNAMP) – a long-term collaborative project among UC Merced SNRI, UC Berkeley, and the US Forest Service to evaluate the ecological and environmental impacts of fire control thinning practices.

* Sierra Nevada Hydrologic Observatory – a Sierra-wide, UC Merced SNRI-led initiative to improve understanding of the hydrological dynamics that determine much of the water supply for California.

* Effects of Prescribed Fire on Spotted Owls – A joint UC Davis and USGS project to understand how management fires in Yosemite influence the food base and breeding success of the endangered California spotted owl.

* Conservation Ecology of Great Gray Owls – Two projects based out of Humboldt State University and the US Forest Service Pacific Southwest Research Station (USFS PSW) that are trying to protect this endangered species, which breeds in the Wawona area.

* Climate Change and Yosemite Toad decline – A new collaboration among UC Merced SNRI, Yosemite National Park, and the USFS PSW to understand the relative importance of climate and other impacts to the breeding success of Yosemite toads (*Bufo canorus*), a threatened species endemic to the Sierra Nevada.

* Risk Assessment of Packstock Impacts to Wilderness Meadows – A collaboration among UC Merced SNRI, Yosemite National Park, and the USGS to a) develop the first integrated meadow spatial database for Yosemite and b) to develop efficient protocols for monitoring and modeling packstock impacts to wilderness meadows.

**Education/Outreach:**

In close collaboration with the branch chief for education in Yosemite, the Wawona field station is running and/or facilitating the following educational activities. Long-term programs that are supported by SNRI are marked with ‘**’.

**K-12:**

** Yosemite High School (Oakhurst): see “Description of current programs.”

** Environmental Science Academy (Merced UHSD): see “Description of current programs.”

* UCM Admissions: The UC Admissions program for developing relations with high schools and colleges is bringing high school and community college counselors to SNRI Wawona field station to encourage minority student recruitment to UCM. The Wawona field station and YLP internship are used as ‘poster children’ for UCM to illustrate the unique educational opportunities available at UCM.

* UCM Center for Educational Partnerships: this UCM program works with approximately 28 high schools in the Central Valley and provides students with ongoing academic advising to
ensure that they successfully complete the required college prep courses. This program is now collaborating with SNRI Wawona field station to bring these students to Yosemite for environmental education programs and to expose the students to the unique opportunities offered by UCM.

* ARC – SNRI Wawona field station is working with the Adventure, Risk, Challenge Summer Literacy and Leadership program at the UC Berkeley Sagehen Creek Field Station to develop a parallel summer program in Yosemite. ARC combines an intensive literacy program with outdoor education for teenagers who are English language learners to help prepare them for college. http://sagehen.ucnrs.org/arc/

** Undergraduate:**

** Yosemite Leadership Program Summer Internship in Yosemite: see “Description of current programs.”

* UC AGEP and BA STAR Programs – UC Alliance for Graduate Education and the Professorate, and the Basic and Advanced Science and Technology Academics of Research programs are using the SNRI Wawona field station as part of their summer program to increase the recruitment of minority students into graduate programs in science.

* NASA DEVELOP Program – DEVELOP is a NASA Science Mission Directorate Applied Sciences Program that fosters human capital development to extend NASA science research to local communities. Students demonstrate to community leaders prototype applications of NASA science measurements and predictions addressing local policy issues. The activities are student led, with advisors and mentors from NASA and other partner organizations. One DEVELOP project is using the SNRI Wawona field station as a base to conduct student-led research in remote sensing applications to monitoring ecological change in Yosemite.

* UCM courses that used the SNRI Wawona field station in 2006-07: Environmental Writing (Jan Goggans), Mountain Hydrology (Roger Bales), Ecosystems of California (Jessica Green).


** Graduate:**

* SNRI Graduate Fellowship – Susan Roberts – UC Davis Graduate Program in Ecology and USGS Field Station in Yosemite.

* SNRI Scientific Visualization Fellowship – Jennifer Parks – UC Santa Cruz Graduate Program in Scientific Illustration

* Sarah Martin – UCM Ph.D. student – Sierra Nevada Adaptive Management Project (SNAMP)

** Art:**

* Earthdance Environmental Film Festival – SNRI Wawona field station facilitated a screening in Yosemite of this “Short-Attention-Span” Environmental Film Festival, curated by the Oakland Museum of California. http://earthdancefilms.com/
* Oakland Museum “Experience Science” Program – SNRI Wawona field station served as a base for this environmental science program for Oakland high school students. The students create environmental art inspired by their outdoor experiences.

* Yosemite Renaissance Artist-in-Residence partnership – SNRI Wawona field station has established a partnership with the Yosemite Renaissance program to encourage recruitment of artists who are interested in collaborating with scientists. YR artists in residence will now be based in Wawona in part to encourage interaction with SNRI scientists and students.  
http://www.yosemiterenaissance.org/index.html

* Dandelion Dance Theater – Dandelion is a post-modern dance group based in San Francisco that used SNRI Wawona field station as a base for an environmental dance workshop.  
http://www.dandeliondancetheater.org/

**Proposals Submitted:**


* Science Education Center Renovation. Submitted to The Yosemite Fund. July 2006. Collaborative proposal with Yosemite Interpretation and Education Division. $350,000. (declined)

* Historic Rehabilitation of the SNRI Wawona Field Station Classroom. Submitted to The Yosemite Fund. July 2007. Collaborative proposal with both the Resource Management and Science and the Interpretation and Education Divisions of Yosemite. $80,000. (in review.)

* Climate Change and Yosemite Toad Decline. Submitted to The Yosemite Fund. July 2007. $200,000. Collaborative proposal with the Yosemite Resource Management and Science Division. (in review.)
IX. HIGH PRIORITY NEEDS

Facilities Needs:

The primary limitation to developing a more vibrant and integrated research and education program at the SNRI Wawona field station is limited housing and office space. The demand for space already greatly exceeds our capacity. In particular, it is critical that we have the capacity to accommodate a critical mass of undergraduate students, graduate students, and researchers at the same time in order to create a vibrant interactive community and to facilitate interdisciplinary links. Two essential improvements that would help alleviate this problem are to renovate the Livingston house and the detached classroom/workshop. Additionally, now that ATT is providing DSL service to Wawona, it is worth considering establishing internet access at the guest houses to alleviate pressure on the office space for internet use.

* Livingston house high priority needs:
  * Asbestos abatement
  * Repair leaking roof
  * Install sprinkler system (or do other renovations to meet fire code)
  * Repair/Replace all leaking faucets and toilets
  * Make main floor bathroom ADA accessible
  * Install new flooring
  * Renovate downstairs into student dorm
  * Purchase/install kitchen appliances (minor renovation to fit larger stove)
  * Furnish entire house

*Detached classroom/workshop high priority needs:
  * remove fake room, create open shop/storage room, add shelving for shop room
  * purchase/install wall heater for shop room
  * remove fake ceiling in classroom
  * install new flooring
  * blow in insulation into existing exterior walls
  * replace roofing and add layer of rigid insulation
  * repair leaky foundation
  * paint exterior
  * purchase/install new lighting fixtures
  * paint interior and exterior
  * blow in insulation
  * replace old leaky windows
  * purchase/install ceiling fans in main room
  * install fire alarms, extinguishers
  * repair/replace doors and locks
  * build ramp for ADA access
  * furnish classroom and shop room

Programmatic Needs:

While there are clear obstacles to conducting experimental studies in Yosemite National Park, there are enormous opportunities for investigating large-scale questions using remote sensing, GIS, data synthesis, observational field sampling. To best facilitate and encourage this kind of research, and for the SNRI Wawona field station to serve as a spatial data clearinghouse, it is essential that we establish a Center for Ecological Informatics. This center would include a high quality GIS and remote sensing workstation that would provide local access to high quality spatial data and imagery, as well as cutting-edge data
mining, analysis, and visualization tools. In the long run, the success of this center would depend on funding at least a part-time eco-informatics specialist who would excel not just in data management, but also in data synthesis, spatial statistics, data mining, and data visualization. It is essential that we begin discussions about how best to fund such a position. This will ensure that the SNRI will stand out as a leader in data integration and analysis in addressing critical large scale environmental questions related to the Sierra Nevada region.

Administrative Needs:

We submitted a recharge proposal to UCM in May, 2007, but have not yet been approved to receive recharge income from station users. Since our current operating budget will be absorbed entirely by Facilities Management for building maintenance, repairs, and operations, we must be able to generate recharge income to fund programmatic developments at the Wawona field station.